BY ORDER OF THE SECRETARIES OF THE AIR FORCE, THE ARMY, THE NAVY, THE MARINE CORPS, THE DEFENSE LOGISTICS AGENCY, AND THE DEFENSE CONTRACT MANAGEMENT AGENCY

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PREPARING HAZARDOUS MATERIALS FOR MILITARY AIR SHIPMENTS

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This manual implements AFPD 24-2, *Preparation and Movement of Air Force Material*. It provides guidance and procedures for preparing hazardous materials for shipment by military aircraft to ensure that such materials are packaged, marked, labeled, and prepared properly for transportation. This manual includes the shipment of nuclear materials, except for nuclear weapon major assemblies and nuclear components packaged and shipped per Department of Energy-Defense Nuclear Agency (DOE-DNA) TP 45-51 and its supplements. It includes labeling requirements, instructions for transporting passengers with hazardous materials and instructions for notifying the aircraft commander regarding hazardous materials on the aircraft. It implements Department of Defense (DoD) Regulation 4500.9-R, *Defense Transportation Regulation (Parts II and III)* and Department of Transportation (DOT) Exemptions 7573 and 9232 (DOT-E 7573 and DOT-E 9232) for commercial aircraft under contract to the Air Mobility Command (AMC). The use of a name of any specific manufacturer, commercial product, commodity or service in this publication does not imply endorsement by the military services.** **Penalties and Disciplinary Action.** Failure to observe prohibitions and mandatory provisions of this manual by military personnel is a violation of Article 92, Uniform Code of Military Justice (UCMJ). Violations by civilian employees may result in administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions for violations of related laws. See **Attachment 1** and **Attachment 2** for terms, abbreviations, and acronyms used in this manual.

SUMMARY OF REVISIONS

This revision incorporates applicable changes to the Department of Transportation (DOT) Title 49 Code of Federal Regulations (CFR) and the International Civil Aviation Organization (ICAO) Technical Instructions. This revision amends policy statements (**Chapter 1**-**Chapter 3**), hazard classification and communication information (**Attachment 4**), and packaging requirements (**Attachment 5**-**Attachment 13**). Other major changes include the addition of a new label to indicate air eligibility. Paragraphs that have been changed are preceded with a "|". This manual reorganizes text to comply with Air Force Manual format and changes many procedures. These changes clarify requirements and further standardize DoD packaging and shipping with the commercial sector.

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Chapter 1

GENERAL GUIDANCE

1.1. Applicability. Handlers, packers, inspectors, and preparers (certifiers) of hazardous materials shall comply with rules designed to maximize safety and security of the aircraft, aircrew, cargo and passengers. They must know the exceptions, exemptions, and waivers to federal laws and related government directives that are unique to military airlift operations and how to apply them.

1.1.1. This manual governs the transport of hazardous material when entered into the Defense Transportation System (DTS) as cargo on military controlled fixed and rotary wing aircraft according to DoD 4500.9R, Defense Transportation Regulation. Apply the requirements specified in this manual unless modified or updated according to **1.2.1.**

1.1.2. Hazardous materials required as operational equipment of the aircraft for ground/air servicing as identified in applicable aircraft flight publications are not regulated by this manual.

1.1.3. The provisions of this manual are directive in nature, and must be complied with by those personnel whose positions or jobs entail responsibility for the functions covered.

1.1.4. Ensure compliance with current applicable DOT and EPA requirements when transporting hazardous materials outside of the Defense Transportation System. Hazardous waste shipments entering or exiting a domestic location must comply with 40 CFR Parts 260-265, including preparation of a hazardous waste manifest. Hazardous waste shipments originating and terminating at OCONUS locations must comply with applicable local regulations as appropriate. If local regulations do not exist, comply with 40 CFR Parts 260-265.

1.2. Responsibilities Assigned.

1.2.1. **Office of Primary Responsibility (OPR)** will publish emergency changes of an operational or technical nature that do not change policies or major procedures without service coordination. Coordinate all policy changes with Service focal points. Issue hazardous cargo information, clarifications, updates, procedural and policy changes to Air Force activities and Service focal points. Focal points retransmit changes to their respective service or agency shippers.

1.2.2. **Service Focal Points** jointly establish procedures and prepare any documentation necessary to implement this manual. Users contact their Service focal points for all clarifications and waivers. Service focal points are:

1.2.2.1. **Air Force.** AFMC LSO/LOT, 5215 Thurlow Road, Suite 5, Wright-Patterson AFB, OH 45433-5540, (937) 257-4503/1984, DSN: 787-4503/1984.

1.2.2.2. **Army.** US Army Material Command, Logistics Support Activity, Packaging, Storage, and Containerization Center, ATTN: AMXLS-TP, 11 Hap Arnold Blvd, Tobyhanna PA 18466-5097, (570) 895-6622/7070, DSN: 795-6622/7070.

1.2.2.3. **Navy.** Commander, Naval Inventory Control Point, Code 0772.30, P.O. Box 2020, 5450 Carlisle Pike, Mechanicsburg, PA 17055-0788, (717) 605-2784, DSN: 430-2784.

1.2.2.4. **Marine Corps.** Commandant of Marine Corps (LPC-2), Headquarters, U.S. Marine Corps, 2 Navy Annex, Washington, DC 20380-1775, (703) 695-8947, DSN: 225-8947.

1.2.2.5. **Defense Logistics Agency.** Defense Logistics Agency, Attn: J3731, 8725 John J. Kingman Road, Suite 4330, Fort Belvoir VA 22060-6221, (703) 767-6582, DSN: 427-6582.

1.2.2.6. **Defense Contract Management Agency.** Defense Contract Management Agency, ATTN: DCMA-OCT, 6350 Walker Lane-Ste 300, Alexandria, VA 22310-3241, (703) 428-0957.

1.2.3. **Packers** package hazardous materials, but do not sign legally binding documents.

1.2.4. **Preparers** certify that hazardous materials are properly classified, described, packaged, marked and labeled, and in proper condition for military airlift according to the applicable regulations of the Department of Transportation and this manual. Preparers include Technical Specialists. These individuals are qualified based on their training in handling and preparing the hazardous material in the performance of their duties.

1.2.5. **Handlers** maintain safe operations when transporting hazardous materials and proficiency in job specific responsibilities. Handlers include warehouse workers, load planners, load selectors, special handling personnel, and aircraft load teams.

1.2.6. **Inspectors** ensure hazardous materials are properly prepared and documented before entering into the military airlift system (see **Attachment 28**).

1.2.7. **Installation or Activity Commanders (or their designated representatives).**

1.2.7.1. Train personnel according to paragraph **1.3.**

1.2.7.2. Appoint preparers as certifying officials to complete the Shipper's Declaration for Dangerous Goods Certification. This authorization must include the scope of the individual's authority and qualified training according to **Attachment 25**. Document the authorization in writing, electronically, or other auditable method.

1.2.8. **Contracting Officers.** Ensure all DoD contracts and purchase requests for hazardous materials include the provisions of the supplement to the Federal Acquisition Regulation (FAR), Paragraph 52.228-7007 (Safety, Ammunition, and Explosives). Contractors get copies of specifications, standards, and publications from the procuring agency or as directed by the contracting officer.

1.2.9. **Air terminal or base operations personnel.** Notify the aircraft commander (or designated representative), in writing, of all hazardous materials aboard the aircraft. The activity responsible for delivering the cargo to the aircraft provides this notification in the absence of an established air terminal or base operation. The briefing agency must meet the requirements of **Attachment 21**.

1.3. Hazardous Material Training Requirements. Commanders assign hazardous material workers and ensure each successfully completes relevant training. Train hazardous material workers according to **Attachment 25**. Training for all levels of hazardous material workers who may effect the safety of hazardous materials in transportation, as a minimum, must address the following areas:

1.3.1. Hazardous material general awareness and familiarization.

1.3.2. Safety procedures to include emergency response.

1.3.3. Function specific responsibilities directly relevant to the individual's role in hazardous material transportation.

1.4. Special Assignment Airlift Missions (SAAM). Process SAAM requests, cargo clearance, and appropriate confirmations according to DoD 4500.9-R, Defense Transportation Regulation. Unless specifically exempted under the provisions of paragraph **2.3.**, properly prepare, package, mark, label, and document all hazardous materials transported by SAAM aircraft according to this manual. Do not automatically apply the provisions of **Chapter 3** for use of SAAM aircraft. Refer to paragraph **3.2.** for validation and use of SAAMs for tactical, contingency, or emergency operations.

1.5. Transportability Design Criteria. Configure hazardous materials (items and articles) to ensure transportability on military aircraft. Items in their shipping configuration and skidded or wheeled equipment must meet the transportability design criteria identified in MIL-STD-1791, *Designing for Internal Aerial Delivery in Fixed Wing Aircraft.*

1.6. General Packaging Requirements. Package hazardous materials in containers authorized by this manual, Title 49 *Code of Federal Regulations* (CFR) Part 173, the *International Civil Aviation Organization* (ICAO) *Technical Instructions*, or the *International Air Transport Association* (IATA) *Dangerous Goods Regulation*. **Attachment 3** applies to all military air shipments. See paragraph **A17.1.2.** for certification instructions.

1.7. United Nations (UN) Performance Specification Packaging. Prepare hazardous materials in UN specification containers unless exempted by a specific packaging paragraph in this manual. DoD activities use the DoD POP Program to locate tested and authorized DoD packaging configurations. If the hazardous material is procured in a manufacturer's UN specification container, use that container. Ensure compliance with all other requirements of this manual, including air-eligibility. If the managing activity has specified a container Special Packaging Instruction (SPI), use that UN specification container. Frustrate hazardous cargo not correctly packaged and marked to UN specification requirements. For additional information concerning UN specification packaging or performance test requirements see DLAD 4145.41/AR 700-143/AFJI 24-210/NAVSUPINST 4030.55/MCO 4030.40A, *Packaging of Hazardous Material.* Service focal points are unable to waive UN specification requirements.

1.7.1. **Exempt Items.** The following materials are exempt from UN performance specification packaging test requirements. The packaging paragraph from **Table A4.1.** will specify required packaging.

– Compressed gas cylinders

– Radioactive material

– Dry ice

– Magnetized material

– Life-saving appliances

– Mercury contained in manufactured articles

– Packages whose net mass exceeds 400 kg (882 pounds) or with a capacity exceeding 450 liters (119 gallons)

1.7.2. **Grandfathered Items.** Government-owned explosives (Class 1) packaged before January 1990 are exempt from UN specification requirements. Ship these items under the packaging requirements in effect at the time of packaging. Annotate the shipping papers "Government-owned goods packaged before 1 January 1990." See **Attachment 17** for certification instructions.

1.8. Fueled Vehicles and Equipment. Limit quantity of fuel within a vehicle or wheeled support equipment to a minimum. Do not exceed the maximum fuel in tank limits specified in **Attachment 13**. Commanders must consider availability of fuel at the destination and operational requirements for mission readiness when determining fuel levels and ship with less than the maximum allowable amount when applicable. The preparer (certifying official) must ensure any unnecessary fuel is drained prior to shipment.

1.9. Damaged or Improper Shipments. Do not transport any damaged, leaking, or improperly packed, marked, or labeled item or material.

1.9.1. Return shipments to the originator, at the originator's expense, when a shipment requiring UN specification containers is not packaged properly. The originating activity may provide the shipper with the appropriate UN specification marking to correct the shipment. Consider urgency of need when determining the best method for correcting a deficient shipment. Ensure compliance with applicable modal regulations when offering any shipment for transportation.

1.9.2. Report deficiencies on SF 361, **Transportation Discrepancy Report,** or SF 364, **Supply Discrepancy Report** (or equivalent reporting means as designated by the Service Focal Points and coordinated with AFMC LSO/LOT). Report leaks from packages, equipment, and self-propelled vehicles during loading or unloading, or in flight as a packaging deficiency.

1.9.3. Immediately report any release of a hazardous substance in a quantity equal or greater than its reportable quantity to the Environmental Protection Agency (EPA) by calling the US Coast Guard National Response Center at 800-424-8802 or 202-267-2675.

1.9.4. Consult local installation operating procedures for hazardous material emergency planning, response, and reporting requirements in the event of an incident involving hazardous materials.

1.9.5. Do not move dropped or damaged explosive items. The Transportation or Packaging Office will immediately contact Explosive Ordnance Disposal (EOD), safety or munitions personnel to determine disposition.

1.10. Empty Containers, Cylinders, Radioactive Packages and Nonhazardous Materials. Except as specified in this paragraph, empty containers or articles are not subject to any other requirements of this manual.

1.10.1. **Empty Containers.** Inspect packages that formerly contained a hazardous material covered by this manual to determine the presence or absence of hazardous material. If there is presence of hazardous material, purge the hazardous material or the package is regulated in the same manner as prescribed for the package when it was full. A container is considered empty if:

1.10.1.1. A hazardous article has been removed from its container and there is no possibility of remaining residue (i.e., empty torpedo or missile containers).

1.10.1.2. If the container has been purged of the hazardous material it previously contained.

1.10.2. **Empty Cylinders.** Compressed gas cylinders are empty if the pressure in the cylinder is less than 40 pounds per square inch absolute (psia) at 21 degrees C (70 degrees F). Psia equals the gauge pressure plus atmospheric pressure (14.7 psi).

1.10.2.1. Before shipment, inspect empty cylinders for dents, bulges, oxidation pits, or other damage. Handle faulty cylinders as required by the latest DOT regulations or DLAI 4145.25/AR

700-68/NAVSUPINST 4440.128D/MCO 10330.2D/AFJMAN 23-227(I), *Storage and Handling of Liquified and Gaseous Compressed Gasses and Their Full and Empty Cylinders.*

1.10.2.2. Tightly close valves of cylinders before offering for transportation. The requirements of **A3.3.2.2.** apply to the protection of the valves.

1.10.2.3. If the cylinder contains residue of the following material, ship regulated as full cylinders, regardless of psia, unless completely cleaned and purged of residue or vapors:

– Ammonia, Anhydrous

– Division 2.2 with a subsidiary risk (other than division 5.1)

– Contains a flammable or poisonous material

1.10.3. **Empty Radioactive Material Packaging.** Empty the contents of the packaging as far as practical and ensure:

1.10.3.1. The requirements of **A11.11.** are met.

1.10.3.2. The packaging is in unimpaired condition and is securely closed so that there will be no leakage of radioactive material under normal transportation conditions.

1.10.3.3. Internal contamination is not over 100 times the limits specified in **A3.3.7.11.**

1.10.3.4. The packaging is prepared for shipment according to the requirements of **A11.12.**

1.10.4. **Identifying Nonregulated Material, Containers or Cylinders.** An item listed in **Table A4.1.** may not be regulated because it does not meet the definition of the hazard class. This includes containers or articles defined as empty according to this paragraph. In this situation, when the item is determined to be nonregulated, the shipper must alert the carrier by:

1.10.4.1. Annotating "NONHAZARDOUS" in the address block of the Military Shipment Label (MSL). In the absence of the MSL, the shipper will use an equivalent means of notification.

1.10.4.2. Ship the item as general cargo and a Shipper's Declaration for Dangerous Goods form is not required.

1.10.4.3. Apply an "EMPTY" label according to **Attachment 15**, when applicable. A label is not required for equipment or articles unless packaged, crated, or otherwise enclosed to prevent ready identification.

1.10.4.4. The "NONHAZARDOUS" entry on the MSL and the use of an "EMPTY" label is not required when the hazardous contents are completely removed from the container and there is no possibility of remaining residue, and the hazard communication markings and labels are removed or covered.

1.11. Stowing Hazardous Materials.

1.11.1. Ensure hazardous materials are compatible (**Attachment 18**) when stored in transit.

1.11.2. Ensure hazardous materials are accessible in flight.

1.11.3. Ensure hazard markings and warning labels are visible to aircrew and unloading personnel.

1.11.4. Do not stow hazardous materials susceptible to leaking on the same aircraft pallet with foodstuff, feed, or any other edible material intended for consumption by humans or animals (see para-

graph 3.6.3.). Solid material, such as explosive articles, may be loaded on the same aircraft pallet with foodstuffs based on operational requirements.

1.12. Protective Equipment. The aircraft operator will ensure appropriate equipment is available to protect aircrew and passengers when transporting materials whose vapors are toxic, irritating or corrosive. Aircraft must have a closed oxygen system or protective mask for each person aboard. The shipper will provide any required special equipment to meet unique cargo safety requirements. It is the shipper's responsibility, based on intimate knowledge of the material, to determine necessary required protective equipment. While the exact equipment required depends on the materials being transported, following are the recommended minimum (or equivalent substitutions):

–Two pairs of rubber gloves.

–One pair of protective gloves.

–One plastic or rubber apron.

–A five-pound (2.3 kg) package of incombustible absorbent material.

–Three large plastic bags (4-mil thick, as a minimum).

–One oxygen or protective mask for each person.

1.12.1. The base must ensure availability of protective equipment to cope with ground emergencies involving the cargo during loading operations. Coordinate respiratory and other personal protection requirements with the medical service.

1.13. Unitized, Palletized, Overpacked, or Containerized Loads. Shippers must ensure aerial ports can handle loads. Ensure load configurations are:

1.13.1. As stable as a single container. Items within containerized units will be secured in a manner to prevent damage or breakage during transportation. Consider both horizontal and vertical movement when securing the load.

1.13.2. Individually packaged as prescribed by **Table A4.1.** The containerization unit (e.g., ISU, CONEX, MILVAN, etc.) is for ease of handling, it is not considered the outer package for any item stowed inside.

1.13.3. Individually marked, labeled, and certified to the requirements of this manual and MIL-STD-129.

1.13.4. Designed to provide installed equipment in approved holders meeting airlift restraint criteria.

1.13.5. Compatible as required by **Attachment 18**.

1.13.6. Developed not using fiberboard or plywood sideboards unless specifically required by this manual.

1.13.7. Marked and labeled on the outer most containers (overpack, bin, consolidation container, etc.) according to **Attachment 14** and **Attachment 15**. A marking board may be used for required markings/labels in lieu of applying directly to a containerized unit (see **A14.3.12.**).

1.13.8. The requirements of this paragraph apply to Mobility Readiness Spares Package (MRSP).

1.13.9. **Accessibility.** Do not ship hazardous material in containerization units (MILVANs, CONEXs, ISUs, etc.) that are not easily accessible to the aircrew during flight. Physically stow hazardous materials next to the container opening and position to allow access while on the aircraft. The aircrew must have visual and physical access to all hazardous materials to mitigate any hazard posed by an in-flight incident. If there is evidence of a leak, the crew-member can locate the hazard, determine the extent of the risk, and take appropriate action to get under control or declare an in-flight emergency. Ensure air transportation personnel have access to the contents for inspection. Provide a key to unescorted, locked containers to the aircraft commander or designated representative. Ship only the following hazardous materials in inaccessible containers or tactical shelters:

1.13.9.1. Recompression vans, support vans, and shelters used by the Underwater Construction Team. Hazardous items inside these escorted containers have been identified to and approved for shipment by AFMC LSO/LOT.

1.13.9.2. Fire extinguishers secured in appropriate holders or brackets, or properly packaged according to this manual.

1.13.9.3. Vehicles, support equipment, or other mechanical apparatus. Completely drain (residual fuel not to exceed 17 oz) items fueled by a flammable liquid with a flash point at or above 38 degrees C (100 degrees F). Tightly seal fuel lines and tank to prevent residual fuel leaks. Drain and purge items fueled by a flammable liquid with a flash point below 38 degrees C (100 degrees F). Installed batteries must be nonspillable type and secured upright.

1.13.9.4. Items shipped under the PSN "Life Saving Appliances" and packaged according to this manual.

1.13.9.5. Air conditioners and environmental control units, magnetic material, radioactive material, and thermometers.

1.13.9.6. Class/division 1.4S explosives packaged according to this manual.

1.13.9.7. Non-flammable gases or non-flammable aerosols prepared according to this manual and packed in strong outer containers.

1.13.9.8. "Consumer Commodities" not containing a liquid or a flammable gas.

1.14. Procedures for Airdropping Hazardous Materials. Prepare airdrop loads according to the TO 13C7/FM 10-500 series. Prepare, mark, label, certify, and accept airdrop hazardous cargo the same as air landed cargo.

1.15. Nuclear Weapons Material. Use the detailed information and procedures for preparing nuclear weapons material in DOE-DNA TP 45-51/Army TM 39-45-51/Navy SWOP 45-51/Air Force TO 11N-45-51, *Transportation of Nuclear Weapons Material* (including supplements). This document provides a chart indicating the air shipment compatibility of nuclear material with nonnuclear explosives and hazardous materials. Also, determine the inter-compatibility of explosives and hazardous materials according to **Attachment 18**. Packaging and handling of nuclear material not specifically outlined in the above document must meet the requirements of this manual.

1.16. Air Standardization Coordinating Committee (ASCC) Air Standards. Member nations (Australia, Canada, New Zealand, United Kingdom, and United States) agree in Air Standards 44/9 to accept the categorization and authorization by participating nations of explosives, radioactive materials, and dan-

gerous cargo for onward carriage in their own military aircraft. Label shipments according to the ICAO, IATA, or by nationally approved labels. Certify the shipment meets all requirements for air transport.

1.17. NATO STANAG 3854, Policies and Procedures Governing the Air Transportation of Dangerous Cargo. Participating nations agree to apply the United Nations International System for the Classification of Dangerous Cargo for air transportation. This includes the labeling (supplemented where necessary by ICAO or IATA labels) and certification. National regulations are still the authority for preparing, packing, aircraft stowing, and restraining dangerous cargo. Apply the national handling regulations of the carrier when transferring dangerous cargo from one nation to another for onward carriage.

NOTE: Paragraphs **1.16.** and **1.17.** are subject to international military standardization agreements. Do not make changes or deviations without authorization as prescribed in AFI 60-103 or NAVAIR Instruction 5711.1.

1.18. Mail Shipments. Shipment of hazardous material by mail is not permitted on military aircraft.

Chapter 2

DEVIATIONS, WAIVERS, AND SPECIAL REQUIREMENTS

2.1. Deviations and Waivers. Deviations and waivers are a departure from established procedures in this manual.

2.2. Passenger Movement Deviations. Do not transport passengers with hazardous materials coded as cargo aircraft only in **Table A4.1.**, column 7 and **Table A4.2.** Passenger Eligibility "P" Codes. See **Attachment 22** for deviation authority, additional passenger information, and supplemental oxygen requirements.

2.3. Packaging and Compatibility Waivers. Waivers are exceptions to the packaging or compatibility requirements of this manual. Safety and risk management of airlift assets are the overriding factors for waiver consideration. Ease of operation, convenience, or program office preference are not reasons for waiver. Service focal points will not issue waivers if surface transportation is reasonably available.

2.3.1. **Packaging Waivers.** The shipper must obtain a waiver for any hazardous item or packaging not authorized in **Attachment 5** through **Attachment 13** Submit waiver requests to your Service focal point (see paragraph **1.2.2.**) by letter, message, or telephone. Confirm waivers requested by telephone with a letter or message. Ensure receipt of the letter or message prior to issuing the waiver. A copy of the waiver must accompany the shipment. The DoD does not have authority to issue packaging waivers to UN specification requirements. Do not jeopardize safety for convenience or ease of operation. To obtain a waiver, the shipper must:

2.3.1.1. Provide a detailed description of the package, including pertinent test data.

2.3.1.2. Provide the PSN, hazard class, identification number, packing group, and net quantity of the material.

2.3.1.3. Provide a detailed explanation why the established requirements can not be met.

2.3.1.4. Provide a transportation analysis identifying why surface transportation can not be effectively utilized.

2.3.2. **Compatibility Waivers for Military Aircraft.** A waiver is required when hazardous materials are not compatible according to **Table A18.1.** and/or **Table A18.2.** are shipped aboard the same military aircraft (see **A18.4.** for exceptions).

2.3.2.1. Shippers submit waiver requests to their Service focal point (see paragraph **1.2.2.**) for approval. For Air Force aircraft, the major command (MAJCOM) having operational control of the aircraft during the mission will be the waiver approval authority. Each service or MAJCOM will establish policy and procedures for approving compatibility waiver requests. Air Force approval authorities:

– HQ AMC/SEW, (618) 229-0950, DSN 779-0950 (Class 1 only)

– HQ AMC/A43C (618) 229-4260, DSN 779-4260 (Non-Class 1 only)

– HQ PACAF, COMM (808) 449-3594, DSN 315-449-3594

– HQ USAFE AMOCC/XOLP, 011-49-6371-7166, DSN (314) 480-7166 (P4/P5 Local ATOC)

– HQ ANG, (301) 836-7167, DSN 278-7167

– HQ AFRC, (478) 327-1718, DSN 497-1718

2.3.2.2. Waiver requests must contain the following information in **2.3.2.2.1.** through **2.3.2.2.6.**:

2.3.2.2.1. Reason incompatible materials require shipment together.

2.3.2.2.2. Reason for air movement and why other transportation modes cannot be utilized.

2.3.2.2.3. Statement that if one item detonates or leaks, incompatible items (in the same container or on the same aircraft) will not cause a propagation detonation, fire, corrosive effect, or contamination of the aircraft. Provide a brief description (include tests, if performed) which support your safety conclusions. Also, provide any additional safety controls the carrier must exercise.

2.3.2.2.4. Provide intended date of movement, routing, and type of airlift required.

2.3.2.2.5. Provide national stock numbers; model numbers of explosive items; PSNs; hazard classes; identification numbers; quantity or net explosive weight (individual and total as applicable); and packaging paragraphs.

2.3.2.2.6. Provide points of contact at origin and destination bases.

2.3.3. **Compatibility Waivers for AMC-Contracted (Commercial) Aircraft.** Do not move incompatible items by AMC-contracted aircraft unless authorized by a DOT exemption. If an emergency situation exists to airlift incompatible items by AMC-contracted aircraft, provide the information required by paragraph **2.3.2.** to HQ AMC/A43C/SEW who will request an exemption from the DOT if warranted.

2.3.4. **Operational Necessity Waivers.** Variations to the requirements of this manual are authorized for a specific mission when strategic and compelling reasons exist. The Service/MAJCOM having operational control of the aircraft must approve the operating procedures for specific missions. USTRANSCOM approves operating procedures for overall program management of strategic lift assets operated by HQ AMC. This paragraph applies to the following conditions:

2.3.4.1. Recovery of downed aircraft.

2.3.4.2. Emergency rescue operations.

2.3.4.3. Movement of portable generators to support critical and key functions where power has been disrupted.

2.3.4.4. Movement of fueled support equipment (SE) to replace inoperative equipment supporting an ongoing mobility exercise or operational plan. Equipment may be transported with fuel not to exceed one-half tank.

2.3.4.5. Shipments in accordance with the requirements of AFI 11-289, *Phoenix Banner, Phoenix Silver, and Copper Operations.*

2.3.5. **Intelligence or Criminal Investigations.** Variations to the requirements of this manual are authorized for airlift of hazardous materials involved in intelligence or criminal investigations. Qualified personnel of those agencies responsible for the cargo must certify that all safety precautions have been taken to transport the materials safely. The shipper must ensure compliance with as many requirements of this manual as possible. This authorization is valid only for movement out of an austere environment. At the first secure in-route airfield, the cargo must be prepared according to this manual or paragraph **2.3.1.**

2.4. DOT Exemptions. A DOT exemption is authority to deviate from the requirements of 49 CFR 100-199. Use exemptions as authority for shipment by military air, if applicable. Follow all requirements of the exemption.

2.4.1. The shipping activity must provide a copy of the exemption for each shipment. If the approval date on the exemption has expired, but a renewal has been applied for, enter, "Renewal Requested, Current Exemption Still Valid". Place this statement on the exemption after verifying renewal request with the Service Focal Point.

2.4.2. The exemption must accompany the cargo in the Defense Transportation System.

2.4.3. Maintain a copy of the exemption at each facility where it is used in connection with the transportation of the hazardous material.

2.4.4. Do not use DOT packaging exemptions for international shipments unless the item is exempted from UN specification requirements (see **1.7.1.**).

2.4.5. Forward requests for new exemptions or copies of existing exemptions according to the DTR, Volume II.

2.5. Competent Authority Approvals (CAA). A CAA is an approval issued by a national agency responsible under its national law for the regulation of hazardous materials transportation. These may also be referred to as “Special Approvals.” The U.S. Competent Authority is the U.S. Department of Transportation (DOT). CAAs are used for both domestic and international shipment.

2.5.1. **Packaging CAAs.** A CAA may be issued for packaging or other transportation requirements when specified by the responsible national agency for the originating shipment. These include CAAs issued by the U.S. Competent Authority and foreign agencies.

2.5.1.1. Use the CAA as authority for military air shipment.

2.5.1.2. Follow all requirements of the approval.

2.5.1.3. The shipping activity must provide a copy of the CAA for each shipment.

2.5.1.4. The CAA must accompany the cargo in the Defense Transportation System (attach copy to the Shipper's Declaration for Dangerous Goods).

2.5.1.5. Request copies of existing CAAs according to the DTR, Volume II.

2.5.2. **Explosive Hazard Classification CAAs/Approvals.** The DOT may also issue explosive hazard classification approvals. These may also be referred to as CAAs. See paragraph **A3.3.1.2.** for applicability of DOT and foreign nation issued explosive classification approvals for military air shipments. If packaging requirements are included as part of a DOT explosive hazard classification approval, use the CAA as authority for air shipment. If there is no approval number assigned to the CAA, the shipping activity will certify the shipment to **A5.6.** and attach a copy of the approval document to the Shipper's Declaration of Dangerous Goods (see **A17.4.1.**). Explosive hazard classification approvals without packaging instructions cannot be used as a certification reference.

2.5.3. **Requests for CAAs.** Follow the procedures outlined in DLAD 4145.41/AR 700-143/AFJI 24-210/NAVSUPINST 4030.55/MCO 4030.40A, *Packaging of Hazardous Material*, to request a CAA from the U.S. Competent Authority.

2.6. DoD Certification of Equivalency (COE). A COE is a certification that the proposed packaging equals or exceeds the requirements of 49 CFR 100-199. Use COEs as authority for shipment by military air, if applicable. Follow all requirements of the approval.

2.6.1. The shipping activity must provide a copy of the COE for each shipment.

2.6.2. The COE must accompany the cargo in the Defense Transportation System.

2.6.3. Do not use COEs for international shipments unless the item is exempted from UN specification requirements (see **1.7.1.**).

2.6.4. Forward requests for new COEs according to the DTR, Volume II. Request copies of existing COEs according to **1.2.2.**

2.6.5. COE issuing officials, as identified in the DTR, Volume II, follow guidance in DLAD 4145.41/AR 700-143/AFJI 24-210/NAVSUPINST 4030.55/MCO 4030.40, *Packaging of Hazardous Material*, for approving COEs. Any COE that approves military airlift of a hazardous material that is forbidden by this manual, either primary or secondary hazard, must be coordinated with the respective Service Focal Point and AFMC LSO/LOT.

2.7. Limited and Excepted Quantities. Use good quality packaging specified in **Attachment 19** to ship small quantities of hazardous materials aboard military aircraft. Personnel may use UN specification packaging even though it's not required.

2.8. Emergency Response Information. Do not offer for transportation, accept for transportation, transfer, store, or otherwise handle hazardous materials unless emergency response information is available at all times. The shipper must provide a 24-hour emergency response telephone number that is monitored at all times by personnel who are knowledgeable of the hazards and characteristics of the materials being shipped. This information is required in the event of an emergency involving the material. Enter the phone number on the manifest (or on the Shipper's Declaration for Dangerous Goods attached to the manifest) immediately following the description of the hazardous material, in a clearly visible location. Enter the phone number only one time if the number applies to each hazardous material on the manifest. Indicate the telephone number is for emergency response information by annotating the words "EMERGENCY

CONTACT," followed by the telephone number (including the area code or international access code). DoD activities use the following telephone numbers:

2.8.1. For Class 1 material, contact The Army Operations Center, (703) 697-0218/0219 (COLLECT), or DSN 227-0218/0219. Ask for the Watch Officer.

2.8.1.1. r radioactive material, contact:

Army: (703) 697-0218 (COLLECT)

Air Force: (202) 767-4011 (COLLECT)

Navy / Marines: (757) 887-4692 (COLLECT), or 1-888-528-0148

DLA: (717) 770-5283 (COLLECT)

2.8.1.2. For all other hazardous materials, contact The DoD Emergency Response Hotline, 1-800-851-8061 (toll free) or 1-804-279-3131.

2.8.2. Shipments originating from non-DoD activities use a company, safety organization, or other contact telephone number applicable to the material shipped.

2.9. Complying With Special Cargo Requirements. Ensure any Inhalation Hazard Zone A material (as identified by Special Provision 1 in **Table A4.1.**, column 7); Class 1, compatibility group K; Fissile Class III Radioactive Materials; infectious substances and biological research materials requiring a technical escort comply with the extensive protective measures outlined in **Attachment 24**.

Chapter 3

TACTICAL, CONTINGENCY, OR EMERGENCY AIRLIFT

3.1. Purpose. Identifies procedural exceptions for movement of hazardous materials under tactical, contingency, or emergency conditions and those airlift movements specified in DoD 4500.9-R, Defense Transportation Regulation, Part III, and implementing Service directives. This chapter does not apply to helicopters being used for insertion or extraction of combat troops to, from, or within a combat area.

3.2. Applicability. This chapter imposes a considerable increase in risk to the aircraft, air crew, and customers. Real world situations may dictate use, but mission validators must evaluate the strategic and compelling reason to increase the risk.

3.2.1. The applicability of this chapter will be indicated in Operating Plans (OPlans).

3.2.2. Ensure this chapter is used for operations that support DoD agencies and allies in providing sustained, immediate, and responsive air movement, and delivery of personnel and material to, within, or from objective areas. Included are Joint Chiefs of Staff (JCS), component, and unilateral mobility exercises designed to simulate and evaluate responsiveness to tactical, contingency, or emergency situations requiring airlift when use is identified in OPlans.

3.2.3. Do not use the provisions of this chapter during redeployments unless mission readiness is affected. Responsibility remains with the MAJCOM having operational control of the deploying unit to justify the applicability of this chapter by indicating the nature of the movement in the airlift request.

3.2.4. Apply these provisions to notional tasking of Standard Air Munitions Package/Standard Tank Rack Adapter and Pylon Package (STAMP/STRAPP) and deployable munitions packages, as directed by HQ AFMC/DRW.

3.2.5. Observe all practical ground and flight rules and brief each aircraft commander (or representative designated by the commander) according to **Attachment 21**.

3.2.6. Refer to Department of Defense (DoD) Regulation 4500.9-R for manifesting requirements.

3.2.7. Do not transport hazardous cargo aboard tactical or strategic aeromedical evacuation aircraft. The field commander may allow the transportation of casualties on aircraft carrying hazardous cargo in extreme circumstances that may result in potential loss of life.

3.2.8. USTRANSCOM Mobility Control Center (MCC) approves the use of provisions of this chapter for airlift missions not identified in the OPlan.

3.3. Use of Commercial Airlift. Use DOT exemption 9232 (DOT-E 9232), as outlined in **Attachment 23**, as required for AMC contracted commercial cargo airlift.

3.4. Packaging Requirements. Comply with UN specification requirements (except when otherwise specified) and the packaging configurations specified in **Attachment 5** through **Attachment 13**. Do not remove hazardous materials from their required packaging except as authorized in this chapter.

3.4.1. **Compliance with Technical Orders.** Comply with all technical orders and technical publications to ensure correct storage of hazardous materials when removed from their packaging and stored in the racks or containers of tactical equipment or vehicles.

3.4.2. **Basic Combat Load or Individual Issue.** Personnel are permitted to carry their basic combat load or individual issue of hazardous materials removed from its required packaging under the following conditions.

3.4.2.1. Personnel will engage an enemy force immediately upon deplaning at the objective or will be airdropped. The following requirements apply:

3.4.2.1.1. Personnel must not handle explosives and other hazardous materials during flight operations.

3.4.2.1.2. Ensure all individual hazardous materials are safe from accidental initiation (i.e., grenades in fiber containers, safety pins secured, etc.).

3.4.2.1.3. Ensure all small arms ammunition remain in the individual carrier (for example, bandoleers, ammunition belts, pouches), and all weapons remain clear until the aircraft has landed.

3.4.2.1.4. Ensure all NBC equipment remain in the individual carrier (for example, protective mask bag, mobility bag), and accompany the individual at all times. First aid kit components must remain within individual kit carriers or pouches.

3.4.2.1.5. Prepare all hazardous material, other than small arms ammunition, nuclear, biological, and chemical (NBC) equipment, and first aid kits for shipment according to this manual, consolidate in one central location on the aircraft as directed by the loadmaster, and distribute to personnel before landing.

3.4.2.1.6. Lithium batteries installed in electronic equipment battery box or compartment require no additional packaging. Individuals may handcarry (pockets, rucksack, backpacks, etc.) the minimum number of spare lithium batteries required to sustain the immediate operation (as determined by the troop commander). Pack handcarried lithium batteries in original wrapping or in nonconductive material to prevent external short-circuiting. Prepare equipment containing lithium batteries, not considered individual issue or basic combat, according to **A13.8.**

3.4.2.1.7. The troop commander or team chief must brief the aircraft commander or designated representative (i.e. loadmaster) on the location of all hazardous materials.

3.4.2.1.8. Provisions of this paragraph may be used during exercises when identified in the exercise operations plan. Except for small arms ammunition, NBC equipment, and first aid kits, items may not be shipped unpackaged unless there is intent to use explosives and other hazardous materials upon exiting the aircraft or as part of an airdrop exercise. Use and employment of unpackaged or hand carried explosives and other hazardous materials will be included in the exercise operations plan.

3.4.2.1.9. See **Attachment 23** for use of contract air carriers operating under DOT-E 9232.

3.4.2.1.10. A Shipper's Declaration for Dangerous Goods is not required.

3.4.2.2. Personnel not immediately engaging the enemy force when deplaning, but will assume a tactical mission on arrival or re-deploying upon mission completion, may deploy with their basic load or individual issue of hazardous materials in accordance with **3.4.2.1.** However, the troop commander must collect these items, including small arms ammunition, before the anti-hijack briefing. On arrival at the aircraft, the troop commander must brief the loadmaster on the hazardous materials and assist the loadmaster, as directed, in the tiedown before departing. The hazardous materials will be redistributed on arrival at destination. If required, apply these provisions to redeployment of troops upon mission completion.

3.5. Passenger Eligibility. Personnel who are participants in tactical, contingency, emergency, or deployment operations (to include exercises) on military organic aircraft according to DTR, Part III are not considered passengers. Passenger deviation requirements do not apply. This authority does not apply to medical evacuees or passengers. If passenger seats are released to nonparticipants, the cargo must not be prepared using a provision authorized under the authority of this chapter and the requirements of **2.2.** apply. Refer to **Attachment 23** for contract airlift of personnel under DOT-E 9232.

3.6. Load Configurations.

3.6.1. **Compatibility.** Review operational plans and implement procedures to minimize the exposure of personnel to hazards of the cargo when more than one aircraft is available. Separate incompatible explosives and other hazardous materials (and personnel) to the maximum extent possible, as the mission allows. Use **Attachment 18**, paragraph **A18.4.** for incompatible hazardous materials transported on the same aircraft.

3.6.2. **Complete Round Rigging (CRR).** CRR (unassembled on airdrop platform) allows deploying units to airlift normally incompatible items. CRR encompasses all items necessary for mission completion (i.e., primers, propelling charges, projectiles, fuses, etc.). CRR will allow loss of one or more pallets without jeopardizing total mission accomplishment.

3.6.2.1. Use CRR to meet operational requirements. Authorized for exercises only when there is an intent to fire munitions.

3.6.2.2. Use only CRR load configurations shown in TO 13C7/FM 10-500 series for low and high velocity parachute airdrop. Remove hazardous material from required packaging only when specifically identified in the TO/FM.

3.6.3. **Meals Ready to Eat (MRE).** Follow the requirements of paragraph **1.11.** for stowing edible material intended for human consumption on the same aircraft pallet as hazardous material. If required by operational necessity, load MRE's on the same 463L pallet with hazardous materials under the following conditions:

3.6.3.1. Do not load MREs or other edible material on the same pallet with any hazardous material liquid or Class/division 2.3 gases.

3.6.3.2. Separate hazardous materials (except Class 1) from the MREs by the greatest distance possible, but not less than 44 inches in all directions.

3.6.3.3. Do not load hazardous materials above the MRE's.

3.6.3.4. Flameless Ration Heaters (FRH) packed as a component of the MRE, regardless of the number shipped, are not regulated by this manual (see **A3.3.4.**). Prepare FRHs shipped separately from the MRE as regulated hazardous material according to this manual.

3.6.3.5. Do not open, handle, or activate fuel sources shipped along with the MRE's inside the aircraft.

3.7. Fuel for Vehicles and Equipment. Transport fuel needed to operate vehicles and equipment at the deployment site in air-eligible UN specification containers listed in paragraph **A7.3.** If required, stow these containers in the vehicle or equipment according to paragraph **1.11.** The following applies when using jerricans:

3.7.1. Allow sufficient ullage (outage) and tightly secure jerrican caps to prevent leakage.

3.7.2. Secure jerricans in permanently configured and approved holders on vehicles or equipment.

3.7.3. Total combined fuel quantity for a vehicle or equipment equipped with DOT 5L jerricans can not exceed the capacity of the item's fuel tank times two (2).

3.7.4. Fuel quantity limit does not apply to UN specification jerricans identified in **A7.3.** when secured in permanently configured and approved holders.

3.7.5. DOT 5L jerricans must be drained but not purged when not shipped in an approved holder according to this paragraph. Prepare Shipper's Declaration of Dangerous Goods according to **Attachment 17**.

3.7.6. UN specification jerricans (not in an approved holder) may be shipped palletized, loaded and secured on a vehicle, or floor loaded. Prepare Shipper's Declaration of Dangerous Goods according to **Attachment 17**.

3.7.7. Prevent metal-to-metal contact by using cushioning material or fiberboard.

3.7.8. **Fuel-in-Tank Limitations.** Limit fuel in vehicles, self-propelled units, wheeled engine-powered support equipment, and all other types of support equipment according to paragraph **1.8.** Units transported under the provisions of this chapter may contain additional quantities of fuel in tank according to **Attachment 13**, paragraphs **A13.5.** and **A13.6.**, based on operational necessity. During redeployments, unless mission readiness is affected, limit fuel in tank to a minimum. See **Attachment 17** for certification requirements.

3.7.9. **Bulk Fuel.** Do not transport servicing trucks, trailers, semitrailers, or storage tanks containing bulk fuel, or any bulk hazardous material by air (except as authorized in paragraph **3.7.10.**). The following draining/purging requirements apply:

3.7.9.1. Purge bulk tanks for all liquids with a flash point below 38 degrees C (100 degrees F), regardless of whether the technical manual only requires draining.

3.7.9.2. Drain, but need not purge, liquids with a flash point at or above 38 degrees C (100 degrees F), unless the technical manual specifically requires purging.

3.7.9.3. Provide air circulation in the cargo compartment of pressurized aircraft.

3.7.10. **Additional Fuel.** Transport flammable liquid fuel in MIL-D-23119 collapsible fabric drums, not to exceed 500 gallon rated capacity. Ship all other collapsible fabric drums completely drained. Prepare according to paragraph **A7.3.**

3.8. Lithium Batteries. Batteries (new and used) must be prepared and packaged according to **A13.8.** The following applies:

3.8.1. Do not transport damaged lithium batteries or those suspected of damage.

3.8.2. Prepare lithium batteries according to this chapter or **Attachment 13**, as applicable.

3.8.3. Only transport used lithium batteries when properly installed in a battery box or compartment of electronic equipment.

3.8.4. Do not transport used lithium batteries (not installed in equipment) by military airlift if surface transportation is available. Air movement from forward combat or exercise area is authorized if it is the only mode available. See paragraph **A13.8.** for proper packaging of used batteries.

3.8.5. For airdrop missions, pack electronic equipment handcarried in a rucksack, in a shipping (air-drop) container, or as a door bundle depending on mission requirements. Shipper's Declaration for Dangerous Goods certification is not required.

3.9. Chemically Contaminated Cargo. Decontaminate items to the greatest extent possible in the theater in which they became contaminated. Destroy reusable wood and fiberboard containers in the theater in which they became contaminated. Decontaminate reusable shipping containers other than wood and fiberboard (drums, etc.) before reusing. Double wrap palletized cargo that is susceptible to exposure to contamination. Remove the outside wrap if exposed to contamination (the inner wrap should protect the cargo). Destroy the contaminated outside wrap in the theater in which it became contaminated. The following procedures apply to chemically contaminated cargo:

3.9.1. **Handling Instructions.** Handle carefully, wear protective equipment when necessary. Contamination could include nerve, blister, or blood chemical agents. Take precautions (protective clothing and breathing apparatus) when handling or opening contaminated containers and working on contaminated items. Open containers in a controlled, protected, and well-ventilated area.

3.9.2. **Packaging Requirements.** Package contaminated items in a hermetically sealed barrier bag, placed in an open head metal drum (1A2) with an air-tight gasket. In the absence of a hermetically sealed barrier bag, wrap and place the contaminated material in an open head metal drum with an air-tight gasket then overpack into an open head metal drum (1A2) with an air-tight gasket. The outer drum must meet PG I requirements.

3.10. Marking, Labeling, and Certification. Mark, label, and certify hazardous materials transported under the provisions of this chapter according to **Attachment 14**, **Attachment 15**, and **Attachment 17**.

3.11. Diverting Hazardous Materials to Nontactical Airlift. Hazardous materials certified according to **A17.3.** may be transported on nontactical airlift provided the following conditions are met:

3.11.1. All hazardous materials which are part of a single shipment unit must be compatible according to **Table A18.1.** and **Table A18.2.**

3.11.2. Hazardous materials which are part of the single shipment unit must be compatible with all other hazardous materials according to **Table A18.1.** and **Table A18.2.**

3.11.3. Vehicle and equipment fuel levels will not exceed limits authorized for nontactical airlift.

3.11.4. Any unpackaged to hand-carried hazardous materials must be packaged as required by this manual and certified according to **Attachment 17**.

3.11.5. Use provisions of **A17.2.4.** when extra copies of the Shipper's Declaration for Dangerous Goods are needed.

3.12. Transporting Foreign Troops. Transport hazardous materials belonging to non-U.S. military units using the same guidelines as for U.S. forces.

3.12.1. Comply with paragraph **3.4.2.** for handcarried items

3.12.2. Ensure use of serviceable UN specification containers or packaging approved by the competent authority of the transported force. Packaged hazardous materials must be properly marked and labeled to identify the contents.

3.12.3. Equivalent foreign certification documents as approved by the competent authority of the transported force may be accepted in place of the Shipper's Declaration for Dangerous Goods form. As a minimum, the foreign certification document must include in English, the proper shipping name, UN identification number, hazard class/division and compatibility group, packing group (if required), and quantity per package of hazardous materials.

3.13. Forms Prescribed. SF 361, **Transportation Discrepancy Report** and SF 364, **Supply Discrepancy Report** and DD Form 2133, **Joint Airlift Inspection Record**.

Official
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By Order of the Secretary of the Army:

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Installations and Logistics

Official

_____
Director
DLA Support Services

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFI 11-289, *Phoenix Banner, Phoenix Silver, and Copper Operations*

DLAD 4145.41/AR 700-143/AFJI 24-210/NAVSUPINST 4030.55/MCO 4030.40A, *Packaging of Hazardous Materials*

DLAI 4145.21/TB MED284/NAVSUPINST 4610.31/AFR 167-9*, Preparation of Medical Materiel Requiring Freeze or Chill Environment for Shipment*

DLAR 4145.25/AR 700-68/NAVSUPINST 4440.128B/MCO 10330.2B/AFR 67-12, *Storage and Handling of Compressed Gases and Liquid in Cylinders*

DNA TP 45-51/Army TM 39-45-51/Navy SWOP 45-51/Air Force TO 11N-45-51, *Transportation of Nuclear Weapons Material*

DoD Catalog 5010.16-c *Defense Management Education and Training*

DoD 6055.9-STD, *Explosive Safety Standards*

DoD 4500.9-R, *Defense Transportation Regulation* (DTR)

DoD 6050.5, *Hazardous Material Information Resource System* (HMIRS)

DOT Title 49 *Code of Federal Regulations* (49 CFR)

IAEA "*Regulations for the Safe Transport of Radioactive Materials, No. TS-R-1"*

International Civil Aviation Organization (ICAO) *Technical Instructions*

International Air Transport Association (IATA) *Dangerous Goods Regulation*

MIL-STD-129, *Standard Practice for Military Marking for Shipment and Storage*

MIL-STD-1791, *Designing for Internal Aerial Delivery in Fixed Wing Aircraft*

TB 700-2, NAVSEAINST 8020.8B, TO 11A-1-47, DLAR 8220.1, *DoD Ammunition and Explosive Hazard Classification Procedures*

Title 40 CFR, Parts 260-265, Protection of Environment

Abbreviations and Acronyms

AFMC—Air Force Materiel Command

AFSC—Air Force Specialty Code

ALC—Air Logistics Center

ALCE—Airlift Control Element

AMC—Air Mobility Command

ASCC—Air Standardization Coordinating Committee

ASME—American Society of Mechanical Engineers

ASTM—American Society for Testing and Materials

ATOC—Air Terminal Operations Center

CAA—Competent Authority Approval

CERCLA—Comprehensive Environmental Response, Compensation, and Liability Act

CFR—Code of Federal Regulations

COE—Certification of Equivalency

CONUS—Continental United States

CRAF—Civil Reserve Air Fleet

CRR—Complete Round Rigging

DACG—Departure Airfield Control Group

DLA—Defense Logistics Agency

DMET—Defense Management Education and Training

DoD—Department of Defense

DOT—Department of Transportation

DSN—Defense Switched Network

DTS—Defense Transportation System

EOD—Explosive Ordinance Disposal

EPA—Environmental Protection Agency

ERG—Emergency Response Guidebook

FAR—Federal Acquisition Regulation

FPM—Federal Personnel Manual

FRH—Flameless Ration Heater

IAEA—International Atomic Energy Agency

IATA—International Air Transportation Association

IBD—Inhabited Building Distance

ICAO—International Civil Aviation Organization

ID—Identification

IHC—Interim Hazard Classification

IMDG—International Maritime Dangerous Goods

IRFNA—Inhibited Red Fuming Nitric Acid

ISO—International Standards Organization

ITO—Installation Transportation Officer

JCS—Joint Chiefs of Staff

kPa—Kilopascal

LSA—Low Specific Activity

MAJCOM—Major Command

MCC—Mobility Control Center

MILVAN—Military Van

MOS—Military Occupational Specialty

MRE—Meals Ready to Eat

MRSP—Mobility Readiness Spares Package

MSL—Military Shipping Label

MTMC—Military Traffic Management Command

NA—North American

NBC—Nuclear, Biological, and Chemical

NEW—Net Explosive Weight

N.O.S. —Not Otherwise Specified

OPlans—Operating Plans

OPR—Office of Primary Responsibility

PCB—Polychlorinated Biphenyls

PG—Packing Group

POD—Port of Debarkation

POE—Port of Embarkation

ppm—Parts Per Million

PSI—Pounds Per Square Inch

PSIA—Pounds Per Square Inch Absolute

PSIG—Pounds Per Square Inch Gauge

PSN—Proper Shipping Name

RQ—Reportable Quantity

SAAM—Special Assignment Airlift Mission

SCF—Standard Cubic Feet

SCFH—Standard Cubic Feet per Hour

SE—Support Equipment

SMPT—School of Military Packaging Technology

SPI—Special Packaging Instruction

STAMP—Standard Air Munitions Package

STRAPP—Standard Tank Rack Adapter and Pylon Package

TALCE—Tanker Airlift Control Element

TCN—Transportation Control Number

TCU—Transportation Control Unit

TMO—Traffic Management Office

UCT—Underwater Construction Team

UN—United Nations

USG—United States Government

USTRANSCOM—United States Transportation Command

WRSK—War Readiness Spares Kit

Terms

A1—The maximum activity of special form radioactive material permitted in a type A package.

A2—The maximum activity of radioactive material, other than special form or low specific activity radioactive material, permitted in a type A package. These values are either listed in **A11.5.** or may be derived using the procedure in **A11.4.**

Aerosol—Any non-refillable receptacle containing a gas compressed, liquefied, or dissolved under pressure, the sole purpose of which is to expel a nonpoisonous (other than a division 6.1 packing group III material) liquid, paste, or powder and fitted with a self-closing release device allowing the contents to be effected as solid or liquid particles in suspension in a gas, as a foam, paste, or powder, or in a liquid or gaseous state.

Article—A manufactured item, containing a hazardous material or substance, in a specific shape or design which end use is dependent on the shape or design. The shape or design prevents loss of hazardous contents during normal conditions of transport.

Atmospheric Pressure—Atmospheric pressure is 101.3kPa (14.7 psi).

Aviation Regulated Solid or Liquid.—Any material which has a narcotic, noxious, or other properties such that in the event of spillage or leakage on an aircraft, extreme annoyance or discomfort could be caused to crew members so as to prevent the correct performance of assigned duties.

Bag—A flexible packaging made of paper, plastic film textiles, woven material or other similar materials.

Becquerel (Bq) —The unit of activity for radioactive material. Because this is a very small unit of measure (1 Bq = one atomic transformation per second), the standard is the larger multiple of terabecquerel (TBq). One TBq = one trillion Bq. This unit of measure is used when measuring how radioactive the item is.

Biological Product—A virus, therapeutic serum, toxin, antitoxin, vaccine, blood, blood component or derivative, allergenic product, or analogous product used in the prevention, diagnosis, treatment, or cure

of diseases in humans or animals. A biological product includes a material manufactured and distributed in accordance with one of the following provisions: 9 CFR part 102 (Licenses for Biological Products); 9 CFR part 103 (Experimental Products, Distribution, and Evaluation of Biological Products Prior to Licensing); 9 CFR part 104 (Permits for Biological Products); 21 CFR part 312 (Investigational New Drug Application); 21 CFR part 314 (Applications for FDA Approval to Market a New Drug); 21 CFR parts 600 to 680 (Biologics); or 21 CFR part 812 (Investigational Device Exemptions).

Bottle—An inner packaging having a neck of relatively smaller cross section than the body and an opening capable of holding a closure for retention of the contents.

Box—A packaging with complete rectangular or polygonal faces made of metal, wood, plywood, reconstituted wood, fiberboard, plastic, or other suitable material.

Bulk Packaging—A packaging, with no intermediate form of containment, that has a maximum capacity greater than 400 kg (882 lbs) or 450 L (119 gallons).

Channel Airlift—Common user airlift service provided on a scheduled basis between two points.

Class 1 (Explosives)—Any substance or article (including a device) which is designed to function by explosion (i.e., an extremely rapid release of gas and heat). Unless the substance or article is otherwise classed in **Table A4.1.**, the term "explosive" may also refer to an item that is able to produce a chemical reaction within itself and is able to function in a similar manner even if not designed to function by explosion. Explosives in Class 1 are divided into six divisions as follows:

Division 1.1—Consists of explosives that have a mass explosion hazard. A mass explosion is one which affects almost the entire load instantaneously.

Division 1.2—Consists of explosives that have a projection hazard but not a mass explosion hazard.

Division 1.3—Consists of explosives that have a fire hazard and a minor blast hazard or a minor projection hazard (or both), but not a mass explosion hazard.

Division 1.4—Consists of explosive devices that present a minor explosion hazard. The explosive effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package.

Division 1.5—Consists of very insensitive explosives. This division is comprised of substances which have a mass explosion hazard but are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal transportation conditions.

Division 1.6—Consists of extremely insensitive articles that do not have a mass explosion hazard. This division is comprised of articles which contain only extremely insensitive detonating substances and which demonstrate a negligible probability of accidental initiation or propagation. The risk from these articles is limited to the explosion of a single article.

Class 2.1 (Flammable Gas)—Any material that is a gas (boiling point) at 20 degrees C (68 degrees F) or less and has a pressure of 101.3 kPa (14.7 psi), in addition to one of the following properties:

–Is ignitable at 101.3 kPa (14.7 psi) when in a mixture of 13 percent or less by volume with air.

–Has a flammable range of 101.3 kPa (14.7 psi) with air of at least 12 percent regardless of the lower limit.

–The limits specified above shall be determined at 101.3 kPa (14.7 psi) of pressure and a temperature of 20 degrees C (68 degrees F) according to ASTM E681-85 Standard Test Method for Concentration Limits of Flammability of Chemicals.

Class 2.2 (Nonflammable, Nonpoisonous Compressed Gas, Including Compressed—*Gas, Liquefied Gas, Pressurized Cryogenic Gas, and Compressed Gas in Solution)--*Any material or mixture which has an absolute pressure of 280 kPa (41 psia) inside the container at 20 degrees C (68 degrees F) and does not meet the definition of a Class 2.1 or 2.3.

Class 2.3 (Gas Poisonous by Inhalation)—Any material that is a gas (boiling point) at 20 degrees C (68 degrees F) or less and has a pressure of 101.3 kPa (14.7 psi), in addition to one of the following properties:

–The material is known to be so toxic to humans as to pose a hazard to health during transportation.

–In the absence of adequate data on human toxicity, the material is presumed to be toxic to humans because when tested it has an LC50 (inhalation toxicity) value of not more than 5000 parts per million (ppm).

Class 3 (Flammable Liquid)—A flammable liquid is any liquid having a flash point equal to or below 60.5 degrees C (141 degrees F), except:

–Any liquid meeting the definition of a Class 2 material.

–Any mixture having one or more compounds with a flash point above 60.5 degrees C (141 degrees F) that makes up at least 99 percent of the total volume of the mixture. Distilled spirits of 140 proof or lower are considered to have a flash point no lower than 23 degrees C (73 degrees F).

Class 4.1 (Flammable Solids)—Flammable solids consist of solids (other than those classed as explosives) which are readily combustible under conditions encountered in transport, or may cause or contribute to fire through friction.

Class 4.2 (Spontaneously Combustible Material)—Liquids or solids which are prone to spontaneous heating under normal conditions encountered in transport or to heating in contact with air, thus being liable to ignite.

Class 4.3 (Dangerous When Wet Material)—Solids that are liable to become spontaneously flammable or emit flammable gases when they come into contact with water.

Class 5.1 (Oxidizers)—A material that may cause or enhance the combustion of other material, generally by yielding oxygen.

Class 5.2 (Organic Peroxides)—Any organic compound containing oxygen (O) in the bivalent -O-O- structure, and which may be considered a derivative of hydrogen peroxide where one or more of the hydrogen atoms have been replaced by organic radicals. Organic peroxides are thermally unstable substances which may undergo exothermic self-accelerating decomposition. These substances may be prone to explosive decomposition or rapid burning; be sensitive to impact or friction; react dangerously with other material; or cause damage to the eyes. A material which meets this definition must be classed in Class 5.2, unless it also meets the definition of a Class 1 material, or unless the available oxygen content of an organic peroxide formulation is less than the amount specified (by the percentage equation) in 49 CFR 173.128.

–Type A: An organic peroxide that can detonate or deflagrate rapidly as packaged for transport. Transportation of type A organic peroxides is forbidden.

–Type B: An organic peroxide that, as packaged for transport, neither detonates nor deflagrates rapidly, but can undergo a thermal explosion.

–Type C: An organic peroxide that, as packaged for transport, neither detonates or deflagrates rapidly and cannot undergo a thermal explosion.

–Type D: An organic peroxide which exhibits the following characteristics:

–Detonates only partially, but does not deflagrate rapidly and is not affected by heat when confined.

–Does not detonate, deflagrates slowly, and shows no violent effect if heated when con fined.

–Does not detonate or deflagrate, and shows a medium effect when heated under confinement.

–Type E: An organic peroxide that neither detonates or deflagrates, and shows low or no effect when heated under confinement.

–Type F: An organic peroxide that will not detonate in a cavitated state, does not deflagrate, shows low or no effect if heated when confined, and has low or no explosive power.

–Type G: An organic peroxide that will not detonate in a cavitated state, will not deflagrate, shows no effect when heated under confinement, has no explosive power, is thermally stable (self-accelerating decomposition temperature above 60 degrees C (140 degrees F)); and, for desensitized liquid formulations, is desensitized with a compatible organic liquid which boils above 150 degrees C (300 degrees F).

Class 6.1 (Poisonous Material)—A material, other than a gas, which is known to be so toxic to humans as to afford a hazard to health during transportation, or is presumed to be toxic to humans because it falls within one of the test categories identified in 49 CFR 173.132.

Class 6.2 (Infectious Substances)——A material known to contain or suspected of containing a pathogen. A pathogen is a virus or micro-organism (including its viruses, plasmids, or other genetic elements, if any) or a proteinaceous infectious particle (prion) that has the potential to cause disease in humans or animals. A Division 6.2 material must be assigned to a risk group in accordance with paragraph 173.134 of Title 49 CFR. Infectious substances are subject to applicable requirements in 42 CFR Part 72--Interstate Shipment of Etiologic Agents.

Class 7 (Radioactive Material)-–—Any material containing radionuclides where both the activity concentration and the total activity in the consignment exceed the values in **Table A11.1.**

Class 8 (Corrosive Material)—A liquid or solid that causes visible destruction or irreversible alterations in human skin tissue on contact. If the packaging leaks, the liquid will have a severe corrosion rate on other materials such as steel and aluminum. The main hazard from Class 8 liquids and vapors is the corrosive effect on humans and the aircraft or cargo. Some Class 8 materials have very dangerous additional hazards such as toxicity, flammability, and explosiveness.

Class 9 Material—A material that may pose an unreasonable risk to health, safety, or property during transport, but does not meet any of the definitions of the other hazard classes specified in this manual.

This class includes:

–A material that has an anesthetic, noxious, or other similar property which can cause extreme annoyance or discomfort to passengers and crew in the event of leakage during transportation, so as to prevent the correct performance of the crews assigned duties.

–A material in quantities that meets the definition of a hazardous waste or a hazardous substance, but does not meet the definition of any other class.

Combination Packaging—A combination of packaging, for transport purposes, consisting of one or more inner packagings secured in a nonbulk outer packaging. It does not include a composite packaging.

Combustible Liquid—A combustible liquid is any liquid that does not meet the definition of any other classification specified in this manual and has a flash point above 60.5 degrees C (141 degrees F) and below 93 degrees C (200 degrees F). Any mixture having one or more components with a flash point of 93 degrees C (200 degrees F) or higher, that makes up at least 99 percent of the total volume of the mixture is not a combustible liquid.

Compatibility Group Letter—A designated alphabetical letter used to categorize different types of explosive substances and articles for stowage and segregation.

Composite Packaging—Packaging consisting of an outer packaging and inner receptacle, so constructed that the inner receptacle and the outer packaging form an integral packaging. Once assembled it remains thereafter an integrated single unit; it is filled, stored, shipped, and emptied as such.

Compressed Gas in Solution—A nonliquified compressed gas dissolved in a solvent.

Consignment—A package or group of packages or load of radioactive material offered by a person for transport in the same shipment.

Consumer Commodity—A material that is packaged and distributed in a form intended or suitable for retail sale for purposes of personal care or household use. This does not include material designed for military or industrial use that is not readily available from commercial retail sources.

Contamination—The presence of a radioactive substance on a surface in quantities in excess of 0.4Bq/Cm^2 for beta and gamma emitters and low toxicity alpha emitters or 0.04Bq/cm^2 for all other alpha emitters. Contamination exists in two phases:

– Fixed radioactive contamination means radioactive contamination that cannot be removed from a surface during normal conditions of transport.

– Nonfixed radioactive contamination means radioactive contamination that can be removed from a surface during normal conditions of transport.

Contingency—An emergency involving military forces caused by natural disasters, terrorists, subversives, or by required military operations. Due to the uncertainty of the situation, contingencies require plans, rapid response, and special procedures to ensure the safety and readiness of personnel, installations, and equipment.

Conveyance—Any aircraft for the purposes of this manual.

Crate—An outer packaging with incomplete surfaces.

Criticality Safety Index (CSI) ——A number (rounded up to the next tenth) which is used to provide control over the accumulation of packages overpacks or freight containers containing fissile material. The

CSI for packages containing fissile material is determined in accordance with the instructions provided in 10 CFR 71. The CSI for an overpack, freight container, or consignment or consignment containing fissile material packages is the sum of the CSIs of all the fissile material packages contained within the overpack, freight container or consignment.

Cryogenic Liquid—A refrigerated liquefied gas having a boiling point colder than -90 degrees C (-130 degrees F) at 101.3 kPa (14.7 psi) absolute. A material meeting this definition is subject to requirements of **Attachment 6**, regardless of whether it also meets the definition of a nonflammable, nonpoisonous compressed gas. The material is partially described as "(* * *), refrigerated liquid (cryogenic liquid)" in **Table A4.1.**, (with the asterisks replaced by the name of the gas).

Cultures or Stocks—*M*aterials prepared and maintained for growth and storage and containing a Risk Group 2, 3 or 4 infectious substance.

Cylinder—A pressure vessel designed for pressures higher than 40 psia and having a circular cross section.

Depleted Uranium—Uranium containing less uranium-235 than the naturally occurring distribution of uranium isotopes.

Dermal Toxicity—A material with an LD50 for acute dermal toxicity of not more than 1000 mg/kg.

Design—The description of a special form material, a package, or a packaging, that enables those items to be fully identified. The description may include specifications, engineering drawings, reports meeting regulatory requirements, and other relevant documentation.

Diagnostic Specimens—Diagnostic specimen means any human or animal material, including excreta, secreta, blood and its components, tissue, and tissue fluids being transported for diagnostic or investigational purposes, but excluding live infected humans or animals. A diagnostic specimen is not assigned a UN identification number unless the source patient or animal has or may have a serious human or animal disease from a Risk Group 4 pathogen, in which case it must be classed as Division 6.2, described as an infectious substance, and assigned to UN 2814 or UN 2900, as appropriate. Assignment to UN 2814 or UN 2900 is based on known medical condition and history of the patient or animal, endemic local conditions, symptoms of the source patient or animal, or professional judgment concerning individual circumstances of the source patient or animal.

Dilutent Type A—An organic liquid that does not damage the thermal stability or increase the hazard of the organic peroxide and with a boiling point not less than 150 degrees C (302 degrees F) at atmospheric pressure. Type A dilutents may be used for desensitizing all organic peroxides.

Dilutent Type B—An organic liquid that does not damage the thermal stability or increase the hazard of the organic peroxide and with a boiling point, at atmospheric pressure, of less than 150 degrees C (302 degrees F) but at least 60 degrees C (140 degrees F), and a flash point greater than 5 degrees C (41 degrees F). Type B dilutents are only used when specified in **Table A9.1.** The boiling point of a type B dilutent must be at least 50 degrees C (122 degrees F) above the control temperature of the organic peroxide. A type A dilutent may be substituted for a type B dilutent in equal concentration.

Division—A subdivision of a hazard class.

Domestic Addressee—The continental United States, Alaska, Hawaii, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, the Virgin Islands, American Samoa, Guam, and other US Territories.

Drum—A flat-ended or convex-ended cylindrical packaging made of metal, fiberboard, plastic, plywood, or other suitable materials.

Emergency—An emergency operation is the movement of personnel, equipment and supplies of an organization so they can respond to a non combat (i.e. natural disaster) event requiring special and immediate action.

Enriched Uranium—Uranium containing more uranium-235 than the naturally occurring distribution of uranium isotopes.

Exclusive Use—(Also referred to in other publications as "sole use" or "full load.") The sole use of a conveyance by a single consignor for which all initial, intermediate, and final loading and unloading are carried out according to the direction of the consignor or consignee. Specific instructions for maintaining exclusive use shipment controls must be issued in writing and included with the shipping paper information provided to the carrier by the consignor.

Filling Density—Designates the percent ratio of the weight of gas in a container to the weight of water that the container will hold at 15.5 degrees C (60 degrees F) (one pound of water equals 27.737 cubic inches at 15.5 degrees C).

Fissile Material—Any material consisting of or containing one or more fissile radionuclides. Fissile radionuclides are plutonium-239, plutonium-241, uranium-233, and uranium-235. Neither natural nor depleted uranium are fissile material. Fissile materials are classified according to the controls needed to provide nuclear criticality safety during transportation, as provided in A4.3.7. Certain exclusions are provided in **A3.3.7.9.**

Flash Point—The minimum temperature at which a liquid within a test vessel gives off vapor in sufficient concentration to form an ignitable mixture with air near the surface of the liquid. Flash points are determined by the testing prescribed in 49 CFR 173.120.

Freight Container—A reusable container having a volume of 1.81 cubic meters (64 cubic feet) or more, designed and constructed to permit lifting with its contents intact, and intended primarily for containment of packages in unit form during transportation. A small freight container has either one outer dimension less than 1.5 meters (4.9 feet) or an internal volume of not more than 3.0 cubic meters (106 cubic feet). All other freight containers are designated as "large freight containers." Also known as ‘ISO Containers’.

Gross Weight (Gross Mass):—

–Weight of a vehicle, fully equipped and serviced for operation, including the weight of the fuel, lubricants, coolant, vehicle tools and spares, crew, personal equipment, and load.

–Weight of a container or pallet including freight (contents) and binding.

Handlers—Personnel who only handle hazardous materials or hazardous materials documentation.

Hazard Class—The category of hazard assigned to a hazardous material based on defining criteria. Hazard classes are: explosives (Class 1), compressed gases (Class 2), flammable liquids (Class 3), flammable solids (Class 4), oxidizers and organic peroxides (Class 5), poisons and infectious substances (etiologic agents) (Class 6), radioactive materials (Class 7), corrosive materials (Class 8), and miscellaneous dangerous goods (Class 9).

Hazard Zone—One of four levels of hazard (hazard zones A through D) assigned to gases and one of two levels of hazard (hazard zones A and B) assigned to liquids that are poisonous by inhalation. A hazard zone is based on the LC50 value for acute inhalation toxicity of gases and vapors.

Hazardous Materials Inspectors—DoD personnel whose duties require them to review the integrity of the packaging and accuracy of documentation for all hazardous materials being transported within the Defense Transportation System (DTS) or by commercial carriers.

Hazardous Materials Preparers—DoD personnel whose duties require them to sign legally binding documentation certifying that hazardous materials are properly classified, packaged, marked and labeled, and in all respects meet the legal requirements for transportation within the DTS or by commercial carriers.

Hazardous Materials—A substance or material that is capable of posing an unreasonable risk to health, safety, and property when transported and has been so designated by this manual. May also be referred to as hazardous cargo or dangerous goods. ***NOTE:*** For identification, listing and rules pertaining to hazardous WASTE, refer to Title 40 CFR, Parts 260-265, *Protection of Environment,* established by the U.S. Environmental Protection Agency (EPA).

Hazardous Substance—A material, including its mixtures and solutions, that meets ALL of the following conditions:

–Listed in **Table A4.3.** as originated in Appendix A to 49 CFR 172.101.

–In a quantity, in one package, which equals or exceeds the reportable quantity (RQ) listed in **Table A4.3.**

–When in a mixture or solution:

–For radionuclides, conforms to paragraph 6 of the appendix to 49 CFR 172.101.

–For other than radio nuclides, is in a concentration by weight which equals or exceeds the concentration corresponding to the RQ of the material shown in **Figure A1.1.**

Figure A1.1. Quantity Required To Be a Hazardous Substance Mixture or Solution.

RQ	RQ	Concentration by Weight	
Pounds	**Kilograms**	**Percent**	**PPM**
5,000	2270	10	100,000
1,000	454	2	20,000
100	45.4	0.2	2,000
10	4.54	0.02	200
1	0.454	0.002	20

Hazardous Waste—Any material that is subject to the hazardous waste MANIFEST requirements of the EPA specified in 40 CFR 262.

Highway Route Controlled Quantity—A quantity within a single package that is over 3,000 times the A_1 (Special Form) or A_2 (Normal Form) value of the radionuclides specified in **A11.4.**; or over 1000 TBq (27,000 Ci), whichever is least.

Inert Solid—A solid that does not damage the thermal stability or increase the hazard of the organic peroxide.

Inhalation Toxicity —

–A dust or mist with a lethal concentration where 50 percent of the test subjects die (LC50) from acute toxicity on inhalation of not more than 10 mg/L.

–A material with a saturated vapor concentration in air at 20 degrees C (68 degrees F) of more than one-fifth of the LC50 acute toxicity on inhalation of vapors and with an LC50 for acute toxicity on inhalation of vapors of not more than 5000 mL/m3 (5000 parts per million (PPM)).

–An irritating material, with properties similar to tear gas which causes extreme irritation, especially in confined spaces.

Inner Packaging—Packaging for which an outer packaging is required for transport. It does not include the inner receptacle of a composite packaging.

Inner Receptacle—Receptacle which requires an outer packaging in order to perform its containment function. The inner receptacle may be an inner packaging of a combination packaging or the inner receptacle of a composite packaging.

Jerrican—A metal or plastic packaging of rectangular or polygonal cross-section.

Kit—A set of materials or articles used for a specific purpose, shipped as a single item and assigned a single National Stock Number or Part Number by the Service/Agency Item Manager. A kit may include one or more different hazardous materials. Hazardous components may or may not be compatible but may be transported together as a kit.

Limited Quantity of Radioactive Materials—A quantity of radioactive material which is not over the limits specified in **A11.15.** and conforms to the requirements specified in **A11.11.**

Liquefied Compressed Gas—A gas, which under charged pressure, is partially liquid at a temperature of 20 degrees C (68 degrees F).

Low Specific Activity (LSA) Material —

–Uranium or thorium ores and physical or chemical concentrates of those ores.

–Unirradiated natural or depleted uranium or unirradiated natural thorium.

–Tritium oxide in aqueous solutions provided the concentration is not over 5.0 millicuries (mCi) per milliliter (mL).

–Material in which the radioactivity is essentially uniformly distributed and where the estimated average concentration of contents is:

–Not over 0.0001 millicurie per gram (mCi/g) of radionuclides for which the A_2 quantity is not more than 0.05 Ci.

–Not over 0.005 mCi/g of radionuclides for which the A_2 quantity is more than 0.05 Ci but not more than 1 Ci.

–Not over 0.3 mCi/g of radionuclides for which the A_2 quantity is more than 1 Ci.

–Objects of nonradioactive material externally contaminated with radioactive material, provided that the radioactive material is not readily dispersible. The surface contamination, when averaged over an area of 1 square meter, must not exceed 0.0001 mCi (220,000 disintegrations per minute) per square centimeter of radionuclides for which the A_2 quantity is not more than 0.05 Ci or 0.001 mCi (2,200,000 disintegrations per minute) per cm^2 for other radionuclides. These items must be suitably wrapped or enclosed.

Magnetic Material—Any packaged material that has a magnetic field strength of 0.002 gauss or more measured at 2.1 m (7 ft) from any surface of the package.

Natural Thorium—Thorium with the naturally occurring distribution of thorium isotopes (essentially 100 weight percent thorium-232).

Natural Uranium—Chemically separated uranium containing the naturally occurring distribution of uranium isotopes (approximately 99.28% uranium-238 and 0.72% ranium-235 by mass).

Net Explosive Weight (NEW)—As it relates to this manual, NEW is the total weight, expressed in kilograms, of all explosive components. Refer to DoD 6055.9-STD, *Explosive Safety Standards* or Service directives for definition of NEW used to determine Quantity Distance (QD) criteria.

Net Mass —The weight of the contents in a single packaging.

Non-Bulk Packaging—A packaging that has a maximum net mass of 400 kg (882 lbs) or less and a maximum capacity of 450 L (119 gallons) or less.

Nonfixed Radioactive Contamination—Radioactive contamination that can be readily removed from a surface by wiping with an absorbent material. Nonfixed (removable) radioactive contamination is not significant if it is not over the limits specified in **A3.3.7.11.**

Nonliquefied Compressed Gas—A gas, other than gas in solution, which under charged pressure is entirely gaseous at a temperature of 20 degrees C (68 degrees F).

Normal Form Radioactive Material—Radioactive material that has not been demonstrated to qualify as "special form radioactive material."

Oral Toxicity—Liquid with a lethal dose where 50 percent of the test subjects die (LD50) from acute oral toxicity of not more than 500 mg/kg or a solid with an LD50 for acute oral toxicity of not more than 200 mg/kg.

ORM-D—For the purposes of this manual, ORM-D material, are only those materials with flammable properties (liquids, solids, and gases) that present a limited hazard during transportation due to their form, quantity, and packaging. Each ORM-D material is listed in **Table A4.1.** ORM-D classification is only authorized for domestic shipments. International shipments must not be transported under the classification "ORM-D."

Outage or Ullage—The amount a packaging falls short of being liquid full, usually expressed in percent by volume.

Outer Packaging—The outermost enclosure of a composite or combination packaging together with any absorbent materials, cushioning, and any other components necessary to contain and protect the inner receptacles or inner packagings.

Overpack-—1) A container or enclosure (that prevents identification of contents) used to hold one or more air eligible packages to form a single unit for convenience of handling or storage during

transportation. 2) Placement of containers that do not meet air eligibility pressure requirements into an outer approved UN packaging.

Package—For radioactive materials, the packaging together with its radioactive contents as presented for transport.

Package or Outside Package—The packaging plus its contents.

Packaging(s)—A receptacle and any other components or materials necessary for the receptacle to perform its containment function in conformance with the minimum packing requirements of this manual. For radioactive materials, the assembly of components necessary to ensure compliance with the packaging requirements of this manual. It may consist of one or more receptacles, absorbent materials, spacing structures, thermal insulation, radiation shielding, and devices for cooling or absorbing mechanical shocks. The conveyance, tie down system, and auxiliary equipment may sometimes be designated as part of the packaging.

Packers—Personnel who package hazardous materials, but do not sign legally binding documents.

Packing Group—The degree of danger presented by the hazardous material.

–Packing Group I indicates great danger.

–Packing Group II indicates medium danger.

–Packing Group III indicates minor danger.

Polymerizable Material—Any material that may polymerize (combine or react with itself) with an evolution of a dangerous quantity of heat or gas.

Pounds Per Square Inch (PSI)—The amount of force exerted on one square inch of the container or cylinder wall.

Pounds Per Square Inch Absolute (PSIA)—The absolute value of the force exerted on the container or cylinder wall. Absolute pressure is atmospheric pressure plus gauge pressure.

Pounds Per Square Inch Gauge (PSIG)—The gauge pressure is the pressure taken by a pressure gauge that represents the force exerted within the container or cylinder. Gauge pressure is always that pressure above atmospheric pressure.

Purged-—As it relates to this manual, purged means void of hazardous material. Removal of liquid hazardous material by physical, chemical, or mechanical means as directed by a technical publication or directive. In the absence of a specific technical procedure, it is the shipper's determination based on the specific knowledge of the item to decide the appropriate preparation to ensure the item is void of hazardous material.

Primary Hazard—The hazard class of the material as assigned by **Table A4.1.**

Pyrophoric Material—This material is a liquid or solid that, even in small quantities and without an external ignition source, can ignite within five minutes of coming in contact with air. This material is the most likely to spontaneously combust.

Radiation Level—The radiation dose-equivalent rate expressed in millisievert per hour or mSv/h (millirem per hour or mrem/h). Neutron flux densities may be converted into radiation levels according to 49 CFR 173.403 (v).

Radioactive Instrument or Article—Any manufactured instrument or article such as clock, electronic tube or apparatus, or a similar instrument or article having radioactive material in gaseous or non-dispersible solid form as a component part.

Radioactive Contents—The radioactive material, together with any contaminated or activated solids, liquids or gases, within the package.

Radioactive Material—See definition in Class 7.

Receptacle—A containment vessel for receiving and holding materials, including any means of closing.

Refrigerant Gas (Dispersant Gas)—This term applies to all flammable, nonflammable, nonpoisonous refrigerant gases, dispersant gases (fluorocarbons), or mixtures listed in **Table A4.1.**; or any other compressed gas meeting one of the following conditions:

–A nonflammable mixture containing not less than 50 percent fluorocarbon content, having a vapor pressure not over 1792 kPa (260 psig) at 54 degrees C (130 degrees F).

–A flammable mixture containing not less than 50 percent fluorocarbon content, not over 40 percent by weight of a flammable component, having a vapor pressure not over 1792 kPa (260 psig) at 54 degrees C (130 degrees F).

Regulated Medical Waste—A waste or reusable material known to contain or suspected of containing an infectious substance in Risk Group 2 or 3 and generated in the diagnosis, treatment, or immunization of human beings or animals; research on the diagnosis, treatment or immunization of human beings or animals; or the production or testing of biological products. Regulated medical waste containing an infectious substance in Risk Group 4 must be classed as Division 6.2, described as an infectious substance, and assigned to UN 2814 or UN 2900, as appropriate.

Reportable Quantity—The quantity of material, as set forth in 40 CFR 302.4, the release of which requires notification pursuant to 40 CFR Part 302. See also "Hazardous Substance."

Residue—The hazardous material remaining in a packaging after its contents have been removed to the maximum extent possible and before the packaging has been purged to remove any hazardous vapors.

Risk Group—A ranking of a micro-organism's ability to cause injury through disease. A risk group is defined by criteria developed by the World Health Organization (WHO) based on the severity of the disease caused by the organism, the mode and relative ease of transmission, the degree of risk to both an individual and a community, and the reversibility of the disease through the availability of known and effective preventative agents and treatment. There is no relationship between a risk group and a packing group.

Secondary Hazard—A distinct and separate hazardous item that is a component or integral part of a larger item that is considered the primary hazard.

Secondary Load—A distinct and separate hazardous item (other than a secondary hazard) that is loaded and transported by a vehicle or on support equipment.

Self-Heating Material—This material, when in contact with air and without an energy supply, is liable to self-heat.

Self-Reactive Material—At normal or elevated temperatures, this material is liable to undergo a strong exothermic reaction. Exothermic reaction can be caused by excessively high transport temperatures or by contamination.

Service Pressure—This term refers to the authorized pressure marking on the container. For example, for a cylinder marked "DOT 3A1800" the service pressure is 12410 kPa (1800 psi).

Sharps—Any object contaminated with a pathogen or that may become contaminated with a pathogen through handling or during transportation and also capable of cutting or penetrating skin or a packaging material. Sharps includes needles, syringes, scalpels, broken glass, culture slides, culture dishes, broken capillary tubes, broken rigid plastic, and exposed ends of dental wires.

Shipping Activity—Unit, organization, or activity that originally offers a hazardous material into the Defense Transportation System.

Shipping Paper—The Air Cargo Manifest which includes minimum hazardous material information as required by DoD 4500.32R. In the absence of an Air Cargo Manifest, the Shipper's Declaration for Dangerous Goods form may serve as a shipping paper.

Single Packaging—Nonbulk packaging other than a combination or composite packaging.

Sievert (Sv)—The standard unit of measure for radiation dose-equivalent. One-thousandth unit is normally used and denoted as mSv (millisievert), but the one-ten thousandth unit may be used for smaller amounts and is denoted as µSv (microsievert). Dose-equivalent rates are established cumulatively by year and are applied as limiting the dose-equivalent per hour. Because of this, the unit of measure given at the time of reading is usually mSv/h (millisieverts per hour) or µSv/h (microsieverts per hour). This unit of measure is used when measuring how much radiation is leaking out of the package. The sievert replaces the older unit dor dose-equivalent, the "rem". One Sv is equal to 100 rem.

Special Approvals —An authorization issued by the appropriate authority for transport of certain hazardous materials. These approvals may be a Department of Transportation Exemption, Competent Authority Approval (CAA), or a Certification of Equivalency (COE).

Special Form Radioactive Material—Radioactive material that satisfies the following conditions:

–It must be either a single solid piece or be contained in a sealed capsule that can be opened only by destroying the capsule.

–The piece or capsule must have at least one dimension not less than 5 mm (0.197 inch).

–It must satisfy the test requirements of 49 CFR 173.469. Special form encapsulations designed according to the requirements of the DOT in effect on 30 June 1983 and constructed before 1 July 1985 may still be used. Special form encapsulations, either designed or constructed after 30 June 1985, must meet the requirements of 49 CFR 178.350.

Specific Activity of a Radionuclide—The activity of the radionuclide per unit mass of that nuclide. The specific activity of a material in which the radionuclide is essentially uniformly distributed is the activity per unit mass of the material.

Stabilized—The substance is in a condition that precludes uncontrolled reaction. This may be achieved by methods such as addition of an inhibiting chemical, degassing the substance to remove dissolved oxygen and inerting the air space in the package, or maintaining the substance under temperature control.

Subsidiary Risk—An additional hazardous property of a material other than the primary hazard as identified in **Table A4.1.**

Tactical—A tactical operation is the movement of personnel, equipment and supplies of an organization so they can accomplish their immediate military combat objective.

Technical Name—A recognized chemical name or micro biological name currently used in scientific and technical handbooks, journals, and texts. Generic descriptions are authorized provided they readily identify the general chemical or micro biological group.

Toxin—A Division 6.1 material from a plant, animal, or bacterial source. A toxin containing an infectious substance or a toxin contained in an infectious substance must be classed as Division 6.2, described as an infectious substance, and assigned to UN 2814 or UN 2900, as appropriate.

Transport Index—The dimensionless number (rounded up to the next tenth) placed on the label of a package to designate the degree of control to be exercised by the carrier during transportation. The transport index is determined by multiplying the maximum radiation level in millisieverts (mSv) per hour at 1 m (3.3 ft) from the external surface of the package by 100 (equivalent to the maximum radiation level in millirem per hour at 1 m (3.3 ft)

Type A Package—A type A packaging (see definition for type A packaging) together with its limited radioactive contents. A type A package does not require competent authority approval since its contents are limited to A_1 or A_2.

Type A Packaging—A packaging designed to retain the integrity of containment and shielding required by this manual under normal conditions of transport, as demonstrated by the tests set forth in 49 CFR 173.465 or 173.466.

Type B (M) Package—A type B packaging (see definition for type B packaging), together with its radioactive contents, that for international shipments requires multilateral approval of the package design and may require approval of the conditions of shipment. Type B(M) packages are those type B package designs that have a maximum normal operating pressure of more than 7 kg/cm^2 (100 pounds/in^2 gauge) or a relief device that allows the release of radioactive material to the environment under the hypothetical accident conditions specified in 10 CFR part 71.

Type B (U) Package—A type B packaging (see definition for type B packaging), together with its radioactive contents, that for international shipments requires unilateral approval only of the package design and of any stowage provisions that may be necessary for heat dissipation.

Type B Package—A type B packaging (see definition for type B packaging) together with its radioactive contents is designed to transport greater than an A_1 or A_2 quantity of radioactive material.

Type B Packaging—Is a packaging designed to retain the integrity of containment and shielding required when subjected to the normal conditions of transport and hypothetical accident test conditions set forth in 10 CFR, part 71.

Uncompressed Gas—For the purposes of this manual, gas at a pressure not exceeding the ambient atmospheric pressure at the time and location the containment system is closed. All other radioactive gases are considered to be compressed.

Unirradiated Thorium—Thorium containing not more than 10^{-7} grams uranium-233 per gram of thorium-232.

Unirradiated Uranium—Uranium containing not more than 2 x 10^3Bq of plutonium per gram of uranium-235 , not more than 9 x 10^6Bq of fission products per gram of uranium-235 and more than 5 x 10^{-3} g of uranium-236 per gram of uranium-235.

Used Health Care Product—A medical, diagnostic, or research device or piece of equipment, or a personal care product used by consumers, medical professionals, or pharmaceutical providers that does not meet the definition of a diagnostic specimen, biological product, or regulated medical waste, is contaminated with potentially infectious body fluids or materials, and is not decontaminated or disinfected to remove or mitigate the infectious hazard prior to transportation.

Vehicle—Any device or conveyance used for carrying or transporting passengers, equipment, or cargo. Includes, but not limited to automobiles, trucks, motorcycles, aircraft, boats, etc.

Wetted Explosive—This material, when dry, is a Class 1 material other than those of compatibility group A. Items in compatibility group A have been wetted with sufficient water, alcohol, or plasticizer to suppress explosive properties. Wetted explosives also includes items specifically authorized by name in **Table A4.1.** or which have been assigned a PSN and hazard class by the DOT.

Attachment 2

STEPS FOR PREPARING HAZARDOUS MATERIAL

Use the following illustration as a guide for preparing hazardous materials for military air shipment.

STEP 1 – TRAINING	- Ensure you are properly trained and qualified according to paragraph **1.3.** and **Attachment 25**. - If a Preparer, ensure compliance with paragraph **1.2.4.** for authorization to certify.
STEP 2 – IDENTIFY MATERIAL	- Determine if material is hazardous and appropriate hazard classification by utilizing: - Hazardous Material Information Resource System (HMIRS) - Product Material Safety Data Sheets (MSDS) - Manufacturers Information - Joint Hazardous Classification System (JHCS) or Service Technical Directives
STEP 3 – DETERMINE PROPER SHIPPING NAME (PSN)	- See **Table A4.1.** for listing of PSNs. - Also listed with PSN is the hazard class, UN number, packaging group (PG), special provisions, and packaging paragraph(s). - Determine whether item is "forbidden." If so, the item may not be shipped via military airlift. - Determine whether item is a "Hazardous Substance." Determine whether a technical name is required.
STEP 4 – DETERMINE REQUIREMENT FOR **Chapter 3** AND NON-**Chapter 3** MISSION (CHANNEL)	- Non-**Chapter 3** (Channel) Airlift – See **Chapter 1** & 2 for general requirements that cover all hazardous materials shipments by military airlift. **Chapter 2** covers deviations, waivers, and special requirements. **Chapter 3** Operations – See **Chapter 3** for exceptions.

STEP 5 – PACKAGE ITEM	– Package or prepare the item for airlift. Utilize: - DoD PC-POP computer program - Special Packaging Instruction or drawing - Technical order, directive or field manual - Manufacturer or vendor packaging – If already packaged, go to step 6
STEP 6 – VERIFY PACKAGING IS ACCEPTABLE	- Some items list more than one packaging paragraph. Review the paragraphs listed to determine which paragraph best describes the hazardous material. - Determine whether special provisions apply. **Attachment 22** outlines rules regarding passenger movement. - Review **Attachment 3** to determine if package is air eligible and for general packaging requirements. - Ensure UN specification packaging requirements are met. - Review **Attachment 19** for "Excepted" and "Limited Quantity" exceptions. - Ensure absorbent cushioning requirements found in **Attachment 20** are met.
STEP 7 – MARK AND LABEL PACKAGE	- Mark Container – See **Attachment 14**. - Review general marking requirements. - Review hazard class specific marking requirements. - Label Container – See **Attachment 15**. Subsidiary labels are listed in column 6 of **Table A4.1.** - Review general labeling requirements. - Review handling label requirements (includes **Chapter 3** requirements). Review hazard class specific label requirements.

STEP 8 – COMPLETE HAZARDOUS MATERIAL CERTIFICATION	- Certify shipment in accordance with **Attachment 17**. - Review hazard class specific requirements. - Review exceptions for **Chapter 3** operations. - – Samples of shipper's declarations are included in **Attachment 17** for reference.
STEP 9 – COMPATIBILITY REQUIREMENTS	- Compatibility Requirements – See **Attachment 18**. - **Table A18.1.** details segregation requirements for all hazardous material - **Table A18.2.** specifies compatibility requirements for Class 1 - – Review exceptions for **Chapter 3** operations.
STEP 10 – BRIEFING AGENCY REQUIREMENTS	- **Attachment 21** details information required to be briefed to the aircraft commander (or designated representative)

Attachment 3

GENERAL AND HAZARD CLASS SPECIFIC PACKAGING REQUIREMENTS

A3.1. General Packaging Requirements. The general requirements of **Attachment 3** are in addition to the specific packaging requirements outlined in **Attachment 5** through **Attachment 13**. Hazardous material packaging must be authorized by this manual, 49 CFR Part 173, ICAO, or IATA, and meet the requirements outlined in this attachment. Specific requirements contained in a technical directive governing the packaging or preparation of an item, commodity, or article, must be complied with when stricter than requirements in this manual.

A3.1.1. **Transportability.** Securely close and construct containers to prevent leakage due to changes in temperature, humidity, altitude, and damage during transportation and in-transit handling. Hazardous materials must be packaged/prepared according to one of the following: DLA Performance Oriented Packaging (POP) Program, DoD Special Packaging Instruction (SPI) or an approved service drawing, technical publication (e.g., technical order/manual), manufacturer's supplied closing instructions, UN specification test report, or technical knowledge/training to construct strong outside packaging when required by this manual

A3.1.1.1. Primary and secondary items and their containers (unit or exterior) must provide protection without deformation, leakage, or rupture against:

A3.1.1.1.1. Temperature changes (-40 to 65.5 degrees C [-40 to +150 degrees F]).

A3.1.1.1.2. Pressure changes due to altitude changes (sea level to 3.7 km (12,000 feet)).

A3.1.1.1.3. Pressure changes due to explosive decompression from 3.7 to 15.24 km (12,000 to 50,000 feet).

A3.1.1.2. Do not fill a UN specification packaging to a gross mass greater than the authorized gross mass marked on the packaging.

A3.1.1.3. Provide adequate protection for material susceptible to damage by freezing during both ground and air operations.

A3.1.2. **Compatibility.** All containers must be designed and constructed of materials that do not react with, or are not decomposed by, the material contained therein. Plastic containers or liners must prevent permeation of contents. Plastic packaging or receptacles used for liquid hazardous materials must be capable of withstanding, without failure, the test specified in 49 CFR 173, appendix B, *Procedure for Testing Chemical Compatibility and Rate of Permeation in Plastic Packagings and Receptacles.*

A3.1.3. **Ullage (Outage).** Do not entirely fill containers designed to hold liquids. When filling packagings with liquid hazardous material, leave sufficient interior space (outage) to prevent leakage of contents or distortion of containers due to change of temperature during transportation, storage, and handling. For flammable liquids and other volatile liquids with a high coefficient of expansion, a minimum outage of 2 percent at 54 degrees C (130 degrees F), is required.

A3.1.4. **Leak Containment (Liner) General Requirements.** Leak containment must be provided for hazardous liquids when required outer packaging is not liquid-tight. This does not apply to overpacks used only for air shipment consolidation. Use a leak-proof liner, plastic bag, or other equally efficient means of containment. Items drained and purged that are susceptible to leaking purging fluid (e.g. small fuel components) should also be contained in a liner to prevent leaking. When securely

closed polyethylene (4-mil minimum) bags are used to contain cushioning and hazardous liquid, the bags must be of sufficient size to form a liner for the exterior container, or a bag for the interior container.

A3.1.5. **Closures.** Packages and containers must be closed as specified in a test report, packaging instruction, or drawing. When used, stoppers, corks, or other such friction-type closures must be held in place securely, tightly, and effectively. Each screw-type closure on any packaging/container (other than UN specification jerricans) containing a hazardous liquid must be secured with pressure-sensitive tape, self-shrinking plastic, wire, a device designed to prevent the cap from loosening, or other positive means to prevent the closure from loosening due to vibration or substantial temperature change (that is, secondary seal).

A3.1.6. **Inner Packaging.** Pack, secure, and cushion inner packagings of combination packagings to prevent breakage or leakage and to control movement within the outer container. When partial contents are removed, fill voids to ensure a tight pack. Cushioning material must not react dangerously with the contents of the inner packagings. Inner packagings are required as specified by the applicable packaging paragraph. If inner packagings are not required, the packaging paragraph will state that inner packagings are not necessary. See **Attachment 20** for absorbent cushioning requirements.

A3.1.7. **Metal Containers.** Unless otherwise specified, the maximum capacity of metal drums is 208 L (55 gallons). Do not accept for shipment metal containers having corrosion or dents at the chime or seam, soldered, or welded area.

A3.1.8. **Indicators.** Valves and indicators (with protective caps when required), which are necessary to ensure safe transportation, must be installed in the shipping container. Examples are relief valves (vacuum or pressure), humidity indicators, or leak indicators with adequate sensitivity to alert monitor or crew of imminent danger.

A3.1.9. **Polymerizable Material.** Transportation of any liquid, solid, or gaseous material that may polymerize (combine or react with itself) or decompose so as to cause dangerous evolution of heat or gas under normal transportation conditions is prohibited. Such materials may be offered for transportation when properly stabilized or inhibited.

A3.1.10. **Solids in a Liquid Single Packaging.** A single or composite packaging which is tested and marked for liquid hazardous materials may be filled with a solid hazardous material to a gross mass, in kilograms, not exceeding the rated capacity of the packaging in liters, multiplied by the specific gravity marked on the packaging, or 1.2 if not marked. In addition:

A3.1.10.1. A single or composite packaging which is tested and marked for PG I liquid hazardous materials may be filled with:

A3.1.10.2. A PG II solid hazardous material to a gross mass, in kilograms, not exceeding the rated capacity of the packaging in liters, multiplied by 1.5, multiplied by the specific gravity marked on the packaging, or 1.2 if not marked; or

A3.1.10.3. A PG III solid hazardous material to a gross mass, in kilograms, not exceeding the rated capacity of the packaging in liters, multiplied by 2.25, multiplied by the specific gravity marked on the packaging, or 1.2 if not marked.

A3.1.10.4. A single or composite packaging which is tested and marked for PG II liquid hazardous materials may be filled with a PG III solid hazardous material to a gross mass, in kilograms,

not exceeding the rated capacity of the packaging in liters, multiplied by 1.5, multiplied by the specific gravity marked on the packaging, or 1.2 if not marked.

A3.1.11. **Outside Package/Container.** The package or container must be of such size that there is adequate space to affix all markings and labels in a manner required by this manual (**Attachment 14** and **Attachment 15**). If necessary, use overpacks to provide adequate space.

A3.2. Air-Eligible Packaging Requirements.

A3.2.1. **Combination Packaging Pressure Standard.** Inner receptacles (including closures) used to retain a hazardous liquid or semi-solid in a combination packaging must be capable of withstanding (without leaking) an internal air gauge pressure of not less than 95 kilopascal (kPa) (14 psi); or 75 kPa (11 psi) for PG III liquids in Class 3 or Class 6.1 and Consumer Commodities; or a pressure related to the vapor pressure of the liquid contained in the receptacle, whichever is greater. This standard may be determined through actual test data or the shipper's evaluation and transportation experience. Repack or overpack liquid hazardous materials in containers that do not meet the internal hydraulic pressure standard, into United Nations (UN) certified specification containers that meet this requirement. Determine the pressure related to the vapor pressure of the liquid by one of the following methods:

A3.2.1.1. The total gauge pressure measured in the receptacle (that is, the vapor pressure of the liquid and the partial pressure of the air, or other inert gases, less 100 kPa (15 psi) at 55 degrees C (131 degrees F), multiplied by a safety factor of 1.5. The total gauge pressure is determined on the basis of a filling temperature of 15 degrees C (59 degrees F) and a degree of filling such that the receptacle is not liquid full at a temperature of 55 degrees C (131 degrees F).

A3.2.1.2. times the vapor pressure at 50 degrees C (122 degrees F) less 100 kPa (15 psi).

A3.2.1.3. times the vapor pressure at 55 degrees C (131 degrees F) less 100 kPa (15 psi).

A3.2.2. **Single and Composite Packaging Pressure Requirement.** Single packagings containing liquid hazardous material must meet the hydraulic pressure test requirements of 49 CFR 178.605. A test pressure of not less than 250 kPa (36 psi) for liquids of PG I; 80 kPa (12 psi) for PG III liquids in Class 3 or Class 6.1; and 100 kPa (15 psi) for all other liquids is required. If shipping liquid hazardous materials in containers that do not meet the internal hydraulic pressure requirement, repack or overpack into UN specification certified containers that do meet the requirement.

A3.2.3. **Overpacking Containers.** Pack containers holding liquids that do not meet the pressure requirement for air transport into an outer container that does meet the requirement. Separate interior containers by absorbent cushioning material as required by **Attachment 20**. Do not overpack pressurized containers in sealed metal drums. See **Attachment 14** and **Attachment 15** for marking/labeling requirements and **Figure A17.1.** for certification instructions.

A3.2.4. **Equipment Fuel Leakers.** The shipper is responsible for ensuring the maximum allowable fuel-in-tank is not exceeded, the amount of fuel is necessary to meet operational requirements for mission readiness, and the equipment is prepared properly to prevent leakage. Measure fuel quantity on a level surface. The following items are considered fuel leakers and must be drained of fuel.

A3.2.4.1. MC-1A and MC-2A compressors. The MC-1A model 2MC-1A, T.O. 34Y1-56-71, CAGE 16004, part number 66950, NSN 4310-01-060-0642 is not considered a leaker and may be shipped with fuel-in-tank according to **Chapter 3**. Identify the item nomenclature on the Shipper's Declaration form as "2MC-1A". Units must stencil "2MC-1A' on the item.

A3.2.4.2. MA-3 air conditioner.

A3.2.4.3. H-1 heater.

A3.2.4.4. The USCSMK Boston Whaler boat. The United States Navy Patrol Boat Light (PBL) is not considered a leaker and may be shipped with fuel-in-tank as authorized according to this manual.

A3.2.4.5. The USMC River Assault Craft (RAC).

A3.2.4.6. All commercial support equipment.

A3.3. General Requirements Applicable to Hazard Class. In addition to **A3.1.** and **A3.2.**, the following general requirements apply to each hazard class:

A3.3.1. **Class 1.**

A3.3.1.1. **Forbidden Explosives.** Do not offer explosives listed below for air shipment:

A3.3.1.1.1. An explosive that has not been approved according to **A3.3.1.2.**

A3.3.1.1.2. Bulk fulminates or other detonating compounds in dry condition.

A3.3.1.1.3. Explosive compounds that ignite spontaneously or undergo marked decomposition when subjected to a temperature of 75 degrees C (167 degrees F) for 48 hours.

A3.3.1.1.4. An explosive mixture or device containing a chlorate and also containing:

A3.3.1.1.5. An ammonium salt including a substituted ammonium or quaternary ammonium salt.

A3.3.1.1.6. An acidic substance including a salt of a weak base and a strong acid.

A3.3.1.1.7. Leaking, dropped, or otherwise damaged explosives and ammunition.

A3.3.1.1.7.1. Do not ship explosives that have been dropped any distance until inspected by qualified Munitions/EOD personnel.

A3.3.1.1.7.2. Onward shipment of suspected or damaged explosives may be made provided the shipment is inspected, repacked, and certified to be in proper condition for safe transport. Qualified personnel must sign the certification.

A3.3.1.1.7.3. Air terminal personnel must not repack leaking or otherwise damaged shipments of explosives and ammunition unless an ammunition inspector is present.

A3.3.1.1.8. Nitroglycerin, diethylene glycol dinitrate, or any other liquid explosives not specifically authorized by **Attachment 5**.

A3.3.1.1.9. A loaded firearm except as authorized by **Chapter 3**.

A3.3.1.1.10. Fireworks that combine an explosive and a detonator.

A3.3.1.1.11. Fireworks containing yellow or white phosphorus.

A3.3.1.1.12. A toy torpedo whose outside dimension exceeds 23 mm (0.906 in), or a toy torpedo containing a mixture of potassium chlorate, black antimony (antimony sulphide), and sulphur if the weight of the explosive material in the device exceeds 0.26 g (0.01 oz).

A3.3.1.1.13. Explosives specifically forbidden in **Table A4.1.**

A3.3.1.2. **Explosives Classification Approval.** Explosives, explosive devices, and munitions, including commercial and foreign, to be eligible for military air transportation, must be either assigned a DoD classification or meet the provisions for transport without a DoD classification according to TB 700-2, NAVSEAINST 8020.8B, TO 11A-1-47, DLAR 8220.1, *DoD Ammunition and Explosive Hazard Classification Procedures*. All explosives indexed in the Joint Hazard Classification System (JHCS) are approved for movement by military controlled aircraft. Unless listed in the JHCS, a copy of the classification approval document must accompany the shipment. A copy is not required for 1.4S munitions. Transport explosives not listed in the JHCS only under one of the following conditions:

A3.3.1.2.1. Assigned a DoD interim hazard classification (IHC) by a DoD classification authority according to TB 700-2, NAVSEAINST 8020.8B, TO 11A-1-47, DLAR 8220.1

A3.3.1.2.2. Assigned a DOE final or interim hazard classification (IHC).

A3.3.1.2.3. Assigned a DOT-approved final hazard classification and EX number, and listed in **Table A4.1.**, Column 7 (Special Provision) as "A69".

A3.3.1.2.4. An explosive classified as 1.4S in accordance with a foreign issued CAA or Special Approval document.

A3.3.1.2.5. Foreign troop (and hazardous materials) movements according to paragraph **3.12.**

A3.3.1.2.6. Explosives and munitions transported for allied/coalition countries supporting joint operations with U.S. forces.

A3.3.1.3. **Explosive Safety.** Comply with AFMAN 91-201 (Air Force), AR 385-64 and DA PAM 385-64 (Army), and NAVSEA OP 5 (Navy) for safety precautions, standards, and rules when operating in an environment with explosives.

A3.3.1.4. **Explosive Components of Airdrop Deployment Systems.** Explosive components of parachutes or other airdrop deployment systems prepared or “rigged” according to technical directives, and intended for use during flight, are not governed by this manual.

A3.3.2. **Class 2.**

A3.3.2.1. **Cylinder Requirements.** Comply with Title 49 CFR and this manual for shipping compressed gas cylinders, including safety relief devices. Requirements covering cylinders also apply to spherical pressure vessels. Reference DLAR 4145.25/AR 700-68/ NAVSUPINST 4440.128B/MCO 10330.2B/AFR 67-12 for additional data on compressed gas cylinders.

A3.3.2.1.1. Cylinders or spherical pressure vessels must not contain gases or materials capable of combining chemically so as to endanger their serviceability. Make sure all cylinders, including closing devices and cushioning materials, are in good condition so that their contents are well protected during transit.

A3.3.2.1.2. Close each cylinder containing poisonous materials with a plug or valve meeting the following requirements:

A3.3.2.1.3. Each plug or valve must have a taper-threaded connection directly to the cylinder and be capable of withstanding the test pressure of the cylinder.

A3.3.2.1.4. Each valve must be of the packless type with nonperforated diaphragm, except that for corrosive materials, the valve may be of the packed type, provided the assembly is

made gas-tight by means of a seal cap with gasketed joint attached to the valve body of the cylinder to prevent loss of material through or past the packing.

A3.3.2.1.5. Each valve outlet must be sealed by a threaded cap or threaded solid plug.

A3.3.2.1.6. Cylinders, valves, plugs, outlet caps, luting, and gaskets must be compatible with each other and with the material.

A3.3.2.2. **Valve Protection.** Protect all valves of containers charged with compressed gas by one of the following methods:

A3.3.2.2.1. By a securely attached metal cap of sufficient strength to protect the valve from injury during transit.

A3.3.2.2.2. By boxing or crating the cylinder or sphere to give proper protection to the valve.

A3.3.2.2.3. By recessed valve or otherwise protected valve so that it cannot be subjected to a blow when the container is dropped on a flat surface.

A3.3.2.2.4. By valves strong enough to avoid injury during transit for cylinders or spheres containing nonliquefied gas under pressure not over 2068.5 kPa (300 psig) at 21 degrees C (70 degrees F).

A3.3.2.3. **Cylinders Containing Poisonous Material.** Overpack cylinders containing a poisonous material, which have a wall thickness at any point of less than 2.03 mm (0.080 inch) and do not have fitted value protection, in a 4C1, 4D, 4F, 4G, 4H1, or 4H2 box. The box must meet the requirements of **A3.1.** Ensure box and valve protection is of sufficient strength to protect all parts of the cylinder and valve (if it has a valve) from deformation and breakage resulting from a drop of 2.0 m (7 ft) or more onto a concrete floor, impacting at an orientation most likely to cause damage. If the cylinder is not overpacked, equip the cylinder with a protective cap or other means of valve protection sufficient to protect the valve from deformation and breakage resulting from a drop of 2.0 m (7 ft) or more onto a concrete floor, impacting at an orientation most likely to cause damage.

A3.3.2.4. **Cylinders Requiring an Outside Container.** Ship DOT 2P, 2Q, 3E, 3HT, 4BA spherical type, 4D, 4DA, 4DS, 9, 39, 40, and 41 cylinders in strong outside containers. Ensure the package is capable of protecting the cylinder and all its parts from deformation or breakage resulting from a 1.2 m (4 foot) drop on a solid concrete floor. Do not pack cylinders, spheres, or containers under pressure in metal drums or airtight outside packages. DOT 4BA spherical cylinders may be securely mounted on pallets to provide protection for the spheres and any attachments.

A3.3.2.5. **Pressure and Filling Requirements.**

A3.3.2.5.1. Ensure the pressure in the container at 21 degrees C (70 degrees F) is not more than the service pressure for which the container is marked or designated, except as provided below.

A3.3.2.5.2. When cylinders with a marked pressure limit are prescribed, other cylinders made under the same specification, but with a higher marked service pressure limit are authorized. For example, a cylinder marked DOT 4B500 may be used where DOT 4B300 is specified.

A3.3.2.5.3. The pressure in the cylinder or sphere at 54 degrees C (130 degrees F) must not exceed 1 1/4 times the service pressure except cylinders of acetylene, liquefied nitrous oxide,

and liquefied carbon dioxide which must not exceed the allowable charging pressure of the cylinder.

A3.3.2.5.4. The pressure of a cylinder containing a poisonous material must not exceed the service pressure of the cylinder at 55 degrees C (131 degrees F). Provide sufficient outage to ensure the cylinder is not liquid full at 55 degrees C (131 degrees F).

A3.3.2.5.5. Use the service pressure identified for a current specification for containers made before the effective date of specifications.

A3.3.2.5.6. Except for carbon dioxide, nitrous oxide, and vinyl fluoride, stabilized, the liquid portion of the gas (if any) must not completely fill the cylinder at 54 degrees C (130 degrees F). The liquid portion of vinyl fluoride, stabilized, may completely fill the cylinder provided the pressure is not over 1 1/4 times the service pressure (see definition for filling density).

A3.3.2.5.7. Use the service pressure identified in **Figure A3.1.** for authorized cylinders not marked with a service pressure.

A3.3.2.5.8. DOT 3A, 3AX, 3AA, 3AAX, and 3T cylinders may be charged with compressed gases other than liquefied, dissolved, poisonous, or flammable gases to a pressure of 10 percent over their marked service pressure, provided the following conditions are met:

A3.3.2.5.8.1. Equip each cylinder with frangible disc safety devices (without fusible metal backing) having a bursting pressure not over the minimum prescribed test pressure.

A3.3.2.5.8.2. Determine the elastic expansion at the time of the last test or retest by the water-jacket method.

A3.3.2.5.8.3. Do not exceed either the average wall stress or the maximum wall stress limitations in **Figure A3.2.**

A3.3.2.5.9. Use **Figure A3.3.** for filling density requirements of Liquified Petroleum Gases. Any filling density prescribed in **Figure A3.3.** may be increased by 2 percent for liquefied petroleum gas in DOT 26 or DOT 3 cylinders (or in DOT 3A cylinders marked for 1,800 pounds or higher service pressure, subject to the bullet above).

A3.3.2.5.10. Use **Figure A3.4.** for filling density requirements when shipping cryogenic liquids of argon, helium, neon, nitrogen, and oxygen. Ship hydrogen (minimum 95 percent parahydrogen) according to **Figure A3.5.**

Figure A3.1. Cylinder Specification and Service Pressures.

Specification Marking	Service Pressure Kilopascal (Pounds Per Square Inch)	
DOT-3	12411.0	(1800)
DOT-3E	12411.0	(1800)
DOT-4	2068.5	(300)
DOT-8	1723.8	(250)
DOT-9	1379.0	(200)
DOT-25	2068.5	(300)
DOT-33	3309.6	(480)
DOT-38	1723.8	(250)
DOT-40	1379.0	(200)
DOT-41	1654.8	(240)

Figure A3.2. Wall-Stress Limitations.

Type of Steel	Wall Stress Average	Limitation Maximum
Plain carbon steels over 0.35 carbon and medium manganese steels.	53,000	58,000
Steels of analysis and heat treatment specified in DOT Specification 3AA.	67,000	73,000
Plain carbon steels less than 0.35 carbon made before 1920.	45,000	48,000

Figure A3.3. Prescribed Filling Density for Liquefied Petroleum Gas.

Minimum Specific Gravity of the Liquid Material at 60 degrees F (15.5 degrees C)	Maximum Filling Density in Percent of the Water Capacity of the Container	Minimum Specific Gravity of the Liquid Material at 60 degrees F (15.5 degrees C)	Maximum Filling Density in Percent of the Water Capacity of the Container
0.271-0.289	26	0.504-0.510	42
0.290-0.306	27	0.511-0.519	43
0.307-0.322	28	0.520-0.527	44
0.323-0.338	29	0.528-0.536	45
0.339-0.354	30	0.537-0.544	46
0.355-0.371	31	0.545-0.552	47
0.372-0.398	32	0.553-0.560	48
0.399-0.425	33	0.561-0.568	49
0.426-0.440	34	0.569-0.576	50
0.441-0.452	35	0.577-0.584	51
0.453-0.462	36	0.585-0.592	52
0.463-0.472	37	0.593-0.600	53
0.473-0.480	38	0.601-0.608	54
0.481-0.488	39	0.609-0.617	55
0.489-0.495	40	0.618-0.626	56
0.496-0.503	41	0.627-0.634	57

Figure A3.4. Filling Density for Cryogenic Liquids Except Hydrogen.

Pressure control valve setting (maximum start-to-discharge pressure, kPa (psig.)	**Maximum permitted filling density (percent by weight)**					
	Air	**Argon**	**Nitrogen**	**Oxygen**	**Helium**	**Neon**
310.3 (45)	82.5	133	76	108	12.5	109
517 (75)	80.3	130	74	105	12.5	104
724 (105)	78.4	127	72	103	12.5	100
1172 (170)	76.2	122	70	100	12.5	92
1585.8 (230)	75.1	119	69	98	12.5	85
2034 (295)	73.3	115	68	96	12.5	77
2482 (360)	70.7	113	65	93	12.5	
3103 (450)	65.9	111	61	91	12.5	
3723 (540)	62.9	107	58	88	12.5	
4309 (625)	60.1	104	55	86	12.5	
Design Service Temperature (degrees F)	-320	-320	-320	-320	-452	-411
(degrees C)	-196	-196	-196	-196	-269	-246

Figure A3.5. Filling Density for Cryogenic Liquids of Hydrogen.

Column 1	**Column 2**
Design service temperature	Minus 253 degrees C (-423 degrees F) or colder
Maximum permitted filling density, based on cylinder capacity at -253 degrees C (-423 degrees F)(see note)	6.7 percent
The pressure control valve must be designed and set to limit the pressure in the cylinder to not more than	117 kPa (17 psig)

NOTE: The filling density for hydrogen, cryogenic liquid, is defined as the percent ratio of the weight of lading in a package to the weight of water that the packaging will hold at -253 degrees C (-423 degrees F). The volume of the packaging at -253 degrees C (-423 degrees F) is determined in cubic inches. The volume is converted to pounds of water (1 pound of water = 27.737 cubic inches). Each cylinder must be constructed, insulated, and maintained so that the total rate of venting must not be over 30 standard cubic feet (SCF) of hydrogen per hour during transportation.

A3.3.2.6. **Mandatory Color-Code Identification.** Exact color-code identification of any material contained in a compressed gas cylinder is mandatory for DOD and DLA owned cylinders and must meet MIL-STD-101.

A3.3.2.7. **Foreign Cylinders.** A foreign cylinder may not be offered for military airlift unless manufactured, inspected, and tested according to 49 CFR, Part 178, or a copy of the competent authority approval of the nation manufacturing the cylinder accompanies the shipment. All other requirements of this manual also apply.

A3.3.2.8. **Unregulated Compressed Gases.** Compressed gasses in the following items are not regulated:

A3.3.2.8.1. Inflated tires, when inflated to a pressure not greater than its rated inflation pressure.

A3.3.2.8.2. Inflated balls used for sports.

A3.3.2.8.3. Aerosols, containing non-flammable gas, with capacity of 50 ml or less.

A3.3.2.8.4. Carbonated beverages.

A3.3.2.8.5. Refrigerating machines, including dehumidifiers, air conditioners, and components thereof such as precharged tubing containing 12 kg (25 pounds) or less of nonflammable liquefied gas.

A3.3.2.8.6. Shipping containers pressurized according to a technical directive with a non-flammable gas which has an absolute pressure of 40 psia or less inside the container at 20 degrees C (68 degrees F).

A3.3.2.8.7. Cylinders considered empty according to paragraph **1.10.2.**

A3.3.2.8.8. Shock absorbers. Articles containing a non-flammable or non-toxic gas intended to function as shock absorbers that are manufactured to industry quality assurance standards; has a gas space capacity less than 1L and a charge pressure not exceeding 5000 kpa; has a minimum burst pressure of 4 times the charge pressure at 20 degrees C, manufactured from a material which will not fragment; and when subject to fire is protected from rupture by degradable seal or pressure release device.

A3.3.2.9. **Previously Authorized Cylinders.** Cylinders marked with the prefix "ICC" (i.e. ICC-4BA240) are authorized in place of cylinders required by this manual with a "DOT" prefix. The cylinders must comply with all other applicable specification requirements for DOT cylinders.

A3.3.2.10. **Fire Extinguishers.** Fire extinguishers may be shipped secured in holders of equipment and protected from possible accidental damage. Package according to **A6.8.** if fire extinguishers are not in an approved holder.

A3.3.2.11. **Aircraft** Fire Suppression Bottles. Use description “Liquified Gases, UN 1058”; “Compressed Gas, N.O.S., UN 1956”; or the hazard classification assigned by the manufacturer for DOT specification 3HT, 4D, 4DA, or 4DS. See paragraph **A6.5.1.** and **Table A6.1.**

A3.3.2.12. **Bulk Compressed Gas Tanks.** Bulk compressed gas tanks must meet applicable cylinder specification requirements identified in **Attachment 6**, or be certified to a Competent Authority Approval (CAA), Certification of Equivalency (COE), or a DOT-Exemption (DOT-E). If not certified to the above, the tank must be drained, purged, or otherwise considered empty. Use paragraph **1.10.** to identify “empty” tanks.

A3.3.2.13. **Vehicle Fire Suppression Systems.** Cylinders and pressure vessels which are an integral part of a vehicle fire suppression system and exceed 40 pounds per square inch absolute (psia) at 21 degrees C (70 degrees F) must be identified as a secondary hazard according to **A17.4.4.1.**

A3.3.3. **Class 3.**

A3.3.3.1. **Combustible Liquids.** The requirements in this manual do not apply to materials classed as combustible liquids, unless specifically mentioned. Use the same fuel level requirements specified in **Attachment 13** for flammable liquids when a combustible liquid is used as fuel for a vehicle, self-propelled item, or support equipment.

A3.3.3.2. **Pads and Swabs.** Pads, swabs, rags, and similar items soaked with a flammable liquid and sealed in a bag are not subject to the requirements of this manual provided there is no free liquid and each bag or packet contains no more than 10 ml of a flammable liquid in PG II or PG III. If a bag or packet contains an item(s) soaked with PG I flammable liquid or soaked with more than 10 ml of a PG II or PG III flammable liquid refer to requirements for "Solids Containing Flammable Liquids, N.O.S.," UN3175.

A3.3.3.3. **Alcoholic Beverages.** Alcoholic beverages in packagings of five liters or less are not subject to the requirements of this manual.

A3.3.4. **Class 4.**

A3.3.4.1. **Packaging.** Unless otherwise specified by a packaging paragraph, package a material identified as PG III in **Table A4.1.** in a container that meets the PG I or II performance level.

A3.3.4.2. **Flameless Ration Heaters (FRH).** FRH packaged as a component of meals-ready-to-eat are not subject to the requirements of this manual.

A3.3.4.3. **Charcoal Briquettes.** Lump charcoal briquettes, packaged in a form suitable for consumer use, generally will not meet the classifying criteria of a Class 4.2 spontaneously combustible material. If the charcoal briquettes do not meet the definition of a Class 4.2 material, it is not subject to any other requirements of this manual. Ensure the specific type and form of charcoal being shipped does not meet the definition of a Class 4.2 material and passed the self-heating test for carbon (which indicates that it is not spontaneously combustible).

A3.3.5. **Class 5.**

A3.3.5.1. **Packed with Other Materials.** Do not pack Class 5 materials in the same outside container with corrosive liquids, unless the corrosive liquids are in bottles cushioned by incombustible absorbent material in tightly closed metal containers. Class 5 materials in securely closed metal cans and in quantities not over 118 ml (4 ounces), are acceptable for air shipment if packed in the same compartment with other securely packed materials necessary for a complete fumigant.

A3.3.5.2. **Packaging.** Unless otherwise specified by a packaging paragraph, package a material identified as PG III in **Table A4.1.** in a container that meets the PG I or II performance level.

A3.3.6. **Class 6.**

A3.3.6.1. Do not place any liquid toxic material on the same 463L pallet with foodstuffs or rations.

A3.3.6.2. Regulated Medical Waste containing Risk Group 1 infectious material are not regulated as a hazardous material by this manual (see paragraph **1.10.4.**)

A3.3.6.3. Regulated Medical Waste containing Risk Group 4 infectious material will be described and packaged as an "Infectious Substance."

A3.3.6.4. Diagnostic specimens containing other than Risk Group 4 infectious material will be described and packaged as an "Infectious Substance."

A3.3.6.5. Diagnostic Specimins containing Risk Groups 1, 2, or 3 are not regulated as a hazardous material by this manual provided:

A3.3.6.5.1. The package is marked "Diagnostic Specimen"

A3.3.6.5.2. Compliance with paragraph **1.10.4.**

A3.3.6.5.3. Package meets requirements of **A10.9.**

A3.3.6.6. Live animals infected or injected with an infectious substance or biological product are not regulated by this manual provided they are accompanied by technically qualified escorts.

A3.3.7. **Class 7.**

A3.3.7.1. **General Design Requirements.** Design each package used for shipment of radioactive materials so that:

A3.3.7.1.1. The package can be easily handled and properly secured during transport.

A3.3.7.1.2. Each lifting attachment on the package, when used in the intended manner, with a minimum safety factor of three, does not impose an unsafe stress on the structure of the package. In addition, design the lifting attachment so that failure under excessive load does not impair the ability of the package to meet all other requirements of this attachment and **Attachment 11**. Remove, make inoperable for transport, or design with equivalent strength for lifting each attachment or other feature on the outer surface of the packaging that could be used to lift the package.

A3.3.7.1.3. The external surface, as far as practical, may be easily decontaminated.

A3.3.7.1.4. The outer layer of packaging avoids, as far as practicable, pockets or crevices where water might collect.

A3.3.7.1.5. Each feature that is added to the package at the time of transport, and is not a part of the package, does not reduce the safety of the package.

A3.3.7.1.6. The package will be capable of withstanding the effects of any acceleration, vibration, or vibration resonance that may occur during transportation without any deterioration in the effectiveness of the of any of the closing devices or in the integrity of the package and without loosening or unintentionally releasing the nuts, bolts, or other securing devices.

A3.3.7.1.7. The packaging materials and any components will be physically and chemically compatible with each other and the contents.

A3.3.7.1.8. All valves through which the package contents could escape will be protected against unauthorized operation.

A3.3.7.2. **Additional Design Requirements for Type A and B Packages.**

A3.3.7.2.1. In addition to meeting the general design requirements each Type A packaging must also meet the design requirements of 49 CFR 173.412 and test requirements of 49 CFR 173.461.

A3.3.7.2.2. Each type B(U) or type B(M) package must meet the design and test requirements of 10 CFR Part 71.

A3.3.7.3. **Radiation Level and Thermal Limitations.**

A3.3.7.3.1. Design each package of radioactive materials so that:

A3.3.7.3.1.1. The radiation level is not more than 2 mSv/h (200 mrem/h) at any point on the external surface of the package.

A3.3.7.3.1.2. The transport index is not over 10.

A3.3.7.3.2. Design, construct, and load each package of radioactive material so that:

A3.3.7.3.2.1. The heat generated within the package due to the radioactive contents will not, at any time during transportation, affect the integrity of the package under normal transportation conditions.

A3.3.7.3.2.2. The temperature of the accessible external surfaces of the loaded package will not, assuming still air in the shade at an ambient temperature of 38 degrees C (100 degrees F), exceed either a temperature of 50 degrees C (122 degrees F) in other than an exclusive use shipment or 82 degrees C (180 degrees F) in an exclusive use shipment.

A3.3.7.4. **General Transportation Requirements.**

A3.3.7.4.1. Secure each shipment of radioactive materials to prevent shifting during normal transportation conditions.

A3.3.7.4.2. Except as specifically required by a CAA, a package of radioactive materials may be carried among packaged general cargo without special stowage provisions, if:

A3.3.7.4.2.1. The heat output in watts is not over 0.1 times the minimum package dimension in centimeters.

A3.3.7.4.2.2. The average surface heat flux of the package is not over 15 watts per square meter (W/m^2) and the immediately surrounding cargo is not in sacks or bags or otherwise in a form that would seriously impede air circulation for heat removal.

A3.3.7.4.3. Aircraft in which radioactive materials have been spilled may not again be placed in service or routinely occupied until radiation dose rate at any accessible surface is less than 0.005 mSv/h (0.5 mrem/h) and there is no significant removable radioactive surface contamination as determined in **A3.3.7.11.** When contamination is present or suspected, segregate the package and any other materials it has touched as far as practical from personnel contact until needed radiological advice or assistance is obtained. For personnel safety, take care to avoid possible inhalation, ingestion, or contact with radioactive materials that may have leaked or spilled from its package. Leave any loose radioactive materials and associated packaging materials in a segregated area pending disposal instructions from responsible radiological authorities.

A3.3.7.4.4. Do not offer for military airlift:

A3.3.7.4.4.1. Any type B(U) or type B(M) package with an accessible surface temperature in excess of 50 degrees C (122 degrees F).

A3.3.7.4.4.2. Any continuously vented type B(M) packages, which require external cooling by an auxiliary cooling system or packages subject to operational controls during transport.

A3.3.7.4.4.3. Any liquid pyrophoric radioactive materials.

A3.3.7.4.5. Do not transport exclusive use shipments of packages having a surface radiation level in excess of 2 mSv/h (200 mrem/h) except by special arrangement.

A3.3.7.5. **Approval of Special Form Radioactive Material.**

A3.3.7.5.1. Each shipper of special form radioactive materials must maintain on file for at least 1 year after the latest shipment, a complete safety analysis, including documentation of any tests demonstrating that the special form material meets the requirements of 49 CFR 173.469. An International Atomic Energy Agency (IAEA) certificate of competent authority issued for the special form material may be used to satisfy this requirement.

A3.3.7.5.2. Before the first export shipment of a special form radioactive material from the United States, each shipper must obtain a competent authority certificate for the specific material. For special form material manufactured outside the United States an IAEA certificate of component authority from the country of origin may be used to meet this requirement. For special form materials manufactured in the United States each shipper must obtain a US competent authority certificate for the specific material. Submit each petition for a US competent authority certificate according to 49 CFR 173.471 and include the following information:

A3.3.7.5.2.1. A detailed description of the material or, if a capsule, a detailed description of the contents. Make a particular reference to both physical and chemical states.

A3.3.7.5.2.2. If a capsule is used, a detailed statement of its design and dimensions, including complete engineering drawings and schedules of material, and methods of construction.

A3.3.7.5.2.3. A statement of tests performed and their results; evidence based on calculative methods to show that the material is able to pass the tests; or other evidence that the special form radioactive material complies with 49 CFR 173.469.

A3.3.7.5.3. Unless otherwise required, the shipper is exempt from maintaining the documentation required in the bullets above if that documentation is maintained by the Inventory Control Point (national stock number managing activity).

A3.3.7.5.4. The documentation requirements specified in the bullets above do not apply in those cases where A_1 equals A_2 and the material is not described on the shipping papers as "Radioactive Material, Special Form, N.O.S."

A3.3.7.6. **Stowage on Aircraft or Storage Incident to Transportation.**

A3.3.7.6.1. Do not ship radioactive yellow II or radioactive yellow III material on the same aircraft or store in any one area, such as a transit area, terminal building, storeroom, or assembly yard, if the sum of the transport indexes in any individual group of packages exceeds 50.

A3.3.7.6.2. If the total transport index for all packages exceeds 50, separate the packages into groups. Store groups of these packages so as to maintain a spacing of at least 6 meters (20 feet) from other groups of packages containing radioactive materials.

A3.3.7.6.3. Ensure separation of yellow II or yellow III material from packages containing undeveloped film according to the distances shown in 49 CFR 175.703.

A3.3.7.7. **Uranium Hexafluoride (Fissile and Low Specific Activity).** In addition to any other applicable requirements of **Attachment 3** and **Attachment 11**, package uranium hexafluoride, fissile or low specific activity, according to the following requirements:

A3.3.7.7.1. Before initial filling and during periodic inspection and test, clean packages according to American National Standard N14.1.

A3.3.7.7.2. Design, fabricate, inspect, test, and mark packagings according to American National Standard N14.1 in effect at the time the packaging was manufactured.

A3.3.7.7.3. Ensure uranium hexafluoride is in solid form when offered for transportation.

A3.3.7.7.4. The volume of the solid uranium hexafluoride at 20 degrees C (68 degrees F) must not exceed 61 percent of the volumetric capacity of the package.

A3.3.7.7.5. Ensure the pressure in the package at 20 degrees C (68 degrees F) is less than 101.3kPa (14.8 psia).

A3.3.7.7.6. Periodically inspect, test, and mark packages of uranium hexafluoride according to American National Standard N14.1-1987.

A3.3.7.7.7. Perform each repair to a package of uranium hexafluoride according to American National Standard N14.1-1987.

A3.3.7.8. **Specific Requirements for Fissile Shipments.**

A3.3.7.8.1. Packages containing fissile radioactive material which are not excepted according to **A3.3.7.9.** must be assigned a criticality safety index (CSI) and a transport index (TI).

A3.3.7.8.2. Fissile material packages and conveyances transporting these packages must satisfy the radiation level restrictions in **A3.3.7.3.**

A3.3.7.8.3. Except for consignments under exclusive use, the CSI of any packages or overpack may not exceed 50. A fissile material package with CSI greater than 50 must be transported by exclusive use.

A3.3.7.8.4. For non-exclusive use shipments of fissile material packages the total sum of CSIs in a freight container or on a conveyance may not exceed 100.

A3.3.7.8.5. Exclusive use shipments of fissile material packages must satisfy the radiation level and administrative requirements of 49 CFR 173.441(b).

A3.3.7.8.6. Mixing fissile material packages with other types of radioactive materials, in any conveyance is authorized only if the TI of any single packages does not exceed 10, the CSI of any single package does not exceed 50 and the requirements in this paragraph and in **A3.3.7.3.** are met.

A3.3.7.8.7. See **Attachment 24** for Fissile Class III shipments.

A3.3.7.9. **Fissile Materials--Exceptions.** The requirements of **A3.3.7.8.** do not apply to:

A3.3.7.9.1. A package containing less than 2 grams or less of fissile radionuclides.

A3.3.7.9.2. A package containing 15 grams or less of fissile radionuclides provided the package has at least 200 grams of solid nonfissile material for every gram of fissile material.

A3.3.7.9.3. Low concentrations of solid fissile material commingled with solid nonfissile material where:

A3.3.7.9.3.1. There is at least 2000 grams of nonfissile material for every gram of fissile material.

A3.3.7.9.3.2. There is no more than 180 grams of fissile material distributed within 360 kg of contiguous nonfissile material.

A3.3.7.9.4. Uranium enriched in uranium-235 to a maximum of 1 percent by weight, and with a total plutonium and uranium-233 content of up to 1 percent of the mass of uranium-235.

A3.3.7.9.5. Liquid solutions of uranyl nitrate enriched in uranium-235 to a maximum of 2 percent by weight, with total plutonium and uranium-233 content not exceeding 0.002 percent of the mass of uranium and with minimum nitrogen to uranium atomic ratio of 2. The material must be contained in at least a DOT Type A package.

A3.3.7.9.6. A package containing individually a total plutonium mass of not more than 1000 grams of which not more than 20 percent by mass may consist of plutonium-239, plutonium-241 or any combination of these radionuclides.

A3.3.7.10. **Requirements for Foreign-Made Packages.** In addition to the requirements of **Attachment 11**, each shipper of a foreign-made type B(U), type B(M), type C, type CF, type H(U), type H(M) or fissile material package for which a competent authority certificate is required by the IAEA "Regulations for the Safe Transport of Radioactive Materials, No. TS-R-1" must meet the requirements of 49 CFR 173.473.

A3.3.7.11. **Radioactive Contamination.**

A3.3.7.11.1. **Contamination Control.** Keep the level of nonfixed (removable) radioactive contamination on the external surfaces of each package offered for shipment as low as practical. The level of nonfixed radioactive contamination may be determined by wiping an area of 300 cm^2 of the surface concerned with an absorbent material, using moderate pressure, and measuring the activity on the wiping material. Take sufficient measurements in the most appropriate locations to yield a representative assessment of the nonfixed contamination levels. The amount of radioactivity measured on any single wiping material divided by the surface area wiped and divided by the efficiency of the wipe procedure may not exceed the limits set forth in Table A3.3. at any time during transport. Other methods of assessment of equal or greater efficiency may be used.

A3.3.7.11.2. **Inspecting Aircraft for Contamination.** Periodically check aircraft used to routinely transport radioactive materials for radioactive contamination. Determine frequency of the checks based on the likelihood of contamination and the extent to which radioactive materials are carried aboard the aircraft. An aircraft must be taken out of service if the radiation dose rate at any accessible surface is 0.005 mSv/h (0.5 mrem/h) or if there is significant removable radioactive surface contamination as outlined above.

Table A3.1. Removable External Radioactive Contamination--Wipe Limits.

Contaminant	Maximum permissible limits		
	Bq/cm^2	uCi/cm^2	dpm/cm^2
Beta and gamma emitters and low toxicity alpha emitters.	4	10^{-4}	220
All other alpha emitting radionuclides	0.4	10^{-5}	2.2

A3.3.8. **Class 8.**

A3.3.8.1. **Packed with Other Materials.** Do not pack bottles containing corrosive liquids in the same outside container with other hazardous materials.

A3.3.8.2. **Packaging.** Unless otherwise specified by a packaging paragraph, package a liquid material identified as PG III in **Table A4.1.** in a container that meets the PG I or II performance level.

A3.3.9. **Class 9.**

A3.3.9.1. Any package that has a magnetic field strength of more than 0.00525 gauss measured at 4.6 m (15 ft) from any surface of the package is forbidden on military aircraft.

A3.3.9.2. **Fuel Levels.** Fuel levels for vehicles, engines, equipment, and other mechanical devices will be determined by the technical directive used to prepare the item for air movement. However, fuel levels cannot exceed limits established in **Attachment 13**. When technical directives do not specify fuel levels for shipment, the requirements of **Attachment 13** apply.

A3.3.9.3. **Unregulated Engines and Fuel Components.** The following items when drained, purged, and containing no other hazardous materials are nonhazardous for transportation. Comply with **1.10.4.**

A3.3.9.3.1. Vehicles and internal combustion engines, with or without fuel tanks attached, prepared for shipment according to applicable technical directives or standards. Fuel systems including carburetors, pumps, controls, and fuel tanks must be completely drained, purged, and sealed with appropriate pressure seal type plug and caps with gaskets and “O” rings.

A3.3.9.3.2. Aircraft engines which are drained and purged according to the responsible technical manual, and containing no other hazardous materials.

A3.3.9.3.3. Fuel tanks, and cells that are drained, purged, and sealed according to the applicable technical directive.

A3.3.9.3.4. All preserved and packed serviceable fuel assemblies, for example, carburetors, fuel pumps, filters, etc., that are drained and purged of all fuel. In addition, they must be sealed with proper caps, plugs, and covers according to the applicable technical directive. Use a barrier bag to contain residual purging fluid. Mark the type of purging fluid used and the flash point on the outer container.

A3.3.9.4. **Dry Ice Limitations.**

A3.3.9.4.1. Seat passengers forward of and separate by the greatest distance possible (minimum one full pallet position) from dry ice. On C-135 aircraft, passengers are seated behind dry ice.

A3.3.9.4.2. Passenger and crewmembers will not occupy the same pallet position as dry ice.

A3.3.9.4.3. Do not carry dry ice (exceeding passenger acceptable carry-on quantities specified in **Attachment 22**) in any upper deck compartment.

A3.3.9.4.4. Vent the aircraft cargo compartment to the greatest extent possible allowed by the flight profile and environmental conditions.

A3.3.9.4.5. Quantity limits specified in this paragraph apply to all personnel, other than aircrew members, who occupy the cargo compartment with dry ice. Aircrew members entering cargo compartments exceeding quantity limits specified in this paragraph should take precautions to prevent oxygen deprivation (i.e. oxygen masks).

A3.3.9.4.6. **Pressurized Aircraft.** For pressurized aircraft, the amount of dry ice that can be safely shipped by air regardless of the type container used depends on the sublimation rate of the ice, the volume of the aircraft, and the number of air changes per hour. To minimize the sublimation rate, use insulated containers surrounded with insulating blankets and tarpaulin during shipment to the greatest extent possible. To determine the amount of dry ice that can be safely shipped by air, use the formula in **Figure A3.6.**

A3.3.9.4.7. **Aircraft on Minimum Air Changes.** When aircraft is on minimum air changes per hour, safe loads are drastically reduced. When the aircraft is on the ground longer than 45 minutes, recalculate the safe quantity using new numbers of air changes per hour. Maximum quantities are shown in **Figure A3.7.** and **Figure A3.8.**

Figure A3.6. Formula For Determining Dry Ice Limitations.

$$X = \frac{VA(0.47)}{32.3}$$

Where:

V= Volume of aircraft

A= Air changes per hour

X= Maximum dry ice loading in pounds

Figure A3.7. Dry Ice Limitations When Aircraft is on Minimum Air Changes.

Aircraft	**Maximum Amount**	
Type	**in Pounds**	**Kilograms**
C-130	600	272
C-135	200	91
C-141B (See Note 1)	3,430	1,556

Figure A3.8. Maximum Quantities for Dry Ice Aboard C-17 Aircraft.

	Maximum Amount in Pounds	Maximum Amount in Kilograms
Two Packs – High Flow Setting at 35,000 feet	3,430	1,556
Two Packs – High Flow Setting at 10,000 feet or less	2,080	943
Two Packs – Normal Flow Setting at 35,000 feet	1,880	853
Two Packs – Normal Flow Setting at 10,000 feet or less	1,040	472
One Pack – High Flow Setting at 35,000 feet	1,720	780
One Pack – High Flow Setting Holding at 10,000 feet	1,040	472

NOTE: Above quantities are the maximum amounts for operating with no passengers in the cargo compartment. Limitation with passengers in the cargo compartment is set at 1,040 pounds (472 kilograms) for both high and normal flow.

A3.3.9.4.8. **Non-pressurized Aircraft.** For non-pressurized aircraft, the amount of dry ice that can be safely shipped by air depends upon the sublimation rate and ventilation of the aircraft. To minimize the sublimation rate, use insulated containers surrounded with insulating blankets and tarpaulins. The aircraft must have maximum ventilation during the shipment. With unpressurized cargo compartment, the quantity of dry ice that can be transported is unlimited if the fumes are vented overboard the aircraft. Maximum quantities abroad a C-5 aircraft are shown in **Figure A3.9.**

Figure A3.9. Maximum Quantities for Dry Ice Abroad C-5 Aircraft.

	Maximum amount in Pounds	Maximum Amount in Kilograms
Cruise (mach 0.5 and up) and altitudes up to 30,000 feet (Note 1)	4,700	2,132
Cruise (mach 0.6 and up) and altitudes up to 30,000 feet (Note 1)	3,120	1,415
During Non-pressurized up to 10,000 feet (Note 2)	6,500	2,948
During Ground Operations with one auxiliary power unit (Note 3)	2,950	1,338

NOTES:

1. The Environmental Control System (ECS) must be operated with “both” air conditioning units on a “Normal” flow control valve and the “Intermediate” setting on the alternative air valve.
2. The auxiliary vent value must be open for this condition.
3. The air turbine motor is at idle. The auxiliary vent valve must be open for this condition.

A3.3.9.4.9. **KC-10 Aircraft.** Dry ice may be carried in the KC-10 cargo compartment under the following aircraft operating conditions:

A3.3.9.4.9.1. If "one" air conditioning pack is lost in flight, then accomplish emergency procedures for cabin. Turn Cargo Smoke Light on per KC-10 flight manual T.O. 1C-10(K)A-1, Section II. Include "Smoke Source is not Accessible" portion of procedure except do not put cabin pressure control in manual and do not depressurize cabin.

A3.3.9.4.9.2. Environmental curtain at station 615 or 879: If "one" air conditioning pack is lost in flight, then accomplish emergency procedures for cabin, turn cargo smoke light on, mixed passenger and cargo configuration per KC-10 flight manual T.O 1C-10(k) A-1, section II, except do not initiate firefighting procedures.

A3.3.9.4.9.3. During cargo loading, the following procedures apply to minimize carbon dioxide concentration:

A3.3.9.4.9.3.1. Ensure APU is running and "both" air conditioning packs are operating.

A3.3.9.4.9.3.2. Open number 4 passenger service door for additional ventilation.

A3.3.9.4.9.3.3. Open all air inlets in the aerial refueling operator’s station and close aerial refueling operators hatch.

A3.3.9.4.9.4. Ensure environmental curtain is closed before flight.

A3.3.9.4.9.5. Transport maximum quantities as shown in **Figure A3.10.**

Figure A3.10. Maximum Quantities for Dry Ice Abroad KC-10 Aircraft.

	Maximum amount in Pounds	Maximum Amount in Kilograms
No environmental curtain (27 pallet all-cargo configuration):		
Both packs operating	2,295	1,041
One pack operating	1,251	568
Environmental curtain at station 615:		
Both packs operating	1,782	808
One pack operating	969	440
Environmental curtain at station 879:		
Both packs operating	1,204	546
One pack operating	653	296

A3.3.9.4.10. **AMC Contract Aircraft.** Do not transport more than 440 pounds (200 kilograms) of dry ice in a cargo compartment of AMC contract aircraft without prior approval from HQ AMC/A43C.

A3.4. Household Goods (HHG) Shipments. DoD 4500.34-R, *Personnel Property Traffic Management Regulation* establishes requirements for the movement of HHG and specifies that hazardous materials are not authorized for military airlift. One exception is that engine power-driven equipment (motorcycle, moped, lawnmower, boat, snowmobile, etc.) may be transported as HHG under the following requirements:

A3.4.1. Completely drain all fuel.

A3.4.2. Run until the engine stalls.

A3.4.3. Drain all oil and cooling fluids.

A3.4.4. Allow fuel tanks and lines to remain open for at least 24 hours prior to pickup.

A3.4.5. Disconnect nonspillable gel-type batteries and tape the ends to prevent short circuit. Batteries may remain in the equipment holder, but ensure they are firmly secured and remain upright in the shipping container. Do not ship batteries with acid or alkali.

A3.4.6. Engine power-driven equipment prepared in this manner are not regulated by this manual. A Shipper's Declaration for Dangerous Goods is not required.

Attachment 4

ITEMS LISTING

A4.1. General Requirements. This attachment contains :

A4.1.1. An alphabetical listing of the hazardous materials subject to the requirements of this manual. See paragraph **1.10.** for material determined to be nonhazardous.

A4.1.2. Classification criteria for hazard classes. See **Attachment 1** for definitions.

A4.1.3. Identification of items prohibited for military air transportation.

A4.1.4. Listing of Hazardous Substances and applicable Reportable Quantities.

A4.2. Using Table A4.1. Table A4.1. identifies "hazardous materials" for the purpose of military air transportation. To use **Table A4.1.** locate the proper shipping name (PSN) of the hazardous material and follow the information identified on the same line with the PSN. Use **Table A4.1.** to identify the following: eligibility of material for shipment, proper shipping name (PSN), hazard class and identification division, identification number, packing group (PG), subsidiary risk, special provisions applicable to the material (including passenger eligibility), and packaging paragraph.

A4.2.1. **Column 1: Symbols.** Column 1 contains symbols that pertain to the PSN.

A4.2.1.1. The letter "D" means that the PSN applies only to domestic shipments. These items are also identified by "NA" numbers in column 4. For international shipments, select an alternate PSN that is not preceded by a "D".

A4.2.1.2. The "*" (asterisk) identifies that a technical name is required in association with the PSN.

A4.2.1.3. The "+" (plus) fixes the proper shipping name, hazard class and packing group for that entry without regard to whether the material meets the definition of that class or packing group or meets any other hazard class definition.

A4.2.2. **Column 2: Proper Shipping Names (PSN).** PSNs are listed alphabetically in all bold capital letters in **Table A4.1.** Use either singular or plural wording. New and revised PSNs in 49 CFR, part 172, ICAO, or IATA are authorized PSNs under this manual, provided the packaging requirements do not change. A PSN modifier which appear as lower case italicized letters are descriptive words which may be used, but are not required as part of the PSN.

A4.2.2.1. **Technical or Chemical Group Names.** Provide a technical or chemical group name in association with the PSN when required by an "*" in column 1.

A4.2.2.1.1. **Organic Peroxides.** Use technical names listed below the appropriate generic PSN (in lower case letters) in **Table A4.1.** See A4.3.5. for PSN assignment based on technical name.

A4.2.2.1.2. **Mixtures and Solutions.** If the hazardous material is a mixture or solution of two or more hazardous materials, enter the technical names of at least two components most contributing to the hazards of the mixture or solution in parentheses after the PSN.

A4.2.2.2. **The Word "OR" in Table A4.1.** The word "or" in a sequence of PSNs means that PSNs in the sequence are synonymous. Therefore, use of any one of the PSNs in the series is appropriate. Select only one PSN in the series when classifying the shipment.

A4.2.2.3. **The Word "SEE" in Table A4.1.** When one item references another item (by use of the word "see") and both names are in capital letters, use either name as the PSN. Forbidden designations and passenger restrictions applicable to the referenced entry also apply to the "see" entry.

A4.2.2.4. **The Words "SOLUTION" or "MIXTURE".** A mixture or solution containing a hazardous material listed by name in **Table A4.1.** together with one or more materials not subject to this manual must be identified by the PSN of the hazardous material. The qualifying word "solution" or "mixture" should be added to the PSN.

A4.2.2.5. **Concentration Ranges.** When a shipping name includes a concentration range as part of the shipping description, the actual concentration shipped (if it is in the range stated) may be used in place of the concentration range. For example, ship a hydrogen peroxide solution containing 30 percent peroxide as either "Hydrogen peroxide aqueous solution (with not less than 20 percent but not more than 40 percent hydrogen peroxide)" or "Hydrogen peroxide aqueous solution (with 30 percent hydrogen peroxide)."

A4.2.2.6. **Hazardous Wastes.** The PSN for a hazardous material that is a hazardous waste must include the word "WASTE" preceding the name of the material (i.e., WASTE, ACETONE). Comply with all requirements of this manual identified for the hazardous material when shipped as waste.

A4.2.3. **Column 3: Hazard Class.** Column 3 contains:

A4.2.3.1. Primary hazard class and division numbers. When this manual references hazard class, that includes any division number if appropriate. For Class 1 (explosives), the compatibility group is also given. See **A4.3.** for additional information on class/divisions.

A4.2.3.2. Some items that contain explosive material may be assigned to a classification other than Class 1 by DoD explosives hazard classification approval authorities due to the predominant hazard (see **A3.3.1.2.**). Compatibility group letters assigned to non-Class 1 material do not apply to military air transportation.

A4.2.4. **Column 4: Identification Number.** Column 4 lists the identification number assigned to each PSN.

A4.2.4.1. Ship items classified with "UN" (United Nations) or "ID" (identification) numbers domestically or internationally.

A4.2.4.2. Ship items classified with "NA" (North American) numbers domestically only, or to and from Canada or Mexico. Use of "UN" numbers is preferred even for domestic shipment.

A4.2.4.3. New or revised UN or NA numbers in 49 CFR, part 172, ICAO, or IATA are recognized for use with this manual.

A4.2.5. **Column 5: Packing Group (PG).** Column 5 specifies one or more packing groups assigned to each PSN and hazard class. Hazard classes 2, 7, and ORM-D do not have packing groups. Unless otherwise identified, Hazard Class 1 are PG II. See **A4.4.** for additional information on PG.C

A4.2.6. **Column 6: Subsidiary. C**olumn 6 identifies the hazard class/division of any subsidiary risk posed by a material. Subsidiary risk may vary, depending on the applicable PG.

A4.2.7. **Column 7: Special Provisions.** Column 7 specifies codes for special provisions that are applicable for each PSN, hazard class, and PG. Special provision codes may vary, depending on the PG. Requirements of the special provision codes are identified in **Table A4.2.** The codes reflect four categories: numeric codes, codes beginning with "A", codes beginning with "N", and codes beginning with a “P”.

A4.2.7.1. Use codes beginning with a “P” to determine passenger eligibility for transport with hazardous materials.

A4.2.7.2. Use all other codes to determine packaging provisions, restrictions, and exceptions from requirements for particular quantities or forms of materials.

A4.2.7.3. When an additional packaging requirement is prescribed, the requirement is mandatory.

A4.2.8. **Column 8: Packaging Paragraph.** This column lists the applicable packaging paragraph. “FORBIDDEN” items are also identified in this column. Do not transport "FORBIDDEN" items by military aircraft.

A4.2.8.1. Except when otherwise identified, prepare hazardous material shipments according to the specified packaging paragraph.

A4.2.8.2. Packaging paragraphs in each attachment provide titles as a guide for PSNs covered by that paragraph. These titles are a guide only and are not all-inclusive.

A4.2.8.3. If a packaging paragraph in **Table A4.1.** specifies packaging that is not applicable to the form of the material (i.e., the packaging specified is for a solid material and the material shipped is in liquid form) use the following guidance to select the appropriate paragraph:

A4.2.8.3.1. Use either packaging paragraph **A8.3.** (liquids) or (solids) as appropriate.

A4.2.8.3.2. Use either packaging paragraph **A9.7.** (liquids) or **A9.8.** (solids) as appropriate.

A4.2.8.3.3. Use either pacakaging paragraph **A10.5.** (liquids) or **A10.6.** (solids as appropriate).

A4.2.8.3.4. Use either packaging paragraph **A12.3.** (liquids) or **A12.4.** (solids) as appropriate).

A4.3. Classifying Hazardous Materials.

A4.3.1. **Hazard Class Names.** The hazard class and division is a numerical identification which describes the class (type) of primary hazard involved and if appropriate, its division within the class. Use the Hazardous Material Information Resource System (HMIRS), product Material Safety Data Sheet, or other manufacturer’s information if assistance in determining the hazard classification is needed. **Figure A4.1.** lists class and division numbers and the corresponding class and division names.

Figure A4.1. Hazard Classes.

HAZARD CLASS/ DIVISION NUMBER	HAZARD CLASS/ DIVISION NAME	HAZARD CLASS/ DIVISION NUMBER	HAZARD CLASS/ DIVISION NAME
1.1	Explosives (with mass explosion hazard)	4.1	Flammable solid
1.2	Explosives (with a projection hazard)	4.2	Spontaneously combustible material
1.3	Explosives (with predominately a fire hazard)	4.3	Dangerous when wet material
1.4	Explosives (with no significant blast hazard)	5.1	Oxidizer
1.5	Very insensitive explosives; blasting agents	5.2	Organic peroxide
1.6	Extremely insensitive detonating substances	6.1	Poisonous (toxic) material
2.1	Flammable gas	6.2	Infectious substances (etiologic agents)
2.2	Nonflammable gas	7	Radioactive material
2.3	Poisonous gas	8	Corrosive material
3	Flammable liquid	9	Miscellaneous hazardous material

A4.3.2. **Items Not Specifically Listed.** If a material is not specifically listed in **Table A4.1.**, determine the PSN by comparing the characteristics of the items with the definitions of the various hazard classes in this manual. Assign a "Not Otherwise Specified" (N.O.S.) name based on the hazard class of the material. Examples are: "FLAMMABLE LIQUID, N.O.S.; CORROSIVE SOLID, N.O.S." **Attachment 1** contains hazardous class definitions. Determine the appropriate technical name according to **A4.2.2.**

A4.3.3. **Tentative PSN Assignment.** A material for which the hazard class must be determined by testing, or a material that is a hazardous waste, the shipper may assign a tentative shipping name, based on:

A4.3.3.1. The defining criteria of the hazard class.

A4.3.3.2. The hazard precedence prescribed in **A5.9.**

A4.3.3.3. The shipper's knowledge of the material.

A4.3.3.4. **A3.3.1.2.** for new explosives.

A4.3.3.5. If a N.O.S. PSN is assigned, a technical name is not required.

A4.3.4. **Precedence of Hazard.** Assign any material specifically identified and listed in **Table A4.1.** the hazard class identified in column 3 of **Table A4.1.** Classification tools identified in **A5.9.1.** should be used to determine appropriate hazardous material description. If required, classify a hazardous

material that is not specifically identified and listed in **Table A4.1.** (or is a mixture of materials), and meets the definition of more than one hazard, according to the following order of precedence:

A4.3.4.1. Class 7 (Radioactive material, other than limited quantities). When limited quantities are involved the other hazardous properties take precedence.

A4.3.4.2. Class 1 (Explosives).

A4.3.4.3. Class 2.3. (poisonous gas).

A4.3.4.4. Class 2.1 (flammable gas). See also Class 9.

A4.3.4.5. Class 2.2 (nonflammable gas). See also Class 9.

A4.3.4.6. Class 5.2 (organic peroxide).

A4.3.4.7. Class 6.2 (infectious substances or etiologic agents)

A4.3.4.8. Class 4.1. (flammable solid). Only self-reactive substances and wetted explosives.

A4.3.4.9. Class 4.2 (substances liableto spontaneous combustion) . Only pyrophoric substances.

A4.3.4.10. Class 6.1 (poisonous substances), PG I, poisnous by inhalation only.

A4.3.4.11. Small quantities of compressed gas such as starter fluid (Class 2.1) or fire extinguisher (Class 2.2) installed on a vehicle do not take precedence over the flammable liquid (Class 3).

A4.3.4.12. If required, classify other hazardous materialsnot identified above according to 49 CFR 173.2a.

A4.3.5. **Hazard Classification of Class 5.2 Organic Peroxides.** Class 5.2 organic peroxides are categorized into one of seven "types" in a system of generic proper shipping names. The generic PSN for the organic peroxide describes the physical state of the material (i.e., liquid or solid), provides an indication of controlled temperature requirements, and includes the "type" of the organic peroxide. The seven types of organic peroxides are described in **Attachment 1**. Transport all Class 5.2 material under one of the generic proper shipping names listed in **Table A4.1.** beginning with the words "ORGANIC PEROXIDE". Technical names are listed below each PSN in lower case letters. To determine the correct PSN:

A4.3.5.1. Find the technical name in **Table A9.1.** and select the UN identification number assigned to the technical name that best describes the item (in terms of concentration ranges, physical characteristics, etc).

A4.3.5.2. Turn to the "ORGANIC PEROXIDE" listed in **Table A4.1.** These entries constitute the "generic" organic peroxide proper shipping names.

A4.3.5.3. Match the UN identification number for the technical name with a UN identification number associated with the generic PSN.

A4.3.5.4. The generic PSN associated with organic peroxides will include the "type" under which the organic peroxide falls. Organic peroxide types are defined in **Attachment 1**.

A4.3.6. **Hazard Classification of Fissile Materials.** Except as provided in **A3.3.7.9.**, classify each package of fissile materials as fissile class I, II, or III. Determine the numerical values for package assignments as fissile class I, the transport indexes for fissile class II packages, and the conveyance limitations for fissile class III shipments according to 10 CFR Part 71.

A4.3.6.1. **Fissile Class I.** Packages may be transported in unlimited numbers, and in any arrangement, and require no nuclear criticality safety controls during transportation. A transport index is not assigned to fissile class I packages for the purpose of nuclear criticality safety control, although, the external radiation levels may require a transport index number.

A4.3.6.2. **Fissile Class II.** Packages may be transported together in any arrangement, but in numbers that are not over an aggregate transport index of 50. For the purposes of nuclear criticality safety control, individual packages may have a transport index of not less than 0.1 and not more than 10. However, the external radiation levels may require a higher transport index number. These shipments require no nuclear criticality safety control by the shipper during transportation.

A4.3.6.3. **Fissile Class III.** Shipments of packages of fissile materials that do not meet the requirements of fissile class I or fissile class II and are controlled in transit as prescribed in **A3.3.7.8.** by appropriate arrangements between the shipper and the carrier.

A4.4. Determining Degree of Hazard (PG). For most material, the PG is assigned in column 5 of **Table A4.1.** Packing groups I, II, and III indicate the degree of hazard associated with the materials and are used to identify the severity of UN specification performance tests associated with the packaging for the item. Poisonous by inhalation material are assigned hazard zones (see **Attachment 1**) in **Table A4.1.** If unknown, the PG or hazard zone may be determined according to this paragraph. Class 2, and 7 do not have packing groups.

A4.4.1. **Class 2 Hazard Zone.** The hazard zone of a Class 2.3 material is given in column 7 of **Table A4.1.** When column 7 of **Table A4.1.** provides more than one hazard zone or is blank, determine the hazard zone from **Figure A4.2.** There are no hazard zones for Class 2.1 and 2.2.

Figure A4.2. Determination of Hazard Zone for Class 2.3.

Hazard Zone	Inhalation Toxicity (parts per million)
A	LC_{50} less than or equal to 200 ppm
B	LC_{50} greater than 200 ppm and less than or equal to 1000 ppm
C	LC_{50} greater than 1000 ppm and less than or equal to 3000 ppm
D	LC_{50} greater than 3000 ppm or less than or equal to 5000 ppm

A4.4.2. **Class 3 Packing Groups.** When **Table A4.1.** lists more than one PG for a material, or indicates that the PG is to be determined on the basis of the PG criteria for Class 3, determine the PG by using **Figure A4.4.** To use **Figure A4.3.**, match the initial boiling point and flash point of the material to the corresponding PG. Flash points may be determined from the material safety data sheet, the Hazardous Material Information Resource System (HMIRS), the National Fire Protection Guide, or markings on the package. For example, a Class 3 material with an initial boiling point of 38 degrees C (100 degrees F) and a flash point of 25 degrees C (77 degrees F) would be assigned a PG III. If the initial boiling point is less than or equal to 35 degrees C (95 degrees F), assign PG I. Viscous Class 3 material

(i.e., paints, varnishes, enamels, lacquers, adhesives, and polishes) in PG II with a flash point of less than 23 degrees C (73 degrees F) may be grouped in PG III provided the requirements of 49 CFR 173.121(b) are met.

Figure A4.3. Criteria for Class 3 PG.

PG	Flash Point (closed-cup)	Initial Boiling Point
I		less than or equal to 35°C (95°F)
II	less than 23°C (73°F)	greater than 35°C (95°F)
III	equal to or greater than 23°C (73°F) but less than or equal to 60.5°C (141°F)	greater than 35°C (95°F)

A4.4.3. **Class 4 Packing Groups.** When **Table A4.1.** indicates that the PG of the material is to be determined on the basis of test criteria for Class 4 material, the test methods and appropriate criteria must comply with 49 CFR, part 173.125.

A4.4.4. **Class 5 Packing Groups.** When column 5 of **Table A4.1.** is blank for a solid in Class 5.1, determine the PG based on the test criteria found in 49 CFR, part 173.127. If column 5 is blank for a liquid in Class 5.1, packing groups can be assigned by a comparison to existing entries in **Table A4.1.**

A4.4.5. **Class 6 Packing Groups and Hazard Zone.** When **Table A4.1.**, column 5 provides more than one PG and hazard zone for a specific Class 6.1 material, determine the PG and hazard zone by applying the following criteria:

A4.4.5.1. Determine the PG assignment for other than inhalation of vapors by using **Figure A4.4.**

A4.4.5.2. Determine the PG and hazard zone assignments for inhalation of vapors by using **Figure A4.5.**

Figure A4.4. PG Assignment For Other Than Inhalation of Vapors.

PG	Oral Toxicity LD_{50}(mg/kg)	Dermal Toxicity LD_{50} (mg/kg) LC_{50}mg/L)	Inhalation Toxicity by dusts and mists
I	≤ 5	≤ 40	≤ 0.5
II	$> 5, \leq 50$	$>40, \leq 200$	$<0.5, \leq 2$
III	solids: $> 50, \leq 200$, liquids $> 50, \leq 500$	$>200, \leq 1000$	$> 2, \leq 10$

Figure A4.5. Inhalation Toxicity.

PG (Hazard Zone)	Vapor Concentration and Toxicity
I (Hazard Zone A)	V $\geq$500 LC_{50} and $LC_{50} \leq$ 200 mL/M^3
I (Hazard Zone B)	V $\geq$10 LC_{50} and $LC_{50} \leq$1000 mL/m^3 , and the criteria for PG I, hazard zone A are not met
II (Hazard Zone C)	V $\geq LC_{50}$ and $LC_{50} \leq$3000 mL/m^3, and the criteria for PG I, hazard zones A and B are not met
III (Hazard Zone D)	V $\geq$.2 LC_{50} and LC_{50} $^{<}$ 5000 mL/m^3, and the criteria for packing groups I and II, hazard zones A, B, and C are not met

A4.4.5.3. "V" is the saturated vapor concentration in air of the material in mL/m^3 at 20 degrees C (68 degrees F) and standard atmospheric pressure.

A4.4.5.4. When the PG determined by **Figure A4.5.** and Figure A4.6 is different for two or more (oral, dermal, inhalation) requirements, the PG assigned to the material is the highest degree of toxicity identified.

A4.4.5.5. Compute the PG and hazard zone for Class 6.1 mixtures that are poisonous (toxic) by inhalation as identified in 49 CFR 173.133 (b).

A4.4.6. **Class 8 Packing Groups.** When **Table A4.1.** lists more than one PG for a material, determine the PG according to 49 CFR 173.137.

A4.5. Hazardous Substances. **Table A4.3.** identifies materials that are designated hazardous substances under Section 101 (14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). See **Attachment 1** for a detailed definition of a hazardous substance. Ensure review of **Table A4.3.** to determine if a material is a hazardous substance.

A4.5.1. Determine if the material is a hazardous substance by identifying the reportable quantity (RQ) in **Table A4.3.** The RQ is used to determine if material is a hazardous substance. The material is a hazardous substance if the amount in one package equal or exceeds the RQ quantity. **Table A4.3.** specifies, in pounds and kilograms, the minimum quantity of the material that constitutes an RQ. For example: sodium arsenate (RQ-1.0/0.454) means the RQ is 1.0 pounds or 0.454 kilograms.

A4.5.2. A substance or solution is a "hazardous substance" when the concentration by weight equals or exceeds the concentration listed in **Figure A1.1.**

A4.5.3. If the technical name of the hazardous substance appears in **Table A4.1.**, then the technical name is the PSN. If the hazardous substance does not appear in **Table A4.1.** and is not a forbidden material, select an appropriate generic (N.O.S.) PSN. Specify the technical name in parenthesis after the PSN. See **Attachment 17** for certification requirements.

A4.5.4. For Radionuclides, see Table 4.4.

Table A4.1. Alphabetical Listing of Items: A7.3.

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Accellerene; see **p-NITROSODIMETHYLANILINE**						
	Accumulators, electric; see **BATTERIES, WET,** *etc.*						
	Accumulators, pressurized, hydraulic (containing nonflammable gas),see **ARTICLES, PRESSURIZED, HYDRAULIC**						
	Accumulators, pressurized, pneumatic, see **ARTICLES, PRESSURIZED, PNEUMATIC**						
	ACETAL	3	UN1088	II		P5	A7.3.
	ACETALDEHYDE	3	UN1089	I		P3, A3	A7.3.
	ACETALDEHYDE AMMONIA	9	UN1841	III		P5	A13.13.
	ACETALDEHYDE OXIME	3	UN2332	III		P5	A7.3.
	ACETIC ACID, GLACIAL *or* **ACETIC ACID SOLUTION**, *with more than 80% acid, by mass*	8	UN2789	II	3	P5, A3, A6, A7, A10	A12.3.
	ACETIC ACID SOLUTION, *with not less than 50%, but not more than 80% acid, by mass*	8	UN2790	II		P5, A3, A6, A7, A10	A12.3.
	ACETIC ACID SOLUTION, *with more than10%, but less than 50% acid, by mass*	8	UN2790	III		P5	A12.3.
	ACETIC ANHYDRIDE	8	UN1715	II	3	P5, A3, A6, A7, A10	A12.3.
	Acetic oxide; see **ACETIC ANHYDRIDE**						
	Acetoin; see **ACETYL METHYL CARBINOL**						
	ACETONE	3	UN1090	II		P5	A7.3.
	ACETONE CYANOHYDRIN, STABILIZED	6.1	UN1541	I		P2, 2, A3, N34	A10.7.
	ACETONE OILS	3	UN1091	II		P5	A7.3.
	ACETONITRILE	3	UN1648	II		P5	A7.3.
	Acetyl acetone peroxide with more than 9% by mass active oxygen						FORBIDDEN
	Acetyl benzoyl peroxide, solid, or with more than 40% in solution						FORBIDDEN
	ACETYL BROMIDE	8	UN1716	II		P5	A12.3.
	ACETYL CHLORIDE	3	UN1717	II	8	P5, A3, A6, A7, N34	A7.3.
	Acetyl cyclohexanesulphonyl peroxide,with more than 82% wetted with less than 12% water						FORBIDDEN
	Acetylene dichloride; see **DICHLOROETHYLENE**						
	ACETYLENE, DISSOLVED	2.1	UN1001			P4	A6.10.
	Acetylene (liquefied)						FORBIDDEN
	Acetylene silver nitrate						FORBIDDEN
	ACETYLENE, SOLVENT FREE	2.1	UN3374			P4	A6.10.
	Acetylene tetrabromide; see **TETRABROMOETHANE**						

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Acetylene tetrachloride; *see* **TETRACHLOROETHANE**						
	ACETYL IODIDE	8	UN1898	II		P5	**A12.3.**
	ACETYL METHYL CARBINOL	3	UN2621	III		P5	**A7.3.**
	Acetyl oxide; see **ACETIC ANHYDRIDE**						
	Acetyl peroxide, solid or with more than 25% in solution						FORBIDDEN
	Acid butyl phosphate, see **BUTYL ACID PHOSPHATE**						
	Acid, sludge, see **Sludge Acid**						
	Acids, liquid, N.O.S.; see **CORROSIVE LIQUIDS, N.O.S.**						
	Acraldehyde, stabilized; see **ACROLEIN, STABILIZED**						
	ACRIDINE	6.1	UN2713	III		P5	**A10.6.**
	ACROLEIN DIMER, STABILIZED	3	UN2607	III		P5	**A7.3.**
	ACROLEIN, STABILIZED	6.1	UN1092	I	3	P1, 1	**A10.7.**
	ACRYLAMIDE	6.1	UN2074	III		P5	**A10.6.**
	ACRYLIC ACID, STABILIZED	8	UN2218	II	3	P5	**A12.3.**
	ACRYLONITRILE, STABILIZED	3	UN1093	I	6.1	P3	**A7.3.**
	Activated charcoal; see **CARBON, ACTIVATED**						
	ADHESIVES, *containing flammable liquid*	3	UN1133	I II III		P3 P5 P5	**A7.3.** **A7.3.** **A7.3.**
	ADIPONITRILE	6.1	UN2205	III		P5	**A10.5.**
	AEROSOLS, FLAMMABLE	2.1	UN1950			P5	**A6.3.**
	AEROSOLS, *flammable, corrosive, containing substances in Division 8, Packing Group II*						FORBIDDEN
	AEROSOLS, *flammable, corrosive, containing substances in Division 8, Packing Group III*	2.1	UN1950		8	P5	**A6.3.**
	AEROSOLS, *flammable, toxic, containing substances in Division 6.1, Packing Group II*						FORBIDDEN
	AEROSOLS, *flammable, toxic, containing substances in Division 6.1, Packing Group III*	2.1	UN1950		6.1	P5	**A6.3.**
	AEROSOLS, *flammable, containing substances in Division 6.1, Packing Group III and substances in Class 8, Packing Group III*	2.1	UN1950		6.1, 8	P5	**A6.3.**
	AEROSOLS, *flammable, containing toxic gas*						FORBIDDEN
	AEROSOLS, *flammable ,n.o.s.* *(engine starting fluid)*	2.1	UN1950			P5	**A6.3.**
	AEROSOLS, *flammable, corrosive, containing substances in Class 8, Packing Group I*						FORBIDDEN
	AEROSOLS, *flammable, toxic, containing substances in Class 6.1, Packing Group I*						FORBIDDEN
	AEROSOLS, *non-flammable, containing substances in Class 8, Packing Group I*						FORBIDDEN

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	AEROSOLS, *non-flammable, containing substances in Class 6.1, Packing Group I*						FORBIDDEN
	AEROSOLS, NON-FLAMMABLE	2.2	UN1950			P5	**A6.3.**
	AEROSOLS, NON-FLAMMABLE *(containing biological products or a medicinal preparation which will be deteriorated by a heat test)*	2.2	UN1950			P5	**A6.3.**
	AEROSOLS, *non-flammable, corrosive, containing substances in Class 8, Packing Group II*						FORBIDDEN
	AEROSOLS, *non-flammable, corrosive, containing substances in Class 8, Packing Group III*	2.2	UN1950		8	P5	P5
	AEROSOLS, *non-flammable, toxic containing substances in Division 6.1, Packing Group II (other than tear gas device)*						FORBIDDEN
	AEROSOLS, *non-flammable, toxic containing substances in Division 6.1, Packing Group III*	2.2	UN1950		6.1	P5	**A6.3.**
	AEROSOLS, *non-flammable, containing substances in Division 6.1, Packing Group III and substances in Class 8, Packing Group III*	2.2	UN1950		6.1, 8	P5	**A6.3.**
	AEROSOLS, *non-flammable, containing toxic gas*						FORBIDDEN
	AEROSOLS, *non-flammable, (tear gas devices)*	2.2	UN1950		6.1	P5	**A6.3.**
	AIR BAG INFLATORS *or* **AIR BAG MODULES** *or* **SEAT-BELT PRETENSIONERS**	9	UN3268	III		P5	**A13.14.**
	AIRBAG INFLATORS, COMPRESSED GAS *or* **AIR BAG MODULES**, **COMPRESSED GAS** *or* **SEAT-BELT PRETENSIONERS COMPRESSED GAS**	2.2	UN3353			P5	**A13.14.**
	AIR, COMPRESSED	2.2	UN1002			P5, A124	**A6.4.**, **A6.6.**
	AIR, REFRIGERATED LIQUID *(cryogenic liquid) pressurized*	2.2	UN1003		5.1	P4	**A6.12.**
	AIR, REFRIGERATED LIQUID *(cryogenic liquid)* non-*pressurized*	2.2	UN1003		5.1	P4	**A6.12.**
	Aircraft Engines; see **ENGINES, INTERNAL COMBUSTION**						
	Aircraft evacuation slides; see **LIFE-SAVING APPLIANCES**						
	AIRCRAFT HYDRAULIC POWER UNIT FUEL TANK *(containing a mixture of anhydrous hydrazine and monomethyl hydrazine) (M86 fuel)*	3	UN3165	I	6.1, 8	P3, A501	**A7.5.**
	Aircraft Survival Kits; see **LIFE-SAVING APPLIANCES**						
*	**ALCOHOLATES SOLUTION, N.O.S.** *in alcohol*	3	UN3274	II	8	P5	**A7.3.**
	ALCOHOLIC BEVERAGES	3	UN3065	II III		P5 P5	**A7.3.** **A7.3.**
*	**ALCOHOLS, N.O.S.**	3	UN1987	I II III		P3 P5 P5	**A7.3.** **A7.3.** **A7.3.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*	**ALCOHOLS, FLAMMABLE, TOXIC, N.O.S.**	3	UN1986	I II III	6.1 6.1 6.1	P3 P4 P5	**A7.3.** **A7.3.** **A7.3.**
*	**ALDEHYDES, N.O.S.**	3	UN1989	I II III		P3 P5 P5	**A7.3.** **A7.3.** **A7.3.**
*	**ALDEHYDES, FLAMMABLE, TOXIC, N.O.S**	3	UN1988	I II III	6.1 6.1 6.1	P3 P4 P5	**A7.3.** **A7.3.** **A7.3.**
	ALDOL	6.1	UN2839	II		P5	**A10.5.**
*	**ALKALI METAL ALCOHOLATES, SELF-HEATING, CORROSIVE, N.O.S.**	4.2	UN3206	II III	8 8	P4 P5	**A8.4.** **A8.4.**
	ALKALI METAL ALLOYS, LIQUID, N.O.S	4.3	UN1421	I		P3, A2, A3, N34	**A8.3.**
	ALKALI METAL AMALGAMS, LIQUID	4.3	UN1389	I		P3, A2, A3, N34	**A8.3.**
	ALKALI METAL AMALGAMS, SOLID	4.3	UN1389	I		P3, N40	**A8.4.**
	ALKALI METAL AMIDES	4.3	UN1390	II		P5, A6, A7, A8, A19, A20	**A8.4.**
	ALKALI METAL DISPERSIONS *or* **ALKALINE EARTH METAL DISPERSIONS**	4.3	UN1391	I		P3, A2, A3	**A8.3.**
	Alkaline corrosive liquids, N.O.S.; see **CAUSTIC ALKALI LIQUIDS, N.O.S.**						
*	**ALKALINE EARTH METAL ALCOHOLATES, N.O.S**	4.2	UN3205	II III		P4 P5	**A8.4.** **A8.4.**
	ALKALINE EARTH METAL ALLOYS, N.O.S.	4.3	UN1393	II		P5, A19	**A8.4.**
	ALKALINE EARTH METAL AMALGAMS	4.3	UN1392	I		P3, A19, N34, N40	**A8.4.**
*	**ALKALOIDS, LIQUID, N.O.S.** *or* **ALKALOID SALTS, LIQUID, N.O.S.**	6.1	UN3140	I II III		P3, A4 P5 P5	**A10.5.** **A10.5.** **A10.5.**
*	**ALKALOIDS, SOLID, N.O.S.** *or* **ALKALOID SALTS, SOLID, N.O.S.**, *poisonous*	6.1	UN1544	I II III		P5 P5 P5	**A10.6.** **A10.6.** **A10.6.**
	ALKYLSULFONIC ACIDS, LIQUID *or* **ARYLSULFONIC ACIDS, LIQUID** *with more than 5% free sulphuric acid*	8	UN2584	II		P5	**A12.3.**
	ALKYLSULFONIC ACIDS, LIQUID *or* **ARYLSULFONIC ACIDS, LIQUID** *with not more than 5% free sulfuric acid*	8	UN2586	III		P5	**A12.3.**
	ALKYLSULFONIC ACIDS, SOLID, *or* **ARYLSULFONIC ACIDS, SOLID,** *with more than 5% free sulfuric acid*	8	UN2583	II		P5	**A12.4.**
	ALKYLSULFONIC ACIDS, SOLID, *or* **ARYLSULFONIC ACIDS, SOLID,** *with not more than 5% free sulfuric acid*	8	UN2585	III		P5	**A12.4.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ALKYLPHENOLS, LIQUID, N.O.S. *(including C2-C12 homologues)*	8	UN3145	I II III		P3 P5 P5	**A12.3.** **A12.3.** **A12.3.**
	ALKYLPHENOLS, SOLID, N.O.S. *(including C2-C12 homologues)*	8	UN2430	I II III		P5 P5 P5	**A12.4.** **A12.4.** **A12.4.**
*	**ALKYLSULFURIC ACIDS**	8	UN2571	II		P4	**A12.3.**
	Allethrin; see **PESTICIDES, LIQUID, TOXIC, N.O.S.**						
	ALLYL ACETATE	3	UN2333	II	6.1	P4	**A7.3.**
	ALLYL ALCOHOL	6.1	UN1098	I	3	P2, 2	**A10.7.**
	ALLYLAMINE	6.1	UN2334	I	3	P2, 2	**A10.7.**
	ALLYL BROMIDE	3	UN1099	I	6.1	P3	**A7.3.**
	ALLYL CHLORIDE	3	UN1100	I	6.1	P3	**A7.3.**
	ALLYL CHLOROFORMATE	6.1	UN1722	I	3, 8	P2, 2, A3, N41	**A10.7.**
	ALLYL ETHYL ETHER	3	UN2335	II	6.1	P4	**A7.3.**
	ALLYL FORMATE	3	UN2336	I	6.1	P3	**A7.3.**
	ALLYL GLYCIDYL ETHER	3	UN2219	III		P5	**A7.3.**
	ALLYL IODIDE	3	UN1723	II	8	P5, A3, A6, N34	**A7.3.**
	ALLYL ISOTHIOCYANATE, STABILIZED	6.1	UN1545	II	3	P4, A3, A7	**A10.5.**
	ALLYLTRICHLOROSILANE, STABILIZED	8	UN1724	II	3	P5, A7, N34	**A12.3.**
	ALUMINIUM ALKYL HALIDES	4.2	UN3052	I	4.3	P3	**A8.6.**
	ALUMINIUM ALKYL HYDRIDES	4.2	UN3076	I	4.3	P3	**A8.6.**
	ALUMINIUM ALKYLS	4.2	UN3051	I	4.3	P3	**A8.6.**
	ALUMINIUM BOROHYDRIDE *or* **ALUMINIUM BOROHYDRIDE IN DEVICES**	4.2	UN2870	I	4.3	P3	**A8.6.**
	ALUMINIUM BROMIDE, ANHYDROUS	8	UN1725	II		P5	**A12.4.**
	ALUMINIUM BROMIDE, SOLUTION	8	UN2580	III		P5	**A12.3.**
	ALUMINIUM CARBIDE	4.3	UN1394	II		P4, A20, N41	**A8.4.**
	ALUMINIUM CHLORIDE, ANHYDROUS	8	UN1726	II		P5	**A12.4.**
	ALUMINIUM CHLORIDE, SOLUTION	8	UN2581	III		P5	**A12.3.**
	Aluminium dross, wet or hot						FORBIDDEN
	ALUMINIUM FERROSILICON POWDER	4.3	UN1395	II III	6.1 6.1	P4, A19 P5, A19, A20	**A8.4.** **A8.4.**
	ALUMINIUM HYDRIDE	4.3	UN2463	I		P3, A19, N40	**A8.4.**
	Aluminium molten						FORBIDDEN
	ALUMINIUM NITRATE	5.1	UN1438	III		P5, A1, A29	**A9.8.**
	Aluminium phosphate solution; see **CORROSIVE LIQUIDS, N.O.S.**						
	ALUMINIUM PHOSPHIDE	4.3	UN1397	I	6.1	P3, A8, A19, N40	**A8.4.**
	ALUMINIUM PHOSPHIDE PESTICIDES	6.1	UN3048	I		P5, A8	**A10.6.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ALUMINIUM POWDER, COATED	4.1	UN1309	II III		P5 P5	**A8.4.** **A8.4.**
	ALUMINIUM POWDER, UNCOATED	4.3	UN1396	II III		P4, A19, A20 P5, A19, A20	**A8.4.** **A8.4.**
	ALUMINIUM SMELTING BY-PRODUCTS *or* **ALUMINIUM REMELTING BY-PRODUCTS**	4.3	UN3170	II III		P4 P5	**A8.4.** **A8.4.**
	ALUMINIUM RESINATE	4.1	UN2715	III		P5	**A8.4.**
	ALUMINIUM SILICON POWDER, UNCOATED	4.3	UN1398	III		P5, A1, A19	**A8.4.**
	Amatols; see **EXPLOSIVE, BLASTING, TYPE B**						
*	**AMINES, FLAMMABLE, CORROSIVE N.O.S.** *or* **POLYAMINES, FLAMMABLE, CORROSIVE N.O.S.**	3	UN2733	I II III	8 8 8	P3 P4 P4	**A7.3.** **A7.3.** **A7.3.**
*	**AMINES, LIQUID, CORROSIVE, FLAMMABLE N.O.S.** *or* **POLYAMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S.**	8	UN2734	I II	3 3	P3, A3, A6, N34 P4	**A12.3.** **A12.3.**
*	**AMINES, LIQUID, CORROSIVE, N.O.S.** *or* **POLYAMINES, LIQUID, CORROSIVE, N.O.S.**	8	UN2735	I II III		P3, A3, A6, N34 P4 P5	**A12.3.** **A12.3.** **A12.3.**
*	**AMINES, SOLID, CORROSIVE, N.O.S.** *or* **POLYAMINES, SOLID, CORROSIVE N.O.S.**	8	UN3259	I II III		P5 P5 P5	**A12.4.** **A12.4.** **A12.4.**
	2-AMINO-4, 6-DINITORPHENOL, *wetted with not less than 20% water by mass*	4.1	UN3317	I		P5, 23, A8, A19, A20, N41	**A8.4.**
	2-AMINO-4-CHLOROPHENOL	6.1	UN2673	II		P5	**A10.6.**
	2-AMINO-5-DIETHYLAMINOPENTANE	6.1	UN2946	III		P5	**A10.5.**
	2-(2-AMINOETHOXY) ETHANOL	8	UN3055	III		P5	**A12.3.**
	N-AMINOETHYLPIPERAZINE	8	UN2815	III		P5	**A12.3.**
	AMINOPHENOLS *(o-; m-; p-)*	6.1	UN2512	III		P5	**A10.6.**
	AMINOPROPYLDIETHANOLAMINE *see* **AMINES,** *etc.*						
	AMINOPYRIDINES *(o-; m-; p)*	6.1	UN2671	II		P5	**A10.6.**
D	**AMMONIA, ANHYDROUS**	2.2	UN1005			P2, 13	**A6.5.**
	AMMONIA, ANHYDROUS	2.3	UN1005			P2, 4, 13	**A6.5.**
D	**AMMONIA SOLUTIONS,** *relative density less than 0.880 at 15 degrees C in water, with more than 50% ammonia*	2.2	UN3318			P2, 13	**A6.5.**
	AMMONIA SOLUTIONS, *relative density less than 0.880 at 15 degrees C in water, with more than 50% ammonia*	2.3	UN3318		8	P2, 4	**A6.5.**
	AMMONIA SOLUTIONS, *relative density between 0.880 and 0.957 at 15 degrees C in water, with more than 10%, but not more than 35% ammonia*	8	UN2672	III		P5	**A12.3.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	AMMONIA SOLUTIONS, *relative density less than 0.880 at 15 degrees C in water, with more than 35%, but not more than 50% ammonia*	2.2	UN2073			P5	**A6.4.**, **A6.5.**
	AMMONIUM ARSENATE	6.1	UN1546	II		P5	**A10.6.**
	Ammonium azide						FORBIDDEN
	Ammonium Bifluoride, Solid, see **AMMONIUM HYDROGEN DIFLUORIDE, SOLID**						
	Ammonium Bifluoride, Solution, see **AMMONIUM HYDROGEN DIFLUORIDE, SOLUTION**						
	Ammonium bromate						FORBIDDEN
	Ammonium chlorate						FORBIDDEN
	AMMONIUM DICHROMATE	5.1	UN1439	II		P5	**A9.8.**
	AMMONIUM DINITRO-O-CRESOLATE	6.1	UN1843	II		P5	**A10.6.**
	AMMONIUM FLUORIDE	6.1	UN2505	III		P5	**A10.6.**
	AMMONIUM FLUOROSILICATE	6.1	UN2854	III		P5	**A10.6.**
	Ammonium fulminate						FORBIDDEN
	Ammonium hydrate; see **AMMONIA SOLUTIONS,** *etc.*						
	AMMONIUM HYDROGENDIFLUORIDE, SOLID	8	UN1727	II		P5, N34	**A12.4.**
	AMMONIUM HYDROGENDIFLUORIDE, SOLUTION	8	UN2817	II III	6.1 6.1	P4, N34 P5	**A12.3.** **A12.3.**
	AMMONIUM HYDROGEN SULPHATE	8	UN2506	II		P5	**A12.4.**
D	*Ammonium hydroxide; see* **AMMONIA SOLUTIONS**, etc						
	AMMONIUM METAVANADATE	6.1	UN2859	II		P5	**A10.6.**
D	**AMMONIUM NITRATE FERTILIZERS**	5.1	NA2072	III		P5, 7	**A9.8.**
	AMMONIUM NITRATE FERTILIZER; *which is more liable to explode than ammonium nitrate with 0.2 combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance*						FORBIDDEN
	AMMONIUM NITRATE FERTILIZERS; *uniform nonsegregating mixtures of ammonium nitrate/ammonium sulfate, with more than 45%, but not more than 70% ammonium nitrate and not more than 0.4% of total combustible material*	5.1	UN2069	III		P5, A1, A29	**A9.8.**
	AMMONIUM NITRATE FERTILIZER; *uniform non-segregating mixtures of nitrogen/phosphate or nitrogen/potash types or complete fertilizers of nitrogen/phosphate/potash type,with not more than 70% ammonium nitrate and not more than 0.4% total added combustible material or with not more than 45% ammonium nitrate with unrestricted combustible material*	9	UN2071	III		P5	**A13.3.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	AMMONIUM NITRATE FERTILIZERS; *uniform nonsegregating mixtures of ammonium nitrate with added matter which is inorganic and chemically inert towards ammonium nitrate, with not less than 90% ammonium nitrate and not more than 0.2% combustible material (including organic material calculated as carbon), or with more than 70%, but less than 90% ammonium nitrate and not more than 0.4% total combustible material*	5.1	UN2067	III		P5	**A9.8.**
D	**AMMONIUM NITRATE** *mixed fertilizers*	5.1	NA2069	III		P5	**A9.8.**
D	**AMMONIUM NITRATE-FUEL OIL MIXTURE** *(containing only prilled Ammonium Nitrate and fuel oil)*	1.5D	NA0331			P4	**A5.14.**
	AMMONIUM NITRATE, LIQUID *(hot concentrated solution)*						FORBIDDEN
	AMMONIUM NITRATE, *with more than 0.2% combustible substances, including any organic substance calculated as carbon to the exclusion of any other added substance*	1.1D	UN0222			P4, A69	**A5.10.**
	AMMONIUM NITRATE, *with not more than 0.2% total combustible material, including any organic substance calculated as carbon, to the exclusion of any other added substance*	5.1	UN1942	III		P5, A1, A29	**A9.8.**
	Ammonium nitrite						FORBIDDEN
	AMMONIUM PERCHLORATE	1.1D	UN0402			P4, 107	**A5.10.**
	AMMONIUM PERCHLORATE	5.1	UN1442	II		P5, 107, A9	**A9.8.**
	Ammonium Permanganate						FORBIDDEN
	AMMONIUM PERSULPHATE	5.1	UN1444	III		P5, A1, A29	**A9.8.**
	AMMONIUM PICRATE, *dry or wetted with less than l0% water, by mass*	1.1D	UN0004			P4	**A5.9.**
	AMMONIUM PICRATE, WETTED *with not less than 10% water, by mass*	4.1	UN1310	I		P4, 23, A2, N41	**A8.4.**
	AMMONIUM POLYSULPHIDE, SOLUTION	8	UN2818	II III	6.1 6.1	P4 P5	**A12.3.** **A12.3.**
	AMMONIUM POLYVANADATE	6.1	UN2861	II		P5	**A10.6.**
	Ammonium silicofluoride; see **AMMONIUM FLUOROSILICATE**						
	AMMONIUM SULPHIDE SOLUTION	8	UN2683	II	6.1, 3	P4	**A12.3.**
	Ammunition, blank; see **CARTRIDGES FOR WEAPONS, BLANK**						
	Ammunition, fixed, semi-fixed or separate loading; see **CARTRIDGES FOR WEAPONS**, *etc.*						
	AMMUNITION, ILLUMINATING, *with or without burster, expelling charge or propelling charge*	1.2G	UN0171			P4	**A5.15.**
	AMMUNITION, ILLUMINATING, *with or without burster, expelling charge or propelling charge*	1.3G	UN0254			P4	**A5.15.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	AMMUNITION, ILLUMINATING, *with or without burster, expelling charge or propelling charge*	1.4G	UN0297			P5	**A5.15.**
	AMMUNITION, INCENDIARY *liquid or gel, with burster, expelling charge or propelling charge*	1.3J	UN0247			P3	**A5.15.**
	Ammunition, incendiary (water-activated contrivances) with burster, expelling charge or propelling charge; see **CONTRIVANCES, WATER-ACTIVATED**, *etc.*						
	AMMUNITION, INCENDIARY, WHITE PHOSPHOROUS, *with burster expelling charge or propelling charge*	1.2H	UN0243			P3	**A5.15.**
	AMMUNITION, INCENDIARY, WHITE PHOSPHOROUS, *with burster expelling charge or propelling charge*	1.3H	UN0244			P3	**A5.15.**
	AMMUNITION, INCENDIARY, *with or without burster, expelling charge, or propelling charge*	1.2G	UN0009			P4	**A5.15.**
	AMMUNITION, INCENDIARY, *with or without burster, expelling charge, or propelling charge*	1.3G	UN0010			P4	**A5.15.**
	AMMUNITION, INCENDIARY, *with or without burster, expelling charge, or propelling charge*	1.4G	UN0300			P5	**A5.15.**
	AMMUNITION, PRACTICE	1.4G	UN0362			P5	**A5.15.**
	AMMUNITION, PRACTICE	1.3G	UN0488			P4	**A5.15.**
	AMMUNITION, PROOF	1.4G	UN0363			P5	**A5.15.**
	Ammunition, SA (small arms); see **CARTRIDGES FOR WEAPONS**, *etc.*						
	Ammunition, smoke (water-activated contrivances), white phosphorus, with burster, expelling charge or propelling charge; see **CONTRIVANCES, WATER-ACTIVATED,** *etc.*						
	Ammunition, smoke (water-activated contrivances), without white phosphorus or phosphides, with burster, expelling charge or propelling charge; see **CONTRIVANCES, WATER-ACTIVATED,** *etc.*						
	AMMUNITION, SMOKE, WHITE PHOSPHORUS, *with burster, expelling charge, or propelling charge*	1.3H	UN0246			P3	**A5.15.**
	AMMUNITION, SMOKE, WHITE PHOSPHORUS, *with burster, expelling charge, or propelling charge*	1.2H	UN0245			P3	**A5.15.**
	AMMUNITION, SMOKE, *with or without burster, expelling charge or propelling charge*	1.3G	UN0016			P4	**A5.15.**
	AMMUNITION, SMOKE, *with or without burster, expelling charge or propelling charge*	1.4G	UN0303			P5	**A5.15.**
	AMMUNITION, SMOKE, *with or without burster, expelling charge or propelling charge*	1.2G	UN0015			P4	**A5.15.**
	Ammunition, sporting; see **CARTRIDGES FOR WEAPONS**, *etc. (UN0012,UN0328, UN0339)*						
	AMMUNITION, TEAR-PRODUCING, NONEXPLOSIVE, *without burster or expelling charge, nonfuzed*	6.1	UN2017	II	8	P4	**A10.6.**

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	AMMUNITION, TEAR-PRODUCING, *with burster expelling charge or propelling charge*	1.2G	UN0018		8, 6.1	P4	**A5.15.**
	AMMUNITION, TEAR-PRODUCING, *with burster expelling charge or propelling charge*	1.3G	UN0019		8, 6.1	P4	**A5.15.**
	AMMUNITION, TEAR-PRODUCING, *with burster expelling charge or propelling charge*	1.4G	UN0301		8, 6.1	P5	**A5.15.**
	AMMUNITION, TOXIC, NON-EXPLOSIVE, *without burster or expelling charge, nonfuzed*	6.1	UN2016	II		P2	**A10.6.**
	Ammunition, toxic (water-activated contrivances), with burster, expelling charge or propelling charge; see **CONTRIVANCES, WATER-ACTIVATED**, *etc.*						
*	**AMMUNITION, TOXIC**, *with burster, expelling charge, or propelling charge*	1.2K	UN0020		6.1	P1	**A5.6.**
*	**AMMUNITION, TOXIC,** *with burster, expelling charge, or propelling charge*	1.3K	UN0021		6.1	P1	**A5.6.**
	AMYL ACETATES	3	UN1104	III		P5	**A7.3.**
	AMYL ACID PHOSPHATE	8	UN2819	III		P5	**A12.3.**
	AMYL ALCOHOLS	3	UN1105	II III		P5 P5	**A7.3.** **A7.3.**
	AMYLAMINES	3	UN1106	II III	8 8	P5 P5	**A7.3.** **A7.3.**
	AMYL BUTYRATES	3	UN2620	III		P5	**A7.3.**
	AMYL CHLORIDES	3	UN1107	II		P5	**A7.3.**
	n-AMYLENE	3	UN1108	I		P3	**A7.3.**
	AMYL FORMATES	3	UN1109	III		P5	**A7.3.**
	AMYL MERCAPTANS	3	UN1111	II		P5, A3	**A7.3.**
	n-AMYL METHYL KETONE	3	UN1110	III		P5	**A7.3.**
	AMYL NITRATE	3	UN1112	III		P5	**A7.3.**
	AMYL NITRITES	3	UN1113	II		P5	**A7.3.**
	AMYLTRICHLOROSILANE	8	UN1728	II		P5, A7, N34	**A12.3.**
	Anaesthetic ether; see **DIETHYL ETHER**						
	Anhydrous ammonia; see **AMMONIA, ANHYDROUS**						
	Anhydrous hydrazine; see **HYDRAZINE, ANHYDROUS**						
	Anhydrous hydrofluoric acid; see **HYDROGEN FLUORIDE, ANHYDROUS**						
+	**ANILINE**	6.1	UN1547	II		P5	**A10.5.**
	ANLINE HYDROCHLORIDE	6.1	UN1548	III		P5	**A10.6.**
	ANISIDINES	6.1	UN2431	III		P5	**A10.5.**
	ANISOLE	3	UN2222	III		P5	**A7.3.**
	ANISOYL CHLORIDE	8	UN1729	II		P5	**A12.3.**
	Anti-freeze liquid; see **FLAMMABLE LIQUIDS, N.O.S.**						

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Anti-knock compound, mixture; see **MOTOR FUEL ANTI-KNOCK MIXTURES**						
	Antimonious chloride, see **ANTIMONY TRICHLORIDE**						
	ANTIMONY COMPOUNDS, INORGANIC, LIQUID, N.O.S.	6.1	UN3141	III		P5	**A10.5.**
	ANTIMONY COMPOUNDS, INORGANIC, SOLID, N.O.S.	6.1	UN1549	III		P5	**A10.6.**
	ANTIMONY LACTATE	6.1	UN1550	III		P5	**A10.6.**
	ANTIMONY PENTACHLORIDE, LIQUID	8	UN1730	II		P5	**A12.3.**
	ANTIMONY PENTACHLORIDE, SOLUTIONS	8	UN1731	II III		P5 P5	**A12.3.** **A12.3.**
	ANTIMONY PENTAFLUORIDE	8	UN1732	II	6.1	P4, A3, A6, A7, A10, N3	**A12.3.**
	ANTIMONY POTASSIUM TARTRATE	6.1	UN1551	III		P5	**A10.6.**
	ANTIMONY POWDER	6.1	UN2871	III		P5	**A10.6.**
	Antimony sulphide and chlorate, mixture of						FORBIDDEN
	ANTIMONY TRICHLORIDE, LIQUID	8	UN1733	II		P5	**A12.3.**
	ANTIMONY TRICHLORIDE, SOLID	8	UN1733	II		P5	**A12.4.**
	Aqua ammonia, see **AMMONIA SOLUTION**						
	ARGON, COMPRESSED	2.2	UN1006			P5	**A6.4.**, **A6.6.**
	ARGON, REFRIGERATED LIQUID *(cryogenic liquid)*	2.2	UN1951			P4	**A6.12.**
	ARSENIC	6.1	UN1558	II		P5	**A10.6.**
	ARSENIC ACID, LIQUID	6.1	UN1553	I		P3	**A10.5.**
	ARSENIC ACID, SOLID	6.1	UN1554	II		P5	**A10.6.**
	ARSENICAL DUST	6.1	UN1562	II		P5	**A10.6.**
*	**ARSENICAL PESTICIDES, LIQUID, FLAMMABLE, TOXIC,** *flashpoint less than 23 degrees* C	3	UN2760	I II	6.1 6.1	P3 P4	**A7.3.** **A7.3.**
*	**ARSENICAL PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S.,** *flashpoint not less than 23 degrees C*	6.1	UN2993	I II III	3 3 3	P3 P4 P5	**A10.5.** **A10.5.** **A10.5.**
*	**ARSENICAL PESTICIDES, LIQUID, TOXIC**	6.1	UN2994	I II III		P3 P5 P5	**A10.5.** **A10.5.** **A10.5.**
*	**ARSENICAL PESTICIDES, SOLID, TOXIC**	6.1	UN2759	I II III		P5 P5 P5	**A10.6.** **A10.6.** **A10.6.**
	ARSENIC BROMIDE	6.1	UN1555	II		P5	**A10.6.**
	ARSENIC COMPOUNDS, LIQUID, N.O.S. *inorganic, including Arsenates, N.O.S., Arsenites, N.O.S., and Arsenic sulphides, N.O.S*	6.1	UN1556	I II III		P3 P5 P5	**A10.5.** **A10.5.** **A10.5.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ARSENIC COMPOUNDS, SOLID, N.O.S., *including Arsenates, N.O.S., Arsenites, N.O.S., Arsenic sulphides, N.O.S., and Organic compounds of arsenic, N.O.S.*	6.1	UN1557	I II III		P5 P5 P5	**A10.6.** **A10.6.** **A10.6.**
	Arsenic, fuming liquid, see **ARSENIC TRICHLORIDE**						
	ARSENIC PENTOXIDE	6.1	UN1559	II		P5	**A10.6.**
	Arsenic sulphide and a chlorate, mixtures of						FORBIDDEN
	ARSENIC TRICHLORIDE	6.1	UN1560	I		P2, 2	**A10.7.**
	ARSENIC TRIOXIDE	6.1	UN1561	II		P5	**A10.6.**
D	**ARSENIC TRISULPHIDE**	6.1	NA1557	II		P5	**A10.6.**
	ARSINE	2.3	UN2188		2.1	P1, 1	**A6.16.**
	ARTICLES, EXPLOSIVE, EXTREMELY INSENSITIVE *or* **ARTICLES, EEI**	1.6N	UN0486			P5, 101	**A5.6.**
*	**ARTICLES, EXPLOSIVE, N.O.S**	1.4S	UN0349			P5, 101, A69	**A5.6.**
*	**ARTICLES, EXPLOSIVE, N.O.S.**	1.4B	UN0350			P5, 101	**A5.6.**
*	**ARTICLES, EXPLOSIVE, N.O.S.**	1.4C	UN0351			P5, 101	**A5.6.**
*	**ARTICLES, EXPLOSIVE, N.O.S.**	1.4D	UN0352			P5, 101	**A5.6.**
*	**ARTICLES, EXPLOSIVE, N.O.S.**	1.4G	UN0353			P5, 101	**A5.6.**
*	**ARTICLES, EXPLOSIVE, N.O.S.**	1.1L	UN0354			P3, 101	**A5.6.**
*	**ARTICLES, EXPLOSIVE, N.O.S.**	1.2L	UN0355			P3, 101	**A5.6.**
*	**ARTICLES, EXPLOSIVE, N.O.S.**	1.3L	UN0356			P3, 101	**A5.6.**
*	**ARTICLES, EXPLOSIVE, N.O.S.**	1.1C	UN0462			P4, 101	**A5.6.**
*	**ARTICLES, EXPLOSIVE, N.O.S.**	1.1D	UN0463			P4, 101	**A5.6.**
*	**ARTICLES, EXPLOSIVE, N.O.S.**	1.1E	UN0464			P4, 101	**A5.6.**
*	**ARTICLES, EXPLOSIVE, N.O.S.**	1.1F	UN0465			P4, 101	**A5.6.**
*	**ARTICLES, EXPLOSIVE, N.O.S.**	1.2C	UN0466			P4, 101	**A5.6.**
*	**ARTICLES, EXPLOSIVE, N.O.S.**	1.2D	UN0467			P4, 101	**A5.6.**
*	**ARTICLES, EXPLOSIVE, N.O.S.**	1.2E	UN0468			P4, 101	**A5.6.**
*	**ARTICLES, EXPLOSIVE, N.O.S.**	1.2F	UN0469			P4, 101	**A5.6.**
*	**ARTICLES, EXPLOSIVE, N.O.S.**	1.3C	UN0470			P4, 101	**A5.6.**
*	**ARTICLES, EXPLOSIVE, N.O.S.**	1.4E	UN0471			P5, 101	**A5.6.**
*	**ARTICLES, EXPLOSIVE, N.O.S.**	1.4F	UN0472			P5, 101	**A5.6.**
	ARTICLES, PRESSURIZED HYDRAULIC *containing nonflammable gas*	2.2	UN3164			P5	**A6.5.**, **A6.6.**, **A6.9.**
	ARTICLES, PRESSURIZED, PNEUMATIC *containing nonflammable gas*	2.2	UN3164			P5	**A6.5.**, **A6.6.**, **A6.9.**
	ARTICLES, PYROPHORIC	1.2L	UN0380			P3	**A5.6.**
	ARTICLES, PYROTECHNIC *for technical purposes*	1.1G	UN0428			P4	**A5.21.**
	ARTICLES, PYROTECHNIC *for technical purposes*	1.2G	UN0429			P4	**A5.21.**
	ARTICLES, PYROTECHNIC *for technical purposes*	1.3G	UN0430			P4	**A5.21.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ARTICLES, PYROTECHNIC *for technical purposes*	1.4G	UN0431			P5	**A5.21.**
	ARTICLES, PYROTECHNIC *for technical purposes*	1.4S	UN0432			P5, A69	**A5.21.**
	Asbestos; see **BLUE ASBESTOS, WHITE ASBESTOS**, *or* **BROWN ASBESTOS**, *etc.*						
D	*Asphalt, cut back; see* **TARS, LIQUID,** *etc.*						
	ASPHALT, *at or above its flashpoint*						FORBIDDEN
	Automobile, motorcycle, tractor, other self-propelled vehicle, engine, or other mechanical apparatus; see **BATTERY** *or* **VEHICLE**						
	Azaurolic Acid						FORBIDDEN
*	**AVIATION REGULATED LIQUID, N.O.S.**	9	UN3334			P5, A35	**A13.13.**
*	**AVIATION REGULATED SOLID, N.O.S.**	9	UN3335			P5, A35	**A13.13.**
	Azidodithiocarbonic acid						FORBIDDEN
	Azidoethyl nitrate						FORBIDDEN
	Azido guanidine picrate (dry)						FORBIDDEN
	5-Azido-1-hydroxy tetrazole						FORBIDDEN
	Azido hydroxy tetrazole (mercury and silver salts)						FORBIDDEN
	3-Azido-1, 2-propylene glycol dinitrate						FORBIDDEN
	1-Aziridinylphosphine oxide-(tris); see **TRIS-(1-AZIRIDINYL) PHOSPHINE OXIDE, SOLUTION**						
	AZODICARBONAMIDE						FORBIDDEN
	*2,2'-Azodi-(2,4-dimethyl-4-*methoxyvaleronitrile) *see* **SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED**						
	*2,2'-*Azodi-(2,4 *dimethylvaleronitrile) see* **SELF-REACTIVE SOLID TYPE D TEMPERATURE CONTROLLED**						
	1,1'-Azodi-(hexahydrobenzonitrile) see **SELF-REACTIVE SOLID TYPE D**						
	Azodiisobutyronitrile, see **SELF-REACTIVE SOLID TYPE C, TEMPERATURE CONTROLLED**						
	2,2'-Azodi-(2-methylbutyronitrile), see **SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED**						
	Azotetrazole (dry)						FORBIDDEN
	BARIUM	4.3	UN1400	II		P4, A19	**A8.4.**
	BARIUM ALLOYS, PYROPHORIC	4.2	UN1854	I		P3	**A8.6.**
	BARIUM AZIDE, *dry or wetted with less than 50% water, by mass*	1.1A	UN0224		6.1	P3, 111, 117	**A5.7.**
	BARIUM AZIDE, *wetted with not less than 50% water, by mass*	4.1	UN1571	I	6.1	P4, A2	**A8.11.**
	BARIUM BROMATE	5.1	UN2719	II	6.1	P4	**A9.8.**
	BARIUM CHLORATE	5.1	UN1445	II	6.1	P4, A9, N34	**A9.8.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	BARIUM COMPOUNDS, N.O.S.	6.1	UN1564	II III		P5 P5	**A10.6.** **A10.6.**
	BARIUM CYANIDE	6.1	UN1565	I		P5, N74, N75	**A10.6.**
	BARIUM HYPOCHLORITE *with more than 22% available chlorine*	5.1	UN2741	II	6.1	P5, A7, A9, N34	**A9.8.**
	BARIUM NITRATE	5.1	UN1446	II	6.1	P5	**A9.8.**
	BARIUM OXIDE	6.1	UN1884	III		P5	**A10.6.**
	BARIUM PERCHLORATE	5.1	UN1447	II	6.1	P5	**A9.8.**
	BARIUM PERMANGANATE	5.1	UN1448	II	6.1	P5	**A9.8.**
	BARIUM PEROXIDE	5.1	UN1449	II	6.1	P5	**A9.8.**
	Barium selenate; see **SELENATES**						
	Barium selenite; see **SELENITES**						
D	**BARIUM STYPHNATE**	1.1A	NA0473			P3, 111, 117	**A5.7.**
	BATTERIES, CONTAINING SODIUM	4.3	UN3292	II		P5	**A8.19.**
	BATTERIES, DRY CONTAINING POTASSIUM HYDROXIDE SOLID, *electric storage*	8	UN3028	III		P5	**A12.4.**
	BATTERIES, WET, FILLED WITH ACID, *electric storage*	8	UN2794	III		P5	**A12.5.**
	BATTERIES, WET, FILLED WITH ALKALI, *electric storage*	8	UN2795	III		P5	**A12.5.**
	BATTERIES, WET, NONSPILLABLE, *electric storage*	8	UN2800	III		P5, A67	**A12.5.**
	Battery, Dry					A67	
	BATTERY FLUID, ACID	8	UN2796	II		P5, A3, A7, N6, N34	**A12.3.**, **A12.5.**
	BATTERY FLUID, ALKALI	8	UN2797	II		P5, N6	**A12.3.**, **A12.5.**
	BATTERY-POWERED EQUIPMENT*)*	9	UN3171			P5, 134	**A13.7.**
	BATTERY-POWERED VEHICLE	9	UN3171			P5, 134	**A13.7.**
	Battery, wet, with wheelchair; see **BATTERY-POWERED EQUIMENT** *or* **BATTERY-POWERED VEHICLE**						
+	**BENZALDEHYDE**	9	UN1990	III		P5	**A13.3.**
	BENZENE	3	UN1114	II		P5	**A7.3.**
	Benzene diazonium chloride (dry)						FORBIDDEN
	Benzene diazonium nitrate (dry)						FORBIDDEN
	1,4-Benzenediol, see **HYDROQUINONE**						
	Benzene-1,3-disulphohydrazide, not more than 52% as a paste see **SELF- REACTIVE SOLID TYPE D**						
	Benzene phosphorus dichloride; *see* **PHENYL PHOSPHORUS DICHLORIDE**						
	Benzene phosphorus thiodichloride; see **PHENYL PHOSPHORUS THIODICHLORIDE**						
	Benzene sulphohydrazide see **SELF-REACTIVE SOLID TYPE D**						
	BENZENE SULPHONYL CHLORIDE	8	UN2225	III		P5	**A12.3.**
	Benzenethiol; see **PHENYL MERCAPTAN**						

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Benzene triozonide						FORBIDDEN
	BENZIDINE	6.1	UN1885	II		P5	**A10.6.**
	BENZONITRILE	6.1	UN2224	II		P5	**A10.5.**
	BENZOQUINONE	6.1	UN2587	II		P5	**A10.6.**
	BENZOTRICHLORIDE	8	UN2226	II		P5	**A12.3.**
	BENZOTRIFLUORIDE	3	UN2338	II		P5	**A7.3.**
	Benzoxidiazoles (dry)						FORBIDDEN
	Benzoyl azide						FORBIDDEN
	BENZOYL CHLORIDE	8	UN1736	II		P5	**A12.3.**
	BENZYL BROMIDE	6.1	UN1737	II	8	P4, A3, A7, N33, N34	**A10.5.**
	BENZYL CHLORIDE	6.1	UN1738	II	8	P4, A3, A7, N33, N42	**A10.5.**
	BENZYL CHLORIDE, *unstabilized*	6.1	UN1738	II	8	P4, A3, A7, N33, N34, N43	**A10.5.**
	BENZYL CHLOROFORMATE	8	UN1739	I		P3, A3, A6, N41	**A12.3.**
	BENZYLDIMETHYLAMINE	8	UN2619	II	3	P5	**A12.3.**
	4-(benzyl(ethyl)amino)-3-ethoxybenzenediazonium zinc chloride see **SELF-REACTIVE SOLID TYPE D**						
	BENZYLIDENE CHLORIDE	6.1	UN1886	II		P5	**A10.5.**
	BENZYL IODIDE	6.1	UN2653	II		P5	**A10.5.**
	4-(benzyl(methyl)amino)3-ethoxybenzenediazonium zinc chloride see **SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED**						
	BERYLLIUM COMPOUNDS, N.O.S.	6.1	UN1566	II III		P5 P5	**A10.6.** **A10.6.**
	BERYLLIUM NITRATE	5.1	UN2464	II	6.1	P5	**A9.8.**
	BERYLLIUM, POWDER	6.1	UN1567	II	4.1	P5	**A10.6.**
	BICYCLO [2,2,1] HEPTA-2-5-DIENE, STABILIZED *or* **2,5-NORBORNADIENE, STABILIZED**	3	UN2251	II		P5	P7.3
	BIOMEDICAL WASTE, N.O.S.	6.2	UN3291	II		P5, A117	**A10.12.**
	Biphenyl triozonide						FORBIDDEN
*	**BIPYRIDILIUM PESTICIDES, LIQUID, FLAMMABLE, TOXIC,** *flashpoint less than 23 degrees C*	3	UN2782	I II	6.1 6.1	P3 P4	**A7.3.** **A7.3.**
*	**BIPYRIDILIUM PESTICIDES, LIQUID, FLAMMABLE,** *flashpoint not less than 23 degrees C*	6.1	UN3015	I II III	3 3 3	P3 P4 P5	**A10.5.** **A10.5.** **A10.5.**
*	**BIPYRIDILIUM PESTICIDES, LIQUID, TOXIC**	6.1	UN3016	I II		P3 P4	**A10.5.** **A10.5.**
*	**BIPYRIDILIUM PESTICIDES, SOLID, TOXIC**	6.1	UN2781	I II III		P5 P5 P5	**A10.6.** **A10.6.** **A10.6.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	BISULFATE, AQUEOUS SOLUTION	8	UN2837	II III		P5, A7, N34 P5, A7, N34	**A12.3.** **A12.3.**
	BISULPHITES, AQUEOUS SOLUTIONS, N.O.S.	8	UN2693	III		P5	**A12.3.**
	BLACK, POWDER, COMPRESSED *or* **GUNPOWDER, COMPRESSED** *or* **BLACK POWDER, IN PELLETS** *or* **GUNPOWDER, IN PELLETS**	1.1D	UN0028			P4	**A5.11.**
	BLACK POWDER *or* **GUNPOWDER,** *granular or as a meal*	1.1D	UN0027			P4	**A5.11.**
	Blasting agent, n.o.s.; see **EXPLOSIVES, BLASTING**						
	Blasting cap, assemblies; *see* **DETONATOR ASSEMBLIES NONELECTRIC,** *for blasting*						
	Blasting caps, electric; see **DETONATORS, ELECTRIC,** *for blasting*						
	Blasting caps, nonelectric; see **DETONATORS, NONELECTRIC,** *for blasting*						
	Bleaching powder; see **CALCIUM HYPOCHLORITE MIXTURES**, *etc*						
	BLUE ASBESTOS *(crocidolite) or* **BROWN ASBESTOS** (*amosite, mysorite*)	9	UN2212	II		P5	**A13.15.**
	BOMBS, PHOTO-FLASH	1.1F	UN0037			P4	**A5.15.**
	BOMBS, PHOTO-FLASH	1.1D	UN0038			P4	**A5.15.**
	BOMBS, PHOTO-FLASH	1.2G	UN0039			P4	**A5.15.**
	BOMBS, PHOTO-FLASH	1.3G	UN0299			P4	**A5.15.**
	BOMBS, SMOKE, NONEXPLOSIVE, *with corrosive liquid, without initiating device*	8	UN2028	II		P4	**A12.6.**
	BOMBS, *with bursting charge*	1.1F	UN0033			P4	**A5.15.**
	BOMBS, *with bursting charge*	1.1D	UN0034			P4	**A5.15.**
	BOMBS, *with bursting charge*	1.2D	UN0035			P4	**A5.15.**
	BOMBS, *with bursting charge*	1.2F	UN0291			P4	**A5.15.**
	BOMBS WITH FLAMMABLE LIQUID, *with bursting charge*	1.1J	UN0399			P3	**A5.6.**
	BOMBS WITH FLAMMABLE LIQUID, *with bursting charge*	1.2J	UN0400			P3	**A5.6.**
	BOOSTERS WITH DETONATOR	1.1B	UN0225			P4	**A5.19.**
	BOOSTERS WITH DETONATOR	1.2B	UN0268			P4	**A5.19.**
	BOOSTERS, *without detonator*	1.1D	UN0042			P4	**A5.18.**
	BOOSTERS, *without detonator*	1.2D	UN0283			P4	**A5.18.**
	BORNEOL	4.1	UN1312	III		P5, A1	**A8.4.**
+	**BORON TRIBROMIDE**	8	UN2692	I	6.1	P2, 2, A3, A7, N34	**A12.12.**
	BORON TRICHLORIDE	2.3	UN1741		8	P2, 3	**A6.5.**
	BORON TRIFLUORIDE	2.3	UN1008			P2, 2	**A6.6.**
	BORON TRIFLUORIDE ACETIC ACID COMPLEX	8	UN1742	II		P4	**A12.3.**

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	BORON TRIFLUORIDE DIETHYL ETHERATE	8	UN2604	I	3	P3, A19	**A12.3.**
	BORON TRIFLUORIDE DIHYDRATE	8	UN2851	II		P5	**A12.4.**
	BORON TRIFLUORIDE DIMETHYL ETHERATE	4.3	UN2965	I		P3, A19	**A8.3.**
	BORON TRIFLUORIDE PROPIONIC ACID COMPLEX	8	UN1743	II		P4	**A12.3.**
	Box toe gum; see **NITROCELLULOSE**						
	BROMATES, INORGANIC, N.O.S.	5.1	UN1450	II		P5	**A9.8.**
	BROMATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1	UN3213	II		P4	**A9.7.**
	1-BROMOBUTANE	3	UN1126	II		P5	**A7.3.**
	BROMINE CHLORIDE	2.3	UN2901		5.1, 8	P2, 2	**A6.5.**
+	**BROMINE** *or* **BROMINE SOLUTIONS**	8	UN1744	I	6.1	P1, 1, A3, A6, N34, N43	**A12.12.**
	Bromine azide						FORBIDDEN
+	**BROMINE PENTAFLUORIDE**	5.1	UN1745	I	6.1, 8	P1, 1	**A9.11.**
+	**BROMINE TRIFLUORIDE**	5.1	UN1746	I	6.1, 8	P2, 2	**A9.11.**
	BROMOACETIC ACID, *solid*	8	UN1938	II		P5, A7, N34	**A12.4.**
	BROMOACETIC ACID, *solution*	8	UN1938	II		P4	**A12.3.**
+	**BROMOACETONE**	6.1	UN1569	II	3	P2, 2	**A10.4.**
	BROMOACETYL BROMIDE	8	UN2513	II		P5	**A12.3.**
	BROMOBENZENE	3	UN2514	III		P5	**A7.3.**
	BROMOBENZYL CYANIDES, *liquid*	6.1	UN1694	I		P3	**A10.5.**
	BROMOBENZYL CYANIDES, *solid*	6.1	UN1694	I		P5	**A10.6.**
	1-BROMO-3-CHLOROPROPANE	6.1	UN2688	III		P5	**A10.5.**
	2-BROMOBUTANE	3	UN2339	II		P5	**A7.3.**
	BROMOCHLOROMETHANE	6.1	UN1887	III		P5	**A10.5.**
	4-Bromo-1, 2-dinitrobenzene						FORBIDDEN
	2-BROMOETHYL ETHYL ETHER	3	UN2340	II		P5	**A7.3.**
	BROMOFORM	6.1	UN2515	III		P5	**A10.5.**
	1-BROMO-3-METHYLBUTANE	3	UN2341	III		P5	**A7.3.**
	BROMOMETHYLPROPANES	3	UN2342	II		P5	**A7.3.**
	2-BROMO-2-NITROPROPANE-1,3,-DIOL	4.1	UN3241	III		P5, 46	**A8.4.**
	1Bromo-3-Nitrobenzene (unstable at 56 degrees C)						FORBIDDEN
	2-BROMOPENTANE	3	UN2343	II		P5	**A7.3.**
	2-BROMOPROPANES *or* **BROMOPROPANES**	3	UN2344	II III		P5 P5	**A7.3.** **A7.3.**
	3-BROMOPROPYNE	3	UN2345	II		P5	**A7.3.**
	Bromosilane						FORBIDDEN
	Bromotoluene-alpha; see **BENZYL BROMIDE**						
	BROMOTRIFLUOROETHYLENE	2.1	UN2419			P4	**A6.5.**
	BROMOTRIFLUOROMETHANE *(R13B1)*	2.2	UN1009			P5	**A6.4.**, **A6.5.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	BRUCINE	6.1	UN1570	I		P3	**A10.6.**
	BURSTERS, *explosive*	1.1D	UN0043			P4	**A5.19.**
	BUTADIENES, STABILIZED	2.1	UN1010			P4	**A6.4.**, **A6.5.**
	BUTANE *or* **BUTANE MIXTURES**; *see also* **PETROLEUM GASES, LIQUEFIED**	2.1	UN1011			P4	**A6.4.**, **A6.7.**
	Butane, butane mixtures and mixtures having similar properties in cartridges each not exceeding 500 grams see **RECEPTACLES**						
	BUTANEDIONE	3	UN2346	II		P5	**A7.3.**
	BUTANOLS	3	UN1120	II III		P5 P5	**A7.3.** **A7.3.**
	BUTYL ACETATES	3	UN1123	II III		P5 P5	**A7.3.** **A7.3.**
	BUTYL ACID PHOSPHATE	8	UN1718	III		P5	**A12.3.**
	BUTYL ACRYLATE, STABILIZED	3	UN2348	III		P5	**A7.3.**
	Butyl alcohols; see **BUTANOLS**						
	N-BUTYLAMINE	3	UN1125	II	8	P5	**A7.3.**
	N-BUTYLANILINE	6.1	UN2738	II		P5	**A10.5.**
	BUTYL BENZENES	3	UN2709	III		P5	**A7.3.**
	1-BROMOBUTANE	3	UN1126	II		P5	**A7.3.**
	n-Butyl chloride; see **CHLOROBUTANES**						
	N-BUTYL CHLOROFORMATE	6.1	UN2743	I	8, 3	P2, 2	**A10.7.**
D	**SEC-BUTYL CHLOROFORMATE**	6.1	NA2742	I	3, 8	P2, 2	**A10.7.**
	TERT-BUTYLCYCLOHEXYL-CHLOROFORMATE	6.1	UN2747	III		P5	**A10.5.**
	BUTYLENE; *see also* **PETROLEUM GASES, LIQUEFIED**	2.1	UN1012			P4	**A6.7.**
	1,2-BUTYLENE OXIDE, STABILIZED	3	UN3022	II		P5	**A7.3.**
	Butyl ethers; see **DIBUTYL ETHERS**						
	Butyl ethyl ether; see **ETHYL BUTYL ETHER**						
	N-BUTYL FORMATE	3	UN1128	II		P5	**A7.3.**
	TERT-BUTYL HYPOCHLORITE	4.2	UN3255	I	8	P3	**A8.4.**
	Tert-Butyl Hydroperoxide, more than 90% with water						FORBIDDEN
	N-n-BUTYL IMIDAZOLE	6.1	UN2690	II		P5	**A10.5.**
	TERT-BUTYL ISOCYANATE	6.1	UN2484	I	3	P1, 1, A7	**A10.7.**
	N-BUTYL ISOCYANATE	6.1	UN2485	I	3	P2, 2, A7	**A10.7.**
	BUTYL MERCAPTANS	3	UN2347	II		P5, A3	**A7.3.**
	N-BUTYL METHACRYLATE, STABILIZED	3	UN2227	III		P5	**A7.3.**
	BUTYL METHYL ETHER	3	UN2350	II		P5	**A7.3.**
	BUTYL NITRITES	3	UN2351	I II III		P3 P5 P5	**A7.3.** **A7.3.** **A7.3.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Butyl phosphoric acid; see **BUTYL ACID PHOSPHATE**						
	BUTYL PROPIONATES	3	UN1914	III		P5	**A7.3.**
	BUTYLTOLUENES	6.1	UN2667	III		P5	**A10.5.**
	BUTYLTRICHLOROSILANE	8	UN1747	II	3	P4, A7, N34	**A12.3.**
	5-TERT-BUTYL-2,4,6-TRINITRO-M-XYLENE *or* **MUSK XYLENE**	4.1	UN2956	III		P5	**A8.5.**
	BUTYL VINYL ETHER, STABILIZED	3	UN2352	II		P5	**A7.3.**
	1,4-BUTYNEDIOL	6.1	UN2716	III		P5, A1	**A10.6.**
	BUTYRALDEHYDE	3	UN1129	II		P5	**A7.3.**
	BUTYRALDOXIME	3	UN2840	III		P5	**A7.3.**
	BUTYRIC ACID	8	UN2820	III		P5	**A12.3.**
	BUTYRIC ANHYDRIDE	8	UN2739	III		P5	**A12.3.**
	BUTYRONITRILE	3	UN2411	II	6.1	P4	**A7.3.**
	BUTYRYL CHLORIDE	3	UN2353	II	8	P5	**A7.3.**
	Cabazide						FORBIDDEN
	Cable cutters, explosive; see **CUTTERS, CABLE, EXPLOSIVE**						
	CACODYLIC ACID	6.1	UN1572	II		P5	**A10.6.**
	CADMIUM COMPOUNDS	6.1	UN2570	I II III		P5 P5 P5	**A10.6.** **A10.6.** **A10.6.**
	CAESIUM	4.3	UN1407	I		P3, A19, N34, N40	**A8.4.**
	CAESIUM HYDROXIDE	8	UN2682	II		P5	**A12.4.**
	CAESIUM HYDROXIDE SOLUTION	8	UN2681	II III		P5 P5	**A12.3.** **A12.3.**
	CALCIUM	4.3	UN1401	II		P5	**A8.4.**
	CALCIUM ARSENATE	6.1	UN1573	II		P5	**A10.6.**
	CALCIUM ARSENATE AND CALCIUM ARSENITE MIXTURES, SOLID	6.1	UN1574	II		P5	**A10.6.**
D	**CALCIUM ARSENITE, SOLID**	6.1	NA1574	II		P5	**A10.6.**
	Calcium bisulphite solutions; see **BISULPHITES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.**						
	CALCIUM CARBIDE	4.3	UN1402	I II		P3, A1, A8, N34 P5, A1, A8, N34	**A8.4.** **A8.4.**
	CALCIUM CHLORATE	5.1	UN1452	II		P5, N34	**A9.8.**
	CALCIUM CHLORATE, AQUEOUS SOLUTION	5.1	UN2429	II III		P5, A2, N41 P5, A2, N41	**A9.7.** **A9.7.**
	CALCIUM CHLORITE	5.1	UN1453	II		P5, A9, N34	**A9.8.**
	CALCIUM CYANAMIDE *with more than 0.1% of calcium carbide*	4.3	UN1403	III		P5, A1, A19	**A8.4.**
	CALCIUM CYANIDE	6.1	UN1575	I		P5, N79	**A10.6.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	CALCIUM DITHIONITE *or* **CALCIUM HYDROSULPHITE**	4.2	UN1923	II		P5, A19, A20	**A8.4.**
	CALCIUM HYDRIDE	4.3	UN1404	I		P3, A19, N40	**A8.4.**
	CALCIUM HYDROSULPHITE; *see* **CALCIUM DITHIONITE**						
	CALCIUM HYPOCHLORITE, DRY *or* **CALCIUM HYPOCHLORITE MIXTURES, DRY** *with more than 39% available chlorine (8.8% available oxygen)*	5.1	UN1748	II II		P5, A7, A9, N34	**A9.8.**
	CALCIUM HYPOCHLORITE, HYDRATED *or* **CALCIUM HYPOCHLORITE, HYDRATED MIXTURES,** *with not less than 5.5% but not more than 10% water*	5.1	UN2880	II		P5	**A9.8.**
	CALCIUM HYPOCHLORITE MIXTURES, DRY *with more than 10%, but not more than 39% available chlorine*	5.1	UN2208	III		P5, A1, A29, N34	**A9.8.**
	CALCIUM MANGANESE SILICON	4.3	UN2844	III		P5, A1, A19	**A8.4.**
	CALCIUM NITRATE	5.1	UN1454	III		P5	**A9.8.**
	CALCIUM OXIDE	8	UN1910	III		P5	**A12.4.**
	CALCIUM PERCHLORATE	5.1	UN1455	II		P5	**A9.8.**
	CALCIUM PERMANGANATE	5.1	UN1456	II		P5	**A9.8.**
	CALCIUM PEROXIDE	5.1	UN1457	II		P5	**A9.8.**
	CALCIUM PHOSPHIDE	4.3	UN1360	I	6.1	P3, A8, A19, N40	**A8.4.**
	CALCIUM, PYROPHORIC *or* **CALCIUM ALLOYS, PYROPHORIC**	4.2	UN1855	I		P3	**A8.12.**
	CALCIUM RESINATE	4.1	UN1313	III		P5, A1, A19	**A8.4.**
	CALCIUM RESINATE, FUSED	4.1	UN1314	III		P5, A1, A19	**A8.4.**
	Calcium selenate; see **SELENATES** *or* **SELENITES**						
	CALCIUM SILICIDE	4.3	UN1405	II III		P5, A19 P5, A1, A19	**A8.4.** **A8.4.**
	CAMPHOR OIL	3	UN1130	III		P5	**A7.3.**
	CAMPHOR, *synthetic*	4.1	UN2717	III		P5, A1	**A8.4.**
	Cannon primers; see **PRIMERS, TUBULAR**						
	CAPROIC ACID	8	UN2829	III		P5	**A12.3.**
	Caps, blasting; see **DETONATORS,** *etc*						
	Caps, prime; see **PRIMERS, CAP TYPE**						
*	**CARBAMATE PESTICIDES, LIQUID, FLAMMABLE, TOXIC**, *flashpoint less than 23 degrees C*	3	UN2758	I II	6.1 6.1	P3 P4	**A7.3.** **A7.3.**
*	**CARBAMATE PESTICIDES, LIQUID, TOXIC, FLAMMABLE,** *flashpoint not less than 23 degrees C*	6.1	UN2991	I II III	3 3 3	P3 P4 P5	**A10.5.** **A10.5.** **A10.5.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*	**CARBAMATE PESTICIDES**, **LIQUID, TOXIC**	6.1	UN2992	I II III		P3 P4 P5	**A10.5.** **A10.5.** **A10.5.**
*	**CARBAMATE PESTICIDES, SOLID, TOXIC**	6.1	UN2757	I II III		P5 P5 P5	**A10.6.** **A10.6.** **A10.6.**
	Carbolic acid; see **PHENOL, SOLID**, *or* **PHENOL, MOLTEN**						
	Carbolic acid solutions; see **PHENOL SOLUTIONS**						
	CARBON, ACTIVATED	4.2	UN1362	III		P5	**A8.4.**
	CARBON, *animal or vegetable origin*	4.2	UN1361	II III		P5 P5	**A8.4.** **A8.4.**
	Carbon bisulphide; see **CARBON DISULPHIDE**						
	Carbon black (animal or vegetable origin);see **CARBON**						
	CARBON DIOXIDE	2.2	UN1013			P5	**A6.4.**, **A6.5.**, **A6.6.**
	CARBON DIOXIDE AND NITROUS OXIDE MIXTURES	2.2	UN1015			P5	**A6.4.**, **A6.5.**
	CARBON DIOXIDE AND OXYGEN MIXTURES, COMPRESSED	2.2	UN1014		5.1	P5	**A6.4.**, **A6.5.**
	CARBON DIOXIDE, REFRIGERATED LIQUID *(cryogenic liquid)*	2.2	UN2187			P5	**A6.4.**, **A6.12.**
	CARBON DIOXIDE, SOLID *or* **DRY ICE**	9	UN1845	III		P5	**A13.9.**
	Carbon Disulphide						FORBIDDEN
	CARBON MONOXIDE, COMPRESSED	2.3	UN1016		2.1	P2, 4	**A6.6.**
	CARBON MONOXIDE AND HYDROGEN MIXTURE, COMPRESSED	2.3	UN2600		2.1	P2, 6	**A6.6.**
D	**CARBON MONOXIDE, REFRIGERATED LIQUID** *(cryogenic liquid)*	2.3	NA9202		2.1	P2, 4	**A6.12.**
	CARBON TETRABROMIDE	6.1	UN2516	III		P5	**A10.6.**
	CARBON TETRACHLORIDE	6.1	UN1846	II		P5, N36	**A10.5.**
	Carbonyl chloride; see **PHOSGENE**						
	CARBONYL FLUORIDE	2.3	UN2417		8	P2, 2	**A6.6.**
	CARBONYL SULPHIDE	2.3	UN2204		2.1	P2, 3	**A6.5.**
	Cartridge cases, empty primed; see **CASES, CARTRIDGE, EMPTY WITH PRIMER**						
	Cartridges, actuating for aircraft ejector seat catapult, fire extinguisher, canopy removal or apparatus; see **CARTRIDGES, POWER DEVICE**						
	Cartridges, explosive; see **CHARGES, DEMOLITION**						
	CARTRIDGES, FLASH	1.1G	UN0049			P4	**A5.21.**
	CARTRIDGES, FLASH	1.3G	UN0050			P4	**A5.21.**
	CARTRIDGES FOR WEAPONS, BLANK	1.1C	UN0326			P4	**A5.15.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	CARTRIDGES FOR WEAPONS, BLANK	1.2C	UN0413			P4	**A5.15.**
	CARTRIDGES FOR WEAPONS, BLANK; *or* **CARTRIDGES, SMALL ARMS, BLANK**	1.3C	UN0327			P4	**A5.15.**
	CARTRIDGES FOR WEAPONS, BLANK; *or* **CARTRIDGES, SMALL ARMS, BLANK**	1.4C	UN0338			P5, A69	**A5.15.**
	CARTRIDGES FOR WEAPONS, BLANK*; or* **CARTRIDGES, SMALL ARMS, BLANK**	1.4S	UN0014			P5, A69	**A5.15.**
	CARTRIDGES FOR WEAPONS, INERT PROJECTILE *or* **CARTRIDGES, SMALL ARMS**	1.2C	UN0328			P4	**A5.15.**
	CARTRIDGES FOR WEAPONS, INERT PROJECTILE *or* **CARTRIDGES, SMALL ARMS**	1.4S	UN0012			112, P5, A69	**A5.15.**
	CARTRIDGES FOR WEAPONS, INERT PROJECTILE *or* **CARTRIDGES, SMALL ARMS**	1.4C	UN0339			P5, A69	**A5.15.**
	CARTRIDGES FOR WEAPONS, INERT PROJECTILE *or* **CARTRIDGES, SMALL ARMS**	1.3C	UN0417			P4	**A5.15.**
	CARTRIDGES FOR WEAPONS, *with bursting charge*	1.1F	UN0005			P4	**A5.15.**
	CARTRIDGES FOR WEAPONS, *with bursting charge*	1.2F	UN0007			P4	**A5.15.**
	CARTRIDGES FOR WEAPONS*, with bursting charge*	1.4F	UN0348			P5	**A5.15.**
	CARTRIDGES FOR WEAPONS*, with bursting charge*	1.4E	UN0412			P5	**A5.15.**
	CARTRIDGES FOR WEAPONS, *with bursting charge*	1.1E	UN0006			P4	**A5.15.**
	CARTRIDGES FOR WEAPONS, *with bursting charge*	1.2E	UN0321			P4	**A5.15.**
	Cartridges, illuminating; see **AMMUNITION ILLUMINATING**, *etc*						
	CARTRIDGES, OIL WELL	1.3C	UN0277			P4, A69	**A5.20.**
	CARTRIDGES, OIL WELL	1.4C	UN0278			P5, A69	**A5.20.**
	CARTRIDGES, POWER DEVICE	1.3C	UN0275			P4	**A5.20.**
	CARTRIDGES, POWER DEVICE	1.4C	UN0276			P5, 110	**A5.20.**
	CARTRIDGES, POWER DEVICE	1.2C	UN0381			P4	**A5.20.**
	CARTRIDGES, POWER DEVICE	1.4S	UN0323			P5, 110, 112, A69	**A5.20.**
	Cartridges, safety; see **CARTRIDGES, FOR WEAPONS, INERT PROJECTILES**						
	CARTRIDGES, SIGNAL	1.3G	UN0054			P4	**A5.21.**
	CARTRIDGES, SIGNAL	1.4G	UN0312			P5	**A5.21.**
	CARTRIDGES, SIGNAL	1.4S	UN0405			P5, A69	**A5.21.**
	CARTRIDGES, SMALL ARMS; *see* **CARTRIDGES FOR WEAPONS, INERT PROJECTILE**						

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	CARTRIDGES, SMALL ARMS, BLANK*; see* **CARTRIDGES FOR WEAPONS, BLANK**						
	Cartridges, sporting; see **CARTRIDGES FOR WEAPONS,** *etc.*						
	Cartridges, starter, jet engine; see **CARTRIDGES, POWER DEVICE**						
	CASES, CARTRIDGE, EMPTY WITH PRIMER	1.4S	UN0055			P5, A69	**A5.22.**
	CASES, CARTRIDGE, EMPTY WITH PRIMER	1.4C	UN0379			P5, A69	**A5.22.**
	CASES, COMBUSTIBLE, EMPTY WITHOUT PRIMER	1.3C	UN0447			P4	**A5.22.**
	CASES, COMBUSTIBLE, EMPTY WITHOUT PRIMER	1.4C	UN0446			P5	**A5.22.**
	Casinghead gasoline; see **GASOLINE**						
	CASTOR BEANS *or* **CASTOR MEAL** *or* **CASTER POMACE** *or* **CASTOR FLAKE**	9	UN2969	II		P5	**A13.3.**
*	**CAUSTIC ALKALI LIQUIDS, N.O.S.**	8	UN1719	II III		P4 P5	**A12.3.** **A12.3.**
	Caustic potash; see **POTASSIUM HYDROXIDE SOLUTION,** *etc*						
	Caustic soda liquor; see **SODIUM HYDROXIDE,** *etc*						
	CELLS, CONTAINING SODIUM	4.3	UN3292	II		P4	**A8.19.**
	CELLULOID, *in blocks, rods, rolls, sheets, tubes, etc. except scrap*	4.1	UN2000	III		P5	**A8.4.**
	CELLULOID, SCRAP	4.2	UN2002	III		P5	**A8.4.**
	Cement, see **ADHESIVES** *containing flammable liquid*						
	CERIUM*, slabs, ingots, or rods*	4.1	UN1333	II		P5, N34	**A8.4.**
	CERIUM*, turnings or gritty powder*	4.3	UN3078	II		P5, A1	**A8.4.**
	CESIUM	4.3	UN1407	I		P3, A19, N34, N40	**A8.4.**
	CESIUM NITRATE *or* **CAESIUM NITRATE**	5.1	UN1451	III		P5, A1, A29	**A9.8.**
D	**CHARCOAL** *briquettes, shell, screenings, wood, etc.*	4.2	NA1361	III		P5	**A8.4.**
	CHARGES, BURSTING, PLASTICS BONDED	1.1D	UN0457			P4	**A5.15.**
	CHARGES, BURSTING, PLASTICS BONDED	1.2D	UN0458			P4	**A5.15.**
	CHARGES, BURSTING, PLASTICS BONDED	1.4D	UN0459			P5	**A5.15.**
	CHARGES, BURSTING, PLASTICS BONDED	1.4S	UN0460			P5, A69	**A5.15.**
	CHARGES, DEMOLITION	1.1D	UN0048			P4, A69	**A5.15.**
	CHARGES, DEPTH	1.1D	UN0056			P4	**A5.15.**
	Charges, expelling, explosive, for fire extinguishers; see **CARTRIDGES, POWER DEVICE**						
	CHARGES, EXPLOSIVE, COMMERCIAL *without detonator*	1.1D	UN0442			P4, A69	**A5.23.**

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	CHARGES, EXPLOSIVE, COMMERCIAL *without detonator*	1.2D	UN0443			P4, A69	**A5.23.**
	CHARGES, EXPLOSIVE, COMMERCIAL *without detonator*	1.4D	UN0444			P5, A69	**A5.23.**
	CHARGES, EXPLOSIVE, COMMERCIAL *without detonator*	1.4S	UN0445			P5, A69	**A5.23.**
	CHARGES, PROPELLING	1.1C	UN0271			P4	**A5.29.**
	CHARGES, PROPELLING	1.3C	UN0272			P4	**A5.29.**
	CHARGES, PROPELLING	1.2C	UN0415			P4	**A5.29.**
	CHARGES, PROPELLING	1.4C	UN0491			P5	**A5.29.**
	CHARGES, PROPELLING, FOR CANNON	1.2C	UN0414			P4	**A5.15.**
	CHARGES, PROPELLING, FOR CANNON	1.3C	UN0242			P4	**A5.15.**
	CHARGES, PROPELLING, FOR CANNON	1.1C	UN0279			P4	**A5.15.**
	CHARGES, SHAPED, *without detonator*	1.1D	UN0059			P4	**A5.23.**
	CHARGES, SHAPED, *without detonator*	1.2D	UN0439			P4	**A5.23.**
	CHARGES, SHAPED, *without detonator*	1.4D	UN0440			P5	**A5.23.**
	CHARGES, SHAPED, COMMERCIAL *without detonator*	1.4S	UN0441			P5, A69	**A5.23.**
	CHARGES, SHAPED, FLEXIBLE, LINEAR	1.4D	UN0237			P5, A69	**A5.24.**
	CHARGES, SHAPED, FLEXIBLE, LINEAR	1.1D	UN0288			P4, 101, A69	**A5.24.**
	CHARGES, SUPPLEMENTARY, EXPLOSIVE	1.1D	UN0060			P4	**A5.18.**
	CHEMICAL KITS	8	NA1760	II		P5	**A12.7.**
	CHEMICAL KITS *or* **FIRST AID KITS**	9	UN3316			P5	**A13.17.**
	CHLORAL, ANHYDROUS, STABILIZED	6.1	UN2075	II		P5	**A10.6.**
	CHLORATE AND BORATE MIXTURES	5.1	UN1458	II III		P5, A9, N34 P5, A9, N34	**A9.8.** **A9.8.**
	CHLORATE AND MAGNESIUM CHLORIDE MIXTURES	5.1	UN1459	II III		P5, A9, N34 P5, A9, N34	**A9.8.** **A9.8.**
	CHLORATES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1	UN3210	II		P5	**A9.7.**
	CHLORATES, INORGANIC, N.O.S.	5.1	UN1461	II		P5, A9, N34	**A9.8.**
	CHLORIC ACID AQUEOUS SOLUTION, *with not more than 10% chloric acid*						FORBIDDEN
	Chloride of phosphourous; see **PHOSPHORUS TRICHLORIDE**						
	Chloride of sulphur; see **SULPHUR CHLORIDE**						
	Chlorinated lime; see **CALCIUM HYPOCHLORITE MIXTURES,** *etc*						
	CHLORINE	2.3	UN1017		8	P2, 2	**A6.5.**
	Chlorine azide						FORBIDDEN
D	*Chlorine dioxide hydrate, frozen*						FORBIDDEN
	Chlorine dioxide (not hydrate)						FORBIDDEN
	CHLORINE PENTAFLUORIDE	2.3	UN2548		5.1, 8	P1, 1	**A6.5.**
	CHLORINE TRIFLUORIDE	2.3	UN1749		5.1, 8	P2, 2	**A6.5.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	CHLORITE SOLUTION	8	UN1908	II III		P5, A3, A6, A7, N34 P5, A3, A6, A7, N34	**A12.3.** **A12.3.**
	CHLORITES, INORGANIC, N.O.S.	5.1	UN1462	II		P5, A7, N34	**A9.8.**
	CHLOROACETIC ACID, SOLID	6.1	UN1751	II	8	P5, A3, A7, N34	**A10.6.**
	CHLOROACETIC ACID, SOLUTION	6.1	UN1750	II	8	P4, A7, N34	**A10.5.**
	CHLOROACETONE, STABILIZED	6.1	UN1695	I	3, 8	P5, 2, N12, N32, N34	**A10.7.**
	Chloroacetone (unstabilized)						FORBIDDEN
+	**CHLOROACETONITRILE**	6.1	UN2668	II	3	P2, 2	**A10.7.**
	CHLOROACETOPHENONE, *(CN), liquid*	6.1	UN1697	II		P5, A3, N12, N32, N33	**A10.5.**
	CHLOROACETOPHENONE, *(CN), solid*	6.1	UN1697	II		P5, A3, N12, N32, N33, N34	**A10.6.**
	CHLOROACETYL CHLORIDE	6.1	UN1752	I	8	P2, 2, A3, A6, A7, N34, N43	**A12.12.**
	CHLOROANILINES, LIQUID	6.1	UN2019	II		P5	**A10.5.**
	CHLOROANILINES, SOLID	6.1	UN2018	II		P5	**A10.6.**
	CHLOROANISIDINES	6.1	UN2233	III		P5	**A10.6.**
	CHLOROBENZENE	3	UN1134	III		P5	**A7.3.**
	Chlorobenzol; see **CHLOROBENZENE**						
	CHLOROBENZOTRIFLUORIDES	3	UN2234	III		P5	**A7.3.**
	CHLOROBENZYL CHLORIDES	6.1	UN2235	III		P5	**A10.5.**
	1-CHLORO-3-BROMOPROPANE	6.1	UN2688	III		P5	**A10.5.**
	CHLOROBUTANES	3	UN1127	II		P5	**A7.3.**
	CHLOROCRESOLS, *liquid*	6.1	UN2669	II		P5	**A10.5.**
	CHLOROCRESOLS, *solid*	6.1	UN2669	II		P5	**A10.6.**
	3-Chloro-4-diethylaminobenzenediazonium zinc chloride; see **SELF-REACTIVE SOLID TYPE D**						
	CHLORODIFLUOROBROMO-METHANE *or* **REFRIGERANT GAS R12B1**	2.2	UN1974			P5	**A6.4.**, **A6.5.**
	1-CHLORO-1, 1-DIFLUOROETHANES *or* **REFRIGERANT GAS R142B**	2.1	UN2517			P4	**A6.4.**, **A6.5.**
	CHLORODIFLUOROMETHANE *or* **REFRIGERANT GAS R22**	2.2	UN1018			P5	**A6.4.**, **A6.5.**
	CHLORODIFLUOROMETHANE AND CHLOROPENTAFLUOROETHANE MIXTURE *or* **REFRIGERANT GAS R502** *with fixed boiling point, with approximately 49% chlorodifluoromethane*	2.2	UN1973			P5	**A6.4.**, **A6.5.**
+	**CHLORODINITROBENZENES, LIQUID**	6.1	UN1577	II		P5	**A10.6.**
+	**CHLORODINITROBENZENES, SOLID**	6.1	UN1577	II		P5	**A10.6.**
	Chloroethane; see **ETHYL CHLORIDE**						
	2-CHLOROETHANAL	6.1	UN2232	I		P2, 2	**A10.7.**
	CHLOROFORM	6.1	UN1888	III		P5, N36	**A10.5.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	CHLOROFORMATES, TOXIC, CORROSIVE, FLAMMABLE, N.O.S.	6.1	UN2742	II	8, 3	P2, 5	**A10.5.**
*	**CHLOROFORMATES, TOXIC, CORROSIVE, N.O.S.**	6.1	UN3277	II	8	P3	**A10.5.**
	Chloromethane; see **METHYL CHLORIDE**						
	1-Chloro-3-methylbutane; see **AMYL CHLORIDE**						
	2-Chloro-2-methylbutane; see **AMYL CHLORIDE**						
	CHLOROMETHYL CHLOROFORMATE	6.1	UN2745	II	8	P4	**A10.5.**
	CHLOROMETHYL ETHYL ETHER	3	UN2354	II	6.1	P4	**A7.3.**
	3-CHLORO-4-METHYLPHENYL ISOCYANATE	6.1	UN2236	II		P5	**A10.5.**
	1-Chloro-2-methylpropane; see **CHLOROBUTANES**						
	2 Chloro-2-methylopropane; see **CHLOROBUTANES**						
	CHLORONITROANILINES	6.1	UN2237	III		P5	**A10.6.**
+	**CHLORONITROBENZENES,** *ortho, liquid*	6.1	UN1578	II		P4	**A10.5.**
+	**CHLORONITROBENZENES,** *meta or para, solid*	6.1	UN1578	II		P5	**A10.6.**
	CHLORONITROTOLUENES, *liquid*	6.1	UN2433	III		P5	**A10.5.**
	CHLORONITROTOLUENES, *solid*	6.1	UN2433	III		P5	**A10.6.**
	CHLOROPENTAFLUOROETHANE *or* **REFRIGERANT GAS R115**	2.2	UN1020			P5	**A6.4.**, **A6.5.**
	CHLOROPHENOLATES, LIQUID, *or* **PHENOLATES, LIQUID**	8	UN2904	III		P5	**A12.3.**
	CHLOROPHENOLATES, SOLID *or* **PHENOLATES SOLID**	8	UN2905	III		P5	**A12.4.**
	CHLOROPHENOLS, LIQUID	6.1	UN2021	III		P5	**A10.5.**
	CHLOROPHENOLS, SOLID	6.1	UN2020	III		P5	**A10.6.**
	CHLOROPHENYLTRICHLORO-SILANE	8	UN1753	II		P4, A7, N34	**A12.3.**
+	**CHLOROPICRIN**	6.1	UN1580	I		P2, 2	**A10.7.**
	CHLOROPICRIN AND METHYL BROMIDE MIXTURES	2.3	UN1581			P2, 2	**A6.17.**
	CHLOROPICRIN AND METHYL CHLORIDE MIXTURES	2.3	UN1582			P2, 2	**A6.17.**
	Chloropicrun mixture, flammable (pressure not exceeding 14.7 psia at 115 degrees F flashpoint below 100 degrees F); see **TOXIC LIQUIDS, FLAMMABLE,** *etc*						
	CHLOROPICRIN MIXTURES, N.O.S.	6.1	UN1583	I II III		P2, 5 P3 P5	**A10.5.** **A10.5.** **A10.5.**
D	**CHLOROPIVALOYL CHLORIDE**	6.1	NA9263	I	8	P2, 2	**A10.7.**
	CHLOROPLATINIC ACID, SOLID	8	UN2507	III		P5	**A12.4.**
	CHLOROPRENE, STABILIZED	3	UN1991	I	6.1	P3	**A7.3.**
	Chloroprene, unstabilized						FORBIDDEN

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	1-CHLOROPROPANE *see* **PROPYL CHLORIDE**						
	2-CHLOROPROPANE	3	UN2356	I		P3, N36	**A7.3.**
	3-CHLOROPROPANOL-1	6.1	UN2849	III		P5	**A10.5.**
	2-CHLOROPROPENE	3	UN2456	I		P3, A3, N36	**A7.3.**
	2-CHLOROPROPIONIC ACID, LIQUID	8	UN2511	III		P5	**A12.3.**
	2-CHLOROPROPIONIC ACID, SOLID	8	UN2511	III		P5	**A12.4.**
	2-CHLOROPYRIDINE	6.1	UN2822	II		P5	**A10.5.**
	CHLOROSILANES, CORROSIVE N.O.S.	8	UN2987	II		P4	**A12.3.**
	CHLOROSILANES, CORROSIVE, FLAMMABLE, N.O.S.	3	UN2985	II	8	P4	**A7.3.**
	CHLOROSILANES, FLAMMABLE, CORROSIVE, N.O.S.	8	UN2986	II	3	P4	**A12.3.**
	CHLOROSILANES, TOXIC, CORROSIVE, N.O.S.	6.1	UN3361	II	8	P5	**A10.5.**
	CHLOROSILANES, TOXIC, CORROSIVE, FLAMMABLE N.O.S.	6.1	UN3362	II	3, 8	P5	**A10.5.**
	CHLOROSILANES, WATER-REACTIVE, FLAMMABLE, CORROSIVE, **N.O.S.**	4.3	UN2988	I	3, 8	P3, A2	**A8.3.**
+	**CHLOROSULPHONIC ACID** *(with or without sulphur trioxide)*	8	UN1754	I	6.1	P2, 2, A3, A6, A10	**A12.12.**
	1-CHLORO-1,2,2,2-TETRAFLUOROETHANE *or* **REFRIGERANT GAS R124**	2.2	UN1021			P5	**A6.4.**, **A6.5.**
	CHLOROTOLUENES	3	UN2238	III		P5	**A7.3.**
	4-CHLORO-O-TOLUIDINE HYDROCHLORIDE	6.1	UN1579	III		P5	**A10.6.**
	CHLOROTOLUIDINES, *liquid or solid*	6.1	UN2239	III		P5	**A10.5.**, **A10.6.**
	1-CHLORO-2,2,2-TRIFLUOROETHANE *or* **REFRIGERANT GAS R133A**	2.2	UN1983			P5	**A6.4.**, **A6.5.**
	CHLOROTRIFLUOROMETHANE *or* **REFRIGERANT GAS R13**	2.2	UN1022			P5	**A6.4.**, **A6.5.**
	CHLOROTRIFLUOROMETHANE AND TRIFLUOROMETHANE AZEOTROPIC MIXTURE *or* **REFRIGERANT GAS R503** *with approximately 60% Chlorotrifluoromethane*	2.2	UN2599			P5	**A6.4.**, **A6.5.**
	CHROMIC ACID, SOLUTION	8	UN1755	II III		P5 P5	**A12.3.** **A12.3.**
	CHROMIC FLUORIDE, SOLID	8	UN1756	II		P5	**A12.4.**
	CHROMIC FLUORIDE, SOLUTION	8	UN1757	II III		P5 P5	**A12.3.** **A12.3.**
	CHROMIUM NITRATE	5.1	UN2720	III		P5, A1, A29	**A9.8.**
	CHROMIUM OXYCHLORIDE	8	UN1758	I		P3, A3, A6, A7, N34	**A12.3.**
	CHROMIUM TRIOXIDE, ANHYDROUS	5.1	UN1463	II	8	P5	**A9.8.**
	CHROMOSULFURIC ACID	8	UN2240	I		P3, A3, A6, A7, N34	**A12.3.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Chromyl chloride; see **CHROMIUM OXYCHLORIDE**						
	Cigar and cigarette lighters, charged with fuel, see **LIGHTERS**						
	Cleaning fluid or liquid; see **FLAMMABLE LIQUIDS**, *etc*						
	Coal briquettes, hot						FORBIDDEN
	COAL GAS, COMPRESSED	2.3	UN1023		2.1	P2, 3	**A6.6.**
	COAL TAR DISTILLATES, FLAMMABLE	3	UN1136	II III		P5 P5	**A7.3.** **A7.3.**
	Coal tar dye, corrosive liquid, n.o.s.; see **DYES, LIQUID** *or* **SOLID N.O.S**. *or* **DYE INTERMEDIATES, LIQUID** *or* **SOLID N.O.S.**						
	COATING SOLUTION *(includes surface treatments or coatings used for industrial or other purposes such as vehicle undercoating, drum or barrel lining)*	3	UN1139	I II III		P3 P5 P5	**A7.3.** **A7.3.** **A7.3.**
	COBALT NAPHTHENATES, POWDER	4.1	UN2001	III		P5, A19	**A8.4.**
	COBALT RESINATE, PRECIPITATED	4.1	UN1318	III		P5, A1, A19	**A8.4.**
	Coke, hot						FORBIDDEN
*	**COMPONENTS, EXPLOSIVE TRAIN, N.O.S.**	1.1B	UN0461			P4, 101	**A5.6.**
*	**COMPONENTS, EXPLOSIVE TRAIN, N.O.S**.	1.2B	UN0382			P4, 101	**A5.6.**
*	**COMPONENTS, EXPLOSIVE TRAIN, N.O.S.**	1.4B	UN0383			P5, 101	**A5.6.**
*	**COMPONENTS, EXPLOSIVE TRAIN, N.O.S.**	1.4S	UN0384			P5, 101, A69	**A5.6.**
*	**COMPOUNDS, CLEANING LIQUID**	8	NA1760	I II III		P3, A7 P5, N37 P5, N37	**A12.3.** **A12.3.** **A12.3.**
*	**COMPOUNDS, CLEANING LIQUID**	3	NA1993	I II III		P3 P5 P5	**A7.3.** **A7.3.** **A7.3.**
	Compounds, enamel; see **PAINT**, *etc*						
*	**COMPOUNDS, TREE KILLING, LIQUID** *or* **COMPOUNDS WEED KILLING, LIQUID**	8	NA1760	I II III		P3, A7 P5, N37 P5, N37	**A12.3.** **A12.3.** **A12.3.**
*	**COMPOUNDS, TREE KILLING LIQUID** *or* **COMPOUNDS, WEED KILLING, LIQUID**	3	NA1993	I II III		P3 P5 P5	**A7.3.** **A7.3.** **A7.3.**
*	**COMPOUNDS, TREE KILLING LIQUID** *or* **COMPOUNDS, WEED KILLING, LIQUID**	6.1	NA2810	I II III		P3 P5 P5	**A10.5.** **A10.5.** **A10.5.**
*	**COMPRESSED GAS, N.O.S.**	2.2	UN1956			P5	**A6.4.**, **A6.5.**, **A6.6.**
*	**COMPRESSED GAS, FLAMMABLE, N.O.S**.	2.1	UN1954			P4	**A6.4.**, **A6.5.**
*	**COMPRESSED GAS, OXIDIZING, N.O.S.**	2.2	UN3156		5.1	P5	**A6.4.**, **A6.6.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*	**COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S.** *Inhalation Hazard Zone A*	2.3	UN3304		8	P1, 1	**A6.16.**
*	**COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S.** *Inhalation Hazard Zone B*	2.3	UN3304		8	P2, 2	**A6.5.**, **A6.6.**
*	**COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S.** *Inhalation Hazard Zone C*	2.3	UN3304		8	P2, 3	**A6.5.**, **A6.6.**
*	**COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S.** *Inhalation Hazard Zone D*	2.3	UN3304		8	P2, 4	**A6.5.**, **A6.6.**
*	**COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.** *Inhalation Hazard Zone A*	2.3	UN3305		2.1, 8	P1, 1	**A6.16.**
*	**COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.** *Inhalation Hazard Zone B*	2.3	UN3305		2.1, 8	P2, 2	**A6.5.**, **A6.6.**
*	**COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.** *Inhalation Hazard Zone C*	2.3	UN3305		2.1, 8	P2, 3	**A6.5.**, **A6.6.**
*	**COMPRESSED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S.** *Inhalation Hazard Zone D*	2.3	UN3305		2.1, 8	P2, 4	**A6.5.**, **A6.6.**
*	**COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S.,** *Inhalation Hazard Zone A*	2.3	UN1953		2.1	P1, 1	**A6.16.**
*	**COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S.**, *Inhalation Hazard Zone B*	2.3	UN1953		2.1	P2, 2	**A6.5.**, **A6.6.**
*	**COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S.**, *Inhalation Hazard Zone C*	2.3	UN1953		2.1	P2, 3	**A6.5.**, **A6.6.**
*	**COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S.,** *Inhalation Hazard Zone D*	2.3	UN1953		2.1	P2, 4	**A6.5.**, **A6.6.**
*	**COMPRESSED GAS, TOXIC, N.O.S.,** *Inhalation Hazard Zone A*	2.3	UN1955			P1, 1	**A6.16.**
*	**COMPRESSED GAS, TOXIC, N.O.S.**, *Inhalation Hazard Zone B*	2.3	UN1955			P2, 2	**A6.5.**, **A6.6.**
*	**COMPRESSED GAS, TOXIC, N.O.S.,** *Inhalation Hazard Zone C*	2.3	UN1955			P2, 3	**A6.5.**, **A6.6.**
*	**COMPRESSED, GAS, TOXIC, N.O.S.,** *Inhalation Hazard Zone D*	2.3	UN1955			P2, 4	**A6.5.**, **A6.6.**
*	**COMPRESSED, GAS, TOXIC, OXIDING, CORROSIVE, N.O.S.** *Inhalation Hazard Zone A*	2.3	UN3306		5.1, 8	P1, 1	**A6.16.**
*	**COMPRESSED, GAS, TOXIC, OXIDING, CORROSIVE, N.O.S.** *Inhalation Hazard Zone B*	2.3	UN3306		5.1, 8	P2, 2	**A6.5.**, **A6.6.**
*	**COMPRESSED, GAS, TOXIC, OXIDING, CORROSIVE, N.O.S.** *Inhalation Hazard Zone C*	2.3	UN3306		5.1, 8	P2, 3	**A6.5.**, **A6.6.**
*	**COMPRESSED, GAS, TOXIC, OXIDING, CORROSIVE, N.O.S.** *Inhalation Hazard Zone D*	2.3	UN3306		5.1, 8	P2, 4	**A6.5.**, **A6.6.**
*	**COMPRESSED, GAS, TOXIC, OXIDING, N.O.S.** *Inhalation Hazard Zone A*	2.3	UN3303		5.1	P1, 1	**A6.16.**
*	**COMPRESSED, GAS, TOXIC, OXIDING, N.O.S.** *Inhalation Hazard Zone B*	2.3	UN3303		5.1	P2, 2	**A6.5.**

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*	**COMPRESSED, GAS, TOXIC, OXIDING, N.O.S.** *Inhalation Hazard Zone C*	2.3	UN3303		5.1	P2, 3	**A6.5.**
*	**COMPRESSED, GAS, TOXIC, OXIDING, N.O.S.** *Inhalation Hazard Zone D*	2.3	UN3303		5.1	P2, 4	**A6.5.**
	CONSUMER COMMODITY	9	ID8000			P5, A503	**A13.4.**
D	**CONSUMER COMMODITY**	ORM-D	ID8000			P5, A503, A504, A505	**A13.4.**
*	**CONTRIVANCES, WATER-ACTIVATED**, *with burster, expelling charge or propelling charge*	1.2L	UN0248			P3, 101	**A5.30.**
*	**CONTRIVANCES, WATER-ACTIVATED**, *with burster, expelling charge or propelling charge*	1.3L	UN0249			P3, 101	**A5.30.**
	COPPER ACETOARSENITE	6.1	UN1585	II		P5	**A10.6.**
	Copper acetylide						FORBIDDEN
	Copper amine azide						FORBIDDEN
	COPPER ARSENITE	6.1	UN1586	II		P5	**A10.6.**
*	**COPPER BASED PESTICIDES, LIQUID, FLAMMABLE, TOXIC,** *flashpoint less than 23 degrees C*	3	UN2776	I II	6.1 6.1	P3 P4	**A7.3.** **A7.3.**
*	**COPPER BASED PESTICIDES, LIQUID, TOXIC, FLAMMABLE,** *flashpoint not less than 23 degrees C*	6.1	UN3009	I II III	3 3 3	P3 P4 P5	**A10.5.** **A10.5.** **A10.5.**
*	**COPPER BASED PESTICIDES, LIQUID, TOXIC**	6.1	UN3010	I II III		P3 P5 P5	**A10.5.** **A10.5.** **A10.5.**
*	**COPPER BASED PESTICIDES, SOLID, TOXIC**	6.1	UN2775	I II III		P5 P5 P5	**A10.6.** **A10.6.** **A10.6.**
	COPPER CHLORATE	5.1	UN2721	II		P5, A1	**A9.8.**
	COPPER CHLORIDE	8	UN2802	III		P5	**A12.4.**
	COPPER CYANIDE	6.1	UN1587	II		P5	**A10.6.**
	COPPER SELENATE; *see* **SELENATES**						
	COPPER SELENITE; *see* **SELENITES**						
	Copper tetramine nitrate						FORBIDDEN
	Copra						FORBIDDEN
	CORD, DETONATING, *flexible*	1.1D	UN0065			P4, 102, A69	**A5.25.**
	CORD, DETONATING, *flexible*	1.4D	UN0289			P5, A69	**A5.25.**
	CORD, DETONATING *or* **FUSE, DETONATING**, *metal clad*	1.2D	UN0102			P4, A69	**A5.25.**
	CORD, DETONATING *or* **FUSE, DETONATING,** *metal clad*	1.1D	UN0290			P4, A69	**A5.25.**
	CORD, DETONATING, MILD EFFECT *or* **FUSE, DETONATING, MILD EFFECT**, *metal clad*	1.4D	UN0104			P5, A69	**A5.25.**
	CORD, IGNITER	1.4G	UN0066			P5, A69	**A5.26.**
	Cordite, see **POWDER, SMOKELESS**						

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Corrosive battery fluid; see **BATTERY FLUID, ACID** *or* **BATTERY FLUID, ALKALI**						
*	**CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.**	8	UN3264	I		P3	**A12.3.**
				II		P4	**A12.3.**
				III		P5	**A12.3.**
*	**CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.**	8	UN3265	I		P3	**A12.3.**
				II		P4	**A12.3.**
				III		P5	**A12.3.**
*	**CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.**	8	UN3266	I		P3	**A12.3.**
				II		P4	**A12.3.**
				III		P5	**A12.3.**
*	**CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.**	8	UN3267	I		P3	**A12.3.**
				II		P4	**A12.3.**
				III		P5	**A12.3.**
*	**CORROSIVE LIQUID, FLAMMABLE, N.O.S**.	8	UN2920	I	3	P3	**A12.3.**
				II	3	P4	**A12.3.**
*	**CORROSIVE LIQUID, SELF-HEATING, N.O.S.**	8	UN3301	I	4.2	P3	**A12.3.**
				II	4.2	P4	**A12.3.**
*	**CORROSIVE LIQUID, N.O.S.**	8	UN1760	I		P3, A7	**A12.3.**
				II		P4	**A12.3.**
				III		P5	**A12.3.**
*	**CORROSIVE LIQUID, OXIDIZING, N.O.S.**	8	UN3093	I	5.1	P3	**A12.3.**
				II	5.1	P4	**A12.3.**
*	**CORROSIVE LIQUID, TOXIC N.O.S.**	8	UN2922	I	6.1	P3, A7	**A12.3.**
				II	6.1	P4	**A12.3.**
				III	6.1	P5	**A12.3.**
*	**CORROSIVE LIQUID, WATER-REACTIVE, N.O.S.**	8	UN3094	I	4.3	P3	**A12.3.**
				II	4.3	P4	**A12.3.**
*	**CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.**	8	UN3260	I		P5	**A12.4.**
				II		P5	**A12.4.**
				III		P5	**A12.4.**
*	**CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S.**	8	UN3261	I		P5	**A12.4.**
				II		P5	**A12.4.**
				III		P5	**A12.4.**
*	**CORROSIVE SOLID, BASIC, INORGANIC, N.O.S**	8	UN3262	I		P5	**A12.4.**
				II		P5	**A12.4.**
				III		P5	**A12.4.**

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*	**CORROSIVE SOLID, BASIC, ORGANIC, N.O.S**	8	UN3263	I		P5	**A12.4.**
				II		P5	**A12.4.**
				III		P5	**A12.4.**
*	**CORROSIVE SOLID, FLAMMABLE, N.O.S.**	8	UN2921	I	4.1	P3	**A12.4.**
				II	4.1	P4	**A12.4.**
*	**CORROSIVE SOLID, N.O.S.**	8	UN1759	I		P5	**A12.4.**
				II		P5	**A12.4.**
				III		P5	**A12.4.**
*	**CORROSIVE SOLID, OXIDIZING, N.O.S.**	8	UN3084	I	5.1	P5	**A12.4.**
				II	5.1	P5	**A12.4.**
*	**CORROSIVE SOLID, TOXIC N.O.S.**	8	UN2923	I	6.1	P5	**A12.4.**
				II	6.1	P5	**A12.4.**
				III	6.1	P5	**A12.4.**
*	**CORROSIVE SOLID, SELF-HEATING, N.O.S.**	8	UN3095	I	4.2	P5	**A12.4.**
				II	4.2	P5	**A12.4.**
*	**CORROSIVE SOLIDS, WATER-REACTIVE, N.O.S.**	8	UN3096	I	4.3	P3	**A12.4.**
				II	4.3	P4	**A12.4.**
	COTTON WASTE, OILY	4.2	UN1364	III		P5	**A8.4.**
	Cotton Wet						FORBIDDEN
*	**COUMARIN DERIVATIVE PESTICIDES, LIQUID, FLAMMABLE, TOXIC,** *flashpoint not less than 23 degrees C*	3	UN3024	I	6.1	P3	**A7.3.**
				II	6.1	P4	**A7.3.**
*	**COUMARIN DERIVATIVE PESTICIDES, LIQUID, TOXIC, FLAMMABLE,** *flashpoint less than 23 degrees C*	6.1	UN3025	I	3	P3	**A10.5.**
				II	3	P5	**A10.5.**
				III	3	P5	**A10.5.**
*	**COUMARIN DERIVATIVE PESTICIDES, LIQUID, TOXIC**	6.1	UN3026	I		P3	**A10.5.**
				II		P5	**A10.5.**
				III		P5	**A10.5.**
*	**COUMARIN DERIVATIVE PESTICIDES, SOLID, TOXIC**	6.1	UN3027	I		P5	**A10.6.**
				II		P5	**A10.6.**
				III		P5	**A10.6.**
	CRESOLS, LIQUID	6.1	UN2076	II	8	P5	**A10.5.**
	CRESOLS, SOLID	6.1	UN2076	II	8	P5	**A10.6.**
	CRESYLIC ACID	6.1	UN2022	II	8	P5	**A10.5.**
	CROTONALDEHYDE, STABILIZED	6.1	UN1143	I	3	P2, 2	**A10.7.**
	CROTONIC ACID, *liquid or solid*	8	UN2823	III		P5	**A12.3.**, **A12.4.**
	CROTONYLENE	3	UN1144	I		P3	**A7.3.**
	CUPRIETHYLENEDIAMINE SOLUTION	8	UN1761	II	6.1	P4	**A12.3.**
				III	6.1	P5	**A12.3.**
	CUTTERS, CABLE, EXPLOSIVE	1.4S	UN0070			P5, A69	**A5.20.**

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Cyanide or cyanide mixtures, dry; see **CYANIDES, INORGANIC, SOLID N.O.S.**						
*	**CYANIDES, INORGANIC, SOLID N.O.S.**	6.1	UN1588	I		P5, N74, N75	**A10.6.**
				II		P5, N74, N75	**A10.6.**
				III		P5, N74, N75	**A10.6.**
	CYANIDE SOLUTIONS, N.O.S.	6.1	UN1935	I		P3	**A10.5.**
				II		P4	**A10.5.**
				III		P5	**A10.5.**
	CYANOGEN BROMIDE	6.1	UN1889	I	8	P3, A6, A8	**A10.6.**
	CYANOGEN CHLORIDE, STABILIZED	2.3	UN1589		8	P1, 1	**A6.16.**
	Cyanogen Chloride, unstabilized						FORBIDDEN
	CYANOGEN	2.3	UN1026		2.1	P2, 2	**A6.16.**
	CYANURIC CHLORIDE	8	UN2670	II		P5	**A12.4.**
	Cyanuric triazide						FORBIDDEN
	CYCLOBUTANE	2.1	UN2601			P4	**A6.4., A6.5.**
	CYCLOBUTYL CHLOROFORMATE	6.1	UN2744	II	3, 8	P4	**A10.5.**
	1,5,9-CYCLODODECATRIENE	6.1	UN2518	III		P5	**A10.5.**
	CYCLOHEPTANE	3	UN2241	II		P5	**A7.3.**
	CYCLOHEPTATRIENE	3	UN2603	II	6.1	P5	**A7.3.**
	CYCLOHEPTENE	3	UN2242	II		P5	**A7.3.**
	CYCLOHEXANE	3	UN1145	II		P5	**A7.3.**
	CYCLOHEXANONE	3	UN1915	III		P5	**A7.3.**
	CYCLOHEXENE	3	UN2256	II		P5	**A7.3.**
	CYCLOHEXENYLTRICHLORO-SILANE	8	UN1762	II		P4, A7, N34	**A12.3.**
	CYCLOHEXYL ACETATE	3	UN2243	III		P5	**A7.3.**
	CYCLOHEXYLAMINE	8	UN2357	II	3	P5	**A12.3.**
	CYCLOHEXYL ISOCYANATE	6.1	UN2488	I	3	P2, 2	**A10.7.**
	CYCLOHEXYL MERCAPTAN	3	UN3054	III		P5	**A7.3.**
	CYCLOHEXYLTRICHLOROSILANE	8	UN1763	II		P4, A7, N34	**A12.3.**
	CYCLOOCTADIENE PHOSPHINES*; see* **9-PHOSPHABICYCLONONANES**						
	CYCLOOCTADIENES	3	UN2520	III		P5	**A7.3.**
	CYCLOOCTATETRAENE	3	UN2358	II		P5	**A7.3.**
	CYCLOPENTANE	3	UN1146	II		P5	**A7.3.**
	Cyclopentane, methyl; see **METHYLCYCLOPENTANE**						
	CYCLOPENTANOL	3	UN2244	III		P5	**A7.3.**
	CYCLOPENTANONE	3	UN2245	III		P5	**A7.3.**
	CYCLOPENTENE	3	UN2246	II		P5	**A7.3.**
	CYCLOPROPANE	2.1	UN1027			P4	**A6.4., A6.5.**
	CYCLOTETRAMETHYLENETE-TRANITRA MINE, DESENSITIZED, *or* **OCTOGEN, DESENSITIZED** *or* **HMX DESENSITIZED**	1.1D	UN0484			P4	**A5.9.**

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Cyclotetramethylenetetranitramine (dry)						FORBIDDEN
	CYCLOTETRAMETHYLENETE-TRANITRA MINE, WETTED, *or* **HMX, WETTED** *or* **OCTOGEN, WETTED** *with not less than 15% water, by mass*	1.1D	UN0226			P4	**A5.9.**
	CYCLOTETRAMETHYLENE-TETRANITRAMINE, **HMX**, *or* **OCTOGEN, WETTED** *with less than 15% water, by mass*						FORBIDDEN
	CYCLOTRIMETHYLENETRI-NITRAMINE, CYCLONITE, HEXOGEN, *or* **RDX, AND CYCLOTETRAMETHYLENE-TETRANITRA MINE, NMX,** *or* **OCTOGEN MIXTURES, WETTED** *with not less than 15% water by mass, or* **CYCLOTRIMETHYLENETRI-NITRAMINE, CYCLONITE, HEXOGEN**, *or* **RDX, AND CYCLOTETRAMETHYLENETE-TRANITRA MINE, NMX,** *or* **OCTOGEN MIXTURES, DESENSITIZED** *with not less than 10% phlegmatizer by mass*	1.1D	UN0391			P4	**A5.9.**
	CYCLOTRIMETHYLENETRI-NITRAMINE, CYCLONITE, HEXOGEN, *or* **RDX, DESENSITIZED**	1.1D	UN0483			P4	**A5.9.**
	CYCLOTRIMETHYLENETRI-NITRAMINE, WETTED, CYCLONITE, WETTED, HEXOGEN, RDX, **WETTED** *with not less than 15% water by mass*	1.1D	UN0072			P4	**A5.9.**
	CYMENES	3	UN2046	III		P5	**A7.3.**
	DANGEROUS GOODS IN APPARATUS *or* **MACHINERY**	9	UN3363			P5	**A13.12.**
	DECABORANE	4.1	UN1868	II	6.1	P5, A19, A20	**A8.4.**
	DECAHYDRONAPHTHALENE	3	UN1147	III		P5	**A7.3.**
	N-DECANE	3	UN2247	III		P5	**A7.3.**
	DEFLAGRATING METAL SALTS OF AROMATIC NITRODERIVATIVES, N.O.S.	1.3C	UN0132			P4	**A5.12.**
	Detonating relays; see **DETONATORS,** *etc*						
	DETONATOR ASSEMBLIES, NON-ELECTRIC *for blasting*	1.1B	UN0360			P4, A69	**A5.17.**
	DETONATOR ASSEMBLIES, NON-ELECTRIC *for blasting*	1.4B	UN0361			P5, 103, A69	**A5.17.**
	DETONATOR ASSEMBLIES, NON-ELECTRIC *for blasting*	1.4S	UN0500	II		P5, A69	**A5.17.**
	DETONATORS, ELECTRIC, *for blasting*	1.1B	UN0030			P4, A69	**A5.16.**
	DETONATORS, ELECTRIC, *for blasting*	1.4B	UN0255			P5, A69	**A5.16.**
	DETONATORS, ELECTRIC, *for blasting*	1.4S	UN0456			P5, A69	**A5.16.**
	DETONATORS FOR AMMUNITION	1.1B	UN0073			P4	**A5.19.**
	DETONATORS FOR AMMUNTION	1.2B	UN0364			P4	**A5.19.**
	DETONATORS FOR AMMUNITION	1.4B	UN0365			P5, 103	**A5.19.**
	DETONATORS FOR AMMUNITION	1.4S	UN0366			P5, A69	**A5.19.**
	DETONATORS, NON-ELECTRIC, *for blasting*	1.1B	UN0029			P4, A69	**A5.17.**
	DETONATORS, NON-ELECTRIC, *for blasting*	1.4B	UN0267			P5, 103, A69	**A5.17.**

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	DETONATORS, NON-ELECTRIC, *for blasting*	1.4S	UN0455			P5, A69	**A5.17.**
	DEUTERIUM, COMPRESSED	2.1	UN1957			P4	**A6.4.**, **A6.6.**
	DEVICES, SMALL, HYDROCARBON GAS POWERED *or* **HYDROCARBON GAS REFILLS FOR SMALL DEVICES** *with release device*	2.1	UN3150			P5	**A6.4.**, **A6.5.**
	DIACETONE ALCOHOL	3	UN1148	II III		P5 P5	**A7.3.** **A7.3.**
	Diacetyl, see **BUTANEDIONE**						
	DIAGNOSTIC SPECIMENS	6.2	UN3373			P5	**A10.10.**
	DIALLYLAMINE	3	UN2359	II	6.1, 8	P4	**A7.3.**
	DIALLYL ETHER	3	UN2360	II	6.1	P4, N12	**A7.3.**
	4,4'-DIAMINODIPHENYL METHANE	6.1	UN2651	III		P5	**A10.6.**
	DI-N-AMYLAMINE	3	UN2841	III	6.1	P5	**A7.3.**
	p-Diazidobenzene						FORBIDDEN
	1,1'-Diazoaminonaphthalene						FORBIDDEN
	DIAZODINITROPHENOL, WETTED *with not less than 40% water, or mixture of alcohol and water, by mass*	1.1A	UN0074			P4, 111, 117	**A5.7.**
	Diazodiphenylmethane						FORBIDDEN
	2-Diazo-1-Naphthol-4-Sulphochloride; see **SELF-REACTIVE SOLID TYPE B**						
	Diazonium nitrates (dry)						FORBIDDEN
	Diazonium perchlorates (dry)						FORBIDDEN
	DIBENZYLDICHLOROSILANE	8	UN2434	II		P5	**A12.3.**
	Diborane						FORBIDDEN
	DIBORANE	2.3	UN1911		2.1	P1, 1	**A6.6.**
D	*Diborane mixtures*						FORBIDDEN
	Dibromoacetylene						FORBIDDEN
	DIBROMOBENZENE	3	UN2711	III		P5	**A7.3.**
	1,2-DIBROMOBUTAN-3-ONE	6.1	UN2648	II		P5	**A10.5.**
	1,2 DI-(DIMETHYL AMINO) ETHANE	3	UN2372	II		P4	**A7.3.**
	DIBROMOCHLOROPROPANE	6.1	UN2872	III		P5	**A10.5.**
	DIBROMODIFLUOROMETHANE, R12B2	9	UN1941	III		P5	**A13.3.**
	1,2-Dibromoethane; see **ETHYLENE DIBROMIDE**						
	DIBROMOMETHANE	6.1	UN2664	III		P5	**A10.5.**
	DI-N-BUTYLAMINE	8	UN2248	II	3	P5	**A12.3.**
	DIBUTYLAMINOETHANOL	6.1	UN2873	III		P5	**A10.5.**
	DIBUTYL ETHERS	3	UN1149	III		P5	**A7.3.**
	DICHLOROACETIC ACID	8	UN1764	II		P5, A3, A6, A7, N34	**A12.3.**
	1,3-DICHLOROACETONE	6.1	UN2649	II		P5	**A10.6.**
	DICHLOROACETYL CHLORIDE	8	UN1765	II		P5, A3, A6, A7, N34	**A12.3.**

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dichloroacetylene						FORBIDDEN
+	**DICHLOROANILINES, SOLID** *or* **LIQUID**	6.1	UN1590	II		P5	**A10.5.**, **A10.6.**
+	**O-DICHLOROBENZENE**	6.1	UN1591	III		P5	**A10.5.**
	2,2'-DICHLORODIETHYL ETHER	6.1	UN1916	II	3	P5, N33, N34	**A10.5.**
	DICHLORODIFLUOROMETHANE *or* **REFRIGERANT GAS R12**	2.2	UN1028			P5	**A6.4.**, **A6.5.**
	DICHLORODIFLUOROMETHANE AND DIFLUOROETHANE AZEOTROPIC MIXTURE *or* **REFRIGERANT GAS R500** *with approximately 74% dichlorodifluoromethane*	2.2	UN2602			P5	**A6.4.**, **A6.5.**
	DICHLORODIMETHYL ETHER, SYMMETRICAL	6.1	UN2249	I	3	P3	**A10.5.**
	1,1-DICHLOROETHANE	3	UN2362	II		P5	**A7.3.**
	1,2-Dichloroethane; see **ETHYLENE DICHLORIDE**						
	1,2-DICHLOROETHYLENE	3	UN1150	II		P5	**A7.3.**
	Dichloroethyl sulphide						FORBIDDEN
	DICHLOROISOCYANURIC ACID, DRY *or* **DICHLOROISOCYANURIC ACID SALTS**	5.1	UN2465	II		P5	**A9.8.**
	DICHLOROISOPROPYL ETHER	6.1	UN2490	II		P5	**A10.5.**
	DICHLOROMETHANE	6.1	UN1593	III		P5, N36	**A10.5.**
	DICHLOROFLUOROMETHANE *or* **REFRIGERANT GAS R21**	2.2	UN1029			P5	**A6.4.**, **A6.5.**
	1,1-DICHLORO-1-NITROETHANE	6.1	UN2650	II		P5	**A10.5.**
	DICHLOROPENTANES	3	UN1152	III		P5	**A7.3.**
	DICHLOROPHENYL ISOCYANATES	6.1	UN2250	II		P5	**A10.6.**
	DICHLOROPHENYLTRICHLORO-SILANE	8	UN1766	II		P4, A7, N34	**A12.3.**
	1,2-DICHLOROPROPANE	3	UN1279	II		P5, N36	**A12.3.**
	1,3-DICHLOROPROPANOL-2	6.1	UN2750	II		P5	**A10.5.**
	DICHLOROPROPENES	3	UN2047	II III		P5 P5	**A7.3.** **A7.3.**
	DICHLOROSILANE	2.3	UN2189		2.1, 8	P2, 2	**A6.5.**
	1,2-DICHLORO-1,1,2,2-TERTAFLUOROETHANE *or* **REFRIGERANT GAS R114**	2.2	UN1958			P5	**A6.4.**, **A6.5.**
D	**3,5 DICHLORO-2,4,6 TRIFLUOROPYRIDINE**	6.1	NA9264	I		P2, 2	**A10.7.**
	Dichlorovinylchloroarsine						FORBIDDEN
	1,4-Dicyanobutane; see **ADIPONITRILE**						
	DICYCLOHEPTADIENE*; see* **2,5-NORBORNADIENE**						
	DICYCLOHEXYLAMINE	8	UN2565	III		P5	**A12.3.**
	dicyclohexYLAMMONIUM NITRITE	4.1	UN2687	III		P5	**A8.4.**
	DICYCLOPENTADIENE	3	UN2048	III		P5	**A7.3.**
	1,2-DI-(DIMETHYLAMINO) ETHANE	3	UN2372	II		P5	**A7.3.**
	DIDYMIUM NITRATE	5.1	UN1465	III		P5, A1	**A9.8.**
	DIESEL FUEL*; also see* **GAS OIL**	3	UN1202	III		P5	**A7.3.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	DIETHOXYMETHANE	3	UN2373	II		P5	**A7.3.**
	3,3-DIETHOXYPROPENE	3	UN2374	II		P5	**A7.3.**
	DIETHYLAMINE	3	UN1154	II	8	P4, N34	**A7.3.**
	2-DIETHYLAMINOETHANOL	8	UN2686	II	3	P5	**A12.3.**
	3-DIETHYLAMINOPROPYLAMINE	3	UN2684	III	8	P5	**A7.3.**
+	**N,N-DIETHYLANILINE**	6.1	UN2432	III		P5	**A10.5.**
	DIETHYLBENZENE	3	UN2049	III		P5	**A7.3.**
	DIETHYL CARBONATE	3	UN2366	III		P5	**A7.3.**
	DIETHYLDICHLOROSILANE	8	UN1767	II	3	P4, A7, N34	**A12.3.**
	Diethylene glycol dinitrate						FORBIDDEN
	Diethylene glycol dinitrate, desensitized with not less than 25% nonvolatile water-insoluble phlegmatizer, by mass						FORBIDDEN
	Diethylgold bromide						FORBIDDEN
	DIETHYLENETRIAMINE	8	UN2079	II		P5	**A12.3.**
	N,N-Diethylethanolamine; see **DIETHYLAMINOETHANOL**						
	DIETHYL ETHER *or* **ETHYL ETHER**	3	UN1155	I		P3	**A7.3.**
	N,N-DIETHYLETHYLENEDIAMINE	8	UN2685	II	3	P5	**A12.3.**
	DIETHYL KETONE	3	UN1156	II		P5	**A7.3.**
	DIETHYL SULPHATE	6.1	UN1594	II		P5	**A10.5.**
	DIETHYL SULPHIDE	3	UN2375	II		P5	**A7.3.**
	DIETHYLTHIOPHOSPHORYL CHLORIDE	8	UN2751	II		P5	**A12.4.**
	DIETHYLZINC	4.2	UN1366	I	4.3	P3	**A8.6.**
	1,1 DIFLUOROETHANE *or* **REFRIGERANT GAS R152A**	2.1	UN1030			P4	**A6.4.**, **A6.5.**
	1,1-DIFLUOROETHYLENE *or* **REFRIGERANT GAS R1132A**	2.1	UN1959			P4	**A6.4.**, **A6.5.**
	DIFLUOROMETHANE *or* **REFRIGERANT GAS R32**	2.1	UN3252			P4	**A6.4.**, **A6.6.**
	DIFLUOROPHOSPHORIC ACID, ANHYDROUS	8	UN1768	II		P5, A6, A7, N5, N34	**A12.3.**
	2,3-DIHYDROPYRAN	3	UN2376	II		P5	**A7.3.**
	DIISOBUTYLAMINE	3	UN2361	III	8	P5	**A7.3.**
	DIISOBUTYLENE, ISOMETRIC COMPOUNDS	3	UN2050	II		P5	**A7.3.**
	DIISOBUTYL KETONE	3	UN1157	III		P5	**A7.3.**
	DIISOOCTYL ACID PHOSPHATE	8	UN1902	III		P5	**A12.3.**
	DIISOPROPYLAMINE	3	UN1158	II	8	P4	**A7.3.**
	DIISOPROPYL ETHER	3	UN1159	II		P5	**A7.3.**
	DIKETENE, STABILIZED	6.1	UN2521	I	3	P2, 2	**A10.7.**
	1,1-DIMETHOXYETHANE	3	UN2377	II		P3	**A7.3.**
	1,2-DIMETHOXYETHANE	3	UN2252	II		P3	**A7.3.**
	DIMETHYLAMINE, ANHYDROUS	2.1	UN1032			P4	**A6.5.**
	DIMETHYLAMINE SOLUTION	3	UN1160	II	8	P4	**A7.3.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	2-DIMETHYLAMINOACETONITRILE	3	UN2378	II	6.1	P4	**A7.3.**
	4-dimethylamino-6-(2-dimethylaminoethoxy) toluene-2-diazonium zinc chloride; see **SELF-RELATIVE SOLID TYPE D, TEMPERATURE CONTROLLED**						
	2-DIMETHYLAMINOETHYL ACRYLATE	6.1	UN3302	II		P5	**A10.5.**
	2-DIMETHYLAMINOETHANOL	8	UN2051	II	3	P5	**A12.3.**
	2-DIMETHYLAMINOETHYL METHACRYLATE	6.1	UN2522	II		P5	**A10.5.**
	N,N-DIMETHYLANILINE	6.1	UN2253	II		P5	**A10.5.**
	2,3-DIMETHYLBUTANE	3	UN2457	II		P5	**A7.3.**
	1,3-DIMETHYLBUTYLAMINE	3	UN2379	II	8	P5	**A7.3.**
	DIMETHYLCARBAMOYL CHLORIDE	8	UN2262	II		P5	**A12.3.**
	DIMETHYL CARBONATE	3	UN1161	II		P5	**A7.3.**
	DIMETHYLCYCLOHEXANES	3	UN2263	II		P5	**A7.3.**
	N,N-DIMETHYLCYCLOHEXYLAMINE	8	UN2264	II	3	P5	**A12.3.**
	DIMETHYLDICHLOROSILANE	3	UN1162	II	8	P5	**A7.3.**
	DIMETHYLDIETHOXYSILANE	3	UN2380	II		P5	**A7.3.**
	DIMETHYLDIOXANES	3	UN2707	II III		P5 P5	**A7.3.** **A7.3.**
	DIMETHYL DISULPHIDE	3	UN2381	II		P5	**A7.3.**
	DIMETHYL ETHER	2.1	UN1033			P4	**A6.4.**, **A6.5.**
	N,N-DIMETHYFORMAMIDE	3	UN2265	III		P5	**A7.3.**
	DIMETHYLHYDRAZINE, SYMMETRICAL	6.1	UN2382	I	3	P2, 2, A7	**A10.7.**
	DIMETHYLHYDRAZINE, UNSYMMETRICAL	6.1	UN1163	I	3, 8	P2, 2	**A10.7.**
	2,2-DIMETHYLPROPANE	2.1	UN2044			P4	**A6.4.**, **A6.5.**
	DIMETHYL-N-PROPYLAMINE	3	UN2266	II	8	P5	**A7.3.**
	DIMETHYL SULPHATE	6.1	UN1595	I	8	P2, 2	**A10.7.**
	DIMETHYL SULPHIDE	3	UN1164	II		P5	**A7.3.**
	DIMETHYL THIOPHOSPHORYL CHLORIDE	6.1	UN2267	II	8	P5	**A10.5.**
	DIMETHYLZINC	4.2	UN1370	I	4.3	P3	**A8.6.**
	DINGU; *see* **DINITROGLYCOLURIL**						
	DINITROANILINES	6.1	UN1596	II		P5	**A10.6.**
	DINITROBENZENES, **LIQUID** *or* **SOLID**	6.1	UN1597	II		P5	**A10.5.**, **A10.6.**
	DINITRO-O-CRESOL, *solid or solution*	6.1	UN1598	II		P5	**A10.5.**, **A10.6.**
	1,3-Dinitro-4,5-dinitrosobenzene						FORBIDDEN
	1,2-Dinitroethane						FORBIDDEN
	Dinitrogen tetroxide						FORBIDDEN
	DINITROGLYCOLURIL *or* **DINGU**	1.1D	UN0489			P4	**A5.10.**
	Dinitromethane						FORBIDDEN
	DINITROPHENOLATES, *alkali metals, dry or wetted with less than 15% water, by mass*	1.3C	UN0077		6.1	P4	**A5.12.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	DINITROPHENOLATES, WETTED *with not less than 15% water, by mass*	4.1	UN1321	I	6.1	P4, 23, A8, A19, A20, N41	**A8.4.**
	Dinitropropylene glycol						FORBIDDEN
	DINITROPHENOL, *dry or wetted with less than 15% water, by mass*	1.1D	UN0076		6.1	P4	**A5.9.**
	DINITROPHENOL SOLUTIONS	6.1	UN1599	II III		P5 P5	**A10.5.** **A10.5.**
	DINITROPHENOL, WETTED *with not less than 15% water, by mass*	4.1	UN1320	I	6.1	P4, 23, A8, A19, A20, N41	**A8.4.**
	Dinitropropylene glycol						FORBIDDEN
	DINITRORESORCINOL, *dry or wetted with less than 15% water, by mass*	1.1D	UN0078			P4	**A5.9.**
	DINITRORESORCINOL, WETTED *with not less than 15% water, by mass*	4.1	UN1322	I		P4, 23, A8, A19, A20, N41	**A8.4.**
	DINITROSOBENZENE	1.3C	UN0406			P4	**A5.12.**
	2,2-Dinitrostilbene						FORBIDDEN
	DINITROTOLUENES, *liquid or solid*	6.1	UN2038	II		P5	**A10.5.**, **A10.6.**
	2,4-Dinitro-1,3,5-trimethylbenzene						FORBIDDEN
	DIOXANE	3	UN1165	II		P5	**A7.3.**
	DIOXOLANE	3	UN1166	II		P5	**A7.3.**
	DIPENTENE	3	UN2052	III		P5	**A7.3.**
	DIPHENYLAMINE CHLOROARSINE	6.1	UN1698	I		P3	**A10.5.**
	DIPHENYLCHLOROARSINE, LIQUID *or* **SOLID**	6.1	UN1699	I		P3, A8, N33, N34	**A10.5.**, **A10.6.**
	DIPHENYLDICHLOROSILANE	8	UN1769	II		P4, A7, N34	**A12.3.**
	DIPHENYLMETHANE-4,4'-DIISOCYANATE	6.1	UN2489	III		P5	**A10.5.**
	DIPHENYLMETHYL BROMIDE	8	UN1770	II		P5	**A12.4.**
	Dipicrylamine; see **HEXANITRODIPHENYLAMINE**						
	DIPICRYL SULPHIDE, *dry or wetted with less than 10% water, by mass*	1.1D	UN0401			P4	**A5.9.**
	DIPICRYL SULPHIDE, WETTED *with not less than 10% water, by mass*	4.1	UN2852	I		P4, A2, N41	**A8.4.**
	DIPROPYLAMINE	3	UN2383	II	8	P4	**A7.3.**
	DI-N-PROPYL ETHER	3	UN2384	II		P5	**A7.3.**
	DIPROPYL KETONE	3	UN2710	III		P5	**A7.3.**
*	**DISINFECTANTS, LIQUID, CORROSIVE, N.O.S**	8	UN1903	I II III		P3, A7 P5 P5	**A12.3.** **A12.3.** **A12.3.**
*	**DISINFECTANTS, LIQUID, TOXIC, N.O.S.**	6.1	UN3142	I II III		P3, A4 P5 P5	**A10.5.** **A10.5.** **A10.5.**
*	**DISINFECTANTS, SOLID, TOXIC, N.O.S.**	6.1	UN1601	II III		P5 P5	**A10.6.** **A10.6.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	DISODIUM TRIOXOSILICATE	8	UN3253	III		P5	**A12.4.**
*	**DISPERSANT gasES; N.O.S.** *see* **REFRIGERANT GASES, N.O.S.**						
	DIVINYL ETHER, STABILIZED	3	UN1167	I		P3	**A7.3.**
	DODECYLTRICHLOROSILANE	8	UN1771	II		P4, A7, N34	**A12.3.**
	DRY ICE, *see* **CARBON DIOXIDE SOLID**						
*	**DYES, LIQUID, CORROSIVE, N.O.S.,** *or* **DYE INTERMEDIATES, LIQUID, CORROSIVE, N.O.S**	8	UN2801	I II III		P5, 11 P5, 11 P5, 11	**A12.3.** **A12.3.** **A12.3.**
*	**DYES, LIQUID, TOXIC, N.O.S.,** *or* **DYE INTERMEDIATES, LIQUID, TOXIC, N.O.S**	6.1	UN1602	II III		P4 P5	**A10.5.** **A10.5.**
*	**DYES, SOLID, CORROSIVE, N.O.S.,** *or* **DYE INTERMEDIATES, SOLID, CORROSIVE N.O.S.**	8	UN3147	I II III		P5 P5 P5	**A12.4.** **A12.4.** **A12.4.**
*	**DYES, SOLID, TOXIC, N.O.S.,** *or* **DYE INTERMEDIATES, SOLID, TOXIC, N.O.S.**	6.1	UN3143	I II III		P5, A5 P5 P5	**A10.6.** **A10.6.** **A10.6.**
	Dynamite; see **EXPLOSIVE, BLASTING, TYPE A**						
	Electrolyte (acid or alkali) for batteries; see **BATTERY FLUID, ACID** *or* **BATTERY FLUID, ALKALI**						
	Elevated temperature liquid, flammable, n.o.s., with flashpoint above 37.8 C, at or above its flashpoint						FORBIDDEN
	Elevated temperature liquid, n.o.s., at or above100 C,and below its flashpoint (including molten metals, molten salts, etc.)						FORBIDDEN
	Elevated temperature solid, n.o.s., at or above 240 C						FORBIDDEN
	ENGINES, INTERNAL COMBUSTION, FLAMMABLE GAS POWERED	9	UN3166			P5, 135	A13.6
	ENGINES, INTERNAL COMBUSTION, FLAMMABLE LIQUID POWERED	9	UN3166			P5, 135	A13.6
*	**ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S.**	9	UN3082	III		P5, 8	**A13.3.**
*	**ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S.**	9	UN3077	III		P5, 8	**A13.3.**
	EPIBROMOHYDRIN	6.1	UN2558	I	3	P3	**A10.5.**
+	**EPICHLOROHYDRIN**	6.1	UN2023	II	3	P5	**A10.5.**
	1,2-EPOXY-3-ETHOXYPROPANE	3	UN2752	III		P5	**A7.3.**
*	**ESTERS, N.O.S.**	3	UN3272	II III		P5 P5	**A7.3.** **A7.3.**
	ETHANE	2.1	UN1035			P4	**A6.4.**, **A6.5.**
	ETHANE, REFRIGERATED LIQUID						FORBIDDEN
	Ethanol amine dinitrate						FORBIDDEN

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ETHANOLAMINE *or* **ETHANOLAMINE SOLUTIONS**	8	UN2491	III		P5	**A12.3.**
	ETHANOL *or* **ETHANOL SOLUTIONS** or **ETHYL ALCOHOL** *or* **ETHYL ALCOHOL SOLUTIONS**	3	UN1170	II III		P5, A58 P5, A58	**A7.3.** **A7.3.**
	Ether; see **DIETHYL ETHER**						
*	**ETHERS, N.O.S.**	3	UN3271	II III		P5 P5	**A7.3.** **A7.3.**
	ETHYL ACETATE	3	UN1173	II		P5	**A7.3.**
	ETHYLACETYLENE, STABILIZED	2.1	UN2452			P4	**A6.5.**
	ETHYL ACRYLATE, STABILIZED	3	UN1917	II		P5	**A7.3.**
	ETHYL ALCOHOL *see* **ETHANOL**						
	Ethyl aldehyde; see **ACETALDEHYDE**						
	ETHYLAMINE	2.1	UN1036			P4	A6.15
	ETHYLAMINE, AQUEOUS SOLUTIONS *with not less than 50%, but not more than 70% ethylamine*	3	UN2270	II	8	P5	**A7.3.**
	ETHYL AMYL KETONE	3	UN2271	III		P5	**A7.3.**
	N-ETHYLANILINE	6.1	UN2272	III		P5	**A10.5.**
	2-ETHYLANILINE	6.1	UN2273	III		P5	**A10.5.**
	ETHYLBENZENE	3	UN1175	II		P5	**A7.3.**
	N-ETHYL-N-BENZYLANILINE	6.1	UN2274	III		P5	**A10.5.**
	N-ETHYLBENZYLTOLUIDINES SOLID, *or* **LIQUID**	6.1	UN2753	III		P5	**A10.5.**, **A10.6.**
	ETHYL BORATE	3	UN1176	II		P5	**A7.3.**
	ETHYL BROMIDE	6.1	UN1891	II		P5	**A10.5.**
	ETHYL BROMOACETATE	6.1	UN1603	II	3	P4	**A10.5.**
	2-ETHYLBUTANOL	3	UN2275	III		P5	**A7.3.**
	2-ETHYLBUTYL ACETATE	3	UN1177	III		P5	**A7.3.**
	ETHYL BUTYL ETHER	3	UN1179	II		P5	**A7.3.**
	2-ETHYLBUTYRALDEHYDE	3	UN1178	II		P5	**A7.3.**
	ETHYL BUTYRATE	3	UN1180	III		P5	**A7.3.**
	ETHYL CHLORIDE	2.1	UN1037			P4	A6.13
	ETHYL CHLOROACETATE	6.1	UN1181	II	3	P5	**A10.5.**
	ETHYL CHLOROFORMATE	6.1	UN1182	I	3, 8	P3, 2, A3, A6, A7, N34	**A10.7.**
	ETHYL 2-CHLOROPROPIONATE	3	UN2935	III		P5	**A7.3.**
+	**ETHYL CHLOROTHIOFORMATE**	8	UN2826	II	3, 6.1	P2, 2	**A12.12.**
	ETHYL CROTONATE	3	UN1862	II		P5	**A7.3.**
	ETHYLDICHLOROARSINE	6.1	UN1892	I		P2, 2	**A10.7.**
	ETHYLDICHLOROSILANE	4.3	UN1183	I	3, 8	P3, A2, A3, A7, N34	**A8.3.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Ethylene, acetylene and propylene in mixtures, refrigerated liquid (cryogenic liquids) containing at least 71.5% ethylene with not more than 22.5% acetylene and not more than 6% propylene						FORBIDDEN
	ETHYLENE CHLOROHYDRIN	6.1	UN1135	I	3	P2, 2	**A10.7.**
	ETHYLENE	2.1	UN1962			P4	**A6.4.**, **A6.5.**
	ETHYLENEDIAMINE	8	UN1604	II	3	P5	**A12.3.**
	Ethylene diamine diperchlorate						FORBIDDEN
	ETHYLENE DIBROMIDE	6.1	UN1605	I		P2, 2	**A10.7.**
	ETHYLENE DICHLORIDE	3	UN1184	II	6.1	P4	**A7.3.**
	ETHYLENE GLYCOL DIETHYL ETHER	3	UN1153	III		P5	**A7.3.**
	Ethylene glycol dinitrate						FORBIDDEN
	ETHYLENE GLYCOL MONOETHYL ETHER	3	UN1171	III		P5	**A7.3.**
	ETHYLENE GLYCOL MONOETHYL ETHER ACETATE	3	UN1172	III		P5	**A7.3.**
	ETHYLENE GLYCOL MONOMETHYL ETHER	3	UN1188	III		P5	**A7.3.**
	ETHYLENE GLYCOL MONOMETHYL ETHER ACETATE	3	UN1189	III		P5	**A7.3.**
	ETHYLENEIMINE, STABILIZED	6.1	UN1185	I	3	P1, 1, N25, N32	**A10.7.**
	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE *with more than 87% ethylene oxide*	2.3	UN3300		2.1	P2, 4	**A6.5.**
	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE *with more than 9% but not more than 87% ethylene oxide*	2.1	UN1041			P4	**A6.4.**, **A6.5.**
	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE *with not more than 9% ethylene oxide*	2.2	UN1952			P5	**A6.4.**, **A6.5.**
	ETHYLENE OXIDE AND CHLOROTETRAFLUORO- ETHANE MIXTURE *with not more than 8.8% ethylene oxide*	2.2	UN3297			P5	**A6.4.**, **A6.5.**
	ETHYLENE OXIDE AND DICHLORODIFLUORO- METHANE MIXTURE *with not more than 12.5% ethylene oxide*	2.2	UN3070			P5	**A6.4.**, **A6.5.**
	ETHYLENE OXIDE AND PENTAFLUOROETHANE MIXTURE *with not more than 7.9% ethylene oxide*	2.2	UN3298			P5	**A6.4.**, **A6.5.**
	ETHYLENE OXIDE AND PROPYLENE OXIDE MIXTURES, *not more than 30% ethylene oxide*	3	UN2983	I	6.1	P2, 5, A11, N4, N34	**A7.3.**
	ETHYLENE OXIDE AND TETRAFLUOROETHANE MIXTURE *with not more than 5.6% ethylene oxide*	2.2	UN3299			P5	**A6.4.**, **A6.5.**
	ETHYLENE OXIDE, *or* **ETHYLENE OXIDE WITH NITROGEN** up to a total pressure of 1 MPA (10 bar) at 50 degrees C	2.3	UN1040		2.1	P2, 4	A6.14
	ETHYLENE, REFRIGERATED LIQUID *(cryogenic liquid)*	2.1	UN1038			P3	**A6.12.**
	ETHYL ETHER; *see* **DIETHYL ETHER**						

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ETHYL FLUORIDE *or* **REFRIGERANT GAS R161**	2.1	UN2453			P4	**A6.4.**, **A6.5.**
	ETHYL FORMATE	3	UN1190	II		P5	**A7.3.**
	2-ETHYLHEXYLAMINE	3	UN2276	III	8	P5	**A7.3.**
	2-ETHYLHEXYL CHLOROFORMATE	6.1	UN2748	II	8	P5	**A10.5.**
	ETHYL ISOBUTYRATE	3	UN2385	II		P5	**A7.3.**
+	**ETHYL ISOCYANATE**	3	UN2481	I	6.1	P1, 1, A7	A7.6
	ETHYL LACTATE	3	UN1192	III		P5	**A7.3.**
	ETHYL MERCAPTAN	3	UN2363	I		P3	**A7.3.**
	ETHYL METHACRYLATE, STABILIZED	3	UN2277	II		P5	**A7.3.**
	ETHYL METHYL ETHER	2.1	UN1039			P4	A6.22
	ETHYL METHYL KETONE *or* **METHYL ETHYL KETONE**	3	UN1193	II		P5	**A7.3.**
	Ethyl nitrite						FORBIDDEN
	ETHYL NITRITE SOLUTIONS						FORBIDDEN
	ETHYL ORTHOFORMATE	3	UN2524	III		P5	**A7.3.**
	ETHYL OXALATE	6.1	UN2525	III		P5	**A10.5.**
	Ethyl perchlorate						FORBIDDEN
	ETHYLPHENYLDICHLOROSILANE	8	UN2435	II		P5, A7, N34	**A12.3.**
D	**ETHYL PHOSPHONOTHIOIC DICHLORIDE, ANHYDROUS**	6.1	NA2927	I	8	P2, 2	**A10.7.**
D	**ETHYL PHOSPHONOUS DICHLORIDE, ANHYDROUS** *pyrophoric liquid*	6.1	NA2845	I	4.2	P2, 2	**A10.7.**
D	**ETHYL PHOSPHORODICHLORIDATE**	6.1	NA2927	I	8	P2, 2	**A10.7.**
	1-ETHYLPIPERIDINE	3	UN2386	II	8	P5	**A7.3.**
	ETHYL PROPIONATE	3	UN1195	II		P5	**A7.3.**
	ETHYL PROPYL ETHER	3	UN2615	II		P5	**A7.3.**
	Ethyl sulphate; see **DIETHYL SULPHATE**						
	ETHYLPHENYLIDICHLOROSILANE	8	UN2435	II		P5, A7, N34	**A12.3.**
	N-ETHYLTOLUIDINES	6.1	UN2754	II		P5	**A10.5.**
	ETHYLTRICHLOROSILANE	3	UN1196	II	8	P4, A7, N34	**A7.3.**
	Etiologic agent; see **INFECTIOUS SUBSTANCES,** *etc.*						
	EXPLOSIVE, BLASTING,TYPE A	1.1D	UN0081			P4, A69	**A5.14.**
	EXPLOSIVE, BLASTING,TYPE B	1.1D	UN0082			P4, A69	**A5.14.**
	EXPLOSIVE, BLASTING,TYPE B *or* **AGENT BLASTING TYPE B**	1.5D	UN0331			P4, 105, 106, A69	**A5.14.**
	EXPLOSIVE, BLASTING,TYPE C	1.1D	UN0083			P4, 123, A69	**A5.14.**
	EXPLOSIVE, BLASTING,TYPE E	1.1D	UN0241			P4, A69	**A5.14.**
	EXPLOSIVE, BLASTING,TYPE E *or* **AGENT BLASTING TYPE E**	1.5D	UN0332			P4, 105, 106, A69	**A5.14.**
	EXPLOSIVE, BLASTING,TYPE D	1.1D	UN0084			P4, A69	**A5.14.**
	Explosives, slurry; see **EXPLOSIVE, BLASTING, TYPE E**						

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Explosives substances; see **SUBSTANCES, EXPLOSIVE, N.O.S.** *etc.*						
	Explosives, water gels; see **EXPLOSIVE, BLASTING, TYPE E**						
	EXTRACTS, AROMATIC, LIQUID	3	UN1169	II III		P5 P5	**A7.3.** **A7.3.**
	EXTRACTS, FLAVORING, LIQUID	3	UN1197	II III		P5 P5	**A7.3.** **A7.3.**
	FERRIC ARSENATE	6.1	UN1606	II		P5	**A10.6.**
	FERRIC ARSENITE	6.1	UN1607	II		P5	**A10.6.**
	FERRIC CHLORIDE, ANHYDROUS	8	UN1773	III		P5	**A12.4.**
	FERRIC CHLORIDE, SOLUTION	8	UN2582	III		P5	**A12.3.**
	FERRIC NITRATE	5.1	UN1466	III		P5, A1, A29	**A9.8.**
	FERROCERIUM	4.1	UN1323	II		P5, A19	**A8.4.**
	FERROSILICON, *with 30% or more, but less than 90% silicon*	4.3	UN1408	III	6.1	P5, A1, A19	**A8.4.**
	FERROUS ARSENATE	6.1	UN1608	II		P5	**A10.6.**
	FERROUS METAL BORINGS; *or* **FERROUS METAL SHAVINGS;** *or* **FERROUS METAL TURNINGS,** *or* **FERROUS METAL CUTTINGS** *in a form liable to self-heating*	4.2	UN2793		III	P5, A1, A19	**A8.4.**
	FERTILIZER AMMONIATING SOLUTION *with free ammonia*	2.2	UN1043			P5	**A6.4.**, **A6.5.**
	FIBRES *or* **FABRICS, ANIMAL** *or* **VEGETABLE,** *or* **SYNTHETIC N.O.S.** *with animal or vegetable oil*	4.2	UN1373	III		P5	**A8.4.**
	FIBERS *or* **FIBER IMPREGNATED WITH WEAKLY NITRATED NITROCELLULOSE, N.O.S**	4.1	UN1353	III		P5, A1	**A8.4.**
	Films, nitrocellulose base, from which gelatine has been removed; film scrap; see **CELLULOID SCRAP**						
	FILMS, NITROCELLULOSE BASE, *gelatine coated (except scrap)*	4.1	UN1324	III		P5	A8.13
	FIRE EXTINGUISHER CHARGES, *corrosive liquid*	8	UN1774	II		P5, N41	**A12.3.**
	Fire extinguisher charges, expelling,explosive; see **CARTRIDGES, POWER DEVICE**						
	FIRE EXTINGUISHERS *containing compressed or liquefied gas*	2.2	UN1044			P5	A6.8
	FIRELIGHTERS, SOLID *with flammable liquid*	4.1	UN2623	III		P5, A1, A19	**A8.4.**
	FIREWORKS	1.1G	UN0333			P4, 108	**A5.21.**
	FIREWORKS	1.2G	UN0334			P4, 108	**A5.21.**
	FIREWORKS	1.3G	UN0335			P4, 108	**A5.21.**
	FIREWORKS	1.4G	UN0336			P5, 108	**A5.21.**
	FIREWORKS	1.4S	UN0337			P5, 108	**A5.21.**
	FIRST AID KITS or **CHEMICAL KITS**	9	UN3316			P5	A.13.17

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	FISH MEAL, UNSTABILZED, *or* **FISH SCRAP, UNSTABILIZED**	4.2	UN1374	II		P5, A1, A19	**A8.4.**
	Flammable compressed gas (small receptacles not fitted with a dispersion device, not refillable); see **RECEPTACLES,** *etc.*						
	Flammable gas in lighters; see **LIGHTERS** *or* **LIGHTER REFILLS** *containing flammable gas*						
*	**FLAMMABLE LIQUIDS, CORROSIVE, N.O.S.**	3	UN2924	I II III	8 8 8	P3 P5 P5	**A7.3.** **A7.3.** **A7.3.**
*	**FLAMMABLE LIQUIDS, N.O.S.**	3	UN1993	I II III		P3 P5 P5	**A7.3.** **A7.3.** **A7.3.**
*	**FLAMMABLE LIQUIDS, TOXIC, N.O.S.**	3	UN1992	I II III	6.1 6.1 6.1	P3 P4 P5	**A7.3.** **A7.3.** **A7.3.**
*	**FLAMMABLE LIQUID, TOXIC, CORROSIVE, N.O.S.**	3	UN3286	I II	6.1, 8 6.1, 8	P3 P4	**A7.3.** **A7.3.**
*	**FLAMMABLE SOLID, CORROSIVE, INORGANIC, N.O.S.**	4.1	UN3180	II III	8 8	P5, A1 P5, A1	**A8.4.** **A8.4.**
*	**FLAMMABLE SOLIDS, CORROSIVE, ORGANIC, N.O.S.**	4.1	UN2925	II III	8 8	P5, A1 P5, A1	**A8.4.** **A8.4.**
*	**FLAMMABLE SOLID, INORGANIC, N.O.S.**	4.1	UN3178	II III		P5, A1 P5, A1	**A8.4.** **A8.4.**
*	**FLAMMABLE SOLIDS, ORGANIC, N.O.S.**	4.1	UN1325	II III		P5, A1 P5, A1	**A8.4.** **A8.4.**
*	**FLAMMABLE SOLID, ORGANIC, MOLTEN, N.O.S.**						FORBIDDEN
*	**FLAMMABLE SOLID, OXIDIZING, N.O.S.**						FORBIDDEN
*	**FLAMMABLE SOLID, TOXIC, INORGANIC, N.O.S.**	4.1	UN3179	II III	6.1 6.1	P5, A1 P5, A1	**A8.4.** **A8.4.**
*	**FLAMMABLE SOLIDS, TOXIC, ORGANIC, N.O.S.**	4.1	UN2926	II III	6.1 6.1	P5, A1 P5, A1	**A8.4.** **A8.4.**
	FLARES, AERIAL	1.3G	UN0093			P4	**A5.21.**
	FLARES, AERIAL	1.4G	UN0403			P5	**A5.21.**
	FLARES, AERIAL	1.4S	UN0404			P5, A69	**A5.21.**
	FLARES, AERIAL	1.1G	UN0420			P4	**A5.21.**
	FLARES, AERIAL	1.2G	UN0421			P4	**A5.21.**
	Flares, aeroplane; see **FLARES, AERIAL**						
	Flares, signal; see **CARTRIDGES, SIGNAL**						
	FLARES, SURFACE	1.1G	UN0418			P4	**A5.21.**
	FLARES, SURFACE	1.2G	UN0419			P4	**A5.21.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	FLARES, SURFACE	1.3G	UN0092			P4	**A5.21.**
	Flares, water-activated; see **CONTRIVANCES, WATER-ACTIVATED,** *etc.*						
	FLASH POWDER	1.1G	UN0094			P4	**A5.11.**
	FLASH POWDER	1.3G	UN0305			P4	**A5.11.**
	FLUORINE, COMPRESSED	2.3	UN1045		5.1, 8	P1, 1	**A6.6.**
	FLUOROACETIC ACID	6.1	UN2642	I		P5	**A10.6.**
	FLUOROANILINES	6.1	UN2941	III		P5	**A10.5.**
	FLUOROBENZENE	3	UN2387	II		P5	**A7.3.**
	FLUOROBORIC ACID	8	UN1775	II		P5, A6, A7, N3, N34	**A12.3.**
	FLUOROPHOSPHORIC ACID, ANHYDROUS	8	UN1776	II		P5, A6, A7, N3, N34	**A12.3.**
	FLUOROSILICATES, N.O.S.	6.1	UN2856	III		P5	**A10.6.**
	FLUOROSILICIC ACID	8	UN1778	II		P5, A6, A7, N3, N34	**A12.3.**
	FLUOROSULPHONIC ACID	8	UN1777	I		P3, A3, A6, A7, A10, N3	**A12.3.**
	FLUOROTOLUENES	3	UN2388	II		P5	**A7.3.**
	FORMALDEHYDE SOLUTIONS *with not less than 25% formaldehyde*	8	UN2209	III		P5	**A12.3.**
	FORMALDEHYDE SOLUTIONS, FLAMMABLE	3	UN1198	III	8	P5	**A7.3.**
	Formalin; see **FORMALDEHYDE, SOLUTIONS**						
	FORMIC ACID	8	UN1779	II		P5	**A12.3.**
	FRACTURING DEVICES, EXPLOSIVE, *without detonators for oil wells*	1.1D	UN0099			P4	**A5.20.**
	FUEL, AVIATION, TURBINE ENGINE	3	UN1863	I II III		P3 P5 P5	**A7.3.** **A7.3.** **A7.3.**
	Fuel devices, lanterns, heaters, etc., see **DANGEROUS GOODS IN APPARATUS** *or* **MACHINERY**						
D	**FUEL OIL** *(No, 1, 2, 3, 4, 5, or 6)*	3	NA1993	III		P5	**A7.3.**
	Fulminate of mercury (dry)						FORBIDDEN
	Fulminate of mercury, wet; see **MERCURY FULMINATE**, *etc.*						
	Fulminating gold						FORBIDDEN
	Fulminating mercury						FORBIDDEN
	Fulminating platinum						FORBIDDEN
	Fulminating silver						FORBIDDEN
	Fulminic acid						FORBIDDEN
	FUMARYL CHLORIDE	8	UN1780	II		P5	**A12.3.**
	FURAN	3	UN2389	I		P3	**A7.3.**
	FURALDEHYDE	6.1	UN1199	II	3	P2	**A10.5.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	FURFURYL ALCOHOL	6.1	UN2874	III		P5	**A10.5.**
	FURFURYLAMINE	3	UN2526	III	8	P5	**A7.3.**
	FUSE, DETONATING, *metal clad; see* **CORD, DETONATING**, *metal clad*						
	FUSE DETONATING, MILD EFFECT, *metal clad, see* **CORD, DETONATING, MILD EFFECT,** *metal clad*						
	FUSE, IGNITER, *tubular metal clad*	1.4G	UN0103			P5	**A5.26.**
	FUSE, NONDETONATING *(instantaneous or Quickmatch)*	1.3G	UN0101			P4	**A5.26.**
	Fusee, matches; see **MATCHES, FUSEE**						
	Fusees, railway or highway, explosive; see **SIGNAL DEVICES, HAND**						
D	**FUSEE** *(railway or highway)*	4.1	NA1325	II		P5	A8.14
	FUSEL OIL	3	UN1201	II III		P5 P5	**A7.3.** **A7.3.**
	FUSE, SAFETY	1.4S	UN0105			P5, A69	**A5.26.**
	Fuses, tracer; see **TRACERS FOR AMMUNITION**						
	Fuzes, combination, percussion and time;see **FUZES, DETONATING** *or* **FUZES, IGNITING**						
	FUZES, DETONATING	1.1B	UN0106			P4	A5.27
	FUZES, DETONATING	1.2B	UN0107			P4	A5.27
	FUZES, DETONATING	1.4B	UN0257			P5, 116	A5.27
	FUZES, DETONATING	1.4S	UN0367			P5, 116, A69	A5.27
	FUZES, DETONATING, *with protective features*	1.1D	UN0408			P4	A5.27
	FUZES, DETONATING, *with protective features*	1.2D	UN0409			P4	A5.27
	FUZES, DETONATING, *with protective features*	1.4D	UN0410			P5, 116	A5.27
	FUZES, IGNITING	1.3G	UN0316			P4	A5.27
	FUZES, IGNITING	1.4G	UN0317			P4	A5.27
	FUZES, IGNITING	1.4S	UN0368			P5, A69	A5.27
	GALLIUM	8	UN2803	III		P3	A12.8
	GAS CARTRIDGE, *(flammable) without a release device, non-refillable*	2.1	UN2037			P4	**A6.4. A6.5.**
	GAS GENERATOR ASSEMBLIES (AIRCRAFT), *containing a nonflammable, nontoxic gas and a propellant cartridge*	2.2	ID8013			P5	A6.23
D	**GAS IDENTIFICATION SET,** *must be classified and labeled according to the hazard class of the constituent(s)*	2.3	NA9035			P2, 6	**A6.17.**
	GAS OIL *or* **DIESEL FUEL** *or* **HEATING OIL, LIGHT**	3	UN1202	III		P5	**A7.3.**
	GASOLINE	3	UN1203	II		P5	**A7.3.**
*	**GAS, REFRIGERATED LIQUID, FLAMMABLE, N.O.S.** *(cryogenic liquid*	2.1	UN3312			P3	A6. 12
*	**GAS, REFRIGERATED LIQUID, N.O.S.** *(cryogenic liquid)*	2.2	UN3158			P4	**A6.12.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*	**GAS, REFRIGERATED LIQUID, OXIDIZING, N.O.S.** *(cryogenic liquid)*	2.2	UN3311		5.1	P4	**A6.12.**
	GAS SAMPLE, NONPRESSURIZED, FLAMMABLE, N.O.S., *not refrigerated liquid*	2.1	UN3167			P4	**A6.4.**, **A6.5.**, **A6.6.**
	GAS SAMPLE, NONPRESSURIZED, TOXIC, FLAMMABLE, N.O.S., *not refrigerated liquid*	2.3	UN3168		2.1	P3	**A6.4.**, **A6.6.**
	GAS SAMPLE, NONPRESSURIZED, TOXIC, N.O.S., *not refrigerated liquid*	2.3	UN3169			P4	**A6.4.**, **A6.5.**, **A6.6.**
	Gelatine, blasting; see **EXPLOSIVE**, **BLASTING, TYPE A**						
	Gelatine dynamites; see **EXPLOSIVE, BLASTING, TYPE A**						
	GERMANE	2.3	UN2192		2.1	P2, 2	**A6.16.**
	Glycerol-1,3-dinitrate						FORBIDDEN
	Glycerol gluconate trinitrate						FORBIDDEN
	Glycerol lactate trinitrate						FORBIDDEN
	GLYCEROL ALPHA-MONOCHLOROHYDRIN	6.1	UN2689	III		P5	**A10.5.**
	Glyceryl trinitrate; see **NITROGLYCERIN,** *etc.*						
	GLYCIDALDEHYDE	3	UN2622	II	6.1	P5	**A7.3.**
	GRENADES, *hand or rifle, with bursting charge*	1.1D	UN0284			P4	A5.27
	GRENADES, *hand or rifle, with bursting charge*	1.2D	UN0285			P4	A5.27
	GRENADES, *hand or rifle, with bursting charge*	1.1F	UN0292			P4	A5.27
	GRENADES, *hand or rifle, with bursting charge*	1.2F	UN0293			P4	A5.27
	Grenades, illuminating; see **AMMUNITION, ILLUMINATING,** *etc.*						
	GRENADES, PRACTICE, *hand or rifle*	1.4G	UN0452			P5	A5.27
	GRENADES, PRACTICE, *hand or rifle*	1.4S	UN0110			P5, A69	A5.27
	GRENADES, PRACTICE, *hand or rifle*	1.3G	UN0318			P4	A5.27
	GRENADES, PRACTICE, *hand or rifle*	1.2G	UN0372			P4	A5.27
	Grenades, smoke; see **AMMUNITION, SMOKE**, *etc.*						
	GUANIDINE NITRATE	5.1	UN1467	III		P5, A1	**A9.8.**
	Guanyl nitrosaminoguanylidene hydrazine (dry)						FORBIDDEN
	GUANYL NITROSAMINOGUANYLIDENE HYDRAZINE, WETTED *with not less than 30% water, by mass*	1.1A	UN0113			P3, 111, 117	**A5.7.**
	Guanyl nitrosaminoguanyltetrazene (dry)						FORBIDDEN
	GUANYL NITROSAMINOGUANYLTETRAZENE, **WETTED;** *or* **TETRAZENE, WETTED** *with not less than 30% water, or mixture of alcohol and water, by mass*	1.1A	UN0114			P3, 111, 117	**A5.7.**
	GUNPOWDER, COMPRESSED *or* **GUNPOWDER IN PELLETS**; *see* **BLACK POWDER** *(UN0028)*						
	GUNPOWDER, *granular or as a meal; see* **BLACK POWDER** *(UN0027)*						

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	HAFNIUM POWDER, DRY	4.2	UN2545	I II III		P3 P5, A19, A20, N34 P5	**A8.4.** **A8.4.** **A8.4.**
	HAFNIUM POWDER, WETTED *with not less than 25% water (a visible excess of water must be present) (a) mechanically produced, particle size less than 53 microns; (b) chemically produced, particle size less than 840 microns*	4.1	UN1326	II		P5, A6, A19, A20, N34	**A8.4.**
D*	**HAZARDOUS WASTE, LIQUID, N.O.S.**	9	NA3082	III		P5	**A13.3.**
D*	**HAZARDOUS WASTE, SOLID, N.O.S**.	9	NA3077	III		P5	**A13.3.**
	HEATING OIL LIGHT	3	UN1202	III		P5	**A7.3.**
	HELIUM, COMPRESSED	2.2	UN1046			P5	**A6.4.**, **A6.6.**
	Helium-oxygen mixture; see **RARE GASES AND OXYGEN MIXTURES**						
	HELIUM, REFRIGERATED LIQUID*(cryogenic liquid)*	2.2	UN1963			P5	**A6.12.**
	HEPTAFLUOROPROPANE *or* **REFRIGERANT GAS R227**	2.2	UN3296			P5	**A6.4.**, **A6.5.**
	N-HEPTALDEHYDE	3	UN3056	III		P5	**A7.3.**
	n-Heptanal; *see* **N-HEPTALDEHYDE**						
	HEPTANES	3	UN1206	II		P5	**A7.3.**
	N-HEPTENE	3	UN2278	II		P5	**A7.3.**
	HEXACHLOROACETONE	6.1	UN2661	III		P5	**A10.5.**
	HEXACHLOROBENZENE	6.1	UN2729	III		P5	**A10.5.**
	HEXACHLOROBUTADIENE	6.1	UN2279	III		P5	**A10.5.**
	HEXACHLOROCYCLOPENTADIENE	6.1	UN2646	I		P2, 2	**A10.7.**
	HEXACHLOROPHENE	6.1	UN2875	III		P5	**A10.6.**
	HEXADECYLTRICHLOROSILANE	8	UN1781	II		P4, A7, N34	**A12.3.**
	HEXADIENES	3	UN2458	II		P5	**A7.3.**
	HEXAETHYL TETRAPHOSPHATE AND COMPRESSED GAS MIXTURES	2.3	UN1612			P2, 3	**A6.19.**
	HEXAETHYL TETRAPHOSPHATE, *liquid or solid*	6.1	UN1611	II		P5, N76	**A10.5.**, **A10.6.**
	HEXAFLUOROACETONE	2.3	UN2420		8	P2, 2	**A6.5.**
	HEXAFLUOROACETONE HYDRATE	6.1	UN2552	II		P5	**A10.5.**
	HEXAFLUOROETHANE or **REFRIGERANT GAS R116**	2.2	UN2193			P5	**A6.4.**, **A6.5.**
	HEXAFLUOROPHOSPHORIC ACID	8	UN1782	II		P5, A6, A7, N3, N34	**A12.3.**
	HEXAFLUOROPROPYLENE, COMPRESSED or **REFRIGERANT GAS R1216**	2.2	UN1858			P5	**A6.4.**, **A6.5.**
	HEXALDEHYDE	3	UN1207	III		P5	**A7.3.**
	HEXAMETHYLENEDIAMINE, SOLID	8	UN2280	III		P5	**A12.4.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	HEXAMETHYLENEDIAMINE SOLUTION	8	UN1783	II III		P5 P5	**A12.3.** **A12.3.**
	HEXAMETHYLENE DIISOCYANATE	6.1	UN2281	II		P5	**A10.5.**
	HEXAMETHYLENEIMINE	3	UN2493	II	8	P5	**A7.3.**
	HEXAMETHYLENETETRAMINE	4.1	UN1328	III		P5, A1	**A8.4.**
	HEXANES	3	UN1208	II		P5	**A7.3.**
	HEXANITRODIPHENYLAMINE *or* **DIPICRYLAMINE** *or* **HEXYL**	1.1D	UN0079			P4	**A5.9.**
	Hexanitroethane						FORBIDDEN
	Hexanitrooxanilide						FORBIDDEN
	HEXANITROSTILBENE	1.1D	UN0392			P4	**A5.9.**
	HEXANOLS	3	UN2282	III		P5	**A7.3.**
	1-HEXENE	3	UN2370	II		P5	**A7.3.**
	HEXOGEN; *see* **CYCLOTRIMETHYLENETRI-NITRAMINE** *etc.*						
	HEXOLITE, *or* **HEXOTOL** *dry or wetted with less than 15% water, by mass*	1.1D	UN0118			P4	**A5.9.**
	HEXOTONAL	1.1D	UN0393			P4	**A5.9.**
	HEXYL; *see* **HEXANITRODIPHENYLAMINE**						
	HEXYLTRICHLOROSILANE	8	UN1784	II		P4, A7, N34	**A12.3.**
	HMX; *see* **CYCLOTETRAMETHYLENE-TETRANITRAMINE**, *etc.*						
	HYDRAZINE, ANHYDROUS *or* **HYDRAZINE AQUEOUS SOLUTIONS** *with more than 64% hydrazine, by mass*	8	UN2029	I	3, 6.1	P3, A3, A6, A7, A10	**A12.3.**
	Hydrazine azide						FORBIDDEN
	Hydrazine chlorate						FORBIDDEN
	Hydrazine dicarbonic acid diazide						FORBIDDEN
	HYDRAZINE, AQUEOUS SOLUTION *with not more than 37% hydrazine, by mass*	6.1	UN3293	III		P5	**A10.5.**
	HYDRAZINE HYDRATE *or* **HYDRAZINE AQUEOUS SOLUTIONS**, *with not less than 37% but not more not more than 64% hydrazine, by mass*	8	UN2030	II	6.1	P4	**A12.3.**
	Hydrazine perchlorate						FORBIDDEN
	Hydrazine selenate						FORBIDDEN
	Hydriodic acid, anhydrous; see **HYDROGEN IODIDE, ANHYDROUS**						
	HYDRIODIC ACID	8	UN1787	II III		P5, A3, A6, N41 P5	**A12.3.** **A12.3.**
	Hydrobromic acid, anhydrous; see **HYDROGEN BROMIDE, ANHYDROUS**						
	HYDROBROMIC ACID, SOLUTION, *more than 49% strength*	8	UN1788	II III		P4, N41 P5	**A12.3.** **A12.3.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	HYDROBROMIC ACID, SOLUTION, *not more than 49% strength*	8	UN1788	II III		P5, A3, A6, N41 P5	**A12.3.** **A12.3.**
*	**HYDROCARBON GAS, MIXTURES COMPRESSED, N.O.S.**	2.1	UN1964			P4	**A6.4.**, **A6.6.**
*	**HYDROCARBON GAS, MIXTURES, LIQUEFIED**, **N.O.S**	2.1	UN1965			P4	**A6.4.**, **A6.5.**
	HYDROCARBON GAS REFILLS FOR SMALL DEVICES, *with release device; see* **DEVICES, SMALL**,						
	HYDROCARBON GAS POWERED, *with release device Hydrochloric acid, anhydrous; see* **HYDROGEN CHLORIDE, ANHYDROUS**						
	HYDROCARBONS, LIQUID, N.O.S.	3	UN3295	I II III		P3 P5 P5	**A7.3.** **A7.3.** **A7.3.**
	HYDROCHLORIC ACID	8	UN1789	II III		P4, A3, A6, N41 P5	**A12.3.** **A12.3.**
	Hydrocyanic acid, anhydrous; see **HYDROGEN CYANIDE,** *etc.*						
	HYDROCYANIC ACID, AQUEOUS SOLUTIONS *or* **HYDROGEN CYANIDE, AQUEOUS SOLUTIONS** *not more than 20% hydrogen cyanide*						FORBIDDEN
	HYDROFLUORIC ACID AND SULPHURIC ACID MIXTURES	8	UN1786	I	6.1	P3, A6, A7, N5, N34	**A12.3.**
	Hydrofluoric acid, anhydrous; see **HYDROGEN FLUORIDE, ANHYDROUS**						
	HYDROFLUORIC ACID, *with more than 60% strength*	8	UN1790	I	6.1	P3, A6, A7, N5, N34	**A12.3.**
	HYDROFLUORIC ACID, *with not more than 60% strength*	8	UN1790	II	6.1	P4, A6, A7, N5, N34	**A12.3.**
	Hydrofluosilicic acid; see **FLUOROSILICIC ACID**						
	HYDROGEN AND METHANE MIXTURES, **COMPRESSED**	2.1	UN2034			P4	**A6.4.**, **A6.6.**
	HYDROGEN BROMIDE, ANHYDROUS	2.3	UN1048		8	P2, 3	**A6.5.**
	HYDROGEN CHLORIDE, ANHYDROUS	2.3	UN1050		8	P2, 3	**A6.5.**
	HYDROGEN CHLORIDE, REFRIGERATED LIQUID						FORBIDDEN
	HYDROGEN, COMPRESSED	2.1	UN1049			P4	**A6.4.**, **A6.6.**
	HYDROGEN CYANIDE, STABILIZED, *with less than 3% water*						FORBIDDEN
	HYDROGEN CYANIDE, SOLUTION IN ALCOHOL *with not more than 45% of hydrogen cyanide*						FORBIDDEN
	HYDROGEN FLUORIDE, ANHYDROUS	8	UN1052	I	6.1	P2, 3	A12.9
	HYDROGEN IODIDE, ANHYDROUS	2.3	UN2197			P2, 3	**A6.5.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Hydrogen iodide solution; see **HYDRIODIC ACID, SOLUTION**						
	HYDROGEN PEROXIDE AND PEROXYACETIC ACID MIXTURES, STABILIZED *with acids, water and not more than 5% peroxyacetic acid,*	5.1	UN3149	II	8	P5, A2, A3, A6	**A9.7.**
	HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS *with more than 40%, but not more than 60% hydrogen peroxide*						FORBIDDEN
	HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS *with not less than 8%, but less than 20% hydrogen peroxide(stabilized as necessary)*	5.1	UN2984	III		P5, A1	**A9.7.**
	HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS *with not less than 20%, but not more than 40% hydrogen peroxide (stabilized as necessary)*	5.1	UN2014	II	8	P5, A2, A3, A6	**A9.7.**
	HYDROGEN PEROXIDE, STABILIZED *or* **HYDROGEN PEROXIDE AQUEOUS SOLUTIONS, STABILIZED** *with more than 60% hydrogen peroxide*						FORBIDDEN
	HYDROGEN, REFRIGERATED LIQUID*(cryogenic liquid)*	2.1	UN1966			P3	**A6.12.**
	HYDROGEN SELENIDE, ANHYDROUS						FORBIDDEN
	HYDROGEN SULPHIDE	2.3	UN1053		2.1	P2, 2	**A6.5.**
	HYDROGENDIFLORIDES, N.O.S. SOLID *or* **SOLUTION**	8	UN1740	II III		P5, N3, N34 P5, N3, N34	**A12.3.**, **A12.4.** **A12.3.**, **A12.4.**
	HYDROQUINONE	6.1	UN2662	III		P5	**A10.6.**
	HYDROXYLAMINE SULPHATE	8	UN2865	III		P5	**A12.4.**
	Hydroxyl amine iodide						FORBIDDEN
	HYPOCHLORITE SOLUTIONS	8	UN1791	II III		P5, A7, A21, N34 P5, A21, N34	**A12.3.** **A12.3.**
	Hyponitrous acid						FORBIDDEN
	HYPOCHLORITES, INORGANIC, N.O.S.	5.1	UN3212	II		P5	**A9.8.**
	Igniter fuse, metal clad; see **FUSE, IGNITER**, *tubular, metal clad*						
	IGNITERS	1.1G	UN0121			P4	A5.28
	IGNITERS	1.2G	UN0314			P4	A5.28
	IGNITERS	1.3G	UN0315			P5	A5.28
	IGNITERS	1.4G	UN0325			P5	A5.28
	IGNITERS	1.4S	UN0454			P5, A69	A5.28
	3,3'-IMINODIPROPYLAMINE	8	UN2269	III		P5	**A12.3.**
*	**INFECTIOUS SUBSTANCES, AFFECTING ANIMALS** *only*	6.2	UN2900			A502	A10.9
*	**INFECTIOUS SUBSTANCES, AFFECTING HUMANS**	6.2	UN2814			A502	A10.9
*	**INSECTICIDE GASES, FLAMMABLE, N.O.S**	2.1	UN3354			P4	**A6.4.**, **A6.6.**
*	**INSECTICIDE GASES, N.O.S**	2.2	UN1968			P5	**A6.4.**, **A6.6.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*	**INSECTICIDE GASES, TOXIC, FLAMMABLE, N.O.S** *Inhalation hazard Zone A*						FORBIDDEN
*	**INSECTICIDE GASES, TOXIC, FLAMMABLE, N.O.S** *Inhalation hazard Zone B*						FORBIDDEN
*	**INSECTICIDE GASES, TOXIC, FLAMMABLE, N.O.S** *Inhalation hazard Zone C*						FORBIDDEN
*	**INSECTICIDE GASES, TOXIC, FLAMMABLE, N.O.S** *Inhalation hazard Zone D*						FORBIDDEN
*	**INSECTICIDE GASES, TOXIC, N.O.S**.						FORBIDDEN
	Iodine azide (dry)						FORBIDDEN
	IODINE MONOCHLORIDE	8	UN1792	II		P4, N41	**A12.3.**
	IODINE PENTAFLUORIDE	5.1	UN2495	I	6.1, 8	P3	A9.9
	2-IODOBUTANE	3	UN2390	II		P5	**A7.3.**
	IODOMETHYLPROPANES	3	UN2391	II		P5	**A7.3.**
	IODOPROPANES	3	UN2392	III		P5	**A7.3.**
	Iron chloride; see **FERRIC CHLORIDE**						
	IRON OXIDE, SPENT, *or* **IRON SPONGE, SPENT** *obtained from coal gas purification*						FORBIDDEN
	IRON PENTACARBONYL	6.1	UN1994	I	3	P1, 1	A10.3
	Irritating material; see **TEAR GAS SUBSTANCE,** *etc.*						
	ISOBUTANE *see also* **PETROLEUM GASES, LIQUEFIED**	2.1	UN1969			P4, 19	**A6.4.**, **A6.5.**
	ISOBUTANOL *or* **ISOBUTYL ALCOHOL**	3	UN1212	III		P5	**A7.3.**
	ISOBUTYL ACETATE	3	UN1213	II		P5	**A7.3.**
	ISOBUTYL ACRYLATE, STABILIZED	3	UN2527	III		P5	**A7.3.**
	Isobutyl Alcohol; see **ISOBUTANOL**						
	Isobutyl Aldehyde; see **ISOBUTYRALDEHYDE**						
	ISOBUTYLAMINE	3	UN1214	II	8	P5	**A7.3.**
D	**ISOBUTYL CHLOROFORMATE**	6.1	NA2742	I	3, 8	P2, 2	**A10.7.**
	ISOBUTYLENE, *see* **PETROLEUM GASES, LIQUEFIED**	2.1	UN1055			P4	**A6.4.**, **A6.5.**
	ISOBUTYL FORMATE	3	UN2393	II		P5	**A7.3.**
	ISOBUTYL ISOBUTYRATE	3	UN2528	III		P5	**A7.3.**
+	**ISOBUTYL ISOCYANATE**	3	UN2486	I	6.1	P1, 1	A7.6
	ISOBUTYL METHACRYLATE, STABILIZED	3	UN2283	III		P5	**A7.3.**
	ISOBUTYL PROPIONATE	3	UN2394	III		P5	**A7.3.**
	ISOBUTYRALDEHYDE *or* **ISOBUTYL ALDEHYDE**	3	UN2045	II		P5	**A7.3.**
	ISOBUTYRIC ACID	3	UN2529	III	8	P5	**A7.3.**
	ISOBUTYRIC ANHYDRIDE	3	UN2530	III	8	P5	**A7.3.**
	ISOBUTYRONITRILE	3	UN2284	II	6.1	P5	**A7.3.**
	ISOBUTYRYL CHLORIDE	3	UN2395	II	8	P5	**A7.3.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*	**ISOCYANATES, TOXIC N.O.S**. *or* **ISOCYANATE SOLUTIONS, TOXIC N.O.S.,** *flashpoint more than 61 degrees C and boiling point less than 300 degrees C*	6.1	UN2206	II III		P4 P4	**A10.5.** **A10.5.**
*	**ISOCYANATES, TOXIC, FLAMMABLE N.O.S.** *or* **ISOCYANATE SOLUTIONS, TOXIC, FLAMMABLE, N.O.S.,** *flashpoint not less than 23 degrees C but not more than 61 degrees C and boiling point less than 300 degrees C*	6.1	UN3080	II	3	P4	**A10.5.**
*	**ISOCYANATES, FLAMMABLE, TOXIC, N.O.S**. *or* **ISOCYANATE SOLUTIONS, FLAMMABLE, TOXIC, N.O.S.,** *flashpoint less than 23 degrees C*	3	UN2478	II	6.1	P2, 5, A3, A7	**A7.3.**
	ISOCYANATOBENZOTRIFLUORIDES	6.1	UN2285	II	3	P2, 5	**A10.5.**
	ISOHEPTENE	3	UN2287	II		P5	**A7.3.**
	ISOHEXENE	3	UN2288	II		P5	**A7.3.**
	Isooctane, see **OCTANES**						
	ISOOCTENE	3	UN1216	II		P5	**A7.3.**
	ISOPENTANE, *see* **PENTANE**						
	ISOPENTENES	3	UN2371	I		P3	**A7.3.**
	Isopentyl nitrite, see **AMYL NITRITE**						
	ISOPHORONEDIAMINE	8	UN2289	III		P5	**A12.3.**
	ISOPHORONE DIISOCYANATE	6.1	UN2290	III		P5	**A10.5.**
	ISOPRENE, STABILIZED	3	UN1218	I		P3	**A7.3.**
	ISOPROPANOL *or* **ISOPROPYL ALCOHOL**	3	UN1219	II		P5	**A7.3.**
	ISOPROPENYL ACETATE	3	UN2403	II		P5	**A7.3.**
	ISOPROPENYLBENZENE	3	UN2303	III		P5	**A7.3.**
	ISOPROPYL ACETATE	3	UN1220	II		P5	**A7.3.**
	ISOPROPYL ACID PHOSPHATE	8	UN1793	III		P5	**A12.4.**
	Isopropyl Alcohol, see **ISOPROPANOL**						
	ISOPROPYLAMINE	3	UN1221	I	8	P3	**A7.3.**
	ISOPROPYLBENZENE	3	UN1918	III		P5	**A7.3.**
	ISOPROPYL BUTYRATE	3	UN2405	III		P5	**A7.3.**
	ISOPROPYL CHLOROACETATE	3	UN2947	III		P5	**A7.3.**
	ISOPROPYL CHLOROFORMATE	6.1	UN2407	I	3, 8	P2, 2	**A10.7.**
	ISOPROPYL 2-CHLOROPROPIONATE	3	UN2934	III		P5	**A7.3.**
	Isopropyl-alpha-chloropropionate, see **ISOPROPYL 2- CHLOROPROPIONATE**						
	ISOPROPYL ISOBUTYRATE	3	UN2406	II		P5	**A7.3.**
+	**ISOPROPYL ISOCYANATE**	3	UN2483	I	6.1	P1, 1	A7.6
	Isopropyl mercaptan, see **PROPANETHIOLS**						
	ISOPROPYL NITRATE	3	UN1222	II		P5	**A7.3.**
	Isopropyl phosphoric acid, see **ISOPROPYL ACID PHOSPHATE**						
	ISOPROPYL PROPIONATE	3	UN2409	II		P5	**A7.3.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ISOSORBIDE DINITRATE MIXTURE *with not less than 60% lactose, mannose, starch or calcium hydrogen phosphate*	4.1	UN2907	II		P5	**A8.4.**
	ISOSORBIDE-5-MONONITRATE	4.1	UN3251	III		P5	**A8.4.**
	Isothiocyanic acid						FORBIDDEN
	Jet fuel, see **FUEL, AVIATION, TURBINE ENGINE**						
D	**JET PERFORATING GUNS, CHARGED** *oil well, with detonator*						FORBIDDEN
D	**JET PERFORATING GUNS, CHARGED** *oil well, with detonator*	1.4D	NA0494			P5, 56, A69	**A5.6.**
	JET PERFORATING GUNS, CHARGED *oil well, without detonator*						FORBIDDEN
	JET PERFORATING GUNS, CHARGED *oil well, without detonator*	1.4D	UN0494			P5, 56, A69	**A5.6.**
	Jet perforators, see **CHARGES, SHAPED, COMMERCIAL** *etc.*						
	Jet tappers, without detonator, see **CHARGES, SHAPED, COMMERCIAL** *etc.*						
	Jet thrust igniters, for rocket motors or Jato, see **IGNITERS**						
	Jet thrust unit (Jato) see **ROCKET MOTORS**						
	KEROSENE	3	UN1223	III		P5	**A7.3.**
*	**KETONES, LIQUID, N.O.S.**	3	UN1224	I II III		P3 P5 P5	**A7.3.** **A7.3.** **A7.3.**
	KRYPTON, COMPRESSED	2.2	UN1056			P5	**A6.4.**, **A6.6.**
	KRYPTON, REFRIGERATED LIQUID*(cryogenic liquid)*	2.2	UN1970			P4	**A6.12.**
	Lacquer base or lacquer chips,nitrocellulose, dry, see **NITROCELLULOSE**, *etc*						
	Lacquerbase or lacquer chips, plastic, wet with alcohol or solvent, see **NITROCELLULOSE** *or* **PAINT**, *etc.*						
	LEAD ACETATE	6.1	UN1616	III		P5	**A10.6.**
	LEAD ARSENATES	6.1	UN1617	II		P5	**A10.6.**
	LEAD ARSENITES	6.1	UN1618	II		P5	**A10.6.**
	Lead azide (dry)						FORBIDDEN
	LEAD AZIDE, *wetted with not less than 20% water or mixture of alcohol and water, by mass*	1.1A	UN0129			P3, 111, 117	**A5.7.**
	LEAD COMPOUNDS, SOLUBLE, N.O.S.	6.1	UN2291	III		P5	**A10.6.**
	LEAD CYANIDE	6.1	UN1620	II		P5	**A10.6.**
	LEAD DIOXIDE	5.1	UN1872	III		P5, A1	**A9.8.**
	LEAD NITRATE	5.1	UN1469	II	6.1	P5	**A9.8.**
	Lead nitroresorcinate (dry)						FORBIDDEN
	LEAD PERCHLORATE SOLID *or* **SOLUTION**	5.1	UN1470	II	6.1	P5	**A9.7.**, **A9.8.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Lead peroxide; see **LEAD DIOXIDE**						
	LEAD PHOSPHITE, DIBASIC	4.1	UN2989	II III		P5 P5	**A8.4.** **A8.4.**
	Lead picrate (dry)						FORBIDDEN
	Lead styphnate (dry)						FORBIDDEN
	LEAD STYPHNATE, WETTED *or* **LEAD TRINITRORESORCINATE, WETTED** *with not less than 20% water or mixture of alcohol and water, by mass*	1.1A	UN0130			P3, 111, 117	**A5.7.**
	LEAD SULPHATE *with more than 3% free acid*	8	UN1794	II		P5	**A12.4.**
	LEAD TRINITRORESORCINATE; *see* **LEAD STYPHNATE**, *etc.*						
	LIFE-SAVING APPLIANCES, NOT SELF INFLATING *containing dangerous goods as equipment*	9	UN3072			P5	A13.11
	LIFE-SAVING APPLIANCES, SELF INFLATING	9	UN2990			P5	A13.11
	LIGHTERS, FUSE	1.4S	UN0131			P5, A69	A5.28
	LIGHTERS *or* **LIGHTER REFILLS** *containing flammable gas*	2.1	UN1057			P5, N10	A6.11
	LIQUEFIED GASES, *nonflammable charged with nitrogen, carbon dioxide or air*	2.2	UN1058			P5	**A6.4.**, **A6.5.**
*	**LIQUEFIED GAS, N.O.S**	2.2	UN3163			P5	**A6.4.**, **A6.5.**
*	**LIQUEFIED GAS OXIDIZING, N.O.S**	2.2	UN3157		5.1	P5	**A6.4.**, **A6.5.**
*	**LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S,** *Inhalation Hazard Zone A*	2.3	UN3160		2.1	P1, 1	**A6.16.**
*	**LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S,** *Inhalation Hazard Zone B*	2.3	UN3160		2.1	P2, 2	**A6.5.**
*	**LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S,** *Inhalation Hazard Zone C*	2.3	UN3160		2.1	P2, 3	**A6.5.**
*	**LIQUEFIED GAS, TOXIC, FLAMMABLE, N.O.S,** *Inhalation Hazard Zone D*	2.3	UN3160		2.1	P2, 4	**A6.5.**
*	**LIQUEFIED GAS, TOXIC, N.O.S,** *Inhalation Hazard Zone A*	2.3	UN3162			P1, 1	**A6.16.**
*	**LIQUEFIED GAS, TOXIC, N.O.S,** *Inhalation Hazard Zone B*	2.3	UN3162			P2, 2	**A6.5.**
*	**LIQUEFIED GAS, TOXIC, N.O.S,** *Inhalation Hazard Zone C*	2.3	UN3162			P2, 3	**A6.5.**
*	**LIQUEFIED GAS, TOXIC, N.O.S,** *Inhalation Hazard Zone D*	2.3	UN3162			P2, 4	**A6.5.**
*	**LIQUEFIED GASES, FLAMMABLE, N.O.S.**	2.1	UN3161			P4	**A6.4.**, **A6.5.**
*	*Liquefied hydrocarbon gas; see* **HYDROCARBON GASES, LIQUEFIED, N.O.S.,** *etc.*						
*	**LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S,** *Inhalation Hazard Zone A*	2.3	UN3308		8	P1, 1	**A6.16.**
*	**LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S,** *Inhalation Hazard Zone B*	2.3	UN3308		8	P2, 2	**A6.5.**

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*	**LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S,** *Inhalation Hazard Zone C*	2.3	UN3308		8	P2, 3	**A6.5.**
*	**LIQUEFIED GAS, TOXIC, CORROSIVE, N.O.S,** *Inhalation Hazard Zone D*	2.3	UN3308		8	P2, 4	**A6.5.**
*	**LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S,** *Inhalation Hazard Zone A*	2.3	UN3309		2.1, 8	P1, 1	**A6.16.**
*	**LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S,** *Inhalation Hazard Zone B*	2.3	UN3309		2.1, 8	P2, 2	**A6.5.**
*	**LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S,** *Inhalation Hazard Zone C*	2.3	UN3309		2.1, 8	P2, 3	**A6.5.**
*	**LIQUEFIED GAS, TOXIC, FLAMMABLE, CORROSIVE, N.O.S,** *Inhalation Hazard Zone D*	2.3	UN3309		2.1, 8	P2, 4	**A6.5.**
*	**LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S,** *Inhalation Hazard Zone A*	2.3	UN3310		5.1, 8	P1, 1	**A6.16.**
*	**LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S,** *Inhalation Hazard Zone B*	2.3	UN3310		2.1, 8	P2, 2	**A6.5.**
*	**LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S,** *Inhalation Hazard Zone C*	2.3	UN3310		2.1, 8	P2, 3	**A6.5.**
*	**LIQUEFIED GAS, TOXIC, OXIDIZING, CORROSIVE, N.O.S,** *Inhalation Hazard Zone D*	2.3	UN3310		2.1, 8	P2, 4	**A6.5.**
*	**LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S,** *Inhalation Hazard Zone A*	2.3	UN3307		5.1	P1, 1	**A6.16.**
*	**LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S,** *Inhalation Hazard Zone B*	2.3	UN3307		5.1	P2, 2	**A6.5.**
*	**LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S,** *Inhalation Hazard Zone C*	2.3	UN3307		5.1	P2, 3	**A6.5.**
*	**LIQUEFIED GAS, TOXIC, OXIDIZING, N.O.S,** *Inhalation Hazard Zone D*	2.3	UN3307		5.1	P2, 4	**A6.5.**
	Liquefied natural gas; see **METHANE** *etc.*						
	Liquefied petroleum gas; see **PETROLEUM GASES, LIQUEFIED**						
	LITHIUM	4.3	UN1415	I		P3, A7, A19, N45	**A8.4.**
	LITHIUM ALKYLS	4.2	UN2445	I	4.3	P3	**A8.6.**
	LITHIUM ALUMINIUM HYDRIDE	4.3	UN1410	I		P3, A19	**A8.4.**
	LITHIUM ALUMINIUM HYDRIDE, ETHEREAL	4.3	UN1411	I	3	P3, A2, A3, A11, N34	**A8.3.**
	LITHIUM BATTERIES CONTAINED IN EQUIPMENT *or* **LITHIUM BATTERIES PACKED WITH EQUIPMENT**	9	UN3091	II		P5	A13.8
	LITHIUM BATTERIES	9	UN3090	II		P5	A13.8
	LITHIUM BOROHYDRIDE	4.3	UN1413	I		P3, A19, N40	**A8.4.**
	LITHIUM FERROSILICON	4.3	UN2830	II		P5, A19	**A8.4.**
	LITHIUM HYDRIDE	4.3	UN1414	I		P3, A19, N40	**A8.4.**
	LITHIUM HYDRIDE, FUSED SOLID	4.3	UN2805	II		P5, A8, A19, A20	**A8.4.**
	LITHIUM HYDROXIDE, MONOHYDRATE *or* **LITHIUM HYDROXIDES, SOLID**	8	UN2680	II		P5	**A12.4.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	LITHIUM HYDROXIDE, SOLUTION	8	UN2679	II III		P5 P5	**A12.3.** **A12.3.**
	LITHIUM HYPOCHLORITE, DRY *or* **LITHIUM HYPOCHLORITE MIXTURES, DRY**	5.1	UN1471	II		P5, A9, N34	**A9.8.**
	LITHIUM NITRATE	5.1	UN2722	III		P5, A1	**A9.8.**
	LITHIUM NITRIDE	4.3	UN2806	I		P3, A19, N40	**A8.4.**
	LITHIUM PEROXIDE	5.1	UN1472	II		P5, A9, N34	**A9.8.**
	LITHIUM SILICON	4.3	UN1417	II		P5, A19, A20	**A8.4.**
	LONDON PURPLE	6.1	UN1621	II		P5	**A10.6.**
	LPG, see **PETROLEUM GASES, LIQUEFIED**						
	Lye, see **SODIUM HYDROXIDE, SOLUTIONS**						
	MAGNESIUM ALKYLS	4.2	UN3053	I	4.3	P3	**A8.6.**
	MAGNESIUM ALUMINIUM PHOSPHIDE	4.3	UN1419	I	6.1	P3, A19, N34, N40	**A8.4.**
+	**MAGNESIUM ARSENATE**	6.1	UN1622	II		P5	**A10.6.**
	Magnesium bisulfite solution, see **BISULFITES AQUEOUS SOLUTIONS, N.O.S.**						
	MAGNESIUM BROMATE	5.1	UN1473	II		P5, A1	**A9.8.**
	MAGNESIUM CHLORATE	5.1	UN2723	II		P5	**A9.8.**
	MAGNESIUM DIAMIDE	4.2	UN2004	II		P5, A8, A19, A20	**A8.4.**
	MAGNESIUM DIPHENYL	4.2	UN2005	I		P3	**A8.12.**
	Magnesium dross, wet or hot						FORBIDDEN
	MAGNESIUM FLUOROSILICATE	6.1	UN2853	III		P5	**A10.6.**
	MAGNESIUM GRANULES, COATED, *particle size not less than 149 Microns*	4.3	UN2950	III		P5, A1, A19	**A8.4.**
	MAGNESIUM HYDRIDE	4.3	UN2010	I		P3, A19, N40	**A8.4.**
	MAGNESIUM *or* **MAGNESIUM ALLOYS** *with more than 50% magnesium in pellets, turnings or ribbons*	4.1	UN1869	III		P5, A1	**A8.4.**
	MAGNESIUM NITRATE	5.1	UN1474	III		P5, A1	**A9.8.**
	MAGNESIUM PERCHLORATE	5.1	UN1475	II		P5	**A9.8.**
	MAGNESIUM PEROXIDE	5.1	UN1476	II		P5	**A9.8.**
	MAGNESIUM PHOSPHIDE	4.3	UN2011	I	6.1	P3, A19, N40	**A8.4.**
	MAGNESIUM, POWDER *or* **MAGNESIUM ALLOYS, POWDER**	4.3	UN1418	I II III	4.2 4.2 4.2	P3, A19 P5, A19 P5, A19	**A8.4.** **A8.4.** **A8.4.**
	Magnesium scrap, see **MAGNESIUM,** *etc.*						
	MAGNESIUM SILICIDE	4.3	UN2624	II		P5, A19, A20	**A8.4.**
	MAGNETIZED MATERIAL	9	UN2807			P5	A13.10
	MALEIC ANHYDRIDE	8	UN2215	III		P5	**A12.4.**
	MALONONITRILE	6.1	UN2647	II		P5	**A10.6.**
	Mancozeb (manganese, ethylenebisdithiocarbamate complex with zinc) see **MANEB**						

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	MANEB *or* **MANEB PREPARATIONS** *with not less than 60% maneb*	4.2	UN2210	III	4.3	P5, A1, A19	**A8.4.**
	MANEB STABILIZED *or* **MANEB PREPARATIONS**, **STABILIZED** *against self-heating*	4.3	UN2968	III		P5, A1, A19	**A8.4.**
	MANGANESE NITRATE	5.1	UN2724	III		P5, A1	**A9.8.**
	MANGANESE RESINATE	4.1	UN1330	III		P5, A1	**A8.4.**
	Mannitan tetranitrate						FORBIDDEN
	Mannitol hexanitrate (dry)						FORBIDDEN
	MANNITOL HEXANITRATE, WETTED *or* **NITROMANNITE, WETTED** *with not less than 40% water, or mixture of alcohol and water, by mass*	1.1D	UN0133			P4	**A5.9.**
	Matches, block, see **MATCHES, STRIKE ANYWHERE**						
	MATCHES, FUSEE	4.1	UN2254	III		P4	A8.15
	MATCHES, SAFETY*(book, card or strike on box)*	4.1	UN1944	III		P5	A8.15
	MATCHES, STRIKE ANYWHERE	4.1	UN1331	III		P4	A8.15
	MATCHES, WAX, VESTA	4.1	UN1945	III		P5	A8.15
	Matting Acid, see **SULPHURIC ACID**						
	MEDICINE, LIQUID, FLAMMABLE, **TOXIC, N.O.S**.	3	UN3248	II III	6.1 6.1	P4, 36 P5, 36	**A7.3.** **A7.3.**
	MEDICINE, LIQUID TOXIC, N.O.S.	6.1	UN1851	II III		P5 P5	**A10.5.** **A10.5.**
	MEDICINE, SOLID, TOXIC, N.O.S.	6.1	UN3249	II III		P5, 36 P5, 36	**A10.6.** **A10.6.**
*	**MERCAPTANS, LIQUID, FLAMMABLE, N.O.S.** *or* **MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, N.O.S.**	3	UN3336	I II III		P3 P5 P5	**A7.3.** **A7.3.** **A7.3.**
*	**MERCAPTANS, LIQUID, FLAMMABLE, TOXIC, N.O.S.** *or* **MERCAPTAN MIXTURES, LIQUID, FLAMMABLE, TOXIC, N.O.S.**	3	UN1228	II III	6.1 6.1	P4 P5	**A7.3.** **A7.3.**
*	**MERCAPTANS, LIQUID, TOXIC, FLAMMABLE, N.O.S**. *or* **MERCAPTAN MIXTURES, LIQUID, TOXIC, FLAMMABLE, N.O.S.,** *flashpoint not less than 23 degrees C*	6.1	UN3071	II	3	P5	**A10.5.**
	5-MERCAPTOTETRAZOL-1-ACETIC ACID	1.4C	UN0448			P5	**A5.12.**
	MERCURIC ARSENATE	6.1	UN1623	II		P5	**A10.6.**
	MERCURIC CHLORIDE	6.1	UN1624	II		P5	**A10.6.**
	MERCURIC NITRATE	6.1	UN1625	II		P5, N73	**A10.6.**
+	**MERCURIC POTASSIUM CYANIDE**	6.1	UN1626	I		P5, N74, N75	**A10.6.**
	Mercuric sulfocyanate, see **MERCURY THIOCYANATE**						
	Mercurol, see **MERCURY NUCLEATE**						
	Mercurous azide						FORBIDDEN
	MERCUROUS NITRATE	6.1	UN1627	II		P5	**A10.6.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	MERCURY	8	UN2809	III		P5	A12.10
	MERCURY ACETATE	6.1	UN1629	II		P5	**A10.6.**
	Mercury acetylide						FORBIDDEN
	MERCURY AMMONIUM CHLORIDE	6.1	UN1630	II		P5	**A10.6.**
*	**MERCURY BASED PESTICIDES, LIQUID, FLAMMABLE, TOXIC,** *flashpoint less than 23 degrees C*	3	UN2778	I II	6.1 6.1	P3 P4	**A7.3.** A7.2
*	**MERCURY BASED PESTICIDES, LIQUID, TOXIC, FLAMMABLE,** *flashpoint not less than 23 degrees C*	6.1	UN3011	I II III	3 3 3	P3 P4 P5	**A10.5.** **A10.5.** **A10.5.**
*	**MERCURY BASED PESTICIDES, LIQUID, TOXIC**	6.1	UN3012	I II III		P3 P4 P5	**A10.5.** **A10.5.** **A10.5.**
*	**MERCURY BASED PESTICIDES, SOLID, TOXIC**	6.1	UN2777	I II III		P5 P5 P5	**A10.6.** **A10.6.** **A10.6.**
	MERCURY BENZOATE	6.1	UN1631	II		P5	**A10.6.**
	MERCURY BROMIDES	6.1	UN1634	II		P5	**A10.6.**
	MERCURY COMPOUNDS, LIQUID, N.O.S.	6.1	UN2024	I II III		P3 P4 P5	**A10.5.** **A10.5.** **A10.5.**
	MERCURY COMPOUNDS, SOLID, N.O.S.	6.1	UN2025	I II III		P5 P5 P5	**A10.6.** **A10.6.** **A10.6.**
	MERCURY CONTAINED IN MANUFACTURED ARTICLES	8	UN2809	III		P5	A12.10
	MERCURY CYANIDE	6.1	UN1636	II		P5, N74, N75	**A10.6.**
	MERCURY FULMINATE, WETTED *with not less than 20% water, or mixture of alcohol and water, by mass*	1.1A	UN0135			P3, 111, 117	**A5.7.**
	MERCURY GLUCONATE	6.1	UN1637	II		P5	**A10.6.**
	MERCURY IODIDE, *solid or solution*	6.1	UN1638	II		P5	**A10.5.**, **A10.6.**
	Mercury iodine aquabasic ammonobasic						FORBIDDEN
	Mercury Nitride						FORBIDDEN
	MERCURY NUCLEATE	6.1	UN1639	II		P5	**A10.6.**
	MERCURY OLEATE	6.1	UN1640	II		P5	**A10.6.**
	MERCURY OXIDE	6.1	UN1641	II		P5	**A10.6.**
	Mercury oxycyanide						FORBIDDEN
	MERCURY OXYCYANIDE, DESENSITIZED	6.1	UN1642	II		P5	**A10.6.**
	MERCURY POTASSIUM IODIDE	6.1	UN1643	II		P5	**A10.6.**
	MERCURY SALICYLATE	6.1	UN1644	II		P5	**A10.6.**
+	**MERCURY SULPHATES**	6.1	UN1645	II		P5	**A10.6.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	MERCURY THIOCYANATE	6.1	UN1646	II		P5	**A10.6.**
	MESITYL OXIDE	3	UN1229	III		P5	**A7.3.**
*	**METAL ALKYL HALIDES, WATER-REACTIVE, N.O.S.** *or* **METAL ARYL HALIDES, WATER-REACTIVE, N.O.S**	4.2	UN3049	I	4.3	P3	**A8.6.**
*	**METAL ALKYL HYDRIDES, WATER-REACTIVE, N.O.S.** *or* **METAK ARYL HYDRIDES, WATER-REACTIVE, N.O.S.**	4.2	UN3050	I	4.3	P3	**A8.6.**
*	**METAL ALKYLS, WATER-REACTIVE, N.O.S.** *or* **METAL ARYLS, WATER-REACTIVE, N.O.S**	4.2	UN2003	I	4.3	P3	**A8.6.**
*	**METAL CARBONYLS, N.O.S.,** *liquid or solid*	6.1	UN3281	I II III		P3, 5 P4 P5	**A10.5.** **A10.5.** **A10.5.**
	METAL CATALYST, DRY	4.2	UN2881	I II III		P3, N34 P5, N34 P5, N34	**A8.12.** **A8.12.** **A8.12.**
	METAL CATALYST, WETTED *with a visible excess of liquid*	4.2	UN1378	II		P5, A2, A8, N34	**A8.4.**
	METALDEHYDE	4.1	UN1332	III		P5, A1	**A8.4.**
*	**METAL HYDRIDES, FLAMMABLE, N.O.S**.	4.1	UN3182	II III		P5, A1 P5, A1	**A8.4.** **A8.4.**
*	**METAL HYDRIDES, WATER-REACTIVE, N.O.S.**	4.3	UN1409	I II		P3, A19, N34, N40 P5, A19, N34, N40	**A8.4.** **A8.4.**
	METAL POWDER, FLAMMABLE, N.O.S.	4.1	UN3089	II III		P5 P5	**A8.4.** **A8.4.**
*	**METAL POWDER, SELF-HEATING, N.O.S.**	4.2	UN3189	II III		P5 P5	**A8.4.** **A8.4.**
	Metal salts of methyl nitramine (dry)						FORBIDDEN
*	**METAL SALTS OF ORGANIC COMPOUNDS, FLAMMABLE, N.O.S.**	4.1	UN3181	II III		P4, A1 P4, A1	**A8.4.** **A8.4.**
*	**METALLIC SUBSTANCE, WATER-REACTIVE, N.O.S.**	4.3	UN3208	I II III		P3 P5 P5	**A8.4.** **A8.4.** **A8.4.**
*	**METALLIC SUBSTANCE, WATER-REACTIVE, SELF-HEATING, N.O.S.**	4.3	UN3209	I II III	4.2 4.2 4.2	P3 P4 P5	**A8.4.** **A8.4.** **A8.4.**
	METHACRYLALDEHYDE, STABILIZED	3	UN2396	II	6.1	P5	**A7.3.**
	METHACRYLIC ACID, STABILIZED	8	UN2531	III		P5	**A12.3.**
+	**METHACRYLONITRILE, STABILIZED**	3	UN3079	I	6.1	P2, 2	A7.6
	METHALLYL ALCOHOL	3	UN2614	III		P5	**A7.3.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	METHANE, COMPRESSED *or* **NATURAL GAS, COMPRESSED** *(with high methane content)*	2.1	UN1971			P4	**A6.4.**, **A6.6.**
	METHANE, REFRIGERATED LIQUID*(cryogenic liquid) or* **NATURAL GAS, REFRIGERATED LIQUID** *(cryogenic liquid, with high methane content)*	2.1	UN1972			P3	**A6.12.**
	METHANESULPHONYL CHLORIDE	6.1	UN3246	I	8	P2, 2	**A10.7.**
+	**METHANOL**	3	UN1230	II	6.1	P4	**A7.3.**
D	**METHANOL**	3	UN1230	II		P4	**A7.3.**
	METHAZOIC ACID						FORBIDDEN
+	**METHOXYMETHYL ISOCYANATE**	3	UN2605	I	6.1	P1, 1	A7.6
	4-METHOXY-4-METHYLPENTAN-2-ONE	3	UN2293	III		P5	**A7.3.**
	1-METHOXY-2-PROPANOL	3	UN3092	III		P5	**A7.3.**
	METHYL ACETATE	3	UN1231	II		P5	**A7.3.**
	METHYL ACETYLENE AND PROPADIENE MIXTURES, STABILIZED	2.1	UN1060			P4	**A6.4.**, **A6.5.**
	METHYL ACRYLATE, STABILIZED	3	UN1919	II		P5	**A7.3.**
	METHYLAL	3	UN1234	II		P5	**A7.3.**
	Methyl Alcohol, see **METHANOL**						
	METHYL ALLYL CHLORIDE	3	UN2554	II		P5	**A7.3.**
	METHYLAMINE, ANHYDROUS	2.1	UN1061			P4	**A6.4.**, **A6.5.**
	METHYLAMINE, AQUEOUS SOLUTION	3	UN1235	II	8	P4	**A7.3.**
	Methylamine dinitramine and dry salts thereof						FORBIDDEN
	Methylamine nitroform						FORBIDDEN
	Methylamine perchlorate (dry)						FORBIDDEN
	METHYLAMYL ACETATE	3	UN1233	III		P5	**A7.3.**
	Methyl amyl ketone, see **AMYL METHYL KETONE**						
	N-METHYLANILINE	6.1	UN2294	III		P5	**A10.5.**
	METHYL BENZOATE	6.1	UN2938	III		P5	**A10.5.**
	ALPHA-METHYLBENZYL ALCOHOL	6.1	UN2937	III		P5	**A10.5.**
	METHYL BROMIDE	2.3	UN1062			P2, 3	**A6.17.**
	Methyl bromide and chloropicrin mixtures with more than 2% chloropicrin, see **CHLOROPICRIN AND METHYL BROMIDE MIXTURES**						
	METHYL BROMIDE AND ETHYLENE DIBROMIDE MIXTURES, LIQUID	6.1	UN1647	I		P2, 2, N65	**A10.7.**
	METHYL BROMOACETATE	6.1	UN2643	II		P5	**A10.5.**
	3-METHYLBUTAN-2-ONE	3	UN2397	II		P5	**A7.3.**
	2-METHYLBUTANAL	3	UN3371	II		P5	**A7.3.**
	3-METHYL-1-BUTENE	3	UN2561	I		P3	**A7.3.**
	2-METHYL-1-BUTENE	3	UN2459	I		P3	**A7.3.**
	2-METHYL-2-BUTENE	3	UN2460	II		P5	**A7.3.**
	N-METHYLBUTYLAMINE	3	UN2945	II	8	P4	**A7.3.**

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	METHYL-TERT-BUTYL ETHER	3	UN2398	II		P5	**A7.3.**
	METHYL BUTYRATE	3	UN1237	II		P5	**A7.3.**
	METHYL CHLORIDE *or* **REFRIGERANT GAS R40**	2.1	UN1063			P4	**A6.4.**, **A6.5.**
	METHYL CHLORIDE AND METHYLENE CHLORIDE MIXTURE	2.1	UN1912			P4	**A6.4.**, **A6.5.**
	METHYL CHLOROACETATE	6.1	UN2295	I	3	P5	**A10.5.**
	Methyl chlorocarbonate, see **METHYL CHLOROFORMATE**						
	METHYL CHLOROFORMATE	6.1	UN1238	I	3, 8	P1, 1, N34	**A10.7.**
	Methyl chloroform, see **1,1,1-TRICHLOROETHANE**						
	METHYL CHLOROMETHYL ETHER	6.1	UN1239	I	3	P1, 1	**A10.7.**
	METHYL-2-CHLOROPROPIONATE	3	UN2933	III		P5	**A7.3.**
	METHYLCHLOROSILANE	2.3	UN2534		2.1, 8	P2, 2, A2, A3, A7, N34	A6.20
	METHYLCYCLOHEXANE	3	UN2296	II		P5	**A7.3.**
	METHYLCYCLOHEXANOLS, *flammable*	3	UN2617	III		P5	**A7.3.**
	METHYLCYCLOHEXANONE	3	UN2297	III		P5	**A7.3.**
	METHYLCYCLOPENTANE	3	UN2298	II		P5	**A7.3.**
	METHYL DICHLOROACETATE	6.1	UN2299	III		P5	**A10.5.**
D	**METHYLDICHLOROARSINE**	6.1	NA1556	I		P2, 2	A10.3
	METHYLDICHLOROSILANE	4.3	UN1242	I	3, 8	P3, A2, A3, A7, N34	**A8.3.**
	Methylene chloride, see **DICHLOROMETHANE**						
	Methylene glycol dinitrate						FORBIDDEN
	Methyl ethyl ether, see **ETHYL METHYL ETHER**						
	METHYL ETHYL KETONE, *see* **ETHYL METHYL KETONE**						
	Methyl ethyl ketone peroxide, in solution with more than 9% by mass active oxygen						FORBIDDEN
	2-METHYL-5-ETHYLPYRIDINE	6.1	UN2300	III		P5	**A10.5.**
	METHYL FLUORIDE *or* **REFRIGERANT GAS R41**	2.1	UN2454			P4	**A6.4.**, **A6.5.**
	METHYL FORMATE	3	UN1243	I		P3	**A7.3.**
	2-METHYLFURAN	3	UN2301	II		P5	**A7.3.**
	a-Methylglucoside Tetranitrate						FORBIDDEN
	a-Methylglycerol Trinitrate						FORBIDDEN
	5-METHYLHEXAN-2-ONE	3	UN2302	III		P5	**A7.3.**
	METHYLHYDRAZINE	6.1	UN1244	I	3, 8	P1, 1, N34	**A10.7.**
	2-METHYL-2-HEPTANETHIOL	6.1	UN3023	I	3	P2, 2	**A10.7.**
	METHYL IODIDE	6.1	UN2644	I		P2, 2	**A10.7.**
	METHYL ISOBUTYL CARBINOL	3	UN2053	III		P5	**A7.3.**
	METHYL ISOBUTYL KETONE	3	UN1245	II		P5	**A7.3.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Methyl isobutyl ketone peroxide, in solution with more than 9% by mass active oxygen						FORBIDDEN
	METHYL ISOCYANATE	6.1	UN2480	I	3	P1, 1	**A10.7.**
	METHYL ISOPROPENYL KETONE, STABILIZED	3	UN1246	II		P5	**A7.3.**
	METHYL ISOTHIOCYANATE	6.1	UN2477	I	3	P2, 2	A7.6
	METHYL ISOVALERATE	3	UN2400	II		P5	**A7.3.**
	METHYL MAGNESIUM BROMIDE IN ETHYL ETHER	4.3	UN1928	I	3	P3	**A8.3.**
	METHYL MERCAPTAN	2.3	UN1064		2.1	P2, 3	**A6.5.**
	METHYL METHACRYLATE MONOMER, STABILIZED	3	UN1247	II		P5	**A7.3.**
	4-METHYLMORPHOLINE or **N-METHYLMORPHOLINE**	3	UN2535	II	8	P5	**A7.3.**
	Methyl nitramine (dry),						FORBIDDEN
	Methyl nitrate						FORBIDDEN
	Methyl nitrite						FORBIDDEN
	METHYL ORTHOSILICATE	6.1	UN2606	I	3	P2, 2	**A10.7.**
	METHYLPENTADIENE	3	UN2461	II		P5	**A7.3.**
	2-METHYLPENTAN-2-OL	3	UN2560	III		P5	**A7.3.**
	METHYLPHENYLDICHLOROSILANE	8	UN2437	II		P5	**A12.3.**
D	**METHYL PHOSPHONIC DICHLORIDE**	6.1	NA9206	I	8	P2, 2, A3 N34, N43	**A10.7.**
	Methyl phosphonothioic dichloride, anhydrous, see **CORROSIVE LIQUID, N.O.S**						
D	**METHYL PHOSPHONOUS DICHLORIDE,** *pyrophoric liquid*	6.1	NA2845	I	4.2	P2, 2	**A10.7.**
	METAL PICRIC ACID *(heavy metal salts of)*						FORBIDDEN
	1-METHYLPIPERIDINE	3	UN2399	II	8	P4	**A7.3.**
	METHYL PROPIONATE	3	UN1248	II		P5	**A7.3.**
	METHYL PROPYL ETHER	3	UN2612	II		P5	**A7.3.**
	METHYL PROPYL KETONE	3	UN1249	II		P5	**A7.3.**
	Methyl sulfate, see **DIMETHYL SULFATE**						
	Methyl sulphide, see **DIMETHYL SULPHIDE**						
	METHYLTETRAHYDROFURAN	3	UN2536	II		P5	**A7.3.**
	METHYL TRICHLOROACETATE	6.1	UN2533	III		P5	**A10.5.**
	METHYLTRICHLOROSILANE	3	UN1250	I	8	P3, A7, N34	**A7.3.**
	Methyl trimethylol methane trinitrate						FORBIDDEN
	ALPHA-METHYLVALERALDEHYDE	3	UN2367	II		P5	**A7.3.**
	METHYL VINYL KETONE, STABILIZED	6.1	UN1251	I	3, 8	P1, 1	A7.6
	MINES *with bursting charge*	1.1F	UN0136			P4	**A5.15.**
	MINES *with bursting charge*	1.1D	UN0137			P4	**A5.15.**
	MINES *with bursting charge*	1.2D	UN0138			P4	**A5.15.**
	MINES *with bursting charge*	1.2F	UN0294			P4	**A5.15.**
D	**MODEL ROCKET MOTOR**	1.4C	NA0276	II		P4, 62	**A5.15.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
D	**MODEL ROCKET MOTOR**	1.4S	NA0323	II		P4, 62	**A5.15.**
	MOLYBDENUM PENTACHLORIDE	8	UN2508	III		P5	**A12.4.**
	Monochloroacetone (unstabilized)						FORBIDDEN
	Monochloroethylene, see **VINYL CHLORIDE, STABILIZED**						
	MORPHOLINE	8	UN2054	I	3	P5	**A12.3.**
	Morpholine, aqueous, mixture, see **CORROSIVE LIQUID, N.O.S.**						
	MOTOR FUEL ANTI-KNOCK MIXTURES	6.1	UN1649	I		P3	**A10.5.**
	MOTOR SPIRIT, *see* **GASOLINE**						
	Muriatic acid, see **HYDROCHLORIC ACID SOLUTION**						
	MUSK XYLENE, *see* **5-TERT-BUTYL-2,4,6-TRINITO-M-XYLENE**						
	Naphtha, see **PETROLEUM DISTALLATE N.O.S**						
	NAPHTHALENE, CRUDE *or* **REFINED**	4.1	UN1334	III		P5, A1	**A8.4.**
	Naphthalene diozonide						FORBIDDEN
	NAPHTHALENE, MOLTEN						FORBIDDEN
	ALPHA-NAPHTHYLAMINE	6.1	UN2077	III		P5	**A10.6.**
	BETA-NAPHTHYLAMINE	6.1	UN1650	II		P5	**A10.6.**
	Naphthylamineperchlorate						FORBIDDEN
	NAPHTHYLTHIOUREA	6.1	UN1651	II		P5	**A10.6.**
	NAPHTHYLUREA	6.1	UN1652	II		P5	**A10.6.**
	NATURAL GAS, REFRIGERATED LIQUID, *with high methane content (cryogenic liquid)*	2.1	UN1972			P3	A6.11
	NEON, COMPRESSED	2.2	UN1065			P5	**A6.4.**, **A6.6.**
	NEON, REFRIGERATED LIQUID *(cryogenic liquid)*	2.2	UN1913			P4	**A6.12.**
	NICKEL CARBONYL						FORBIDDEN
	NICKEL CYANIDE	6.1	UN1653	II		P5, N74, N75	**A10.6.**
	NICKEL NITRATE	5.1	UN2725	III		P5, A1	**A9.8.**
	NICKEL NITRITE	5.1	UN2726	III		P5, A1	**A9.8.**
	Nickel Picrate						FORBIDDEN
	NICOTINE	6.1	UN1654	II		P5	**A10.5.**
	NICOTINE COMPOUNDS, LIQUID, N.O.S. *or* **NICOTINE PREPARATIONS, LIQUID, N.O.S.**	6.1	UN3144	I II III		P3, A4 P5 P5	**A10.5.** **A10.5.** **A10.5.**
	NICOTINE COMPOUNDS, SOLID, N.O. S. *or* **NICOTINE PREPARATIONS, SOLID, N.O.S.**	6.1	UN1655	I II III		P5 P5 P5	**A10.6.** **A10.6.** **A10.6.**
	NICOTINE HYDROCHLORIDE *or* **NICOTINE HYDROCHLORIDE SOLUTION**	6.1	UN1656	II		P5	**A10.5.**
	NICOTINE SALICYLATE	6.1	UN1657	II		P5	**A10.6.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	NICOTINE SULPHATE, *solid or solution*	6.1	UN1658	II		P5	**A10.5.**, **A10.6.**
	NICOTINE TARTRATE	6.1	UN1659	II		P5	**A10.6.**
	NITRATED PAPER *(unstable)*						FORBIDDEN
	NITRATES, INORGANIC, **N.O.S**.	5.1	UN1477	II III		P5 P5	**A9.8.** **A9.8.**
	NITRATES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.	5.1	UN3218	II III		P5 P5	**A9.7.** **A9.7.**
	Nitrates of diazonium compounds						FORBIDDEN
	NITRATING ACID MIXTURES, SPENT *with not more than 50% nitric acid*	8	UN1826	II		P4	A12.11
	NITRATING ACID MIXTURES, SPENT *with 50% or more nitric acid*	8	UN1826	I	5.1	P3	A12.11
	NITRATING ACID MIXTURES *with* not *more than 50% nitric acid*	8	UN1796	II		P4	A12.11
	NITRATING ACID MIXTURES with *50% or more nitric acid*	8	UN1796	I	5.1	P3	A12.11
	NITRIC ACID *other than red fuming, with more than 70% nitric acid*	8	UN2031	I	5.1	P3	A12.11
	NITRIC ACID, *other than red fuming, with not more than 70% nitric acid*	8	UN2031	II		P4	A12.11
+	**NITRIC ACID, RED FUMING**	8	UN2032	I	5.1, 6.1	P2, 2	**A12.12.**
	NITRIC OXIDE, COMPRESSED	2.3	UN1660		5.1, 8	P1, 1	A6.20
	NITRIC OXIDE AND DINITROGEN TETROXIDE MIXTURES *or* **NITRIC OXIDE AND NITROGEN DIOXIDE MIXTURES**						FORBIDDEN
*	**NITRILES, TOXIC, N.O.S.**	6.1	UN3276	I II III		P3, 5 P4 P5	**A10.5.** **A10.5.** **A10.5.**
*	**NITRILES, TOXIC, FLAMMABLE, N.O.S.**	6.1	UN3275	I II	3 3	P3, 5 P4	**A10.5.** **A10.5.**
*	**NITRILES, FLAMMABLE, TOXIC, N.O.S.**	3	UN3273	I II	6.1 6.1	P3 P4	**A7.3.** **A7.3.**
	NITRITES, INORGANIC, N.O.S.	5.1	UN2627	II		P5, 33	**A9.8.**
	NITRITES, INORGANIC, AQUEOUS SOLUTION, N.O.S.	5.1	UN3219	II III		P5 P5	**A9.7.** **A9.7.**
	N-Nitroaniline						FORBIDDEN
+	**NITROANILINES** *(o-;m-;p-;)*	6.1	UN1661	II		P5	**A10.6.**
+	**NITROANISOLE**	6.1	UN2730	III		P5	**A10.5.**, **A10.6.**
+	**NITROBENZENE**	6.1	UN1662	II		P5	**A10.5.**
	m-Nitrobenzene diazonium perchlorate						FORBIDDEN
	NITROBENZENESULPHONIC ACID	8	UN2305	II		P5	**A12.3.**
	Nitrobenzol, see **NITROBENZENE**						
	5-NITROBENZOTRIAZOL	1.1D	UN0385			P4	**A5.9.**
	NITROBENZOTRIFLUORIDES	6.1	UN2306	II		P5	**A10.5.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	NITROBROMOBENZENES, LIQUID *or* **SOLID**	6.1	UN2732	III		P5	**A10.5.**, **A10.6.**
	NITROCELLULOSE, *dry or wetted with less than 25% water (or alcohol), by mass*	1.1D	UN0340			P4	**A5.9.**
	NITROCELLULOSE MEMBRANE FILTERS	4.1	UN3270	II		P5, 43, A1	**A8.4.**
	NITROCELLULOSE, PLASTICIZED *with not less than 18% plasticizing substance, by mass*	1.3C	UN0343			P4	**A5.8.**
	NITROCELLULOSE SOLUTION, FLAMMABLE *with not more than 12.6% nitrogen, by mass, and not more than 55% nitrocellulose*	3	UN2059	II III		P5 P5	**A7.3.** **A7.3.**
	NITROCELLULOSE, *unmodified or plasticized with less than 18% plasticizing substance, by mass*	1.1D	UN0341			P4	**A5.9.**
	NITROCELLULOSE, WETTED *with 25% or more alcohol, by mass*	1.3C	UN0342			P4	**A5.12.**
	NITROCELLULOSE WITH ALCOHOL *25% or more alcohol by mass, and 12.6%or less nitrogen, by dry mass*	4.1	UN2556	II		P5	**A8.4.**
	NITROCELLULOSE WITH WATER *with not less than 25% water by mass*	4.1	UN2555	II		P5	**A8.4.**
	NITROCELLULOSE, *with not more than 12.6% nitrogen, by dry mass, or* **NITROCELLULOSE, MIXTURE WITHOUT PIGMENT** *or* **NITROCELLULOSE, MIXTURE WITHOUT PLASTICIZER,** *or* **NITROCELLULOSE, MIXTURE WITH PIGMENT** *or* **NITROCELLULOSE, MIXTURE WITH PLASTICIZER**	4.1	UN2557	II		P5	**A8.4.**
	3-NITRO-4-CHLOROBENZOTRIFLUORIDE	6.1	UN2307	II		P5	**A10.5.**
	NITROCRESOLS	6.1	UN2446	III		P5	**A10.6.**
	6-Nitro-4-diazotoluene-3-sulphonic acid (dry)						FORBIDDEN
	NITROETHANE	3	UN2842	III		P5	**A7.3.**
	Nitroethylene polymer						FORBIDDEN
	Nitroethyl nitrate						FORBIDDEN
	NITROGEN, COMPRESSED	2.2	UN1066			P5	**A6.4.**, **A6.6.**
	NITROGEN DIOXIDE *see* **DINITROGEN TETROXIDE**						FORBIDDEN
	Nitrogen fertilizer solution; see **FERTILIZER AMMONIATING SOLUTION,** *etc.*						
	Nitrogen peroxide, see **DINITROGEN TETROXIDE, LIQUEFIED**						
	NITROGEN, REFRIGERATED LIQUID *(cryogenic liquid)*	2.2	UN1977			P4	**A6.12.**
	Nitrogen tetroxide and nitric oxide mixtures, see **NITRIC OXIDE AND NITROGEN TETROXIDE MIXTURES**						
	Nitrogen tetroxide, see **DINITROGEN TETROXIDE, LIQUEFIED**						
	Nitrogen trichloride						FORBIDDEN
	NITROGEN TRIFLUORIDE	2.2	UN2451		5.1	P4	**A6.6.**
	Nitrogen triiodide						FORBIDDEN

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Nitrogen triiodide monoamine						FORBIDDEN
	NITROGEN TRIOXIDE						FORBIDDEN
*	**NITROGLYCERIN, MIXTURE, DESENSITIZED LIQUID, FLAMMABLE, N.O.S.,** *with not less than 30% Nitroglycerin by mass*	3	UN3357			P5	**A8.5.**
*	**NITROGLYCERIN, MIXTURE, DESENSITIZED LIQUID, FLAMMABLE, N.O.S.,** *with not less than 30% Nitroglycerin by mass*	3	UN3343			P5	**A8.5.**
*	**NITROGLYCERIN, MIXTURE, DESENSITIZED SOLID, FLAMMABLE, N.O.S.,** *with more than 2% but not more than 10% Nitroglycerin by mass*	4.1	UN3319	II		P4	**A8.5.**
	NITROGLYCERIN, DESENSITIZED *with not less than 40% nonvolatile water insoluble phlegmatizer, by mass*	1.1D	UN0143		6.1	P4	**A5.13.**
	Nitroglycerin, liquid, not desensitized						FORBIDDEN
	NITROGLYCERIN, SOLUTION IN ALCOHOL, *with more than 1%, but not more than 5% nitroglycerin*	3	UN3064	II		P3, N8	**A7.3.**
	NITROGLYCERIN, SOLUTION IN ALCOHOL *with more than 1%, but not more than 10% nitroglycerin*	1.1D	UN0144			P4	**A5.13.**
	NITROGLYCERIN SOLUTION IN ALCOHOL, *with not more than 1% nitroglycerin*	3	UN1204	II		P3, N34	**A7.3.**
	Nitroguanidine nitrate						FORBIDDEN
	NITROGUANIDINE *or* **PICRITE**, *dry or wetted with less than 20% water, by mass*	1.1D	UN0282			P4	**A5.9.**
	NITROGUANIDINE WETTED, *or* **PICRITE WETTED** *with not less than 20% water, by mass*	4.1	UN1336	I		P4, 23, A8, A19, A20, N41	**A8.4.**
	1-Nitrohydantoin						FORBIDDEN
	NITROHYDROCHLORIC ACID	8	UN1798	I		P3, A3, N41	**A12.3.**
	Nitromannite (dry)						FORBIDDEN
	NITROMANNITE, WETTED; *see* **MANNITOL HEXANITRATE, WETTED** *etc.*						
	NITROMETHANE	3	UN1261	II		P5	**A7.3.**
	N-Nitro-N-methylglycolamide nitrate						FORBIDDEN
	2-Nitro-2-methylpropanol nitrate						FORBIDDEN
	Nitromuriatic acid; see **NITROHYDROCHLORIC ACID**						
	NITRONAPHTHALENE	4.1	UN2538	III		P5, A1	**A8.4.**
+	**NITROPHENOLS** *(o-,m-,p-,)*	6.1	UN1663	III		P5	**A10.6.**
	m-Nitrophenyldinitro methane						FORBIDDEN
	NITROPROPANES	3	UN2608	III		P5	**A7.3.**
	P-NITROSODIMETHYLANILINE	4.2	UN1369	II		P5, A19, A20, N34	**A8.4.**
	NITROSTARCH, *dry or wetted with less than 20% water, by mass*	1.1D	UN0146			P4	**A5.9.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	NITROSTARCH, WETTED *with not less than 20% water by mass*	4.1	UN1337	I		P4, 23, A8, A19, A20, N41	**A8.4.**
	Nitrosugars (dry)						FORBIDDEN
	NITROSYL CHLORIDE	2.3	UN1069		8	P2, 3	**A6.5.**
	NITROSYLSULPHURIC ACID	8	UN2308	II		P5, A3, A6, A7, N34	**A12.3.**
	NITROTOLUENES, *liquid or solid (o-,m-,p-)*	6.1	UN1664	II		P5	**A10.5.**, **A10.6.**
	NITROTOLUIDINES (MONO)	6.1	UN2660	III		P5	**A10.6.**
	NITROTRIAZOLONE *or* **NTO**	1.1D	UN0490			P4	**A5.9.**
	NITRO UREA	1.1D	UN0147			P4	**A5.9.**
	Nitrous oxide and carbon dioxide mixtures see **CARBON DIOXIDE AND NITROUS; OXIDE MIXTURES**						
	NITROUS OXIDE	2.2	UN1070		5.1	P5	**A6.4.**, **A6.5.**
	NITROUS OXIDE, REFRIGERATED LIQUID	2.2	UN2201		5.1	P4	**A6.5.**
	NITROXYLENES *(o-,m-,p-)*	6.1	UN1665	II		P5	**A10.5.**
	NONANES	3	UN1920	III		P5	**A7.3.**
	Nonflammable gas, n.o.s.; see **COMPRESSED** *or* **LIQUEFIED GASES,** *etc.*						
	Nonliquefied gases; see **COMPRESSED GASES**, *etc*						
	Nonliquefied hydrocarbon gas; see **HYDROCARBON GASES COMPRESSED, N.O.S.**						
	NONYLTRICHLOROSILANE	8	UN1799	II		P4, A7, N34	**A12.3.**
	OCTADECYLTRICHLOROSILANE	8	UN1800	II		P4, A7, N34	**A12.3.**
	OCTADIENE	3	UN2309	II		P5	**A7.3.**
	1,7-Octadiene-3,5-diyne-1,8-dimethoxy-9-octadecynoic acid						FORBIDDEN
	OCTAFLUOROBUT-2-ENE *or* **REFRIGERANT GAS R1318**	2.2	UN2422			P5	**A6.5.**
	OCTAFLUOROCYCLOBUTANE *or* **REFRIGERANT GAS RC318**	2.2	UN1976			P5	**A6.5.**
	OCTAFLUOROPROPANE *or* **REFRIGERANT GAS R218**	2.2	UN2424			P5	**A6.5.**
	OCTANES	3	UN1262	II		P5	**A7.3.**
	OCTOGEN; *see* **CYLCOTETRAMETHYLENE TETRANITRAMINE,** *etc*						
	OCTOLITE *or* **OCTOL** *dry or wetted with less than 15% water by mass*	1.1D	UN0266			P4	**A5.9.**
	OCTONAL	1.1D	UN0496			P4	**A5.10.**
	OCTYL ALDEHYDES	3	UN1191	III		P5	**A7.3.**
	Tert-Octyl Mercaptan, see **2-METHYL-2-HEPTANETHIOL**						
	OCTYLTRICHLOROSILANE	8	UN1801	II		P4, A7, N34	**A12.3.**
	OIL GAS, COMPRESSED	2.3	UN1071		2.1	P2, 6	**A6.5.**

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Oleum; see **SULPHURIC ACID, FUMING**						
	ORGANIC PEROXIDE TYPE A, LIQUID *or* **SOLID**						FORBIDDEN
*	**ORGANIC PEROXIDE TYPE B, LIQUID**	5.2	UN3101	II	EXPLOSIVE	P3, 53	**Table A9.2.**5
*	**ORGANIC PEROXIDE TYPE B, LIQUID, TEMPERATURE CONTROLLED**	5.2	UN3111	II	EXPLOSIVE	P3, 53	**Table A9.2.**5
*	**ORGANIC PEROXIDE TYPE B, SOLID**	5.2	UN3102	II	EXPLOSIVE	P3, 53	SEE BELOW BY TECHNICAL NAME
	tert-Butyl Monoperoxymaneate						**Table A9.3.**5
	3-Choloroperoxybenzoic Acid						**Table A9.3.**1
	Dibenzoyl Peroxide > 52 < 100						**Table A9.3.**2
	Dibenzoyl Peroxide > 78, < 94						**Table A9.3.**6
	Di-4-Chlorobenzoyl Peroxide						**Table A9.3.**5
	Di-2,4-Dichlorobenzoyl Peroxide						**Table A9.3.**5
	2,2-Dihydroperoxypropane						**Table A9.3.**5
	2,5-Dimethyl -2,5-di-(Benzoyl-Peroxy) Hexane						**Table A9.3.**5
	Di-(2 Phenoxyethyl) Peroxydicarbonate						**Table A9.3.**5
	Disuccinic Acid Peroxide						**Table A9.3.**4
	3,3,6,6,9,9,-Hexamethyl-1,2,4,5-Tetraoxa-cylcononane						**Table A9.3.**4
*	**ORGANIC PEROXIDE TYPE B, SOLID, TEMPERATURE CONTROLLED**	5.2	UN3112	II	EXPLOSIVE	P3, 53	SEE BELOW BY TECHNICAL NAME
	Acetyl Cylcohexanesulphonyl Peroxide						**Table A9.3.**4
	Dibenzyl Peroxydicarbonate						**Table A9.3.**5
	Dicyclohexyl Peroxydicarbonate						**Table A9.3.**5
	Diisopropyl Peroxydicarbonate						**Table A9.3.**2
	Di-(2-Methylbenzoyl) Peroxide						**Table A9.3.**5
*	**ORGANIC PEROXIDE TYPE C, LIQUID**	5.2	UN3103	II		P5	SEE BELOW BY TECHNICAL NAME
	tert-Amyl peroxybenzoate						**Table A9.2.**7
	n-Butyl-4,4-di-(Tertcutylperoxy)-Valerate						**Table A9.2.**5
	tert-Butyl Hydroperoxide						**Table A9.2.**5
	tert-Butyl Hydroperoxide and di-tert-Butyl Peroxide						**Table A9.2.**5
	tert-Butyl Monoperoxymaneate						**Table A9.2.**6
	tert-Butyl Peroxyacetate						**Table A9.2.**6
	tert-Butyl Peroxybenzoate						**Table A9.2.**5
	tert-Butylperoxy Isopropyl Carbonate						**Table A9.2.**5
	2,2-Di-(tert-Butylperoxy) Butane						**Table A9.2.**6
	1,1-Di-(tert-Butylperoxy) Cyclohexane						**Table A9.2.**5
	2,5-Dimethyl-2,5-Di-(tert-Butyl-Peroxy)Hexane -3						**Table A9.2.**5
	Ethyl-3,3-Di-(tert-Butylperoxy)-Butyrate						**Table A9.2.**5
	Organic Peroxide, Liquid, Sample						**Table A9.2.**2

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*	**ORGANIC PEROXIDE TYPE C, LIQUID, TEMPERATURE CONTROLLED**	5.2	UN3113	II		P3	SEE BELOW BY TECHNICAL NAME
	tert-Amyl Peroxypivalate						**Table A9.2.**5
	tert-Butyl Peroxydiethylacetate						**Table A9.2.**5
	tert-Butyl Peroxy-2-Ethylhexanoate						**Table A9.2.**6
	tert-Butyl Peroxypivalate						**Table A9.2.**5
	Di-sec-Butyl-Peroxydicarbonate						**Table A9.2.**4
	Di-(2-Ethylhexyl) Peroxydicarbonate						**Table A9.2.**5
	Di-n-Propyl Peroxydicarbonate						**Table A9.2.**4
	Organic Peroxide, Liquid Temperature Controlled						**Table A9.2.**2
*	**ORGANIC PEROXIDE TYPE C, SOLID**	5.2	UN3104	II		P5	SEE BELOW BY TECHNICAL NAME
	Cyclohexanone Peroxide(s)						**Table A9.3.**6
	Dibenzoyl Peroxide						**Table A9.3.**6
	2,5-Dimethyl-2-5-di-(Benzoyl Peroxy) Hexane						**Table A9.3.**5
	2,5-Dimethyl-2,5-Dihydroperoxyhexane						**Table A9.3.**6
	Organic Peroxide, Solid, Sample						**Table A9.3.**2
*	**ORGANIC PEROXIDE TYPE C, SOLID, TEMPERATURE CONTROLLED**	5.2	UN3114	II		P3	SEE BELOW BY TECHNICAL NAME
	Di-(4-tert-Butylcyclohexyl) Peroxydicarbonate						**Table A9.3.**6
	Dicyclohexyl Peroxydicarbonate						**Table A9.3.**3
	Dideconoyl Peroxide						**Table A9.3.**6
	Di-n-Octanoyl Peroxide						**Table A9.3.**5
	Organic Peroxide, Solid, Temperature Controlled						**Table A9.3.**2
*	**ORGANIC PEROXIDE TYPE D, LIQUID**	5.2	UN3105	II		P5	**Table A9.2.**7
	Acetyl acetone peroxide						
	Acetyl benzoyl peroxide						
	tert-Butyl cumyl peroxide						
	tert-Butyl hydroperoxide						
	tert-Butyl peroxybenzoate						
	tert-Butyl peroxycrotonate						
	tert-Butyl peroxydiethylacetate and tert-Butyl eroxybenzoate						
	tert-Butyl peroxy-3,5,5-trimethylhexanoate						
	Cyclohexanone peroxide(s)						
	1,1 Di-(tert-butylperoxy) cyclohexane						
	Di-(tert-butylperoxy) phthalate						
	2,2-Di-(tert-butylperoxy)-propane						
	2,5-Dimethyl-2,5-di-(tert-butyl-peroxy)hexane						
	2,5-Dimethyl-2,5-di-(3,5,5-trimethylhexanoylperoxy)						
	hexane						

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Ethyl-3,3-di-(tert-amylperoxy)-butryrate						
	Ethyl-3,3-di-(tert-butylperoxy)-butyrate						
	3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononane						
	p-Methyl hydroperoxide						
	Methyl ethyl ketone peroxide(s)						
	Methyl isobutyl ketone peroxide(s)						
	Peroxyacetic acid, type D, stabilized						
	1,1,3,3-Tertamethylbutyl hydroperoxide						
*	**ORGANIC PEROXIDE TYPE D, LIQUID, TEMPERATURE CONTROLLED**	5.2	UN3115	II		P3	**Table A9.2.**7
	Acetyl cyclohexanesulphonyl peroxide						
	tert-Amyl peroxy-2-ethylhexanoate						
	tert-Amyl peroxyneodecanoate						
	tert-Butyl peroxy-2-ethylhexanoate and 2,2-Di-(tert-butylperoxy)butane						
	tert-Butyl peroxyisobutyrate						
	tert-Butyl peroxyneodecanoate						
	tert-Butyl peroxypivalate						
	Cumyl peroxyneodecanoate						
	Cumyl peroxypivalate						
	Diacetone alcohol peroxides						
	Diacetyl peroxide						
	Di-n-butyl-peroxydicarbonate						
	Di-sec-butyl peroxydicarbonate						
	Di-(2-ethylhexyl) peroxydicarbonate						
	Diethyl peroxydicarbonate						
	Diisobutyryl peroxide						
	Diisopropyl peroxydicarbonate						
	Diisotridecyl peroxydicarbonate						
	2,5-Dimethyl-2,5-di-(2-ethylhexanoylperoxy) hexane						
	Di-(3,5,5-trimethylhexanoyl) peroxide						
	Methylcyclohexanone peroxide(s)						
	1,1,3,3-Tetramethylbutylperoxy-2-ethylhexanoate						
	2,4,4-Trimethylpentyl-2-peroxy phenoxyacetate						
*	**ORGANIC PEROXIDE TYPE D, SOLID**	5.2	UN3106	II		P5	**Table A9.3.**7
	Acetyl acetone peroxide, as a paste						
	n-Butyl-4-4-di-(tertbutyl-peroxy)-valerate						
	tert-Butyl peroxybenzoate						
	tert-Butyl-peroxy-2-ethylhexanoate and 2,2-Di-(tert-butylperoxy)butane						
	3-tert-Butylperoxy-3-phenylphthalide						
	tert-Butylperoxy stearylcarbonate						
	3-Chloroperoxybenzoic acid						

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Cyclohexanone peroxide(s) as a paste						
	Dibenzoyl peroxide						
	Dibenzoyl peroxide, as a paste						
	1,1-Di-(tert-butylperoxy) cyclohexane						
	2,2-Di(1,4-tert-butylperoxycyclohexyl)propane						
	Di-(2-tert -butylperoxyisopropyl)-benzene(s)						
	Di-(tert-butylperoxy) phthalate, as a paste						
	2,2-Di-(tert-butylperoxy)propane						
	1,1-Di-(tert-butylperoxy)-3,3,5-trimethyl cyclohexane						
	Di-4-chlorobenzoyl peroxide, as a paste						
	Di-2,4-dichlorobenzoyl peroxide, as a paste with silicon oil						
	Di-(1-hydroxycyclohexyl) peroxide						
	Dilauroyl peroxide						
	2,5-Dimethyl-2,5-di-(tert-butyl-peroxy)hexyne-3						
	2,5-Dimethyl-2,5-di-(tert-butyl-peroxy) hexane						
	Di-(2 phenoxyethyl) peroxydicarbonate						
	Distearyl peroxydicarbonate						
	Ethyl-3,3-di-(tert-butylperoxy)-butyrate						
	3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononae						
	Tetrahydronaphthyl hydroperoxide						
*	**ORGANIC PEROXIDE TYPE D, SOLID, TEMPERATURE CONTROLLED**	5.2	UN3116	II		P3	**Table A9.3.**7
	Dicetyl peroxydicarbonate						
	Dimyristyl peroxydicarbonate						
	Di-n-nonanoyl peroxide						
	Diperoxy azelaic acid						
	Diperoxy dodecane diacid						
	Disuccinic acid peroxide						
	Di-(3,5,5-trimethyl-1,2-dioxo-lanyl-3)						
	peroxide, as a paste						
*	**ORGANIC PEROXIDE TYPE E, LIQUID**	5.2	UN3107	II		P5	**Table A9.2.**8
	tert-Amyl hydroperoxide						
	Di-tert-amyl peroxide						
	Di-tert-butyl peroxide						
	1,1-Di-(tert-butylperoxy)cyclohexane						
	Di-(tert-butylperoxy)phthalate						
	1,1-Di-(tert-butylperoxy)-3,3,5-trimethyl cyclohexane						
	Methyl ethyl ketone peroxide(s)						
	Peroxyacetic acid, type E, stabilized						

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*	**ORGANIC PEROXIDE TYPE E, LIQUID, TEMPERATURE CONTROLLED**	5.2	UN3117	II		P3	SEE BELOW BY TECHNICAL NAME
	tert-Butyl peroxy-2-ethylhexanonate						**Table A9.2.**8
	Di-n-butyl peroxydicarbonate						**Table A9.2.**8
	Di-(2-ethylhexyl) peroxydicarbonate as a stable dispersion in water						**Table A9.2.**8
	Di-(2-Ethylhexyl) Peroxydicarbonate as a stable dispersion in water (frozen)						**Table A9.3.**8
	Dipropionyl peroxide						**Table A9.2.**8
*	**ORGANIC PEROXIDE TYPE E, SOLID**	5.2	UN3108	II		P5	**Table A9.3.**8
	tert-Butyl monoperoxymaleate, as a paste						
	Dibenzoyl peroxide, as a paste						
*	**ORGANIC PEROXIDE TYPE E, SOLID, TEMPERATURE CONTROLLED**	5.2	UN3118	II		P3	**Table A9.3.**8
*	**ORGANIC PEROXIDE TYPE F, LIQUID**	5.2	UN3109	II		P5	**Table A9.2.**8
	tert-Butylhydroperoxide						
	Cumyl hydroperoxide						
	Dilauroyl peroxide, as a stable dispersion in water						
	Isopropylcumyl hydroperoxide						
	p-Menthyl hydroperoxide						
	Peroxyacetic acid, Type F, stablized						
	Pinanyl hydroperoxide						
*	**ORGANIC PEROXIDE TYPE F, LIQUID TEMPERATURE CONTROLLED**	5.2	UN3119	II		P3	**Table A9.2.**8
	Di-(4-tert-butylcyclohexyl) peroxydicarbonate, as a stable dispersion in water						
	Dicetyl peroxydicarbonate, as a stable dispersion in water						
	Dimyristyl peroxydicarbonate, as a stable dispersion in water						
*	**ORGANIC PEROXIDE TYPE F, SOLID** *Dicumyl peroxide*	5.2	UN3110	II		P5	**Table A9.3.**8
*	**ORGANIC PEROXIDE TYPE F, SOLID, TEMPERATURE CONTROLLED**	5.2	UN3120	II		P3	**Table A9.3.**8
	ORGANIC PIGMENTS, SELF-HEATING	4.2	UN3313	II III		P5 P5	**A8.4.** **A8.4.**
D	**ORGANIC PHOSPHATE MIXED WITH COMPRESSED GAS, ORGANIC PHOSPHATE COMPOUND MIXED WITH COMPRESSED GAS** *or* **ORGANIC PHOSPHORUS COMPOUND MIXED WITH COMPRESSED GAS**	2.3	NA1955			P5	**A7.3.**
*	**ORGANOARSENIC COMPOUND, N.O.S.**	6.1	UN3280	I II III		P5, 5 P5 P5	**A10.6.** **A10.6.** **A10.6.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*	**ORGANOCHLORINE PESTICIDES LIQUID, FLAMMABLE, TOXIC,** *flashpoint less than 23 degrees C*	3	UN2762	I II	6.1 6.1	P3 P4	**A7.3.** **A7.3.**
*	**ORGANOCHLORINE PESTICIDES, LIQUID, TOXIC, FLAMMABLE,** *flashpoint not less than 23 degrees C*	6.1	UN2995	I II III	3 3 3	P3 P4 P5	**A10.5.** **A10.5.** **A10.5.**
*	**ORGANOCHLORINE PESTICIDES, LIQUID, TOXIC**	6.1	UN2996	I II III		P3 P4 P5	**A10.5.** **A10.5.** **A10.5.**
*	**ORGANOCHLORINE PESTICIDES, SOLID, TOXIC**	6.1	UN2761	I II III		P5 P5 P5	**A10.6.** **A10.6.** **A10.6.**
*	**ORGANOMETALLIC COMPOUNDS, WATER-REACTIVE, FLAMMABLE, N.O.S.**	4.3	UN3207	I II III	3 3 3	P3 P4 P5	**A8.3.** **A8.3.** **A8.3.**
*	**ORGANOMETALLIC COMPOUND DISPERSION, WATER-REACTIVE, FLAMMABLE, N.O.S.**	4.3	UN3207	I II III	3 3 3	P3 P4 P5	**A8.3.** **A8.3.** **A8.3.**
*	**ORGANOMETALLIC COMPOUND SOLID, WATER-REACTIVE, FLAMMABLE, N.O.S.**	4.3	UN3327	I II III	3 3 3	P3 P4 P5	**A8.3.** **A8.3.** **A8.3.**
*	**ORGANOMETALLIC COMPOUND SOLUTION, WATER-REACTIVE, FLAMMABLE, N.O.S.**	4.3	UN3207	I II III	3 3 3	P3 P4 P5	**A8.3.** **A8.3.** **A8.3.**
*	**ORGANOMETALLIC COMPOUND, TOXIC, N.O.S.**	6.1	UN3282	I II III		P5 P5 P5	**A10.6.** **A10.6.** **A10.6.**
*	**ORGANOPHOSPHORUS COMPOUND, TOXIC, FLAMMABLE, N.O.S.**	6.1	UN3279	I II	3 3	P3, 5 P4	**A10.5.** **A10.5.**
*	**ORGANOPHOSPHORUS COMPOUND, TOXIC, N.O.S.**	6.1	UN3278	I II III		P3, 5 P4 P5	**A10.5.** **A10.5.** **A10.5.**
*	**ORGANOPHOSPHOROUS PESTICIDES, LIQUID, FLAMMABLE, TOXIC,** *flashpoint less than 23 degrees C*	3	UN2784	I II	6.1 6.1	P3 P4	**A7.3.** **A7.3.**
*	**ORGANOPHOSPHORUS PESTICIDES, LIQUID, TOXIC, FLAMMABLE,** *flashpoint not less than 23 degrees C*	6.1	UN3017	I II III	3 3 3	P3, N76 P4, N76 P5, N76	**A10.5.** **A10.5.** **A10.5.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*	**ORGANOPHOSPHORUS PESTICIDES, LIQUID, TOXIC**	6.1	UN3018	I		P3, N76	**A10.5.**
				II		P4, N76	**A10.5.**
				III		P5, N76	**A10.5.**
*	**ORGANOPHOSPHORUS PESTICIDES, SOLID, TOXIC**	6.1	UN2783	I		P5, N77	**A10.6.**
				II		P5, N77	**A10.6.**
				III		P5, N77	**A10.6.**
	ORGANOTIN COMPOUNDS, LIQUID, N.O.S.	6.1	UN2788	I		P3, A3, N33, N34	**A10.5.**
				II		P4, A3, N33, N34	**A10.5.**
				III		P5	**A10.5.**
	ORGANOTIN COMPOUNDS, SOLID, N.O.S.	6.1	UN3146	I		P5, A5	**A10.6.**
				II		P5	**A10.6.**
				III		P5	**A10.6.**
*	**ORGANOTIN PESTICIDES, LIQUID, FLAMMABLE, TOXIC,** *flashpoint less than 23 degrees C*	3	UN2787	I	6.1	P3	**A7.3.**
				II	6.1	P4	**A7.3.**
*	**ORGANOTIN PESTICIDES, LIQUID, TOXIC, FLAMMABLE,** *flashpoint more than 23 degrees C*	6.1	UN3019	I	3	P3	**A10.5.**
				II	3	P4	**A10.5.**
				III	3	P5	**A10.5.**
*	**ORGANOTIN PESTICIDES, LIQUID, TOXIC**	6.1	UN3020	I		P3	**A10.5.**
				II		P4	**A10.5.**
				III		P5	**A10.5.**
*	**ORGANOTIN PESTICIDES, SOLID, TOXIC**	6.1	UN2786	I		P5	**A10.6.**
				II		P5	**A10.6.**
				III		P5	**A10.6.**
	OSMIUM TETROXIDE	6.1	UN2471	I		P5, A8, N33, N34	**A10.6.**
D	**Other Regulated Substances, LIQUID, N.O.S.**	9	NA3082	III		P5	**A13.3.**
D	**Other Regulated Substances, SOLID, N.O.S.**	9	NA3077	III		P5	**A13.3.**
*	**OXIDIZING LIQUID, CORROSIVE, N.O.S.**	5.1	UN3098	I	8	P3	**A9.7.**
				II	8	P4	**A9.7.**
				III	8	P5	**A9.7.**
*	**OXIDIZING LIQUID, N.O.S.**	5.1	UN3139	I		P3, A2	**A9.7.**
				II		P4, A2	**A9.7.**
				III		P5, A2	**A9.7.**
*	**OXIDIZING LIQUID, TOXIC, N.O.S.**	5.1	UN3099	I	6.1	P3	**A9.7.**
				II	6.1	P4	**A9.7.**
				III	6.1	P5	**A9.7.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*	**OXIDIZING SOLID, CORROSIVE, N.O.S.**	5.1	UN3085	I II III	8 8 8	P5 P5 P5	**A9.8.** **A9.8.** **A9.8.**
*	**OXIDIZING SOLID, FLAMMABLE, N.O.S.**	5.1	UN3137	I	4.1	P4	**A9.10.**
*	**OXIDIZING SOLID, N.O.S.**	5.1	UN1479	I II III		P5 P5 P5	**A9.8.** **A9.8.** **A9.8.**
*	**OXIDIZING SOLID, SELF-HEATING, N.O.S.**	5.1	UN3100	II	4.2	P4	**A9.10.**
*	**OXIDIZING SOLID, TOXIC, N.O.S.**	5.1	UN3087	I II III	6.1 6.1 6.1	P5 P5 P5	**A9.8.** **A9.8.** **A9.8.**
*	**OXIDIZING SOLID, WATER-REACTIVE, N.O.S.**	5.1	UN3121		4.3	P4	**A9.10.**
	OXYGEN, COMPRESSED	2.2	UN1072		5.1	P5	**A6.4., A6.6.**
	OXYGEN DIFLUORIDE. COMPRESSED	2.3	UN2190		5.1, 8	P1, 1	**A6.5.**
	OXYGEN GENERATORS, CHEMICAL	5.1	UN3356	II		P4, 60	**A9.12.**
	OXYGEN, REFRIGERATED LIQUID *(cryogenic liquid)*	2.2	UN1073		5.1	P4	**A6.12.**
	PAINT *(including paint, lacquer, enamel, stain, shellac solutions, varnish, polish, liquid filler, and liquid lacquer base) or* **PAINT RELATED MATERIAL** *(including paint thinning or reducing compounds)*	3	UN1263	I II III		P3 P5 P5	**A7.3.** **A7.3.** **A7.3.**
	PAINT *or* **PAINT RELATED MATERIAL**	8	UN3066	II III		P5 P5	**A12.3.** **A12.3.**
	PAPER, UNSATURATED OIL TREATED *incompletely dried (including carbon paper)*	4.2	UN1379	III		P5	**A8.4.**
	PARAFORMALDEHYDE	4.1	UN2213	III		P5, A1	**A8.4.**
	PARALDEHYDE	3	UN1264	III		P5	**A7.3.**
D	**PARATHION AND COMPRESSED GAS MIXTURE**	2.3	NA1967			P2, 3	**A6.19.**
	PCB, *see* **POLYCHLORINATED BIPHENYLS**						
+	**PENTABORANE**						FORBIDDEN
	PENTACHLOROETHANE	6.1	UN1669	II		P5	**A10.5.**
	PENTACHLOROPHENOL	6.1	UN3155	II		P5	**A10.6.**
	Pentaerythrite Tetranitrate (dry)						FORBIDDEN
	PENTAERYTHRITE TETRANITRATE, WETTED *or* **PENTAERYTHRITOL TETRANITRATE, WETTED** *or* **PETN, WETTED** *with not less than 25% water by mass, or* **PENTAERYTHRITE TETRANITRATE** *or* **PENTAERYTHRITOL TETRANITRATE** *or* **PETN; DESENSITIZED** *with not less than 15% phlegmatizer by mass*	1.1D	UN0150			P4	**A5.9.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	PENTAERYTHRITE TETRANITRATE *or* **PENTAERYTHRITOL TETRANITRATE** *or* **PETN,** *with not less than 7% wax by mass*	1.1D	UN0411			P4	**A5.9.**
*	**PENTAERYTHRITE TETRANITRATE MIXTURE, DESENSITIZED SOLID, N.O.S.***with more than 10% but not more than 20% PETN by mass*	4.1	UN3344	II		P4	**A8.5.**
	PENTAERYTHRITOL TETRANITRATE; *see* **PENTAERYTHRITE TETRANITRATE,** *etc.*						
	PENTAFLUOROETHANE *or* **REFRIGERANT GAS R125**	2.2	UN3220			P5	**A6.4.**, **A6.5.**
	PENTAMETHYLHEPTANE	3	UN2286	III		P5	**A7.3.**
	PENTAN-2,4-DIONE	3	UN2310	III	6.1	P5	**A7.3.**
	PENTANES	3	UN1265	I II		P3 P5	**A7.3.** **A7.3.**
	Pentanitroaniline (dry)						FORBIDDEN
	1-PENTENE (N-AMYLENE)	3	UN1108	I		P3	**A7.3.**
	1-PENTOL	8	UN2705	II		P5	**A12.3.**
	PENTANOLS	3	UN1105	II III		P5 P5	**A7.3.** **A7.3.**
	PENTOLITE, *dry or wetted with less than 15% water by mass*	1.1D	UN0151			P4	**A5.9.**
	PERCHLORATES, INORGANIC, N.O.S.	5.1	UN1481	II III		P5 P5	**A9.8.** **A9.8.**
	PERCHLORATES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.	5.1	UN3211	II		P5	**A9.7.**
	Perchloric Acid, with more than 72% acid by mass						FORBIDDEN
	PERCHLORIC ACID *more than 50% but not more than 72% acid, by mass*	5.1	UN1873	I	8	P3, A2, A3, N41	**A9.7.**
	PERCHLORIC ACID *not more than 50% acid by mass*	8	UN1802	II	5.1	P4, N41	**A12.3.**
	Perchloroethylene; see **TETRACHLOROETHYLENE**						
	PERCHLOROMETHYL MERCAPTAN	6.1	UN1670	I		P2, 2, A3, A7, N34	**A10.7.**
	PERCHLORYL FLUORIDE	2.3	UN3083		5.1	P2, 2	**A6.6.**
	Percussion Caps; *see* **PRIMERS, CAP TYPE**						
	PERFLUORO (ETHYL VINYL ETHER)	2.1	UN3154			P4	**A6.4.**, **A6.5.**, **A6.6.**
	PERFLUORO (METHYL VINYL ETHER)	2.1	UN3153			P4	**A6.4.**, **A6.5.**, **A6.6.**
	Perfluoro-2-butene; see **OCTAFLUOROBUT-2-ENE**						
	PERFUMERY PRODUCTS *with flammable solvents*	3	UN1266	II III		P5 P5	**A7.3.** **A7.3.**
	PERMANGANATES, INORGANIC, N.O.S.	5.1	UN1482	II III		P5, A30 P5, A30	**A9.8.** **A9.8.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	PERMANGANATES, INORGANIC AQUEOUS SOLUTIONS, N.O.S.	5.1	UN3214	II		P5	**A9.7.**
	PEROXIDES, INORGANIC, N.O.S.	5.1	UN1483	II III		P5, A7, A20, N34 P5, A7, A20, N34	**A9.8.** **A9.8.**
	Peroxyacetic acid, more than 43% and with more than 6% hydrogen peroxide						FORBIDDEN
	PERSULFATES, INORGANIC, N.O.S.	5.1	UN3215	III		P5	**A9.8.**
	PERSULFATES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.	5.1	UN3216	III		P5	**A9.7.**
*	**PESTICIDES, LIQUID, FLAMMABLE, TOXIC,** *flashpoint less than 23 degrees C*	3	UN3021	I II	6.1 6.1	P3 P4	**A7.3.** **A7.3.**
*	**PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S.** *flashpoint not less than 23 degrees C*	6.1	UN2903	I II III	3 3 3	P3 P4 P5	**A10.5.** **A10.5.** **A10.5.**
*	**PESTICIDES, LIQUID, TOXIC, N.O.S.**	6.1	UN2902	I II III		P3 P4 P5	**A10.5.** **A10.5.** **A10.5.**
*	**PESTICIDES, SOLID, TOXIC, N.O.S.**	6.1	UN2588	I II III		P5 P5 P5	**A10.6.** **A10.6.** **A10.6.**
	PETN; *see* **PENTAERYTHRITE TETRANITRATE**						
	PETN/TNT; *see* **PENTOLITE,** *etc*						
	PETROL; *see* **GASOLINE**						
	PETROLEUM CRUDE OIL	3	UN1267	I II III		P3 P5 P5	**A7.3.** **A7.3.** **A7.3.**
	PETROLEUM DISTILLATES, N.O.S. *or* **PETROLEUM PRODUCTS, N.O.S.**	3	UN1268	I II III		P3 P5 P5	**A7.3.** **A7.3.** **A7.3.**
	PETROLEUM GASES, LIQUEFIED *or* **LIQUEFIED PETROLEUM GAS**	2.1	UN1075			P4	**A6.4.**, **A6.7.**
D	**PETROLEUM OIL**	3	NA1270	I II III		P3 P5 P5	**A7.3.** **A7.3.** **A7.3.**
	PHENACYL BROMIDE	6.1	UN2645	II		P5	**A10.6.**
+	**PHENETIDINES**	6.1	UN2311	III		P5	**A10.5.**
	PHENOLATES, *liquid*	8	UN2904	III			
	PHENOL, MOLTEN						FORBIDDEN
+	**PHENOL, SOLID**	6.1	UN1671	II		P5, N78	**A10.6.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	PHENOL SOLUTIONS	6.1	UN2821	II III		P5 P5	**A10.5.** **A10.5.**
	PHENOLSULFONIC ACID, LIQUID	8	UN1803	II		P5, N41	**A12.3.**
*	**PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC** *(flashpoint less than 23 degrees C)*	3	UN3346	I II	6.1 6.1	P3 P4	**A7.3.** **A7.3.**
*	**PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC**	6.1	UN3348	I II III		P3 P4 P5	**A10.5.** **A10.5.** **A10.5.**
*	**PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC** *(flashpoint not less than 23 degrees C)*	6.1	UN3347	I II III	3 3 3	P3 P4 P5	**A10.5.** **A10.5.** **A10.5.**
*	**PHENOXYACETIC ACID DERIVATIVE PESTICIDE, SOLID, TOXIC**	6.1	UN3345	I II III		P5 P5 P5	**A10.6.** **A10.6.** **A10.6.**
	PHENYLACETONITRILE, LIQUID	6.1	UN2470	III		P5	**A10.5.**
	PHENYLACETYL CHLORIDE	8	UN2577	II		P5	**A12.3.**
	PHENYLCARBYLAMINE CHLORIDE	6.1	UN1672	I		P2, 2	**A10.7.**
	PHENYL CHLOROFORMATE	6.1	UN2746	II	8	P4	**A10.5.**
	m-Phenylene diaminediperchlorate (dry)						FORBIDDEN
+	**PHENYLENEDIAMINES** *(o-,m-,p-)*	6.1	UN1673	III		P5	**A10.6.**
	PHENYLHYDRAZINE	6.1	UN2572	II		P5	**A10.5.**
	PHENYL ISOCYANATE	6.1	UN2487	II	3	P2, 2, N33, N34	**A10.7.**
	PHENYL MERCAPTAN	6.1	UN2337	I	3	P2, 2	**A10.7.**
	PHENYLMERCURIC ACETATE	6.1	UN1674	II		P5	**A10.6.**
	PHENYLMERCURIC COMPOUNDS, N.O.S.	6.1	UN2026	I II III		P5 P5 P5	**A10.6.** **A10.6.** **A10.6.**
	PHENYLMERCURIC HYDROXIDE	6.1	UN1894	II		P5	**A10.6.**
	PHENYLMERCURIC NITRATE	6.1	UN1895	II		P5	**A10.6.**
	PHENYL PHOSPHORUS DICHLORIDE	8	UN2798	II		P4	**A12.3.**
	PHENYL PHOSPHOROUS THIODICHLORIDE	8	UN2799	II		P4	**A12.3.**
	PHENYLTRICHLOROSILANE	8	UN1804	II		P4, A7, N34	**A12.3.**
	PHOSGENE	2.3	UN1076		8	P1, 1	**A6.16.**
	9-PHOSPHABICYCLONONANES *or* **CYCLOOCTADIENE PHOSPHINES**	4.2	UN2940	II		P5, A19	**A8.4.**
	PHOSPHINE	2.3	UN2199		2.1	P1, 1	**A6.16.**
	Phosphoric acid triethyleneimine; *see* **TRIS-(1-AZIRIDIYL)**						
	PHOSPHINE OXIDE, SOLUTION *Phosphoric Anhydride; see* **PHOSPHORUS PENTOXIDE**						

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	PHOSPHORIC ACID	8	UN1805	III		P5, A7, N34	**A12.3.**
	PHOSPHOROUS ACID	8	UN2834	III		P5	**A12.4.**
	PHOSPHORUS, AMORPHOUS	4.1	UN1338	III		P5, A1, A19	**A8.4.**
	PHOSPHORUS HEPTASULPHIDE, *free from yellow or white phosphorus*	4.1	UN1339	II		P5, A20, N34	**A8.4.**
	PHOSPHORUS OXYBROMIDE	8	UN1939	II		P5, N41, N43	**A12.4.**
	PHOSPHORUS OXYBROMIDE, MOLTEN						FORBIDDEN
+	**PHOSPHORUS OXYCHLORIDE**	8	UN1810	II	6.1	P2, 2, A7, N34	**A12.12.**
	PHOSPHORUS PENTABROMIDE	8	UN2691	II		P4, A7, N34	**A12.3.**
	PHOSPHORUS PENTACHLORIDE	8	UN1806	II		P4, A7, N34	**A12.3.**
	PHOSPHORUS PENTAFLUORIDE	2.3	UN2198		8	P1, 2	**A6.5.**, **A6.6.**
	PHOSPHORUS PENTASULPHIDE, *free from yellow or white phosphorus*	4.3	UN1340	II	4.1	P5, A20	**A8.4.**
	PHOSPHORUS PENTOXIDE	8	UN1807	II		P4, A7, N34	**A12.4.**
	PHOSPHORUS SESQUISULPHIDE, *free from yellow or white phosphorus*	4.1	UN1341	II		P5, A20, N34	**A8.4.**
	PHOSPHORUS TRIBROMIDE	8	UN1808	II		P4, A3, A6, A7, N34, N43	**A12.3.**
	PHOSPHORUS TRICHLORIDE	6.1	UN1809	I	8	P2, 2, N34	**A12.12.**
	PHOSPHORUS TRIOXIDE	8	UN2578	III		P5	**A12.4.**
	PHOSPHORUS TRISULPHIDE, *free from yellow or white phosphorus*	4.1	UN1343	II		P5, A20, N34	**A8.4.**
	PHOSPHORUS WHITE, MOLTEN						FORBIDDEN
	Phosphorus (white or red) and a chlorate, mixtures of						FORBIDDEN
	PHOSPHORUS, WHITE DRY *or* **PHOSPHORUS, WHITE, UNDER WATER** *or* **PHOSPHORUS WHITE IN SOLUTION** *or* **PHOROSPHORUS YELLOW DRY** *or* **PHOROSPHORUS YELLOW UNDER WATER** *or* **PHOROSPHORUS YELLOW IN SOLUTION**	4.2	UN1381	I	6.1	P3, N34	**A8.17.**
	Phosphoryl Chloride; see **PHOSPHORUS OXYCHLORIDE**						
	PHTHALIC ANHYDRIDE *with more than .05% maleic anhydride*	8	UN2214	III		P5	**A12.4.**
	PICOLINES	3	UN2313	III		P5	**A7.3.**
	Picramide see **TRINITROANILINE**						
	Picric Acid; *see* **TRINITROPHENOL**, *etc*						
D	**PICRIC ACID, WET,** *with not less than 10% water*	4.1	NA1344	I		P3, A19, A20, N41	**A8.4.**
	Picrite;see **NITROGUANIDINE,** *etc*						
	Picryk Chloride; see **TRINITROCHLOROBENZENE**						
	ALPHA-PINENE	3	UN2368	III		P5	**A7.3.**
	PINE OIL	3	UN1272	III		P5	**A7.3.**
	PIPERAZINE	8	UN2579	III		P5	**A12.4.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	PIPERIDINE	8	UN2401	I	3	P4	**A12.3.**
	Pivaloyl Chloride; *see* **TRIMETHYLACETYL CHLORIDE**						
	PLASTIC MOULDING COMPOUND *in dough, sheet, or extruded rope form evolving flammable vapor*	9	UN3314	III		P5	**A13.16.**
*	**PLASTICS, NITROCELLULOSE BASED, SELF- HEATING, N.O.S.**	4.2	UN2006	III		P2	**A8.4.**
	Plastic solvent, n.o.s.; see **FLAMMABLE LIQUIDS, N.O.S**.						
	Poisonous gases, *n.o.s.; see* **COMPRESSED** *or* **LIQUEFIED GASES, FLAMMABLE** *or* **TOXIC, N.O.S.**						
*	**POLYALKYLAMINES, FLAMMABLE, CORROSIVE, N.O.S.**	3	UN2733	I II III	8 8 8	P3 P5 P5	**A7.3.** **A7.3.** **A7.3.**
*	**POLYALKYLAMINES, LIQUID, CORROSIVE, N.O.S.**	8	UN2735	I II III		P5 P5 P5	**A12.3.** **A12.3.** **A12.3.**
*	**POLYALKYLAMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S.**	8	UN2734	I II	3 3	P5 P5	**A12.3.** **A12.3.**
*	**POLYALKYLAMINES, SOLID, CORROSIVE, N.O.S.**	8	UN3259	I II III		P5 P5 P5	**A12.4.** **A12.4.** **A12.4.**
	POLYCHLORINATED BIPHENYLS, LIQUID	9	UN2315	II		P5, 9	**A13.3.**
	POLYCHLORINATED BIPHENYLS, SOLID	9	UN2315	II		P5, 9	**A13.3.**
	POLYESTER RESIN KIT	3	UN3269	II III		P5 P5	**A7.7.** **A7.7.**
	POLYHALOGENATED BIPHENYLS, LIQUID *or* **POLYHALOGENATED TERPHENYLS, LIQUID**	9	UN3151	II		P5	**A13.3.**
	POLYHALOGENATED BIPHENYLS, SOLID, *or* **POLYHALOGENATED TERPHENYLS, SOLIDS**	9	UN3152	II		P5	**A13.3.**
	POLYMERIC BEADS, EXPANDABLE, *evolving flammable vapor*	9	UN2211	III		P5	**A13.16.**
	POTASSIUM	4.3	UN2257	I		P3, A19, A20, N6, N34	**A8.4.**
	POTASSIUM ARSENATE	6.1	UN1677	II		P5	**A10.6.**
	POTASSIUM ARSENITE	6.1	UN1678	II		P5	**A10.6.**
	Potassium bisulfite solution, see **BISULFITES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.**						
	POTASSIUM BOROHYDRIDE	4.3	UN1870	I		P3, A19, N40	**A8.4.**
	POTASSIUM BROMATE	5.1	UN1484	II		P5	**A9.8.**
	Potassium Carbonyl						FORBIDDEN

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	POTASSIUM CHLORATE	5.1	UN1485	II		P5, A9, N34	**A9.8.**
	POTASSIUM CHLORATE, AQUEOUS SOLUTION	5.1	UN2427	II III		P5, A2 P5, A2	**A9.7.** **A9.7.**
	POTASSIUM CUPROCYANIDE	6.1	UN1679	II		P5	**A10.6.**
	POTASSIUM CYANIDE	6.1	UN1680	I		P5, N74, N75	**A10.6.**
	POTASSIUM DITHIONITE *or* **POTASSIUM HYDROSULFITE**	4.2	UN1929	II		P5, A8, A19, A20	**A8.4.**
	POTASSIUM FLUORIDE	6.1	UN1812	III		P5	**A10.6.**
	POTASSIUM FLUOROACETATE	6.1	UN2628	I		P5	**A10.6.**
	POTASSIUM FLUOROSILICATE	6.1	UN2655	III		P5	**A10.6.**
	Potassium hydrate; see **POTASSIUM HYDROXIDE, SOLID**						
	Potassium hydrogen fluoride; see **POTASSIUM HYDROGENDIFLUORIDE**						
	POTASSIUM HYDROGENDIFLUORIDE, *solid or solution*	8	UN1811	II	6.1	P5, N3, N34	**A12.3.**, **A12.4.**
	Potassium hydrogen fluoride solution; see **CORROSIVE LIQUID, N.O.S.**						
	POTASSIUM HYDROGEN SULPHATE	8	UN2509	II		P5, A7,N34	**A12.4.**
	Potassium Hydrosulfite; see **POTASSIUM DITHIONITE**						
	POTASSIUM, HYDROXIDE, SOLID	8	UN1813	II		P5	**A12.4.**
	POTASSIUM HYDROXIDE, SOLUTION	8	UN1814	II III		P5 P5	**A12.3.** **A12.3.**
	Potassium hypochlorite, solution, see **HYPOCHLORITE SOLUTIONS,** *etc*						
	POTASSIUM, METAL ALLOYS	4.3	UN1420	I		P3, A19, A20	**A8.4.**
	Potassium metal, liquid alloy; see **ALKALI METAL ALLOYS, LIQUID**						
	POTASSIUM METAVANADATE	6.1	UN2864	II		P5	**A10.6.**
	POTASSIUM MONOXIDE	8	UN2033	II		P5	**A12.4.**
	POTASSIUM NITRATE	5.1	UN1486	III		P5, A1, A29	**A9.8.**
	POTASSIUM NITRATE AND SODIUM NITRITE MIXTURES	5.1	UN1487	II		P5	**A9.8.**
	POTASSIUM NITRITE	5.1	UN1488	II		P5	**A9.8.**
	POTASSIUM PERCHLORATE, *solid or solution*	5.1	UN1489	II		P5	**A9.7.**, **A9.8.**
	POTASSIUM PERMANGANATE	5.1	UN1490	II		P5	**A9.8.**
	POTASSIUM PEROXIDE	5.1	UN1491	I		P5, A20, N34	**A9.8.**
	POTASSIUM PERSULFATE	5.1	UN1492	III		P5, A1, A29	**A9.8.**
	POTASSIUM PHOSPHIDE	4.3	UN2012	I	6.1	P3, A19, N40	**A8.4.**
	POTASSIUM SALTS OF AROMATIC NITRO-DERIVATIVES, *explosive*	1.3C	UN0158			P4	A5.69
	Potassium selenate; *see* **SELENATES**						
	Potassium selenite; see **SELENITES**						

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	POTASSIUM SODIUM ALLOYS	4.3	UN1422	I		P3, A19 N34, N40	**A8.3.**
	POTASSIUM SULPHIDE, **ANHYDROUS** *or* **POTASSIUM SULPHIDE** *with less than 30% water of crystallization*	4.2	UN1382	II		P5, A19, A20, N34	**A8.4.**
	POTASSIUM SULPHIDE, HYDRATED *with not less than 30% water of crystallization*	8	UN1847	II		P5	**A12.4.**
	POTASSIUM SUPEROXIDE	5.1	UN2466	I		P5, A20	**A9.8.**
	POWDER CAKE, WETTED, *or* **POWDER PASTE, WETTED** *with not less than 17% alcohol by mass*	1.1C	UN0433			P4	**A5.8.**
	POWDER CAKE, WETTED, *or* **POWDER PASTE, WETTED** *with not less than 25% water, by mass*	1.3C	UN0159			P4	**A5.8.**
	Powder Paste, see **POWDER CAKE**						
	POWDER, SMOKELESS	1.1C	UN0160			P4, A69	**A5.12.**
	POWDER, SMOKELESS	1.3C	UN0161			P4, A69	**A5.12.**
	Power device,explosive;see **CARTRIDGES, POWER DEVICE**						
	PRIMERS, CAP TYPE	1.4S	UN0044			P5, A69	**A5.19.**
	PRIMERS, CAP TYPE	1.1B	UN0377			P4, A69	**A5.19.**
	PRIMERS, CAP TYPE	1.4B	UN0378			P5, A69	**A5.19.**
	Primers small arms, see **PRIMERS, CAP TYPE**						
	PRIMERS, TUBULAR	1.3G	UN0319			P4	**A5.19.**
	PRIMERS, TUBULAR	1.4G	UN0320			P5	**A5.19.**
	PRIMERS, TUBULAR	1.4S	UN0376			P5, A69	**A5.19.**
	PRINTING INK, *flammable*	3	UN1210	I II III		P3 P5 P5	**A7.3.** **A7.3.** **A7.3.**
	Projectiles illuminating;see **AMMUNITION, ILLUMINATING,** *etc*						
	PROJECTILES, *inert with tracer*	1.4S	UN0345			P5, A69	**A5.15.**
	PROJECTILES, *inert, with tracer*	1.3G	UN0424			P4	**A5.15.**
	PROJECTILES, *inert, with tracer*	1.4G	UN0425			P5	**A5.15.**
	PROJECTILES, *with burster or expelling charge*	1.2D	UN0346			P4	**A5.15.**
	PROJECTILES, *with burster or expelling charge*	1.4D	UN0347			P5	**A5.15.**
	PROJECTILES, *with burster or expelling charge*	1.2F	UN0426			P4	**A5.15.**
	PROJECTILES, *with burster or expelling charge*	1.2G	UN0434			P4	**A5.15.**
	PROJECTILES, *with burster or expelling charge*	1.4F	UN0427			P5	**A5.15.**
	PROJECTILES, *with burster or expelling charge*	1.4G	UN0435			P5	**A5.15.**
	PROJECTILES, *with bursting charge*	1.4D	UN0344			P5	**A5.15.**
	PROJECTILES, *with bursting charge*	1.1D	UN0168			P4	**A5.15.**
	PROJECTILES, *with bursting charge*	1.1F	UN0167			P4	**A5.15.**
	PROJECTILES, *with bursting charge*	1.2D	UN0169			P4	**A5.15.**
	PROJECTILES, *with bursting charge*	1.2F	UN0324			P4	**A5.15.**

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	PROPADIENE, STABILIZED	2.1	UN2200			P4	**A6.5.**
	PROPANE, *see also* **PETROLEUM GASES, LIQUEFIED**	2.1	UN1978			P4	**A6.4.**, **A6.7.**
	PROPANETHIOLS	3	UN2402	II		P5	**A7.3.**
	N-PROPANOL *or* **PROPYL ALCOHOL, NORMAL**	3	UN1274	II III		P5 P5	**A7.3.** **A7.3.**
	PROPELLANT, LIQUID	1.3C	UN0495			P4	**A5.13.**
	PROPELLANT, LIQUID	1.1C	UN0497			P4	**A5.13.**
	PROPELLANT, SOLID	1.1C	UN0498			P4	**A5.12.**
	PROPELLANT, SOLID	1.3C	UN0499			P4	**A5.12.**
	PROPIONALDEHYDE	3	UN1275	II		P5	**A7.3.**
	PROPIONIC ACID	8	UN1848	III		P5	**A12.3.**
	PROPIONIC ANHYDRIDE	8	UN2496	III		P5	**A12.3.**
	PROPIONITRILE	3	UN2404	II	6.1	P4	**A7.3.**
	PROPIONYL CHLORIDE	3	UN1815	II	8	P5	**A7.3.**
	N-PROPYL ACETATE	3	UN1276	II		P5	**A7.3.**
	PROPYLAMINE	3	UN1277	II	8	P5, N34	**A7.3.**
	N-PROPYL BENZENE	3	UN2364	III		P5	**A7.3.**
	PROPYL CHLORIDE	3	UN1278	II		P5, N34	**A7.3.**
	N-PROPYL CHLOROFORMATE	6.1	UN2740	I	3, 8	P2, 2, A3, A6, A7, N34	**A10.7.**
	PROPYLENE *see also* **PETROLEUM GASES, LIQUEFIED**	2.1	UN1077			P4	**A6.4.**, **A6.5.**
	PROPYLENE CHLOROHYDRIN	6.1	UN2611	II	3	P5	**A10.5.**
	1,2-PROPYLENEDIAMINE	8	UN2258	II	3	P5, A3, A6, N34	**A12.4.**
	PROPYLENEIMINE, STABILIZED	3	UN1921	I	6.1	P3, A3, N34	**A7.3.**
	PROPYLENE OXIDE	3	UN1280	I		P3, A3, N34	**A7.3.**
	PROPYLENE TETRAMER	3	UN2850	III		P5	**A7.3.**
	PROPYL FORMATES	3	UN1281	II		P5	**A7.3.**
	N-PROPYL ISOCYANATE	6.1	UN2482	I	3	P1, 1	**A10.7.**
	N-PROPYL NITRATE	3	UN1865	II		P5	**A7.3.**
	PROPYLTRICHLOROSILANE	8	UN1816	II	3	P5, A7, N34	**A12.3.**
	PYRETHROID PESTICIDE, LIQUID, FLAMMABLE, TOXIC *(flashpoint less than 23 degrees C)*	3	UN3350	I II	6.1 6.1	P3 P4	**A7.3.** **A7.3.**
	PYRETHROID PESTICIDE, LIQUID, TOXIC	6.1	UN3352	I II III		P3 P4 P5	**A10.6.** **A10.6.** **A10.6.**
	PYRETHROID PESTICIDE, LIQUID, TOXIC, FLAMMABLE *(flashpoint not less than 23 degrees C)*	6.1	UN3351	I II III	3 3 3	P3 P4 P5	**A10.5.** **A10.5.** **A10.5.**

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	PYRETHROID PESTICIDE, SOLID, TOXIC	6.1	UN3349	I II III		P5 P5 P5	**A10.6.** **A10.6.** **A10.6.**
	PYRIDINE	3	UN1282	II		P4	**A7.3.**
	Pyridine perchlorate						FORBIDDEN
*	**PYROPHORIC LIQUIDS, ORGANIC, N.O.S.**	4.2	UN2845	I		P3	**A8.6.**
*	**PYROPHORIC LIQUIDS, INORGANIC, N.O.S.**	4.2	UN3194	I		P3	**A8.6.**
*	**PYROPHORIC METALS, N.O.S.,** *or* **PYROPHORIC ALLOYS, N.O.S.**	4.2	UN1383	I		P3	**A8.12.**
*	**PYROPHORIC SOLIDS, ORGANIC, N.O.S.**	4.2	UN2846	I		P3	**A8.12.**
*	**PYROPHORIC SOLIDS, INORGANIC, N.O.S**.	4.2	UN3200	I		P3	**A8.12.**
*	**PYROPHORIC ORGANOMETALLIC COMPOUNDS, WATER-REACTIVE, N.O.S.**	4.2	UN3203	I	4.3	P3	**A8.12.**
	PYROSULFURYL CHLORIDE	8	UN1817	II		P5	**A12.3.**
	PYRROLIDINE	3	UN1922	II	8	P5	**A7.3.**
	Quebrachitol pentanitrate						FORBIDDEN
	Quicklime; see **CALCIUM OXIDE**						
	QUINOLINE	6.1	UN2656	III		P5	**A10.5.**
	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-ARTICLES MANUFACTURED FROM NATURAL URANIUM OR DEPLETED URANIUM OR NATURAL THORIUM	7	UN2909				**A11.12.**, **A11.16.**
	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-EMPTY PACKAGING	7	UN2908				**A11.12.**, **1.10.3.**
	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE-INSTRUMENTS OR ARTICLES	7	UN2911				**A11.12.**, **A11.14.**
	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE- LIMITED QUANTITY OF MATERIAL	7	UN2910			P5	**A11.11.**, **A11.12.**
	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I) non fissile or fissile-excepted	7	UN2912			A56	**A11.17.**
	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II) non fissile or fissile-excepted	7	UN3321			A56	**A11.17.**
	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-III) non fissile or fissile-excepted	7	UN3322			A56	**A11.17.**
	RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I OR SCO-II) non fissile or fissile-excepted	7	UN2913			A56	**A11.17.**
	RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT non fissile or fissile-excepted	7	UN2919			139, A56	
	RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT, FISSILE	7	UN3331			139, A56	
	RADIOACTIVE MATERIAL, TYPE A PACKAGE, FISSILE non-special form	7	UN3327			A56	**A11.8.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	RADIOACTIVE MATERIAL, TYPE A PACKAGE non-special form**,** non fissile or fissile-excepted	7	UN2915			A56	**A11.6.**
	RADIOACTIVE MATERIAL,TYPE A PACKAGE, SPECIAL FORM non fissile or fissile-excepted	7	UN3332			A56	**A11.6.**, **A3.3.7.5.**
	RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, FISSILE	7	UN3333			A56	**A11.8.**, **A3.3.7.5.**
	RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE, FISSILE	7	UN3329			A56	**A11.8.**
	RADIOACTIVE MATERIAL,TYPE B(M) PACKAGE non fissile or fissile-excepted	7	UN2917			A56	**A11.7.**
	RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, FISSILE	7	UN3328			A56	**A11.8.**
	RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE non fissile or fissile-excepted	7	UN2916			A56	**A11.7.**
	RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE non fissile or fissile-excepted	7	UN2978			A56	**A11.17.**, **A11.18.**
	RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, FISSILE	7	UN2977				**A11.8.**, **A11.18.**
	Railway torpedo, see **SIGNALS, RAILWAY TRACK, EXPLOSIVE**						
	RARE GASES AND NITROGEN MIXTURES, COMPRESSED	2.2	UN1981			P5	**A6.4.**, **A6.6.**
	RARE GASES AND OXYGEN MIXTURES, COMPRESSED	2.2	UN1980			P5	**A6.4.**, **A6.6.**
	RARE GASES MIXTURES, COMPRESSED	2.2	UN1979			P5	**A6.4.**, **A6.6.**
	RDX AND HMX MIXTURES, WETTED *with not more than 15% water by mass or* **RDX AND HMX MIXTURES, DESENSITIZED** *with not less than 10% phlegmatizer by mass*						FORBIDDEN
	RECEPTACLES, SMALL, CONTAINING GAS (gas cartridges) *nonflammable, without release device, not refillable and not exceeding 1L capacity*	2.2	UN2037			P5	**A6.4.**, **A6.5.**
	RECEPTACLES, SMALL, CONTAINING GAS (gas cartridges) *flammable without release device, not refillable and not exceeding 1L capacity*	2.1	UN2037			P5	**A6.4.**, **A6.5.**
	Red Phosphorus, see **PHOSPHORUS, AMORPHUS**						
	REFRIGERANT GAS R12 *or* **DICHLORODIFLUOROMETHANE**	2.2	UN1028			P5	**A6.4.**, **A6.5.**
	REFRIGERANT GAS R12B1 *or* **CHLORODIFLUOROBROMO-METHANE**	2.2	UN1974			P5	**A6.4.**, **A6.5.**
	REFRIGERANT GAS R13 *or* **CHLOROTRIFLUOROMETHANE**	2.2	UN1022			P5	**A6.4.**, **A6.5.**
	REFRIGERANT GAS R13B1 *or* **BROMOTRIFLUOROMETHANE**	2.2	UN1009			P5	**A6.4.**, **A6.5.**
	REFRIGERANT GAS R14 *or* **TETRAFLUOROMETHANE**	2.2	UN1982			P5	**A6.6.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	REFRIGERANT GAS R21 *or* **DICHLOROFLUOROMETHANE**	2.2	UN1029			P5	**A6.4., A6.5.**
	REFRIGERANT GAS R22 *or* **CHLORODIFLUOROMETHANE**	2.2	UN1018			P5	**A6.4., A6.5.**
	REFRIGERANT GAS R23 *or* **TRIFLUOROMETHANE**	2.2	UN1984			P5	**A6.4., A6.5.**
	REFRIGERANT GAS R32 *or* **DIFLUOROMETHANE**	2.1	UN3252			P4	**A6.4., A6.6.**
	REFRIGERANT GAS R40 *or* **METHYL CHLORIDE**	2.1	UN1063			P4	**A6.4., A6.5.**
	REFRIGERANT GAS R41 *or* **METHYL FLUORIDE**	2.1	UN2454			P4	**A6.4., A6.5.**
	REFRIGERANT GAS R114 *or* **DICHLOROTETRAFLUOROETHANE**	2.2	UN1958			P5	**A6.4., A6.5.**
	REFRIGERANT GAS R115 *or* **CHLOROPENTAFLUOROETHANE**	2.2	UN1020			P5	**A6.4., A6.5.**
	REFRIGERANT GAS R116 *or* **HEXAFLUOROETHANE**	2.2	UN2193			P5	**A6.4., A6.5.**
	REFRIGERANT GAS R124 or **CHLOROTETRAFLUOROETHANE**	2.2	UN1021			P5	**A6.4., A6.5.**
	REFRIGERANT GAS R125 *or* **PENTAFLUOROETHANE**	2.2	UN3220			P5	**A6.4., A6.5.**
	REFRIGERANT GAS R133A *or* **CHLOROTRIFLUOROETHANE**	2.2	UN1983			P5	**A6.4., A6.5.**
	REFRIGERANT GAS R134A *or* **1,1,1,2-TETRAFLUOROETHANE**	2.2	UN3159			P5	**A6.4., A6.5.**
	REFRIGERANT GAS 142B *or* **1-CHLORO-1,1-DIFLUOROETHANE**	2.1	UN2517			P4	**A6.4., A6.5.**
	REFRIGERANT GAS 143A *or* **1,1,1-TRIFLUOROETHANE**	2.1	UN2035			P4	**A6.4., A6.5.**
	REFRIGERANT GAS 152A *or* **DIFLUOROETHANE**	2.1	UN1030			P4	**A6.4., A6.5.**
	REFRIGERANT GAS 161 *or* **ETHYL FLUORIDE**	2.1	UN2453			P4	**A6.4., A6.5.**
	REFRIGERANT GAS 218 *or* **OCTAFLUOROPROPANE**	2.2	UN2424			P5	**A6.5.**
	REFRIGERANT GAS 227 *or* **HEPTAFLUOROPROPANE**	2.2	UN3296			P5	**A6.4., A6.5.**
	REFRIGERANT GAS R404A	2.2	UN3337			P5	**A6.4., A6.5.**
	REFRIGERANT GAS R407A	2.2	UN3338			P5	**A6.4., A6.5.**
	REFRIGERANT GAS R407B	2.2	UN3339			P5	**A6.4., A6.5.**
	REFRIGERANT GAS R407C	2.2	UN3340			P5	**A6.4., A6.5.**
	REFRIGERANT GAS R500 *or* **DICHLORODIFLUOROMETHANE AND DIFLUOROETHANE AZEOTROPIC MIXTURE**	2.2	UN2602			P5	**A6.4., A6.5.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	REFRIGERANT GAS R502 *or* **CHLOROPENTAFLUOROETHANE MIXTURE**	2.2	UN1973			P5	**A6.4., A6.5.**
	REFRIGERANT GAS R503 *or* **CHLOROTRIFLUOROMETHANE AND TRIFLUOROMETHANE AZEOTROPIC MIXTURE**	2.2	UN2599			P5	**A6.4., A6.5.**
	REFRIGERANT GAS R1132A *or* **1,1-DIFLUOROETHYLENE**	2.1	UN1959			P4	**A6.4., A6.5.**
	REFRIGERANT GAS R1216 *or* **HEXAFLUOROPROPYLENE**	2.2	UN1858			P5	**A6.4., A6.5.**
	REFRIGERANT GAS R1318 *or* **OCTAFLUOROBUT-2-ENE**	2.2	UN2422			P5	**A6.5.**
	REFRIGERANT GAS RC318 *or* **OCTAFLUOROCYCLOBUTANE**	2.2	UN1976			P5	**A6.5.**
*	**REFRIGERANT GASES, N.O.S.**	2.2	UN1078			P5	**A6.4., A6.5.**
D	**REFRIGERANT GASES, N.O.S.** *or* **DISPERSANT GASES, N.O.S.**	2.1	NA1954			P4	**A6.4., A6.5.**
D	**REFRIGERATING MACHINE**	3	NA1993	III		P5	**A7.4.**
D	**REFRIGERATING MACHINES,** *containing flammable nonpoisonous, liquefied gas*	2.1	NA1954			P4	**A6.4., A6.9.**
	REFRIGERATING MACHINES, *containing nonflammable non-toxic,liquefied gas or ammonia solutions*	2.2	UN2857			P5	**A6.4., A6.9.**
	REGULATED MEDICAL WASTE	6.2	UN3291	II		P5	**A10.11.**
	RELEASE DEVICES, EXPLOSIVE	1.4S	UN0173			P5, A69	**A5.20.**
	RESIN SOLUTION, *flammable*	3	UN1866	I II III		P3 P5 P5	**A7.3.** **A7.3.** **A7.3.**
	RESORCINOL	6.1	UN2876	III		P5	**A10.6.**
	Rifle grenade, see **GRENADES,** *hand or rifle, etc.*						
	Rifle powder, see **POWDER, SMOKELESS**						
	RIVETS, EXPLOSIVE	1.4S	UN0174			P5, A69	**A5.20.**
	ROCKET MOTORS	1.3C	UN0186			P4, 109	**A5.15.**
	ROCKET MOTORS	1.1C	UN0280			P4, 109	**A5.15.**
	ROCKET MOTORS	1.2C	UN0281			P4, 109	**A5.15.**
	ROCKET MOTORS, LIQUID FUELED	1.2J	UN0395			P2, 109	**A5.6.**
	ROCKET MOTORS, LIQUID FUELED	1.3J	UN0396			P2, 109	**A5.6.**
	ROCKET MOTORS WITH HYPERGOLIC LIQUIDS *with or without an expelling charge*	1.3L	UN0250			P2, 109	**A5.6.**
	ROCKET MOTORS WITH HYPERGOLIC LIQUIDS *with or without an expelling charge*	1.2L	UN0322			P2, 109	**A5.6.**
	ROCKETS, LINE-THROWING	1.4G	UN0453			P5	**A5.15.**
	ROCKETS, LINE-THROWING	1.2G	UN0238			P4	**A5.15.**
	ROCKETS, LINE-THROWING	1.3G	UN0240			P4	**A5.15.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ROCKETS, LIQUID FUELED *with bursting charge*	1.2J	UN0398			P2, A500	**A5.6.**
	ROCKETS, LIQUID FUELED *with bursting charge*	1.1J	UN0397			P2, A500	**A5.6.**
	ROCKETS, *with bursting charge*	1.1F	UN0180			P4	**A5.15.**
	ROCKETS, *with bursting charge*	1.1E	UN0181			P4	**A5.15.**
	ROCKETS, *with bursting charge*	1.2E	UN0182			P4	**A5.15.**
	ROCKETS, *with bursting charge*	1.2F	UN0295			P4	**A5.15.**
	ROCKETS, *with expelling charge*	1.2C	UN0436			P4	**A5.15.**
	ROCKETS, *with expelling charge*	1.3C	UN0437			P4	**A5.15.**
	ROCKETS, *with expelling charge*	1.4C	UN0438			P5	**A5.15.**
	ROCKETS, *with inert head*	1.3C	UN0183			P4	**A5.15.**
	ROCKETS, *with inert head*	1.2C	UN0502			P4	**A5.15.**
	ROSIN OIL	3	UN1286	II III		P5 P5	**A7.3.** **A7.3.**
	RUBBER SCRAP *or* **RUBBER SHODDY**, *powdered or granulated, not exceeding 840 microns & rubber Content exceeding 45%*						
	RUBBER SOLUTION	3	UN1287	II III		P5 P5	**A7.3.** **A7.3.**
	RUBIDIUM	4.3	UN1423	I		P3, 22, A7, A19, N34, N40, N45	**A8.4.**
	RUBIDIUM HYDROXIDE	8	UN2678	II		P5	**A12.4.**
	RUBIDIUM HYDROXIDE SOLUTION	8	UN2677	II III		P5 P5	**A12.3.** **A12.3.**
	Safety fuse, see **FUSE, SAFETY**						
*	**SAMPLES, EXPLOSIVE**, *other than initiating explosives*	use class/ division of sample	UN0190	II		P4, 113	**A5.6.**
	SEED CAKE, *containing vegetable oil solvent extractions and expelled seeds, with not more than 10% of oil and when the amount of moisture is higher than 11%, not more than 20% of oil and moisture combined*	4.2	UN1386	III		P5, N7	**A8.4.**
	SEED CAKE *with more than 1.5% oil and not more than 11% moisture*	4.2	UN1386	III		P5, N7	**A8.4.**
	SEED CAKE *with not more than 1.5% oil and not more than 11% moisture*	4.2	UN2217	III		P5, N7	**A8.4.**
	SELENATES *or* **SELENITES**	6.1	UN2630	I		P5	**A10.6.**
	SELENIC ACID	8	UN1905	I		P3, N34	**A12.4.**
	SELENIUM COMPOUND, N.O.S.	6.1	UN3283	I II III		P5 P5 P5	**A10.6.** **A10.6.** **A10.6.**
	SELENIUM DISULPHIDE	6.1	UN2657	II		P5	**A10.6.**
	SELENIUM HEXAFLUORIDE	2.3	UN2194		8	P1, 1	**A6.6.**

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Selenium nitride						FORBIDDEN
D	**SELENIUM OXIDE**	6.1	NA2811	I		P5	**A10.6.**
	SELENIUM OXYCHLORIDE	8	UN2879	I	6.1	P3, A3, A6, A7, N34	**A12.3.**
+, D	**SELF-DEFENSE SPRAY, NON-PRESSURIZED**	9	NA3334			P5, A37	**A13.3.**
*	**SELF-HEATING LIQUID, CORROSIVE, INORGANIC, N.O.S.**	4.2	UN3188	II III	8 8	P4 P5	**A8.3.** **A8.3.**
*	**SELF-HEATING LIQUID, CORROSIVE, ORGANIC, N.O.S.**	4.2	UN3185	II III	8 8	P4 P5	**A8.3.** **A8.3.**
*	**SELF-HEATING LIQUID, INORGANIC, N.O.S.**	4.2	UN3186	II III		P4 P5	**A8.3.** **A8.3.**
*	**SELF-HEATING LIQUID, ORGANIC, N.O.S.**	4.2	UN3183	II III		P4 P5	**A8.3.** **A8.3.**
*	**SELF-HEATING LIQUID, TOXIC, INORGANIC, N.O.S.**	4.2	UN3187	II III	6.1 6.1	P4 P5	**A8.3.** **A8.3.**
*	**SELF-HEATING LIQUID, TOXIC, ORGANIC, N.O.S.**	4.2	UN3184	II III	6.1 6.1	P4 P5	**A8.3.** **A8.3.**
*	**SELF-HEATING SOLID, CORROSIVE, INORGANIC, N.O.S.**	4.2	UN3192	II III	8 8	P5 P5	**A8.4.** **A8.4.**
*	**SELF-HEATING SOLID, CORROSIVE, ORGANIC, N.O.S.**	4.2	UN3126	II III	8 8	P5 P5	**A8.4.** **A8.4.**
*	**SELF-HEATING SOLID, INORGANIC, N.O.S.**	4.2	UN3190	II III		P5 P5	**A8.4.** **A8.4.**
*	**SELF-HEATING SOLID, ORGANIC, N.O.S.**	4.2	UN3088	II III		P5 P5	**A8.4.** **A8.4.**
*	**SELF-HEATING SOLID, OXIDIZING, N.O.S.**	4.2	UN3127		5.1	P3	**A8.5.**
*	**SELF-HEATING SOLID, TOXIC, INORGANIC, N.O.S.**	4.2	UN3191	II III	6.1 6.1	P5 P5	**A8.4.** **A8.4.**
*	**SELF-HEATING SOLID, TOXIC, ORGANIC, N.O.S.**	4.2	UN3128	II III	6.1 6.1	P5 P5	**A8.4.** **A8.4.**
*	**SELF-REACTIVE LIQUID TYPE B**						FORBIDDEN
*	**SELF-REACTIVE LIQUID TYPE C** *(specific technical name required)*	4.1	UN3223	II		P5	**A8.8.**
*	**SELF-REACTIVE LIQUID TYPE D** *(specific technical name required)*	4.1	UN3225	II		P5	**A8.8.**
*	**SELF-REACTIVE LIQUID TYPE E** *(specific technical name required)*	4.1	UN3227	II		P5	**A8.8.**
*	**SELF-REACTIVE LIQUID TYPE F** *(specific technical name required)*	4.1	UN3229	II		P5	**A8.8.**
*	**SELF-REACTIVE LIQUID TYPE B, TEMPERATURE CONTROLLED** *(specific technical name required)*						FORBIDDEN

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*	**SELF-REACTIVE LIQUID TYPE C TEMPERATURE CONTROLLED** *(specific technical name required)*						FORBIDDEN
*	**SELF-REACTIVE LIQUID TYPE D, TEMPERATURE CONTROLLED** *(specific technical name required)*						FORBIDDEN
*	**SELF-REACTIVE LIQUID TYPE E, TEMPERATURE CONTROLLED** *(specific technical name required)*						FORBIDDEN
*	**SELF-REACTIVE LIQUID TYPE F, TEMPERATURE CONTROLLED** *(specific technical name required)*						FORBIDDEN
*	**SELF-REACTIVE SOLID TYPE B***(see below for specific technical name)*	4.1	UN3222	II		P5, 53	(see technical name below for packaging para-graph reference)
	2-diazo-1-naphthol-4-sulphochloride						**A8.10.**
	2-diazo-1-naphthol-5-sulphochloride						**A8.10.**
*	**SELF-REACTIVE SOLID TYPE C** *(see below for specific technical name)*	4.1	UN3224	II		P5	(see technical name below for packaging para-graph reference)
	n,n'-dinitroso-n,n'-dimethyl terephthalamide, as a paste						**A8.7.**
	n,n'-dinitrosopentamethylenetetramine						**A8.8.**
*	**SELF-REACTIVE SOLID TYPE D** *(see below for specific technical name)*	4.1	UN3226	II		P5	(see technical name below for packaging para- graph reference)
	1,1'-azodi-(hexahydrobenzonitrile)						**A8.8.**
	benzene-1,3-disulphohydrazide as a paste						**A8.8.**
	benzene sulphohydrazide						**A8.8.**
	4-(benzyl(ethyl)amino)- 3-ethoxybenzenediazonium zinc chloride						FORBIDDEN
	3-chloro-4-diethylamino-benzenediazonium zinc chloride						**A8.9.**
	diphenyloxide-4,4'-disulphohydrazide						**A8.7.**
	4-dipropylaminobenzenediazonium zinc chloride 4-methylbenzene sulphonylhydrazide						**A8.9.**
	sodium 2-diazo-1-naphthol-4-sulphonate						**A8.9.**
	sodium 2-diazo-1-naphthol-5-sulphonate						**A8.9.**
*	**SELF-REACTIVE SOLID TYPE E,** *(specific technical name required)*	4.1	UN3228	II		P5	**A8.9.**
*	**SELF-REACTIVE SOLID TYPE F,** *(specific technical name required)*	4.1	UN3230	II		P5	**A8.9.**
*	**SELF-REACTIVE SOLID TYPE B, TEMPERATURE CONTROLLED** *(specific technical name required)*						FORBIDDEN

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*	**SELF-REACTIVE SOLID TYPE C**, **TEMPERATURE CONTROLLED***(specific technical name required)*						FORBIDDEN
*	**SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED** *(specific technical name required)*						FORBIDDEN
*	**SELF-REACTIVE SOLID TYPE E, TEMPERATURE CONTROLLED** (*specific technical name required)*						FORBIDDEN
*	**SELF-REACTIVE SOLID TYPE F, TEMPERATURE CONTROLLED** *(specific technical name required)*						FORBIDDEN
	SHALE OIL	3	UN1288	I II III		P3 P5 P5	**A7.3.** **A7.3.** **A7.3.**
	Shaped Charges, commercial, see **CHARGES, SHAPED, COMMERCIAL**, *etc*						
	SIGNAL DEVICES, HAND	1.4G	UN0191			P5, A69	**A5.21.**
	SIGNAL DEVICES, HAND	1.4S	UN0373			P5, A69	**A5.21.**
	SIGNALS, DISTRESS, *ship*	1.1G	UN0194			P4, A69	**A5.21.**
	SIGNALS, DISTRESS, *ship*	1.3G	UN0195			P4, A69	**A5.21.**
	Signals, highway, see **SIGNAL DEVICES, HAND; FIREWORKS TYPE D**						
	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.1G	UN0192			P4, A69	**A5.21.**
	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.3G	UN0492			P4, A69	**A5.21.**
	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.4G	UN0493			P5, A69	**A5.21.**
	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.4S	UN0193			P5, A69	**A5.21.**
	Signals, ship distress, water-activated; see **CONTRIVANCES, WATER-ACTIVATED**, *etc*						
	SIGNALS, SMOKE	1.1G	UN0196			P4	**A5.21.**
	SIGNALS, SMOKE	1.2G	UN0313			P4	**A5.21.**
	SIGNALS, SMOKE	1.4G	UN0197			P5	**A5.21.**
	SIGNALS, SMOKE	1.3G	UN0487			P4	**A5.21.**
	SILANE	2.1	UN2203			P4	**A6.6.**
	SILICON POWDER, AMORPHOUS	4.1	UN1346	III		P5, A1	**A8.4.**
	SILICON TETRACHLORIDE	8	UN1818	II		P5, A3, A6	**A12.3.**
	SILICON TETRAFLUORIDE	2.3	UN1859		8	P2, 2	**A6.6.**
	Silver acetylide (dry)						FORBIDDEN
	SILVER ARSENITE	6.1	UN1683	II		P5	**A10.6.**
	Silver azide (dry)						FORBIDDEN
	Silver chlorite (dry)						FORBIDDEN
	SILVER CYANIDE	6.1	UN1684	II		P5	**A10.6.**
	Silver fulminate (dry)						FORBIDDEN
	SILVER NITRATE	5.1	UN1493	II		P5	**A9.8.**
	Silver oxadate (dry)						FORBIDDEN

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Silver picrate (dry)						FORBIDDEN
	SILVER PICRATE, WETTED, *with not less than 30% water, by mass*	4.1	UN1347	I		P3	**A8.4.**
	SLUDGE, ACID	8	UN1906	II		P5, A3, A7, N34	**A12.3.**
D	**SMOKELESS POWDER FOR SMALL ARMS** *(100 pounds or less)*	4.1	NA3178	I		P4	**A8.18.**
	SODA LIME *with more than 4% sodium hydroxide*	8	UN1907	III		P5	**A12.4.**
	SODIUM	4.3	UN1428	I		P3, A7, A8, A19, A20, N34	**A8.4.**
	SODIUM ALUMINATE, SOLID	8	UN2812	III		P5	**A12.4.**
	SODIUM ALUMINATE, SOLUTION	8	UN1819	II III		P5 P5	**A12.3.** **A12.3.**
	SODIUM ALUMINUM HYDRIDE	4.3	UN2835	II		P5, A8, A19, A20	**A8.4.**
	SODIUM AMMONIUM VANADATE	6.1	UN2863	II		P5	**A10.6.**
	SODIUM ARSANILATE	6.1	UN2473	III		P5	**A10.6.**
	SODIUM ARSENATE	6.1	UN1685	II		P5	**A10.6.**
	SODIUM ARSENITE, AQUEOUS SOLUTIONS	6.1	UN1686	II III		P5 P5	**A10.5.** **A10.5.**
	SODIUM ARSENITE, SOLID	6.1	UN2027	II		P5	**A10.6.**
	SODIUM AZIDE	6.1	UN1687	II		P5	**A10.6.**
	Sodium bifluoride, see **SODIUM HYDROGENFLUORIDE**						
	SODIUM BOROHYDRIDE and SODIUM HYDROXIDE SOLUTION *with no more than 12% sodium borohydride and not more than 40% sodium hydroxide by mass*	8	UN3320	II III		P5, N34 P5, N34	**A12.3.** **A12.3.**
	SODIUM BOROHYDRIDE	4.3	UN1426	I		P3, N40	**A8.4.**
	SODIUM BROMATE	5.1	UN1494	II		P5	**A9.8.**
	SODIUM CACODYLATE	6.1	UN1688	II		P5	**A10.6.**
	SODIUM CHLORATE	5.1	UN1495	II		P5, A9, N34	**A9.8.**
	SODIUM CHLORATE, AQUEOUS SOLUTION	5.1	UN2428	II III		P5, A2 P5, A2	**A9.7.** **A9.7.**
	SODIUM CHLORITE	5.1	UN1496	II		P5, A9, N34	**A9.8.**
	SODIUM CHLOROACETATE	6.1	UN2659	III		P5	**A10.6.**
	SODIUM CUPROCYANIDE, SOLID	6.1	UN2316	I		P5	**A10.6.**
	SODIUM CUPROCYANIDE, SOLUTION	6.1	UN2317	I		P3	**A10.5.**
	SODIUM CYANIDE	6.1	UN1689	I		P5, N74, N75	**A10.6.**
	SODIUM DINITRO-O-CRESOLATE, *dry or wetted, with less than 15% water, by mass*	1.3C	UN0234			P4	**A5.12.**
	SODIUM DINITRO-O-CRESOLATE, WETTED, *with not less than 15% water, by mass*	4.1	UN1348	I	6.1	P4, 23, A8, A19, A20,N41	**A8.4.**
	SODIUM DITHIONITE *or* **SODIUM HYDROSULFITE**	4.2	UN1384	II		P5, A19, A20	**A8.4.**
	SODIUM FLUORIDE	6.1	UN1690	III		P5	**A10.6.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	SODIUM FLUOROACETATE	6.1	UN2629	I		P5	**A10.6.**
	SODIUM FLUOROSILICATE	6.1	UN2674	III		P5	**A10.6.**
	SODIUM HYDRIDE	4.3	UN1427	I		P3, A19, N40	**A8.4.**
	SODIUM HYDROGENDIFLUORIDE, *solid or solution*	8	UN2439	II		P5, N3, N34	**A12.3.**, **A12.4.**
	SODIUM HYDROSULPHIDE, *with less than 25% water of crystallization*	4. 2	UN2318	II		P5, A7, A19, A20	**A8.4.**
	SODIUM HYDROSULPHIDE, *with not less than 25% water of crystallization*	8	UN2949	II		P5, A7	**A12.4.**
	SODIUM HYDROSULFITE; *see* **SODIUM DITHIONITE**						
	SODIUM HYDROXIDE, SOLID	8	UN1823	II		P5	**A12.4.**
	SODIUM HYDROXIDE, SOLUTION	8	UN1824	II III		P5, N34 P5, N34	**A12.3.** **A12.3.**
	SODIUM METHYLATE	4.2	UN1431	II	8	P5, A19	**A8.4.**
	SODIUM METHYLATE SOLUTIONS *in alcohol*	3	UN1289	II III	8 8	P5 P5	**A7.3.** **A7.3.**
	SODIUM MONOXIDE	8	UN1825	II		P5	**A12.4.**
	SODIUM NITRATE	5.1	UN1498	III		P5, A1, A29	**A9.8.**
	SODIUM NITRATE AND POTASSIUM NITRATE MIXTURES	5.1	UN1499	III		P5, A1, A29	**A9.8.**
	SODIUM NITRITE	5.1	UN1500	III	6.1	P5, A1, A29	**A9.8.**
	SODIUM PENTACHLOROPHENATE	6.1	UN2567	II		P5	**A10.6.**
	SODIUM PERCARBONATES	5.1	UN2467	III		P5, 27, A1, A29	**A9.8.**
	SODIUM PERCHLORATE	5.1	UN1502	II		P5	**A9.8.**
	SODIUM PERMANGANATE	5.1	UN1503	II		P5	**A9.8.**
	SODIUM PEROXIDE	5.1	UN1504	I		P3, A20, N34	**A9.8.**
	SODIUM PEROXOBORATE, ANHYDROUS	5.1	UN3247	II		P5	**A9.8.**
	SODIUM PERSULPHATE	5.1	UN1505	III		P5, A1	**A9.8.**
	SODIUM PHOSPHIDE	4.3	UN1432	I	6.1	P3, A19, N40	**A8.4.**
	SODIUM PICRAMATE, *dry or wetted, with less than 20% water, by mass*	1.3C	UN0235			P3	**A5.12.**
	SODIUM PICRAMATE, WETTED, *with not less than 20% water, by mass*	4.1	UN1349	I		P4, 23, A8, A19, N41	**A8.4.**
	Sodium picryl peroxide						FORBIDDEN
	Sodium selenate; see **SELENATES** *or* **SELENITES**						
	SODIUM SULPHIDE, ANHYDROUS *or* **SODIUM SULPHIDE** *with less than 30% water of crystallization*	4.2	UN1385	II		P5, A19, A20, N34	**A8.4.**
	SODIUM SULPHIDE, HYDRATED *with at least 30% water*	8	UN1849	II		P5	**A12.4.**
	SODIUM SUPEROXIDE	5.1	UN2547	I		P5, A20, N34	**A9.8.**
	Sodium tetranitride						FORBIDDEN
*	**SOLIDS CONTAINING CORROSIVE LIQUID, N.O.S.**	8	UN3244	II		P5, 49	**A12.4.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*	**SOLIDS CONTAINING FLAMMABLE LIQUID, N.O.S.**	4.1	UN3175	II		P5, 47	**A8.4.**
*	**SOLIDS CONTAINING TOXIC LIQUID, N.O.S.**	6.1	UN3243	II		P5, 48	**A10.6.**
	SOUNDING DEVICES, EXPLOSIVE	1.2F	UN0204			P4	**A5.20.**
	SOUNDING DEVICES, EXPLOSIVE	1.1F	UN0296			P4	**A5.20.**
	SOUNDING DEVICES, EXPLOSIVE	1.1D	UN0374			P4	**A5.20.**
	SOUNDING DEVICES, EXPLOSIVE	1.2D	UN0375			P4	**A5.20.**
	STANNIC CHLORIDE, ANHYDROUS	8	UN1827	II		P5	**A12.3.**
	STANNIC CHLORIDE, PENTAHYDRATE	8	UN2440	III		P5	**A12.4.**
	STANNIC PHOSPHIDES	4.3	UN1433	I	6.1	P3, A19, N40	**A8.4.**
	STIBINE	2.3	UN2676		2.1	P1, 1	**A6.5.**
	Storage batteries, wet, see **BATTERIES,** *wet,etc.*						
	STRONTIUM ARSENITE	6.1	UN1691	II		P5	**A10.6.**
	STRONTIUM CHLORATE	5.1	UN1506	II		P5, A1, A9, N34	**A9.8.**
	STRONTIUM NITRATE	5.1	UN1507	III		P5, A1, A29	**A9.8.**
	STRONTIUM PERCHLORATE	5.1	UN1508	II		P5	**A9.8.**
	STRONTIUM PEROXIDE	5.1	UN1509	II		P5	**A9.8.**
	STRONTIUM PHOSPHIDE	4.3	UN2013	I	6.1	P3, A19, N40	**A8.4.**
	STRYCHNINE *or* **STRYCHNINE SALTS**	6.1	UN1692	I		P5	**A10.6.**
	STYRENE MONOMER, STABILIZED	3	UN2055	III		P5	**A7.3.**
*	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.1L	UN0357			P3, 101	**A5.6.**
*	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.2L	UN0358			P3, 101	**A5.6.**
*	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.3L	UN0359			P3, 101	**A5.6.**
*	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.1A	UN0473			P3, 101, 111	**A5.6.**
*	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.1C	UN0474			P4, 101	**A5.6.**
*	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.1D	UN0475			P4, 101	**A5.6.**
*	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.1G	UN0476			P4, 101	**A5.6.**
*	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.3C	UN0477			P4, 101	**A5.6.**
*	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.3G	UN0478			P4, 101	**A5.6.**
*	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.4C	UN0479			P5, 101	**A5.6.**
*	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.4D	UN0480			P5, 101	**A5.6.**
*	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.4S	UN0481			P5, 101, A69	**A5.6.**
*	**SUBSTANCES, EXPLOSIVE, N.O.S.**	1.4G	UN0485			P5, 101	**A5.6.**
*	**SUBSTANCES, EXPLOSIVE, VERY INSENSITIVE, N.O.S.** *or* **SUBSTANCES EVI, N.O.S.**	1.5D	UN0482			P5, 101	**A5.6.**
*	**SUBSTITUTED NITROPHENOL PESTICIDES, LIQUID, FLAMMABLE, TOXIC** *flashpoint less than 23 degrees C*	3	UN2780	I II	6.1 6.1	P3 P4	**A7.3.** **A7.3.**
*	**SUBSTITUTED NITROPHENOL PESTICIDES, LIQUID, TOXIC**	6.1	UN3014	I II III		P3 P4 P5	**A10.5.** **A10.5.** **A10.5.**

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*	**SUBSTITUTED NITROPHENOL PESTICIDES, LIQUID, TOXIC, FLAMMABLE** *flashpoint not less than 23 degrees C*	6.1	UN3013	I II III	3 3 3	P3 P4 P5	**A10.5.** **A10.5.** **A10.5.**
*	**SUBSTITUTED NITROPHENOL PESTICIDES, SOLID, TOXIC**	6.1	UN2779	I II III		P5 P5 P5	**A10.6.** **A10.6.** **A10.6.**
	Sucrose octanitrate (dry)						FORBIDDEN
	SULPHAMIC ACID	8	UN2967	III		P5	**A12.4.**
D	**SULPHUR**	9	NA1350	III		P5	**A13.3.**
	SULPHUR	4.1	UN1350	III		P5, 30	**A8.4.**
	Sulphur and chlorate, loose mixtures of						FORBIDDEN
	SULPHUR CHLORIDES	8	UN1828	I		P2, 5, A3, N34	**A12.3.**
	Sulphur dichloride, see **SULPHUR CHLORIDES**						
	SULPHUR DIOXIDE, LIQUEFIED	2.3	UN1079		8	P2, 3	**A6.5.**
	Sulphur dioxide solution, see **SULPHUROUS ACID**						
	SULPHUR HEXAFLUORIDE	2.2	UN1080			P5	**A6.4.**, **A6.5.**
	SULPHURIC ACID *with more than 51% acid*	8	UN1830	II		P4, A3, A7, N34	**A12.3.**
	SULPHURIC ACID, *not more than 51% acid*	8	UN2796	II		P5, A3, A7 N6, N34	**A12.3.**
+	**SULPHURIC ACID, FUMING** *with less than 30% free sulfur trioxide*	8	UN1831	I		P3, A3, A7, N34	**A12.12.**
	SULPHURIC ACID, FUMING *with 30% or more free sulfur trioxide*						FORBIDDEN
	SULPHURIC ACID, SPENT	8	UN1832	II		P4, A3, A7, N34	**A12.3.**
	Sulphuric anhydride, see **SULFUR TRIOXIDE, STABILIZED**						
	SULPHUR, MOLTEN						FORBIDDEN
	SULPHUROUS ACID	8	UN1833	II		P5	**A12.3.**
	SULPHUR TETRAFLUORIDE	2.3	UN2418		8	P1, 1	**A6.6.**
+	**SULPHUR TRIOXIDE, STABILIZED**	8	UN1829	I	6.1	P2, 2, A7, N34	**A12.12.**
+	**SULPHURYL CHLORIDE**	8	UN1834	I	6.1	P1, 1, A3, N34	**A12.12.**
	SULPHURYL FLUORIDE	2.3	UN2191			P2, 4	**A6.5.**
	TARS, LIQUID, *including road asphalt and oils, bitumen and cut backs*	3	UN1999	II III		P5 P5	**A7.3.** **A7.3.**
	TEAR GAS CANDLES	6.1	UN1700	II	4.1	P4	**A10.8.**
	Tear gas cartridges, see **AMMUNITION, TEAR-PRODUCING,** *etc*						
D,*	**TEAR GAS DEVICES**, *with more than 2% tear gas substance, by mass*	6.1	NA1693	I II		P4 P4	**A10.8.** **A10.8.**
	Tear gas grenades, see **TEAR GAS CANDLES**						
*	**TEAR GAS SUBSTANCES LIQUID, N.O.S.**	6.1	UN1693	I II		P3 P5	**A10.5.** **A10.5.**

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*	**TEAR GAS SUBSTANCES, SOLID, N.O.S.**	6.1	UN1693	I II		P5 P5	**A10.6.** **A10.6.**
	TELLURIUM COMPOUND, N.O.S.	6.1	UN3284	I II III		P5 P5 P5	**A10.6.** **A10.6.** **A10.6.**
	TELLURIUM HEXAFLUORIDE	2.3	UN2195		8	P1, 1	**A6.6.**
	TERPENE HYDROCARBONS, N.O.S.	3	UN2319	III		P5	**A7.3.**
	TERPINOLENE	3	UN2541	III		P5	**A7.3.**
	Tetraazido benzene quinone						FORBIDDEN
	TETRABROMOETHANE	6.1	UN2504	III		P5	**A10.5.**
	1,1,2,2-TETRACHLOROETHANE	6.1	UN1702	II		P5, N36	**A10.5.**
	TETRACHLOROETHYLENE	6.1	UN1897	III		P5, N36	**A10.5.**
	Tetraethylammonium perchlorate (dry)						FORBIDDEN
	TETRAETHYL DITHIOPYROPHOSPHATE	6.1	UN1704	II		P5	**A10.6.**
	TETRAETYLENEPENTAMINE	8	UN2320	III		P5	**A12.3.**
	TETRAETHYL SILICATE	3	UN1292	III		P5	**A7.3.**
	1,1,1,2-TETRAFLUOROETHANE *or* **REFRIGERANT GAS R134A**	2.2	UN3159			P5	**A6.4.**, **A6.5.**
	TETRAFLUOROETHYLENE, STABILIZED	2.1	UN1081			P4	**A6.4.**, **A6.5.**
	TETRAFLUOROMETHANE *or* **REFRIGERANT GAS R14**	2.2	UN1982			P5	**A6.6.**
	1,2,3,6-TETRAHYDROBENZALDEHYDE	3	UN2498	III		P5	**A7.3.**
	TETRAHYDROFURAN	3	UN2056	II		P5	**A7.3.**
	TETRAHYDROFURFURYLAMINE	3	UN2943	III		P5	**A7.3.**
	TETRAHYDROPHTHALIC ANHYDRIDES *with more than 0.05% of maleic anhydride*	8	UN2698	III		P5	**A12.4.**
	1,2,3,6-TETRAHYDROPYRIDINE	3	UN2410	II		P5	**A7.3.**
	TETRAHYDROTHIOPHENE	3	UN2412	II		P5	**A7.3.**
	TETRAMETHYLAMMONIUM HYDROXIDE	8	UN1835	II		P5	**A12.3.**
	Tetramethylene diperoxide dicarbamide						FORBIDDEN
	TETRAMETHYLSILANE	3	UN2749	I		P3	**A7.3.**
	TETRANITROANILINE	1.1D	UN0207			P4	**A5.10.**
	Tetranitro diglycerin						FORBIDDEN
+	**TETRANITROMETHANE**						FORBIDDEN
	2,3,4,6-Tetranitrophenol						FORBIDDEN
	2,3,4,6-Tetranitrophenyl methyl nitramine						FORBIDDEN
	2,3,4,6-Tetranitrophenylnitramine						FORBIDDEN
	Tetranitroresorcinol (dry)						FORBIDDEN
	2,3,5,6-Tetranitroso-1,4-dinitrobenzene						FORBIDDEN
	2,3,5,6-Tetranitroso nitrobenzene (dry)						FORBIDDEN
	TETRAPROPYLORTHOTITANATE	3	UN2413	III		P5	**A7.3.**
	TETRAZENE, *see* **GUANYL NITROSAMINOGUANYLTETRAZENE**						

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Tetrazine						FORBIDDEN
	Tetrazolyl azide (dry)						FORBIDDEN
	TETRAZOL-1-ACETIC ACID	1.4C	UN0407			P5	**A5.12.**
	TETRYL, *see* **TRINITROPHENYLMETHYL-NITRAMINE**						
	THALLIUM CHLORATE	5.1	UN2573	II	6.1	P5	**A9.8.**
	THALLIUM COMPOUNDS, N.O.S.	6.1	UN1707	II		P5	**A10.6.**
	THALLIUM NITRATE	6.1	UN2727	II	5.1	P5	**A10.6.**
	4-THIAPENTANAL	6.1	UN2785	III		P5	**A10.5.**
	THIOACETIC ACID	3	UN2436	II		P5	**A7.3.**
*	**THIOCARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC,** *flashpoint less than 23 degrees C*	3	UN2772	I II	6.1 6.1	P3 P5	**A7.3.** **A7.3.**
*	**THIOCARBAMATE PESTICIDE, LIQUID, TOXIC**	6.1	UN3006	I II III		P3 P4 P5	**A10.5.** **A10.5.** **A10.5.**
*	**THIOCARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC,** *flashpoint not less than 23 degrees C*	6.1	UN3005	I II III	3 3 3	P3 P4 P5	**A10.5.** **A10.5.** **A10.5.**
*	**THIOCARBAMATE PESTICIDE, SOLID, TOXIC**	6.1	UN2771	I II III		P5 P5 P5	**A10.6.** **A10.6.** **A10.6.**
	Thiocarbonylchloride, see **THIOPHOSGENE**						
	THIOGLYCOL	6.1	UN2966	II		P5	**A10.5.**
	THIOGLYCOLIC ACID	8	UN1940	II		P5, A7, N34	**A12.3.**
	THIOLACTIC ACID	6.1	UN2936	II		P5	**A10.6.**
	THIONYL CHLORIDE	8	UN1836	I		P3, A7, N34	**A12.3.**
	THIOPHENE	3	UN2414	II		P5	**A7.3.**
+	**THIOPHOSGENE**	6.1	UN2474	II		P2, 2, A7, N33, N34	**A10.7.**
	THIOPHOSPHORYL CHLORIDE	8	UN1837	II		P4, A3, A7, N34	**A12.3.**
	THIOREA DIOXIDE	4.2	UN3341	II III		P5 P5	**A8.4.** **A8.4.**
	Tin chloride, fuming, see **STANNIC CHLORIDE, ANHYDROUS**						
	TINCTURES, MEDICINAL	3	UN1293	II III		P5 P5	**A7.3.** **A7.3.**
	Tinning flux, see **ZINC CHLORIDE**						
	Tin perchloride or Tin tetrachloride, see **STANNIC CHLORIDE, ANHYDROUS**						
	TITANIUM DISULPHIDE	4.2	UN3174	III		P5	**A8.4.**
	TITANIUM HYDRIDE	4.1	UN1871	II		P5, A19, A20, N34	**A8.4.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	TITANIUM POWDER, DRY	4.2	UN2546	I II III		P3 P5, A19, A20, N5, N34 P5	**A8.4.** **A8.4.** **A8.4.**
	TITANIUM POWDER, WETTED, *with not less than 25% water (a visible excess of water must be present) (a) mechanically produced, particle size less than 53 microns; (b) chemically produced, particle size less than 840 microns)*	4.1	UN1352	II		P5, A19, A20, N34	**A8.4.**
	TITANIUM SPONGE GRANULES *or* **TITANIUM SPONGE POWDERS**	4.1	UN2878	III		P5, A1	**A8.4.**
+	**TITANIUM TETRACHLORIDE**	8	UN1838	II	6.1	P2, 2, A3, A6	**A12.12.**
	TITANIUM TRICHLORIDE MIXTURES	8	UN2869	II III		P5, A7, N34 P5, A7, N34	**A12.4.** **A12.4.**
	TITANIUM TRICHLORIDE, PYROPHORIC, *or* **TITANIUM TRICHLORIDEMIXTURES, PYROPHORIC**	4.2	UN2441	I	8	P3, A7,A8, A19, A20, N34	**A8.6.**
	TNT mixed with aluminium, see **TRITONAL**						
	TNT, *see* **TRINITROTOLUENE**, *etc.*						
	TOLUENE	3	UN1294	II		P5	**A7.3.**
+	**TOLUENE DIISOCYANATE**	6.1	UN2078	II		P5	**A10.5.**
+	**TOLUIDINES, LIQUID** *or* **SOLID**	6.1	UN1708	II		P5	**A10.5.**, **A10.6.**
+	**2,4-TOLUYLENEDIAMINE** *or* **2,4-TOLUTENEDIAMINE**	6.1	UN1709	III		P5	**A10.6.**
	TORPEDOES, LIQUID FUELED, *with inert head*	1.3J	UN0450			P3	**A5.6.**
	TORPEDOES, LIQUID FUELED, *with or without bursting charge*	1.1J	UN0449			P3	**A5.6.**
	TORPEDOES, *with bursting charge*	1.1E	UN0329			P4	**A5.15.**
	TORPEDOES, *with bursting charge*	1.1F	UN0330			P4	**A5.15.**
	TORPEDOES, *with bursting charge*	1.1D	UN0451			P4	**A5.15.**
*	**TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S.**	6.1	UN3289	I II	8 8	P3 P4	**A10.5.** **A10.5.**
*	**TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S.,** *Inhalation Hazard, Packing Group I, Zone A*	6.1	UN3289	I	8	P1, 1	**A10.7.**
*	**TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S.,** *Inhalation Hazard, Packing Group I, Zone B*	6.1	UN3289	I	8	P2, 2	**A10.7.**
*	**TOXIC LIQUIDS, CORROSIVE, ORGANIC, N.O.S.**	6.1	UN2927	I II	8 8	P3 P4	**A10.5.** **A10.5.**
*	**TOXIC LIQUIDS, CORROSIVE, ORGANIC,N.O.S.,** *Inhalation Hazard Packing Group I, Zone A*	6.1	UN2927	I	8	P1, 1	**A10.7.**
*	**TOXIC LIQUIDS, CORROSIVE, ORGANIC, N.O.S.,** *Inhalation Hazard Packing Group I, Zone B*	6.1	UN2927	I	8	P2, 2	**A10.7.**
*	**TOXIC LIQUIDS, FLAMMABLE, ORGANIC, N.O.S.**	6.1	UN2929	I II	3 3	P3 P4	**A10.5.** **A10.5.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*	**TOXIC LIQUIDS, FLAMMABLE, ORGANIC, N.O.S.,** *Inhalation Hazard Packing Group I, Zone A*	6.1	UN2929	I	3	P1, 1	**A10.7.**
*	**TOXIC LIQUIDS, FLAMMABLE, ORGANIC, N.O.S.,** *Inhalation Hazard, Packing Group I, Zone B*	6.1	UN2929	I	3	P2, 2	**A10.7.**
*	**TOXIC LIQUID, INORGANIC, N.O.S.**	6.1	UN3287	I II III		P3 P4 P5	**A10.5.** **A10.5.** **A10.5.**
*	**TOXIC LIQUID, INORGANIC, N.O.S.,** *Inhalation Hazard, Packing Group I, Zone A*	6.1	UN3287	I		P1, 1	**A10.7.**
*	**TOXIC LIQUID, INORGANIC, N.O.S.,** *Inhalation Hazard, Packing Group I, Zone B*	6.1	UN3287	I		P2, 2	**A10.7.**
*	**TOXIC LIQUIDS, ORGANIC, N.O.S.**	6.1	UN2810	I II III		P3 P4 P5	**A10.5.** **A10.5.** **A10.5.**
*	**TOXIC LIQUIDS, ORGANIC, N.O.S.,** *Inhalation Hazard, Packing Group I, Zone A*	6.1	UN2810	I		P1, 1	**A10.7.**
*	**TOXIC LIQUIDS, ORGANIC, N.O.S.,** *Inhalation Hazard, Packing Group I, Zone B*	6.1	UN2810	I		P2, 2	**A10.7.**
*	**TOXIC LIQUIDS, OXIDIZING, N.O.S.**	6.1	UN3122	I II	5.1 5.1	P3, A4 P4	**A10.5.** **A10.5.**
*	**TOXIC LIQUIDS, OXIDIZING, N.O.S.,** *Inhalation Hazard, Packing Group I, Zone A*	6.1	UN3122	I	5.1	P1, 1	**A10.7.**
*	**TOXIC LIQUIDS, OXIDIZING, N.O.S.,** *Inhalation Hazard, Packing Group I, Zone B*	6.1	UN3122	I	5.1	P2, 2	**A10.7.**
*	**TOXIC LIQUIDS, WATER-REACTIVE, N.O.S.**	6.1	UN3123	I II	4.3 4.3	P3, A4 P4	**A10.5.** **A10.5.**
*	**TOXIC LIQUIDS, WATER-REACTIVE, N.O.S.,**, *Inhalation Hazard, Packing Group I, Zone A*	6.1	UN3123	I	4.3	P1, 1	**A10.7.**
*	**TOXIC LIQUIDS, WATER-REACTIVE, N.O.S.,**, *Inhalation Hazard, Packing Group I, Zone B*	6.1	UN3123	I	4.3	P2, 2	**A10.7.**
*	**TOXIC SOLID, CORROSIVE, INORGANIC, N.O.S.**	6.1	UN3290	I II	8 8	P5 P5	**A10.6.** **A10.6.**
*	**TOXIC SOLID, INORGANIC, N.O.S.**	6.1	UN3288	I II III		P5 P5 P5	**A10.6.** **A10.6.** **A10.6.**
*	**TOXIC SOLIDS, CORROSIVE, ORGANIC, N.O.S.**	6.1	UN2928	I II	8 8	P5 P5	**A10.6.** **A10.6.**
*	**TOXIC SOLIDS, FLAMMABLE, ORGANIC, N.O.S.**	6.1	UN2930	I II	4.1 4.1	P5 P5	**A10.6.** **A10.6.**
*	**TOXIC SOLIDS, ORGANIC, N.O.S.**	6.1	UN2811	I II III		P5 P5 P5	**A10.6.** **A10.6.** **A10.6.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*	**TOXIC SOLIDS, OXIDIZING, N.O.S.**	6.1	UN3086	I	5.1	P5	**A10.6.**
				II	5.1	P5	**A10.6.**
*	**TOXIC SOLIDS, SELF-HEATING, N.O.S.**	6.1	UN3124	I	4.2	P5, A5	**A10.6.**
				II	4.2	P5	**A10.6.**
*	**TOXIC SOLIDS, WATER-REACTIVE, N.O.S.**	6.1	UN3125	I	4.3	P5, A5	**A10.6.**
				II	4.3	P5	**A10.6.**
*	**TOXINS, FROM LIVING SOURCES, LIQUID, N.O.S.**	6.1	UN3172	I		P3, A43	**A10.5.**
				II		P4, A43	**A10.5.**
				III		P5, A43	**A10.5.**
*	**TOXINS, FROM LIVING SOURCES, SOLID, N.O.S.**	6.1	UN3172	I		P5, A43	**A10.6.**
				II		P5, A43	**A10.6.**
				III		P5, A43	**A10.6.**
D	**TOY CAPS**	1.4S	NA0337	II		P5	**A5.19.**
	TRACERS FOR AMMUNITION	1.3G	UN0212			P4	**A5.19.**
	TRACERS FOR AMMUNITION	1.4G	UN0306			P5	**A5.19.**
	TRIALLYLAMINE	3	UN2610	III	8	P5	**A7.3.**
	TRIALLYL BORATE	6.1	UN2609	III		P5	**A10.5.**
*	**TRIAZINE PESTICIDES, LIQUID, FLAMMABLE, TOXIC,** *flashpoint less than 23 degrees C*	3	UN2764	I	6.1	P3	**A7.3.**
				II	6.1	P4	**A7.3.**
*	**TRIAZINE PESTICIDES, LIQUID, TOXIC, FLAMMABLE,** *flashpoint not less than 23 degrees C*	6.1	UN2997	I	3	P3	**A10.5.**
				II	3	P4	**A10.5.**
				III	3	P5	**A10.5.**
*	**TRIAZINE PESTICIDES, LIQUID, TOXIC**	6.1	UN2998	I		P3	**A10.5.**
				II		P4	**A10.5.**
				III		P5	**A10.5.**
*	**TRIAZINE PESTICIDES, SOLID, TOXIC**	6.1	UN2763	I		P5	**A10.6.**
				II		P5	**A10.6.**
				III		P5	**A10.6.**
	TRIBUTYLAMINE	6.1	UN2542	II		P5	**A10.5.**
	TRIBUTYLPHOSPHANE	4.2	UN3254	I		P3	**A8.4.**
	TRICHLOROACETIC ACID	8	UN1839	II		P5, A7, N34	**A12.4.**
	TRICHLOROACETIC ACID, SOLUTION	8	UN2564	II		P5, A3, A6, A7, N34	**A12.3.**
				III		P5, A3, A6 A7, N34	**A12.3.**
+	**TRICHLOROACETYL CHLORIDE**	8	UN2442	II	6.1	P2, 2, A3, A7, N34	**A12.12.**
	TRICHLOROBENZENES, LIQUID	6.1	UN2321	III		P5	**A10.5.**
	TRICHLOROBUTENE	6.1	UN2322	II		P5	**A10.5.**
	1,1,1-TRICHLOROETHANE	6.1	UN2831	III		P5, N36	**A10.5.**
	TRICHLOROETHYLENE	6.1	UN1710	III		P5, N36	**A10.5.**

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	TRICHLOROISOCYANURIC ACID, DRY	5.1	UN2468	II		P5	**A9.8.**
	Trichloromethyl perchlorate						FORBIDDEN
	TRICHLOROSILANE	4.3	UN1295	I	3, 8	P3, A7, N34	**A8.3.**
D	**MONO-(TRICHLORO) TETRA-(MONOPOTASSIUM DICHLORO)-PENTA-S-TRIAZINETRIONE, DRY** *(containing over 39% available chlorine)*	5.1	NA2468	II		P5	**A9.8.**
	Trichloro-s-triazinetrione dry, containing over 39% available chlorine, see **TRICHLOROISOCYANURIC ACID, DRY**						
	TRICRESYL PHOSPHATE *with more than3% ortho isomer*	6.1	UN2574	II		P5, A3, N33, N34	**A10.5.**
	TRIETHYLAMINE	3	UN1296	II	8	P4	**A7.3.**
	TRIETHYLENETETRAMINE	8	UN2259	II		P5	**A12.3.**
	TRIETHYL PHOSPHITE	3	UN2323	III		P5	**A7.3.**
	TRIFLUOROACETIC ACID	8	UN2699	I		P3, A3, A6, A7, N3, N34	**A12.3.**
	TRIFLUOROACETYL CHLORIDE	2.3	UN3057		8	P2, 2	**A6.5.**
	TRIFLUOROCHLOROETHYLENE, STABILIZED	2.3	UN1082		2.1	P2, 3	**A6.4.**, **A6.5.**
	1,1,1-TRIFLUOROETHANE, COMPRESSED *or* **REFRIGERANT GAS R143A**	2.1	UN2035			P4	**A6.4.**, **A6.5.**
	TRIFLUOROMETHANE *or* **REFRIGERANT GAS R23**	2.2	UN1984			P5	**A6.4.**, **A6.5.**
	TRIFLUOROMETHANE, REFRIGERATED LIQUID *(cryogenic liquids)*	2.2	UN3136			P4	**A6.4.**, **A6.12.**
	3-TRIFLUOROMETHYLANILINE	6.1	UN2948	II		P5	**A10.5.**
	2-TRIFLUOROMETHYLANILINE	6.1	UN2942	III		P5	**A10.5.**
	Triformoxime trinitrate						FORBIDDEN
	TRIISOBUTYLENE	3	UN2324	III		P5	**A7.3.**
	TRIISOCYANATOISOCYANURATE OF ISOPHORONEDIISOCYANTE, SOLUTION, *70%, by mass*	3	UN2906	III		P5	**A7.3.**
	TRIISOPROPYL BORATE	3	UN2616	II III		P5 P5	**A7.3.** **A7.3.**
D	**TRIMETHOXYSILANE**	6.1	NA9269	I	3	P2, 2	**A10.7.**
	TRIMETHYLACETYL CHLORIDE	6.1	UN2438	I	8, 3	P2, 2, A3, A6, A7, N34	**A12.12.**
	TRIMETHYLAMINE, ANHYDROUS	2.1	UN1083			P4	**A6.4.**, **A6.5.**
	TRIMETHYLAMINE, AQUEOUS SOLUTIONS *not more than 50% trimethylamine, by mass*	3	UN1297	I II III	8 8 8	P3 P4 P5	**A7.3.** **A7.3.** **A7.3.**
	1,3,5-TRIMETHYLBENZENE	3	UN2325	III		P5	**A7.3.**
	TRIMETHYL BORATE	3	UN2416	II		P5	**A7.3.**
	TRIMETHYLCHLOROSILANE	3	UN1298	II	8	P5, A3, A7, N34	**A7.3.**
	TRIMETHYLCYCLOHEXYLAMINE	8	UN2326	III		P5	**A12.3.**

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Trimethylene glycol diperchlorate						FORBIDDEN
	TRIMETHYLHEXAMETHYL-ENEDIAMINES	8	UN2327	III		P5	**A12.3.**
	TRIMETHYLHEXAMETHYLENE DIISOCYANATE	6.1	UN2328	III		P5	**A10.5.**
	Trimethylol nitromethane trinitrate						FORBIDDEN
	TRIMETHYL PHOSPHITE	3	UN2329	III		P5	**A7.3.**
	1,3,5-Trimethyl-2,4,6-trinitrobenzene						FORBIDDEN
	Trimethyoxy silane						FORBIDDEN
	Trinitroacetic acid						FORBIDDEN
	Trinitroacetonitrile						FORBIDDEN
	Trinitroamine cobalt						FORBIDDEN
	TRINITROANILINE *or* **PICRAMIDE**	1.1D	UN0153			P4	**A5.10.**
	TRINITROANISOLE	1.1D	UN0213			P4	**A5.10.**
	TRINITROBENZENE, *dry or wetted, with less than 30% water, by mass*	1.1D	UN0214			P4	**A5.9.**
	TRINITROBENZENESULPHONIC ACID	1.1D	UN0386			P4	**A5.10.**
	TRINITROBENZENE, WETTED *with not less than 10% water, by mass*	4.1	UN3367	I		P4, A8, A19, N41	**A8.4.**
	TRINITROBENZENE, WETTED *with not less than 30% water, by mass*	4.1	UN1354	I		P4, 23, A2, A8, A19, N41	**A8.4.**
	TRINITROBENZOIC ACID, *dry or wetted with less than 30% water, by mass*	1.1D	UN0215			P4	**A5.9.**
	TRINITROBENZOIC ACID, WETTED *with not less than 10% water, by mass*	4.1	UN3688	I		P4, A8, A19, N41	**A8.4.**
	TRINITROBENZOIC ACID, WETTED *with not less than 30% water, by mass*	4.1	UN1355	I		P4, 23, A2, A8, A19, N41	**A8.4.**
	TRINITROCHLOROBENZENE *or* **PICRYL CHLORIDE**	1.1D	UN0155			P4	**A5.10.**
	TRINITROCHLOROBENZENE, WETTED *with not less than 10% water, by mass*	4.1	UN3365	I		P4	**A8.4.**
	TRINITRO-META-CRESOL	1.1D	UN0216			P4	**A5.10.**
	2,4,6-Trinitro-1,3-diazobenzene						FORBIDDEN
	Trinitroethanol						FORBIDDEN
	Trinitroethylnitrate						FORBIDDEN
	TRINITROFLUORENONE	1.1D	UN0387			P4	**A5.10.**
	Trinitromethane						FORBIDDEN
	1,3,5-Trinitronaphthalene						FORBIDDEN
	TRINITRONAPHTHALENE	1.1D	UN0217			P4	**A5.10.**
	TRINITROPHENOL, WETTED *with not less than 10% water, by mass*	4.1	UN3364	I		P4, A8, 19, N41	**A8.4.**
	TRINITROPHENETOLE	1.1D	UN0218			P4	**A5.10.**
	TRINITROPHENOL *or* **PICRIC ACID,** *dry or wetted with less than 30% water, by mass*	1.1D	UN0154			P4	**A5.9.**
	TRINITROPHENOL, WETTED *with not less than 30% water, by mass*	4.1	UN1344	I		P4, 23, A8, A19, N41	**A8.4.**
	2,4,6-Trinitrophenyl guanidine (dry)						FORBIDDEN

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	TRINITROPHENYLMETHYL-NITRAMINE *or* **TETRYL**	1.1D	UN0208			P4	**A5.9.**
	2,4,6-Trinitrophenyl nitramine						FORBIDDEN
	2,4,6-Trinitrophenyl trimethylol methyl nitramine trinitrate (dry)						FORBIDDEN
	TRINITRORESORCINOL *or* **STYPHNIC ACID,** *dry or wetted with less than 20% water, or mixture of alcohol and water, by mass*	1.1D	UN0219			P4	**A5.9.**
	TRINITRORESORCINOL WETTED *or* **STYPHNIC ACID, WETTED** *with not less than 20% water, or mixture of alcohol and water, by mass*	1.1D	UN0394			P4	**A5.9.**
	TRINITROTOLUENE (TNT), WETTED *with not less than 10% water, by mass*	4.1	UN3366	I		P4, A8, A19, N41	**A8.4.**
	TRINITROTOLUENE *or* **TNT AND TRINITRO- BENZENE MIXTURES** *or* **TRINITROTOLUENE** *or* **TNT AND HEXANITROSTILBENE MIXTURES**	1.1D	UN0388			P4	**A5.10.**
	TRINITROTOLUENE *or* **TNT,** *dry or wetted with less than 30% water, by mass*	1.1D	UN0209			P4, A69	**A5.10.**
	TNT MIXTURES, CONTAINING TRINITROBENZENE AND HEXANITROSTILBENE	1.1D	UN0389			P4	**A5.10.**
	TRINITROTOLUENE WETTED, *with not less than 30% water, by mass*	4.1	UN1356	I		P4, 23, A2, A8, A19, N41	**A8.4.**
	2,4,6-Trinitro-1,3,6-triazido benzene (dry)						FORBIDDEN
	Tri-(b-nitroxyethyl) ammonium nitrate						FORBIDDEN
	TRIPROPYLAMINE	3	UN2260	III	8	P5	**A7.3.**
	TRIPROPYLENE	3	UN2057	II III		P5 P5	**A7.3.** **A7.3.**
	TRIS-(1-AZIRIDINYL) PHOSPHINE OXIDE SOLUTION	6.1	UN2501	II III		P5 P5	**A10.5.** **A10.5.**
	Tris bis-bifluoroamino diethoxy propane (TVOPA)						FORBIDDEN
	TRITONAL	1.1D	UN0390			P4	**A5.9.**
	Tungsten hexafluoride						FORBIDDEN
	TURPENTINE	3	UN1299	III		P5	**A7.3.**
	TURPENTINE SUBSTITUTE	3	UN1300	I II III		P3 P5 P5	**A7.3.** **A7.3.** **A7.3.**
	UNDECANE	3	UN2330	III		P5	**A7.3.**
	UREA HYDROGEN PEROXIDE	5.1	UN1511	III	8	P5, A1, A7, A29	**A9.8.**
	UREA NITRATE, WETTED *with not less than 10% water by mass*	4.1	UN3370	I		P4, A8, A19, N41	**A8.4.**
	UREA NITRATE, *dry or wetted with less than 20% water, by mass*	1.1D	UN0220			P4	**A5.9.**
	UREA NITRATE, WETTED *with not less than 20% water, by mass*	4.1	UN1357	I		P4, A8, A19, N41	**A8.4.**

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Urea peroxide, see **UREA HYDROGEN PEROXIDE**						
	VALERALDEHYDE	3	UN2058	II		P5	**A7.3.**
	Valeric acid, see **CORROSIVE LIQUID, N.O.S**.						
	VALERYL CHLORIDE	8	UN2502	II	3	P5, A3, A6, A7, N34	**A12.3.**
	VANADIUM COMPOUND, N.O.S.	6.1	UN3285	I II III		P5 P5 P5	**A10.6.** **A10.6.** **A10.6.**
	VANADIUM OXYTRICHLORIDE	8	UN2443	II		P5, A3, A6, A7, N34	**A12.3.**
	VANADIUM PENTOXIDE, *nonfused form*	6.1	UN2862	III		P5	**A10.6.**
	VANADIUM TETRACHLORIDE	8	UN2444	I		P3, A3, A6, A7, N34	**A12.3.**
	VANADIUM TRICHLORIDE	8	UN2475	III		P5	**A12.4.**
	VANADYL SULPHATE	6.1	UN2931	II		P5	**A10.6.**
	VEHICLE, FLAMMABLE GAS POWERED	9	UN3166			P5, 135	**A13.5.**
	VEHICLE, FLAMMABLE LIQUID POWERED	9	UN3166			P5, 135	**A13.5.**
	VINYL ACETATE, STABILIZED	3	UN1301	II		P5	**A7.3.**
	VINYL BROMIDE, STABILIZED	2.1	UN1085			P4	**A6.4.**, **A6.5.**
	VINYL BUTYRATE, STABILIZED	3	UN2838	II		P5	**A7.3.**
	VINYL CHLORIDE, STABILIZED	2.1	UN1086			P4, 21	**A6.4.**, **A6.5.**
	VINYL CHLOROACETATE	6.1	UN2589	II	3	P5	**A10.5.**
	VINYL ETHYL ETHER, STABILIZED	3	UN1302	I		P3, A3	**A7.3.**
	VINYL FLUORIDE, STABILIZED	2.1	UN1860			P4	**A6.4.**, **A6.5.**
	VINYLIDENE CHLORIDE, STABILIZED	3	UN1303	I		P3	**A7.3.**
	VINYL ISOBUTYL ETHER, STABILIZED	3	UN1304	II		P5	**A7.3.**
	VINYL METHYL ETHER, STABILIZED	2.1	UN1087			P4	**A6.4.**, **A6.5.**
	Vinyl nitrate polymer						FORBIDDEN
	VINYLPYRIDINES, STABILIZED	6.1	UN3073	II	3, 8	P5	**A10.5.**
	VINYLTOLUENE, STABILIZED	3	UN2618	III		P5	**A7.3.**
	VINYLTRICHLOROSILANE, STABILIZED	3	UN1305	I	8	P3, A3, A7, N34	**A7.3.**
	WARHEADS,ROCKET *with burster or expelling charge*	1.4D	UN0370			P5	**A5.15.**
	WARHEADS, ROCKET *with burster or expelling charge*	1.4F	UN0371			P5	**A5.15.**
	WARHEADS, ROCKET *with bursting charge*	1.1D	UN0286			P4	**A5.15.**
	WARHEADS, ROCKET *with bursting charge*	1.2D	UN0287			P4	**A5.15.**
	WARHEADS, ROCKET *with bursting charge*	1.1F	UN0369			P4	**A5.15.**
	WARHEADS, TORPEDO *with bursting charge*	1.1D	UN0221			P4	**A5.15.**
*	**WATER-REACTIVE LIQUID, N.O.S**.	4.3	UN3148	I II III		P3 P5 P5	**A8.3.** **A8.3.** **A8.3.**

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
*	**WATER-REACTIVE LIQUID, CORROSIVE, N.O.S.**	4.3	UN3129	I	8	P3	**A8.3.**
				II	8	P4	**A8.3.**
				III	8	P5	**A8.3.**
*	**WATER-REACTIVE LIQUID, N.O.S.**	4.3	UN3130	I	6.1	P3, A4	**A8.3.**
				II	6.1	P4	**A8.3.**
				III	6.1	P5	**A8.3.**
*	**WATER-REACTIVE SOLID, N.O.S.**	4.3	UN2813	I		P3, N40	**A8.4.**
				II		P5	**A8.4.**
				III		P5	**A8.4.**
*	**WATER-REACTIVE SOLID, CORROSIVE, N.O.S.**	4.3	UN3131	I	8	P3, N40	**A8.4.**
				II	8	P5	**A8.4.**
				III	8	P5	**A8.4.**
*	**WATER-REACTIVE SOLID, FLAMMABLE, N.O.S.**	4.3	UN3132	I	4.1	P3, N40	**A8.4.**
				II	4.1	P5	**A8.4.**
				III	4.1	P5	**A8.4.**
*	**WATER-REACTIVE SOLID, OXIDIZING, N.O.S.**	4.3	UN3133	II	5.1	P3	**A8.5.**
				III	5.1	P5	**A8.5.**
*	**WATER-REACTIVE SOLID, TOXIC, N.O.S.**	4.3	UN3134	I	6.1	P3, A8, N40	**A8.4.**
				II	6.1	P5	**A8.4.**
				III	6.1	P5	**A8.4.**
*	**WATER-REACTIVE SOLID, SELF-HEATING, N.O.S.**	4.3	UN3135	I	4.2	P3, N40	**A8.4.**
				II	4.2	P5	**A8.4.**
				III	4.2	P5	**A8.4.**
	Wheelchair, electric see **BATTERY-POWERED EQUIMENT** *or* **BATTERY-POWERED VEHICLE**						
	WHITE ASBESTOS *(Chrysotile, actinolite, anthophyllite, tremolite)*	9	UN2590	III		P5	**A13.15.**
	WOOD PRESERVATIVES, LIQUID	3	UN1306	II		P5	**A7.3.**
				III		P5	**A7.3.**
	XANTHATES	4.2	UN3342	II		P5	**A8.4.**
				III		P5	**A8.4.**
	XENON	2.2	UN2036			P5	**A6.4.**, **A6.6.**
	XENON, REFRIGERATED LIQUID *(cryogenic liquid)*	2.2	UN2591			P4	**A6.12.**
	XYLENES	3	UN1307	II		P5	**A7.3.**
				III		P5	**A7.3.**
	XYLENOLS	6.1	UN2261	II		P5	**A10.6.**
	XYLIDINES, SOLID *or* **LIQUID**	6.1	UN1711	II		P5	**A10.5.**, **A10.6.**
	XYLYL BROMIDE	6.1	UN1701	II		P4, A3, A6, A7, N33	**A10.8.**

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	p-Xylyl diazide						FORBIDDEN
	ZINC AMMONIUM NITRITE	5.1	UN1512	II		P5	**A9.8.**
	ZINC ARSENATE *or* **ZINC ARESINITE** *or* **ZINC ARSENATE AND ZINC ARSENITE MIXTURES**	6.1	UN1712	II		P5	**A10.6.**
	ZINC ASHES	4.3	UN1435	III		P5, A1, A19	**A8.4.**
	Zinc bisulfiite solution, *see* **BISULFITES, INORGANIC AQUEOUS SOLUTIONS, N.O.S.**						
	ZINC BROMATE	5.1	UN2469	III		P5, A1, A29	**A9.8.**
	ZINC CHLORATE	5.1	UN1513	II		P5, A9, N34	**A9.8.**
	ZINC CHLORIDE, ANHYDROUS	8	UN2331	III		P5	**A12.4.**
	ZINC CHLORIDE, SOLUTION	8	UN1840	III		P5	**A12.3.**
	ZINC CYANIDE	6.1	UN1713	I		P5	**A10.6.**
	ZINC DITHIONITE *or* **ZINC HYDROSULPHITE**	9	UN1931	III		P5	**A13.3.**
	Zinc ethyl, see **DIETHYLZINC**						
	ZINC FLUOROSILICATE	6.1	UN2855	III		P5	**A10.6.**
	ZINC NITRATE	5.1	UN1514	II		P5	**A9.8.**
	ZINC PERMANGANATE	5.1	UN1515	II		P5	**A9.8.**
	ZINC PEROXIDE	5.1	UN1516	II		P5	**A9.8.**
	ZINC PHOSPHIDE	4.3	UN1714	I	6.1	P3, A19, N40	**A8.4.**
	ZINC POWDER or **ZINC DUST**	4.3	UN1436	I II III	4.2 4.2 4.2	P3, A19, N40 P4, A19 P5	**A8.4.** **A8.4.** **A8.4.**
	ZINC RESINATE	4.1	UN2714	III		P5, A1	**A8.4.**
	Zinc selenates, see **SELENATES**						
	Zinc selenite, see **SELENITES**						
	ZIRCONIUM, DRY, coiled wire, finished metal sheets, strip (thinner than 254 microns but not thinner than 18 microns)	4.1	UN2858	III		P5, A1	**A8.4.**
	ZIRCONIUM, DRY, finished sheets, strip, or coiled wire	4.2	UN2009	III		P5, A1, A19	**A8.4.**
	ZIRCONIUM HYDRIDE	4.1	UN1437	II		P5, A19, A20, N34	**A8.4.**
	ZIRCONIUM NITRATE	5.1	UN2728	III		P5, A1, A29	**A9.8.**
	ZIRCONIUM PICRAMATE, dry or wetted with less than 20% water, by mass	1.3C	UN0236			P4	**A5.12.**
	ZIRCONIUM PICRAMATE, WETTED with not less than 20% water, by mass	4.1	UN1517	I		P4, 23, N41	**A8.4.**
	ZIRCONIUM POWDER, DRY	4.2	UN2008	I II III		P3 P5, A19, A20, N5, N34 P5	**A8.4.** **A8.4.** **A8.4.**

	PROPER SHIPPING NAME/ DESCRIPTION	HAZARD CLASS/ DIV	UN/ID NUMBER	PG	SUBSIDIARY RISK	SPECIAL PROVISION	PACKAGING PARAGRAPH
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ZIRCONIUM POWDER, WETTED, with not less than 25% water (a visible excess of water must be present (a) mechanically produced, particle size less than 53 microns; (b) chemically produced, particle size less than 840 microns)	4.1	UN1358	II		P5, A19, A20, N34	**A8.4.**
	ZIRCONIUM SCRAP	4.2	UN1932	III		P5, N34	**A8.4.**
D	**ZIRCONIUM SULFATE**	8	NA9163	III		P5, N34	**A12.4.**
	ZIRCONIUM SUSPENDED IN A LIQUID	3	UN1308	I II III		P3 P5 P5	**A7.3.** **A7.3.** **A7.3.**
	ZIRCONIUM TETRACHLORIDE	8	UN2503	III		P5	**A12.4.**

Table A4.2. Special Provisions

When column 7 of **Table A4.1.** refers to a special provision for a hazardous material, the meaning and requirements of that provision are defined in this Table. The following list identifies the requirements of the special provisions referred to in column 7 of **Table A4.1.**:

1. **Passenger Eligibility "P" Codes.** These provisions apply to passenger movement with hazardous materials (see also **Attachment 22**).

P1 Transport this material on Special Assignment Airlift Mission aircraft as identified in **Attachment 24**. Material authorized on cargo aircraft only. Passenger deviations are not authorized.

P2 Transport this material on cargo aircraft only. Passenger deviations are not authorized.

P3 Transport this material on cargo aircraft only. Deviations are authorized according to paragraph **2.2.** and **Attachment 22**. For radioactive materials, those requiring a Yellow III label will be transported under the provisions of P3.

P4 Transport this material on cargo aircraft only. Deviations are authorized according to paragraph **2.2.** and **Attachment 22**. DoD duty passengers do not require a deviation. For radioactive materials, those requiring a Yellow II label will be transported under the provisions of P4.

P5 Transport this material on passenger or cargo aircraft without passenger restriction. For radioactive materials, those requiring a White I or no label will be transported under the provisions of P5.

2. **Additional Codes.** The Special Provision column may provide material and/or packaging requirements. This information is in addition to the standard requirements already prescribed in this manual. The following numeric (1-117), airlift (A codes), and nonbulk packaging (N Codes) special provisions apply (some numbers are intentionally not included):

- **Numeric Provisions.**

1 This material is poisonous by inhalation in Hazard Zone A, describe as an inhalation hazard.

2 This material is poisonous by inhalation in Hazard Zone B, describe as an inhalation hazard.

3 This material is poisonous by inhalation in Hazard Zone C, describe as an inhalation hazard.

4 This material is poisonous by inhalation in Hazard Zone D, describe as an inhalation hazard.

5 If this material meets the defining criteria for a material poisonous by inhalation (49 CFR 173.116(a) or 173.133(a)) use an appropriate Class 2.3 or Class 6.1 generic PSN that identifies the inhalation hazard.

6 This material is poisonous by inhalation and must be described as an inhalation hazard.

7 An ammonia nitrate fertilizer is a fertilizer formulation, containing 90 percent or more ammonium nitrate and no more than 0.2 percent organic combustible material which does not meet the definition and criteria of a Class 1 material.

8 A hazardous substance that is not a hazardous waste may be shipped under the shipping description "Other regulated substance, liquid or solid", as appropriate.

9 EPA in 40 CFR 761.60 and 761.65 prescribes packaging for certain PCBs for disposal and storage.

11 Package material either as a liquid or solid, as appropriate, depending on its physical form at 55 degrees C (131 degrees F) at atmospheric pressure.

12 In concentrations greater than 40 percent, this material has strong oxidizing properties and is capable of starting fires in contact with combustible materials. If applicable, a package containing this material must comply with the subsidiary risk labeling requirements of **Attachment 15**.

13 The words "Inhalation Hazard" shall be entered on each shipping paper in association with the shipping description.

17 Aqueous solutions of hydrogen peroxide containing less than 8 percent hydrogen peroxide are not subject to the requirements of this manual.

21 This material must be stabilized by appropriate means to prevent dangerous polymerization.

22 If the hazardous material is in dispersion in organic liquid, the organic liquid must have a flash point above 50 degrees C (122 degrees F).

23 Classify this material as Class 4.1 only if it is packed so that the percentage of diluent will not fall below that stated in the shipping description at any time during transport.

27 Sodium carbonate peroxyhydrate is considered nonhazardous.

30 Sulphur is not regulated if transported in a non-bulk packaging or if formed to a specific shape (e.g., prills, granules, pellets, pastilles, or flakes).

31 Materials that have undergone sufficient heat treatment to render them nonhazardous are not subject to the requirements of this manual.

33 Ammonium nitrites and mixtures of an inorganic nitrite with an ammonium salt are prohibited.

36 The maximum net quantity per package is 5 L (1 gallon) or 5 kg (11 lbs.).

43 The nitrogen content of the nitrocellulose must not exceed 11.5 percent. Pack each single filter sheet between sheets of glazed paper. Ensure the portion of glazed paper between the filter sheets is not less than 65 percent, by mass. The membrane filters/paper arrangement must not be liable to propagate a detonation.

46 During transport, it must be protected from direct sunshine and stored (or kept) in a cool and well-ventilated place, away from all sources of heat.

47 Mixtures of solids which are not subject to this subchapter and flammable liquids may be transported under this entry without first applying the classification criteria of Division 4.1, provided there is no free liquid visible at the time the material is loaded or at the time the packaging or transport unit is closed. Each packaging must correspond to a design type that has passed a leakproofness test at the Packing Group II level. Small inner packagings consisting of sealed packets containing less than 10 mL of a Class 3 liquid in Packing Group II or III absorbed onto a solid material are not subject to this subchapter provided there is no free liquid in the packet.

48 Mixtures of solids which are not subject to this subchapter and toxic liquids may be transported under this entry without first applying the classification criteria of Division 6.1, provided there is no free liquid visible at the time the material is loaded or at the time the packaging or transport unit is closed. Each packaging must correspond to a design type that has passed a leakproofness test at the Packing Group II level. This entry may not be used for solids containing a Packing Group I liquid.

49 Mixtures of solids which are not subject to this subchapter and corrosive liquids may be transported under this entry without first applying the classification criteria of Class 8, provided there is no free liquid visible at the time the material is loaded or at the time the packaging or transport unit is closed. Each packaging must correspond to a design type that has passed a leakproofness test at the Packing Group II level.

51 This description applies to items previously described as "Toy propellant devices, Class C" and includes reloaded kits. Model rocket motors containing 30 grams or less propellant are classes as Division 1.4S and items containing more than 30 grams of propellant but not more than 62.5 grams of propellant are classed as Division 1.4C.

53 Packages of these materials must bear a subsidiary risk label, "EXPLOSIVE", unless exempted by the DOT. A copy of the exemption must accompany the shipment.

56 Ensure a means to interrupt and prevent detonation of the detonator from initiating the detonating cord is installed between each electric detonator and the detonating cord ends of the jet perforating guns.

60 An oxygen generator, chemical, that is shipped with its means of initiation attached must incorporate at least two positive means of preventing unintentional actuation of the generator, and be classed and approved by the Associate Administrator for Hazardous Materials Safety.

101 Specify the name of the particular substance or article in association with the PSN according to **Figure A17.1.**, Key 11, and **A14.3.1.**

102 This article may be transported as Class 1.4D if all of the conditions specified in 49 CFR 173.63(a) are met. Reclassification requires approval by a DoD Explosive Hazard Classification Authority according to **A3.3.1.2.**

103 Detonators that will not mass detonate and undergo only limited propagation in the shipping package may be assigned to Class 1.4B. Mass detonate means that more than 90 percent of the devices tested in a package explode practically simultaneously. Limited propagation means that if one detonator near the center of a shipping package is exploded, the aggregate weight of explosives, excluding ignition and delay charges, in this and all additional detonators in the outside packaging that explode, may not exceed 25 g. Reclassification requires approval by a DoD Explosive Hazard Classification Authority according to **A3.3.1.2.**

104 Detonators which meet the following conditions may be assigned to Class 1.4S: Each detonator may contain no more than 1 g of explosive, excluding ignition and delay charges, and if one detonator near the center of the package detonates it will not cause functioning of any other device in the same or adjacent packages. Reclassification requires approval by a DoD Explosive Hazard Classification Authority according to **A3.3.1.2.**

105 The word "Agents" may be used instead of "Explosives" when approved by the DOT.

106 The recognized name of the particular explosive may be specified in addition to the type.

107 The classification of the substance is expected to vary especially with the particle size and packaging, but the border lines have not been experimentally determined; appropriate classifications should be verified following the test procedures in 49 CFR 173.57 and 173.58. Reclassification requires approval by a DoD Explosive Hazard Classification Authority according to **A3.3.1.2.**

108 Fireworks must be constructed and packaged so that loose pyrotechnic composition is not present in packages during transportation.

109 Rocket motors must be nonpropulsive in transportation unless approved according to **A3.3.1.2.** To be considered "nonpropulsive", a rocket motor must be capable of unrestrained burning and must not appreciably move in any direction when ignited by any means.

110 Fire extinguisher charges containing 3.2 g or less of propellant explosives per unit are not subject to the requirements of this manual unless listed as a Class 1 material in the JHCS. Reclassification as a non-explosive requires approval by a DoD Explosive Hazard Classification Authority according to **A3.3.1.2.**

111 Explosive substances of Class 1.1A are forbidden for transportation if dry or not desensitized, unless incorporated in a device.

112 Cartridges, small arms, Class 1.4S, may be reclassed and offered for domestic transportation as ORM-D material if they are offered for transportation and transported according to the limitations and packaging requirements of 49 CFR 173.144. For Class 1 material listed in the JHCS, reclassification requires approval by a DoD Explosive Hazard Classification Authority according to **A3.3.1.2.**

113 The sample must be given a tentative approval by an agency or laboratory according to the provisions of 49 CFR 173.56.

115 Boosters with detonator (detonating primers) in which the total explosive charge per unit does not exceed 25 g, and which will not mass detonate and undergo only limited propagation in the shipping package may be assigned to Class 1.4B. Mass detonate means more than 90 percent of the devices tested in a package explode practically simultaneously. Limited propagation means that if one booster near the center of the package is exploded, the aggregate weight of explosives, excluding ignition and delay charges, in this and all additional boosters in the outside packaging that explode may not exceed 25 g. Reclassification requires approval by a DoD Explosive Hazard Classification Authority according to **A3.3.1.2.**

116 Fuzes, detonating, may be classed in Class 1.4 if the fuzes do not contain more than 25 g of explosive per fuze and are made and packaged so that they will not cause functioning of other fuzes, explosives, or other explosive devices if one of the fuzes detonates in a shipping packaging or in adjacent packages. Reclassification requires approval by a DoD Explosive Hazard Classification Authority according to **A3.3.1.2.**

117 If a shipment of the explosive substance is to take place at a time that freezing weather is anticipated, the water contained in the explosive substance must be mixed with denatured alcohol so that freezing will not occur.

123 Any explosive, blasting, type C containing chlorate must be segregated from explosives containing ammonium nitrate or other ammonium salts.

134 This entry applies to vehicles, machinery and equipment that are powered by wet batteries, sodium batteries, or lithium batteries and which are transported with these batteries installed.

135 Change PSN to “Vehicle, flammable gas powered” or “Vehicle, flammable liquid powered”, as appropriate, when internal combustion engines are installed in a vehicle.

139 Use of the "special arrangement" proper shipping names for international shipments must be made under an IAEA Certificate of Competent Authority issued by the Associate Administrator in accordance with the requirements in 49 CFR 173.471, 173.472, or 173.473. Use of these proper shipping names for domestic shipments may be made only under a DOT exemption.

"A" Provisions. These special provisions are in addition to other requirements for military air shipment.

A1 Single packaging is not permitted on aircra3ft carrying passengers. P4 restrictions apply.

A2 Single packagings are not permitted.

A3 For combination packagings, if glass inner packagings (including ampoules) are used, they must be packed with absorbent material in tightly closed metal receptacles before packing in outer packagings.

A4 Liquids having an inhalation toxicity of PG I and are identified as P1, P2, or P3 are notpermitted on passenger aircraft. Deviations are not allowed.

A5 Solids having an inhalation toxicity of PG I and are identified as P1, P2, or P3, are not permitted on passenger aircraft and may not exceed a maximum net quantity per package of 15 kg (33 pounds) on cargo aircraft. See paragraph **2.2.** for deviation authority.

A6 For combination packagings, if plastic inner packagings are used, pack in tightly closed metal receptacles before packing into outer packagings.

A7 Steel packagings must be corrosion-resistant or have protection against corrosion.

A8 For combination packagings, if glass inner packagings (including ampoules) are used, they must be packed with cushioning material in tightly closed metal receptacles before packing in outer packagings.

A9 For combination packages, if plastic bags are used, they must be packed in tightly closed metal receptacles before packing in outer packagings.

A10 When aluminum or aluminum alloy construction materials are used, they must be resistant to corrosion.

A11 For combination packagings, when metal inner packagings are permitted, only specification cylinders constructed of metals which are compatible with the hazardous material may be used.

A19 Combination packagings consisting of outer fiber drums or plywood drums, with inner plastic packagings, are not authorized.

A20 Plastic bags as inner receptacles of combination packagings are not authorized.

A21 Hypochlorite solution with 5% or less available chloride is not regulated by this manual.

A29 Combination packagings consisting of outer expanded plastic boxes with inner plastic bags are not authorized.

A30 Ammonium permanganate is not authorized.

A33 Ammonium nitrates and mixtures of an inorganic nitrite with an ammonium salt are prohibited.

A35 This includes material which is not covered by any other hazard class but has anesthetic, narcotic, noxious or other properties such that, in the event of spillage or leakage on the aircraft, extreme annoyance or discomfort could be caused to aircrew members so as to prevent correct performance of assigned duties. For material containing aromatic extract or flavoring, use packaging paragraph **A13.3.** For all other material shipped under this PSN, use packaging paragraph **A13.13.**

A37 This entry applies only to a material meeting the definition in 49 CFR 171.8 for self-defense spray.

A43 Toxins from plant, animal or bacterial sources, which contain infectious substances, or toxins that are contained in infectious substances, must be classified as Division 6.2.

A56 Radioactive material with a subsidiary hazard of Division 4.2 Packing Group I must be transported in Type B packages when offered for transportation by aircraft. Radioactive material with a subsidiary hazard of Division 2.1 is forbidden from transport on passenger aircraft.

A58 An aqueous solution containing 24% or less alcohol by volume is not subject to these regulations.

A67 Nonspillable batteries are considered dry batteries and not subject to any other requirements of this manual if:

– At a temperature of 55 degrees C (130 degrees F), the electrolyte will not flow from a ruptured or cracked case and there is no free liquid to flow.

– Packaged for transport in inner packagings that effectively prevent short circuit and prevent movement that could lead to short circuit.

A69 May be transported using a DOT hazard classification approval. Except for Class/Division 1.4S, a copy of the approval must accompany the shipment. See **A3.3.1.2.**

A117 Wastes transported under UN 3291 are wastes derived from the medical treatment of humans or animals or from bio-research, where there is a relatively low probability that infectious substances are present. Waste infectious substances which can be specified must be assigned to UN2814 or UN2900. Decontaminated wastes which previously contained infectious substances may be considered as not subject to these regulations unless the criteria of another Class or Division are met.

A124 Only mixtures with not more than 23.5% oxygen may be transported under this entry. A Division 5.1 subsidiary risk label is not required for any concentration within this limit.

A500 P2 Code applies if rocket motor contains hypergolic liquids.

A501 P3 does not apply to unit maintenance and support personnel traveling on Special Assignment Airlift Missions.

A502 Use the following to determine passenger travel acceptability: P1: Risk Code 4 material exceeding 50 ml per package; P2: Risk Code 4 material 50 ml or less per package when accompanied by a technical escort; P3: Risk Code 3; P5: Risk Code 2 and Diagnostic Specimens.

A503 Only Class 2 (non-toxic aerosols only), Class 3 (Packing Group II or III only) and Division 6.1 (Packing Group III only) provided such substances do not have a subsidiary risk may be shipped to an international (non-domestic) location as a Class 9.

A504 ORM-D designation may only be used for domestic shipments. Substances may also be classified as a Class 9 for domestic shipment. Comply with Special Provision A503 for international shipments.

A505 Cartridges, Small Arms (1.4S) and Cartridges, Power Devices (1.4S) classified by the manufacturer as ORM-D may only be shipped to domestic locations. Ammunition shipped internationally must be classified as explosives (Class 1) and packaged according to **Attachment 5**.

"N" Provisions. These provisions apply only to nonbulk packagings:

N3 Glass inner packagings are permitted in combination or composite packagings only if the hazardous material is free from hydrofluoric acid.

N4 For combination or composite packagings, glass inner packagings, other than ampoules, are not permitted.

N5 Glass materials of construction are not authorized for any part of the packaging which is normally in contact with the hazardous material.

N6 Battery fluid packaged with electric storage batteries, wet or dry, must conform to the packaging provisions of **A12.5.3.**

N7 The hazard class or division number of the material must be marked on the package according to 49 CFR 172.302. However, the hazard label corresponding to the hazard class or division may be substituted for the marking.

N8 Nitroglycerin solution in alcohol may be transported under this entry only when the solution is packed in metal cans of not more than 1 L capacity each, overpacked in a wooden box containing not more than 5 L. Completely surround metal cans with absorbent cushioning material. Completely line wooden boxes with a suitable material impervious to water and nitroglycerin.

N10 Lighters and their inner packaging which have been approved by the Associate Administrator must be packaged in one of the following outer packagings at the PG II level: 4C1 or 4C2 wooden boxes; 4D plywood boxes; 4F reconstituted wood boxes; 4G fiberboard boxes; or 4H1 or 4H2 plastic boxes. The approval number must be marked on each outer packaging and on the shipper paper.

N12 Plastic packagings are not authorized.

N25 Steel single packagings are not authorized.

N32 Aluminum materials of construction are not authorized for single packagings.

N33 Aluminum drums are not authorized.

N34 Aluminum construction materials are not authorized for any part of a packaging which is normally in contact with the hazardous materials.

N36 Aluminum or aluminum alloy construction materials are permitted only for halogenated hydrocarbons that will not react with aluminum.

N37 This material may be shipped in an integrally-lined fiber drum (1G) which meets the general packaging requirements of **Attachment 3**, the UN performance tests required based on the PG assigned to the material and to any other special provisions of column 7 of **Table A4.1.** **N40** This material is not authorized in the following packagings:

N40 This material is not authorized in the following packagings::

– A combination packaging consisting of a 4G fiberboard box with inner receptacles of glass or earthenware.

– A single packaging of a 4C2 sift-proof, natural wood box.

– A composite packaging 6PG2 (glass, porcelain, or stoneware receptacles within a fiberboard box).

N41 Metal construction materials are not authorized for any part of a packaging that is normally in contact with the hazardous material.

N43 Metal drums are permitted as single packagings only if constructed of nickel or Monel.

N45 For combination packagings, copper cartridges are permitted as inner packagings when the hazardous material is not in dispersion.

N65 Outage must be sufficient to prevent cylinders or spheres from becoming liquid full at 55 degrees C (130 degrees F). The vacant space (outage) may be charged with a nonflammable, nonliquefied compressed gas if the pressure in the cylinder or sphere at 55 degrees C (130 degrees F) does not exceed 125 percent of the marked service pressure.

N73 Packagings consisting of outer wooden or fiberboard boxes with inner glass, metal, or other strong containers; metal or fiber drums; kegs or barrels; or strong metal cans are authorized and need not conform to the UN test requirements for domestic shipment.

N74 Packages consisting of tightly closed inner containers of glass, earthenware, metal or polyethylene, capacity not over 0.5 kg (1.1 pounds) securely cushioned and packed in outer wooden barrels or wooden or fiberboard boxes, not over 15 kg (33 pounds) net weight, are authorized and need not conform to the UN test requirements for domestic shipment.

N75 Packages consisting of tightly closed inner packagings of glass, earthenware, or metal, securely cushioned and packed in outer wooden barrels, or wooden or fiberboard boxes, capacity not over 2.5 kg (5.5 pounds) net weight, are authorized and need not conform to the UN test requirements for domestic shipment.

N76 For materials of not more than 25 percent active ingredient by weight, packages consisting of inner metal packagings not greater than 250 ml (8 ounces) capacity each, packed in strong outer packagings together with sufficient absorbent material to completely absorb the liquid contents are authorized and need not conform to the UN test requirements for domestic shipment.

N77 For materials of not more than two percent active ingredients by weight and the liquid contents are absorbed in an inert material, the packagings need not conform to the UN test requirements for domestic shipment.

N78 Packages consisting of inner glass, earthenware, polyethylene, or other nonfragile plastic bottles or jars not over 0.5 kg (1.1 pounds) capacity each, or metal cans not over 5 pounds capacity each, packed in outer wooden boxes, barrels, kegs, or fiberboard boxes, are authorized and need not conform to the UN test requirements for domestic shipments. Net weight of contents in fiberboard boxes may not exceed 29 kg (64 pounds). Net weight of contents in wooden boxes, barrels, or kegs may not exceed 45 kg (99 pounds).

N79 Packages consisting of tightly closed metal inner packagings not over 0.5 kg (1.1 pounds) capacity each, packed in outer wooden or fiberboard boxes, or wooden barrels, are authorized and need not conform to UN test requirements for domestic shipment. Net weight of contents may not exceed 15 kg (33 pounds).

Table A4.3. Hazardous Substance and Reportable Quantities.

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)	Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Acenaphthene	100 (45.4)	Ammonium acetate	5000 (2270)
Acenaphthylene	5000 (2270)	Ammonium benzoate	5000 (2270)
Acetaldehyde	1000 (454)	Ammonium bicarbonate	5000 (2270)
Acetaldehyde, chloro-	1000 (454)	Ammonium bichromate	10 (4.54)
Acetaldehyde, trichloro-	5000 (2270)	Ammonium bifluoride	100 (45.4)
Acetamide	100 (45.4)	Ammonium bisulfite	5000 (2270)
Acetamide, N-(aminothioxomethyl)-	1000 (454)	Ammonium carbamate	5000 (2270)
Acetamide, N-(4-ethoxyphenyl)-	100 (45.4)	Ammonium carbonate	5000 (2270)
Acetamide, N-fluoren-2-yl-	1 (0.454)	Ammonium chloride	5000 (2270)
Acetamide, 2-fluoro-	100 (45.4)	Ammonium chromate	10 (4.54)
Acetic acid	5000 (2270)	Ammonium citrate, dibasic	5000 (2270)
Acetic acid (2,4-dichlorophenoxy)-	100 (45.4)	Ammonium dichromate *	10 (4.54)
Acetic acid, ethyl ester	5000 (2270)	Ammonium fluoborate	5000 (2270)
Acetic acid, fluoro-, sodium salt	10 (4.54)	Ammonium fluoride	100 (45.4)
Acetic acid, lead (2+) salt	10 (4.54)	Ammonium hydroxide	1000 (454)
Acetic acid, thallium (I+) salt	1000 (454)	Ammonium oxalate	5000 (2270)
Acetic acid, (2,4,5-trichlorophenoxy)	1000 (454)	Ammonium picrate	10 (4.54)
Acetic anhydride	5000 (2270)	Ammonium silicofluoride	1000 (454)
Acetone	5000 (2270)	Ammonium sulfamate	5000 (2270)
Acetone cyanohydrin	10 (4.54)	Ammonium sulfide	100 (45.4)
Acetonitrile	5000 (2270)	Ammonium sulfite	5000 (2270)
Acetophenone	5000 (2270)	Ammonium tartrate	5000 (2270)
2-Acetylaminofluorene	1 (0.454)	Ammonium thiocyanate	5000 (2270)
Acetyl bromide	5000 (2270)	Ammonium vanadate	1000 (454)
Acetyl chloride	5000 (2270)	Amyl acetate	5000 (2270)
1-Acetyl-2-thiourea	1000 (454)	iso-Amyl acetate	
Acrolein	1 (0.454)	sec-Amyl acetate	
Acrylamide	5000 (2270)	tert-Amyl acetate	
Acrylic acid	5000 (2270)	Aniline	5000 (2270)
Acrylonitrile	100 (45.4)	o-Anisidine	100 (45.4)
Adipic acid	5000 (2270)	Anthracene	5000 (2270)
Aldicarb	1 (0.454)	Antimony +	5000 (2270)
Aldrin	1 (0.454)	Antimony pentachloride	1000 (454)
Allyl alcohol	100 (45.4)	Antimony potassium tartrate	100 (45.4)
Allyl chloride	1000 (454)	Antimony tribromide	1000 (454)
Aluminum phosphide	100 (45.4)	Antimony trichloride	1000 (454)
Aluminum sulfate	5000 (2270)	Antimony trifluoride	1000 (454)
4-Aminobiphenyl	1 (0.454)	Antimony trioxide	1000 (454)
4-Aminopyridine	1000 (454)	Argentate(1-), bis(cyano-C)-, potassium	1 (0.454)
5-(Aminomethyl)-3-isoxazolol	1000 (454)	Aroclor 1016	1 (0.454)
Amitrole	10 (4.54)	Aroclor 1221	1 (0.454)
Ammonia	100 (45.4)		

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Aroclor 1232	1 (0.454)
Aroclor 1242	1 (0.454)
Aroclor 1248	1 (0.454)
Aroclor 1254	1 (0.454)
Aroclor 1260	1 (0.454)
Arsenic +	1 (0.454)
Arsenic acid	1 (0.454)
Arsenic acid H3AsO4	1 (0.454)
Arsenic disulfide	1 (0.454)
Arsenic oxide As203	1 (0.454)
Arsenic oxide As205	1 (0.454)
Arsenic pentoxide	1 (0.454)
Arsenic trichloride	1 (0.454)
Arsenic trioxide	1 (0.454)
Arsenic trisulfide	1 (0.454)
Arsine, diethyl-	1 (0.454)
Arsinic acid, dimethyl-	1 (0.454)
Arsonous dichloride, phenyl-	1 (0.454)
Asbestos ++	1 (0.454)
Auramine	100 (45.4)
Azaserine	1 (0.454)
Aziridine	1 (0.454)
Aziridine, 2-methyl-	1 (0.454)
Azirino[2',3':3,4]pyrrolo(1,2-a)indole-4,7-dione,6-amino-8-[[aminocarbonyl)oxy]methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-,[1aS-(aalpha,8beta,8aalpha,8balpha)]	10 (4.54)
Barium cyanide	10 (4.54)
Benz[j]aceanthrylene,1,2-dihydro-3-methyl-	10 (4.54)
Benz[c]acridine	100 (45.4)
3,4-Benzacridine	100 (45.4)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Benzal chloride	5000 (2270)
Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)	5000 (2270)
Benz[a]anthracene	10 (4.54)
1,2-Benzanthracene	10 (4.54)
Benz[a]anthracene 7,12-dimethyl-	1 (0.454)
Benzenamine	5000 (2270)
Benzenamine, 4,4'-carbonimidoylbis (N,N-dimethyl-	100 (45.4)
Benzenamine, 4-chloro-	1000 (454)
Benzenamine, 4-chloro-2-methyl-, hydrochloride	100 (45.4)
Benzenamine, N,N-dimethyl-4-(phenylazo)-	10 (4.54)
Benzenamine, 2-methyl-	100 (45.4)
Benzenamine, 4-methyl-	100 (45.4)
Benzenamine, 4,4'-methylenebis(2-chloro-	10 (4.54)
Benzenamine, 2-methyl-,hydrochloride	100 (45.4)
Benzenamine, 2-methyl-5-nitro-	100 (45.4)
Benzenamine, 4-nitro-	5000 (2270)
Benzene	10 (4.54)
Benzene, 1-bromo-4-phenoxy-	100 (45.4)
Benzene, chloro-	100 (45.4)
Benzene, chloromethyl-	100 (45.4)
Benzene, 1,2-dichloro-	100 (45.4)
Benzene, 1,3-dichloro-	100 (45.4)
Benzene, 1,4-dichloro-	100 (45.4)
Benzene, 1,1'-(2,2-dichloroethylidene)bis[4-chloro	1 (0.454)
Benezene, dichloromethyl-	5000 (2270)
Benzene, 1,3-diisocyanatomethyl	100 (45.4)
Benzene, dimethyl-	100 (45.4)
Benzene, m-dimethyl-	1000 (454)
Benzene, o-dimethyl-	1000 (454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Benzene, p-dimethyl-	100 (45.4)
Benzene, hexachloro-	10 (4.54)
Benzene, hexahydro-	1000 (454)
Benzene, hydroxy-	1000 (454)
Benzene, methyl-	1000 (454)
Benzene, 1-methyl-2,4-dinitro-	10 (4.54)
Benzene, 2-methyl-1,3-dinitro-	100 (45.4)
Benzene, 1-methylethyl-	5000 (2270)
Benzene, nitro-	1000 (454)
Benzene, pentachloro-	10 (4.54)
Benzene, pentachloronitro-	100 (45.4)
Benzene, 1,2,4,5-tetrachloro-	5000 (2270)
Benzene, 1,1'-(2,2,2-trichloroethylidene) bis[4-chloro-	1 (0.454)
Benzene, 1,1'-(2,2,2-trichloroethylidene) bis[4-methoxy]-	1 (0.454)
Benzene, (trichloromethyl)	10 (4.54)
Benzene, 1,3,5-trinitro-	10 (4.54)
Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy, ethyl ester	10 (4.54)
Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-	10 (4.54)
Benzenediamine, ar-methyl-	10 (4.54)
1,2-Benzenedicarboxylic acid, [bis(2-ethylhexyl)] ester	100 (45.4)
1,2-Benzenedicarboxylic acid, dibutyl ester	10 (4.54)
1,2-Benzenedicarboxylic acid, diethyl ester	1000 (454)
1,2-Benzenedicarboxylic acid, dimethyl ester	5000 (2270)
1,2-Benzenedicarboxylic acid, dioctyl ester	5000 (2270)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
1,3-Benzenediol	5000 (2270)
1,2-Benzenediol,4-[1-hydroxy-2-(methyl amino) ethyl]-	1000 (454)
Benzeneethanamine, alpha,alpha-dimethyl-	5000 (2270)
Benzenesulfonic acid chloride	100 (45.4)
Benzenesulfonyl chloride	100 (4.54)
Benzenethiol	100 (45.4)
Benzidine	1 (0.454)
1,2-Benzisothiazol-3(2H)-one,1,1-dioxid e	100 (45.4)
Benz[o]aanthracene	10 (4.54)
1,3-Benzodioxole, 5-(2-propenyl)-	100 (45.4)
1,3-Benzodioxole, 5-(1-propenyl)-	100 (45.4)
1,3-Benzodioxole, 5-propyl-	10 (4.54)
Benzo[b]fluoranthene	1 (0.454)
Benzo[k]fluoranthene	5000 (2270)
Benzo[j,k]fluorene	100 (45.4)
Benzoic acid	5000 (2270)
Benzonitrile	5000 (2270)
Benzo[g,h,i]perylene	5000 (2270)
2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenyl-buthyl)-, & salts, when present at concentrations greater than 0.3%	100 (45.4)
Benzo[a]pyrene	1 (0.454)
3,4-Benzopyrene	1 (0.454)
p-Benzoquinone	10 (4.54)
Benzo [rst]pentaphene	10 (4.54)
Benzotrichloride	10 (4.54)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Benzoyl chloride	1000 (454)
1,2-Benzphenanthrene	100 (45.4)
Benzyl chloride	100 (45.4)
Beryllium +	10 (4.54)
Beryllium chloride	1 (0.454)
Beryllium dust +	10 (4.54)
Beryllium fluoride	1 (0.454)
Beryllium nitrate	1 (0.454)
alpha - BHC	10 (4.54)
beta - BHC	1 (0.454)
delta - BHC	1 (0.454)
gamma - BHC	1 (0.454)
2,2'-Bioxirane	10 (4.54)
Biphenyl	100 (45.4)
(1,1'-Biphenyl)-4,4'-diamine	1 (0.454)
(1,1'-Biphenyl)-4,4'-diamine,3,3'-dichloro-	1 (0.454)
(1,1'-Biphenyl)-4,4'-diamine,3,3'-dimethoxy-	10 (4.54)
(1,1'-Biphenyl)-4,4'-diamine,3,3'-dimethyl-	10 (4.54)
Bis(2-chloroethoxy) methane	1000 (454)
Bis(2-chloroethyl) ether	10 (4.54)
Bis(2-ethylhexyl)phthalate	100 (45.4)
Bromoacetone	1000 (454)
Bromoform	100 (45.4)
4-Bromophenyl phenyl ether	100 (45.4)
Brucine	100 (45.4)
1,3-Butadiene	10 (4.54)
1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	1 (0.454)
1-Butanamine, N-butyl-N-nitroso-	10 (4.54)
1-Butanol	5000 (2270)
2-Butanone	5000 (2270)
2-Butanone, 3,3-dimethyl-1-(methylthio)-,O-[(methylamino) carbonyl] oxime	100 (45.4)
2-Butanone peroxide	10 (4.54)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
2-Butenal	100 (45.4)
2-Butene, 1,4-dichloro-	1 (0.454)
2-Butenoic acid,2-methyl-,7 [[2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy]methyl]-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester, [1S-[1alpha(Z), 7 (2S*,3R*),7aalpha]]-	10 (4.54)
Butyl acetate	5000 (2270)
iso-Butyl acetate	
sec-Butyl acetate	
tert-Butyl acetate	
n-Butyl alcohol	5000 (2270)
Butylamine	1000 (454)
iso-Butylamine	
sec-Butylamine	
tert-Butylamine	
Butyl benzyl phthalate	100 (45.4)
n-Butyl phthalate	10 (4.54)
Butyric acid	5000 (2270)
iso-Butyric acid	
Cacodylic acid	1 (0.454)
Cadmium +	10 (4.54)
Cadmium acetate	10 (4.54)
Cadmium bromide	10 (4.54)
Cadmium chloride	10 (4.54)
Calcium arsenate	1 (0.454)
Calcium arsenite	1 (0.454)
Calcium carbide	10 (4.54)
Calcium chromate	10 (4.54)
Calcium cyanamide	1000 (454)
Calcium cyanide	10 (4.54)
Calcium cyanide Ca(CN)2	10 (4.54)
Calcium dodecylbenzene sulfonate	1000 (454)
Calcium hypochlorite	10 (4.54)
Camphene, octachloro-	1 (0.454)
Caprolactam	5000 (2270)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Captan	10 (4.54)
Carbamic acid, ethyl ester	100 (45.4)
Carbamic acid, methylnitroso-, ethyl ester	1 (0.454)
Carbamic chloride, dimethyl-	1 (0.454)
Carbamide, thio-	10 (4.54)
Carbamimidoselenoic acid	1000 (454)
Carbamothioic acid, bis (1-methylethyl)-,S-(2,3-dichloro-2-propenyl) ester	100 (45.4)
Carbaryl	100 (45.4)
Carbofuran	10 (4.54)
Carbon bisulfide	100 (45.4)
Carbon disulfide	100 (45.4)
Carbonic acid, dithallium (1+)	100 (45.4)
Carbonic dichloride	10 (4.54)
Carbonic difluoride	1000 (454)
Carbonochloridic acid, methyl ester	1000 (454)
Carbon oxyfluoride	1000 (454)
Carbon tetrachloride	10 (4.54)
Carbonyl sulfide	100 (45.4)
Catechol	100 (45.4)
Chloral	5000 (2270)
Chloramben	100 (45.4)
Chlorambucil	10 (4.54)
Chlordane	1 (0.454)
Chlordane, alpha & gamma isomers	1 (0.454)
Chlordane, technical	1 (0.454)
Chlorine	10 (4.54)
Chlornaphazine	100 (45.4)
Chloroacetaldehyde	1000 (454)
Chloroacetic acid	100 (45.4)
2-Chloroacetophenone	100 (45.4)
p-Chloroaniline	1000 (454)
Chlorobenzene	100 (45.4)
Chlorobenzilate	10 (4.54)
4-Chloro-m-cresol	5000 (2270)
p-Chloro-m-cresol	5000 (2270)
Chlorodibromomethane	100 (45.4)
Chloroethane	100 (45.4)
2-Chloroethyl vinyl ether	1000 (454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Chloroform	10 (4.54)
Chloromethane	100 (45.4)
Chloromethyl methyl ether	10 (4.54)
beta-Chloronaphthalene	5000 (2270)
2-Chloronaphthalene	5000 (2270)
2-Chlorophenol	100 (45.4)
o-Chlorophenol	100 (45.4)
4-Chlorophenyl phenyl ether	5000 (2270)
1-(o-Chlorophenyl)thiourea	100 (45.4)
Chloroprene	100 (45.4)
3-Chloropropionitrile	1000 (454)
Chlorosulfonic acid	1000 (454)
4-Chloro-o-toluidine, hydrochloride	100 (45.4)
Chlorpyrifos	1 (0.454)
Chromic acetate	1000 (454)
Chromic acid	10 (4.54)
Chromic acid H2CrO4, calcium salt	10 (4.54)
Chromic sulfate	1000 (454)
Chromium +	5000 (2270)
Chromous chloride	1000 (454)
Chrysene	100 (45.4)
Cobaltous bromide	1000 (454)
Cobaltous formate	1000 (454)
Cobaltous sulfamate	1000 (454)
Coke Oven Emissions	1 (0.454)
Copper +	5000 (2270)
Copper chloride *	10 (4.54)
Copper cyanide	10 (4.54)
Copper cyanide CuCN	10 (4.54)
Coumaphos	10 (4.54)
Creosote	1 (0.454)
Cresols (isomers and mixture)	100 (45.4)
m-Cresol	100 (45.4)
o-Cresol	100 (45.4)
p-Cresol	100 (45.4)
Cresylic acid (isomers and mixture)	100 (45.4)
m-Cresylic acid	100 (45.4)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
o-Cresylic acid	100 (45.4)
p-Cresylic acid	100 (45.4)
Crotonaldehyde	100 (45.4)
Cumene	5000 (2270)
Cupric acetate	100 (45.4)
Cupric acetoarsenite	1 (0.454)
Cupric chloride	10 (4.54)
Cupric nitrate	100 (45.4)
Cupric oxalate	100 (45.4)
Cupric sulfate	10 (4.54)
Cupric sulfate ammoniated	100 (45.4)
Cupric tartrate	100 (45.4)
Cyanides (soluble salts and complexes) not otherwise specified	10 (4.54)
Cyanogen	100 (45.4)
Cyanogen bromide	1000 (454)
Cyanogen bromide (CN)Br	1000 (454)
Cyanogen chloride	10 (4.54)
Cyanogen chloride (CN)Cl	10 (4.54)
2,5-Cyclohexadiene-1,4-dione	10 (4.54)
Cyclohexane	1000 (454)
Cyclohexane, 1,2,3,4,5,6-hexachloro-, (1alpha,2alpha, 3beta, 4alpha,5alpha,6beta)-	1 (0.454)
Cyclohexanone	5000 (2270)
2-Cyclohexyl-4,6-dinitrophenol	100 (45.4)
1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	10 (4.54)
Cyclophosphamide	10 (4.54)
2,4-D Acid	100 (45.4)
2,4-D Ester	100 (45.4)
Daunomycin	10 (4.54)
DDD	1 (0.454)
4,4'-DDD	1 (0.454)
DDE	5000 (2270)
4,4'-DDE	5000 (2270)
DDT	1 (0.454)
4,4'-DDT	1 (0.454)
Diallate	100 (45.4)
Diamine	1 (0.454)
Diazinon	1 (0.454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Diazomethane	100 (45.4)
Dibenz[a,h]anthracene	1 (0.454)
1,2:5,6-Dibenzanthracene	1 (0.454)
Dibenzo[a,h]anthracene	1 (0.454)
Dibenz[a,i]pyrene	10 (4.54)
Dibenzofuran	100 (45.4)
1,2-Dibromo-3-chloropropane	1 (0.454)
Dibutyl phthalate	10 (4.54)
Di-n-butyl phthalate	10 (4.54)
Dicamba	1000 (454)
Dichlobenil	100 (45.4)
Dichlone	1 (0.454)
Dichlorobenzene	100 (45.4)
1,2-Dichlorobenzene	100 (45.4)
1,3-Dichlorobenzene	100 (45.4)
1,4 Dichlorobenzene	100 (45.4)
m-Dichlorobenzene	100 (45.4)
o-Dichlorobenzene	100 (45.4)
p-Dichlorobenzene	100 (45.4)
3,3'-Dichlorobenzidine	1 (0.454)
Dichlorobromomethane	5000 (2270)
1,4 Dichloro-2-butene	1 (0.454)
Dichlorodifluoromethane	5000 (2270)
1,1 Dichloroethane	1000 (454)
1,2 Dichloroethane	100 (45.4)
1,1-Dichloroethylene	100 (45.4)
1,2 Dichloroethylene	1000 (454)
Dichloroethyl ether	10 (4.54)
Dichloroisopropyl--ether	1000 (454)
Dichloromethane *	1000 (454)
Dichloromethoxy ethane	1000 (454)
Dichloromethyl ether	10 (4.54)
2,4 Dichlorophenol	100 (45.4)
2,6-Dichlorophenol	100 (45.4)
Dichlorophenylarsine	1 (0.454)
Dichloropropane	1000 (454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
1,1-Dichloropropane	
1,3-Dichloropropane	
1,2-Dichloropropane	1000 (454)
Dichloropropane - Dichloropropene (mixture)	100 (45.4)
Dichloropropene	100 (45.4)
2,3-Dichloropropene	
1,3-Dichloropropene	100 (45.4)
2,2-Dichloropropionic acid	5000 (2270)
Dichlorvos	10 (4.54)
Dicofol	10 (4.54)
Dieldrin	1 (0.454)
1,2:3,4-Diepoxybutane	10 (4.54)
Diethanolamine	100 (45.4)
Diethylamine	1000 (454)
N,N-diethylaniline	1000 (454)
Diethylarsine	1 (0.454)
1,4-Diethylenedioxide	100 (45.4)
Diethylhexyl phthalate	100 (45.4)
N,N'-Diethylhydrazine	10 (4.54)
O,O-Diethyl S-methyl dithiophosphate	5000 (2270)
Diethyl-p-nitrophenyl phosphate	100 (45.4)
Diethyl phthalate	1000 (454)
O,O-Diethyl O-pyrazinyl phosphorothioate	100 (45.4)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Diethylstilbestrol	1 (0.454)
Diethyl sulfate	10 (4.54)
Dihydrosafrole	10 (4.54)
Diisopropyl fluorophosphate	100 (45.4)
1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10, 10-hexachloro-1,4, 4a,5, 8,8a-hexahydro, (1alpha, 4alpha, 4abeta, 5abeta,8beta, 8abeta)-	1 (0.454)
1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10, 10-10-hexachloro-1,4, 4a,5,8,8a-hexahydro-,(1alpha, 4alpha, 4abeta,5alpha,8alpha, 8abeta)-	1 (0.454)
2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7, 7a-octahydro-, (1aalpha,2beta, 2abeta, 3alpha,6alpha,6abeta, 7beta, 7aalpha)-	1 (0.454)
2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro -1a,2,2a,3,6,6a,7, 7a-octahydro-, (1aalpha,2beta,2aalpha, 3beta, 6beta,6aalpha,7beta, 7aalpha)-	1 (0.454)
Dimethoate	10 (4.54)
3,3'-Dimethoxybenzidine	10 (4.54)
Dimethylamine	1000 (454)
p-Dimethylaminoazobenzene	10 (4.54)
N,N-dimethylaniline	100 (45.4)
7,12-Dimethylbenz[a]anthracene	1 (0.454)
3,3'-Dimethylbenzidine	10 (4.54)
alpha,alpha-Dimethylbenzylhydroperoxide	10 (4.54)
Dimethylcarbamoyl chloride	1 (0.454)
Dimethylformamide	100 (45.4)
1,1-Dimethylhydrazine	10 (4.54)
1,2-Dimethylhydrazine	1 (0.454)
Dimethylhydrazine, unsymmetrical *	10 (4.54)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
alpha,alpha-Dimethylphenethylamine	5000 (2270)
2,4-Dimethylphenol	100 (45.4)
Dimethyl phthalate	5000 (2270)
Dimethyl sulfate	100 (45.4)
Dinitrobenzene (mixed)	100 (45.4)
m-Dinitrobenzene	
o-Dinitrobenzene	
p-Dinitrobenzene	
4,6-Dinitro-o-cresol and salts	10 (4.54)
Dinitrogen tetroxide *	10 (4.54)
Dinitrophenol	10 (4.54)
2,5-Dinitrophenol	
2,6-Dinitrophenol	
2,4-Dinitrophenol	10 (4.54)
Dinitrotoluene	10 (4.54)
3,4-Dinitrotoluene	
2,4-Dinitrotoluene	10 (4.54)
2,6-Dinitrotoluene	100 (45.4)
Dinoseb	1000 (454)
Di-n-octyl phthalate	5000 (2270)
1,4-Dioxane	100 (45.4)
1,2-Diphenylhydrazine	10 (4.54)
Diphosphoramide, octamethyl-	100 (45.4)
Diphosphoric acid, tetraethyl ester	10 (4.54)
Dipropylamine	5000 (2270)
Di-n-propylnitrosamine	10 (4.54)
Diquat	1000 (454)
Disulfoton	1 (0.454)
Dithiobiuret	100 (45.4)
Diuron	100 (45.4)
Dodecylbenzenesulfonic acid	1000 (454)
2,4-D,salts and esters	100 (45.4)
Endosulfan	1 (0.454)
alpha - Endosulfan	1 (0.454)
beta - Endosulfan	1 (0.454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Endosulfan sulfate	1 (0.454)
Endothall	1000 (454)
Endrin	1 (0.454)
Endrin, & metabolites	1 (0.454)
Endrin aldehyde	1 (0.454)
Epichlorohydrin	100 (45.4)
Epinephrine	1000 (454)
1,2-Epoxybutane	100 (45.4)
Ethanol	1000 (454)
Ethanamine, N-ethyl-N-nitroso-	1 (0.454)
Ethane, 1,2-dibromo-	1 (0.454)
Ethane, 1,1-dichloro-	1000 (454)
Ethane, 1,2-dichloro-	100 (45.4)
Ethane, hexachloro-	100 (45.4)
Ethane, 1,1'-[methylenebis (oxy)]bis(2-chloro-	1000 (454)
Ethane, 1,1'-oxybis-	100 (45.4)
Ethane, 1,1'-oxybis(2-chloro-	10 (4.54)
Ethane, pentachloro-	10 (4.54)
Ethane, 1,1,1,2-tetrachloro-	100 (45.4)
Ethane, 1,1,2,2 tetrachloro-	100 (45.4)
Ethane, 1,1,2-trichloro-	100 (45.4)
Ethane, 1,1,1-trichloro-	1000 (454)
1,2-Ethanediamine, N, N-dimethyl-N'-2-pyridinyl-N'-(2-thienyl-methyl)-	5000 (2270)
Ethanedinitrile	100 (45.4)
Ethanenitrile	5000 (2270)
Ethanethioamide	10 (4.54)
Ethanimidothioic acid, N-[[(methylamino) carbonyl] oxy]-, methyl ester	100 (45.4)
Ethanol, 2-ethoxy-	1000 (454)
Ethanol, 2,2'-(nitrosoimino)bis-	1 (0.454)
Ethanone, 1-phenyl-	5000 (2270)
Ethanoyl chloride	5000 (2270)
Ethene, chloro-	1 (0.454)
Ethene, 2-chloroethoxy-	1000 (454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Ethene, 1,1-dichloro-	100 (45.4)
Ethene, 1,2-dichloro- (E)	1000 (454)
Ethene, tetrachloro-	100 (45.4)
Ethene, trichloro-	100 (45.4)
Ethion	10 (4.54)
Ethyl acetate	5000 (2270)
Ethyl acrylate	1000 (454)
Ethylbenzene	1000 (454)
Ethyl carbamate (Urethan)	100 (45.4)
Ethyl chloride *	100 (45.4)
Ethyl cyanide	10 (4.54)
Ethylene dibromide	1 (0.454)
Ethylene dichloride	100 (45.4)
Ethylene glycol	5000 (2270)
Ethylene glycol monoethyl ether	1000 (454)
Ethylene oxide	10 (4.54)
Ethylenebisdithiocarbamic acid	5000 (2270)
Ethylenebisdithiocarbamic acid, salts and esters	5000 (2270)
Ethylenediamine	5000 (2270)
Ethylenediamine tetraacetic acid (EDTA)	5000 (2270)
Ethylenethiourea	10 (4.54)
Ethylenimine	1 (0.454)
Ethyl ether	100 (45.4)
Ethylidene dichloride	1000 (454)
Ethyl methacrylate	1000 (454)
Ethyl methanesulfonate	1 (0.454)
Ethyl methyl ketone *	5000 (2270)
Famphur	1000 (454)
Ferric ammonium citrate	1000 (454)
Ferric ammonium oxalate	1000 (454)
Ferric chloride	1000 (454)
Ferric fluoride	100 (45.4)
Ferric nitrate	1000 (454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Ferric sulfate	1000 (454)
Ferrous ammonium sulfate	1000 (454)
Ferrous chloride	100 (45.4)
Ferrous sulfate	1000 (454)
Fluoranthene	100 (45.4)
Fluorene	5000 (2270)
Fluorine	10 (4.54)
Fluoroacetamide	100 (45.4)
Fluoroacetic acid, sodium salt	10 (4.54)
Formaldehyde	100 (45.4)
Formic acid	5000 (2270)
Fulminic acid, mercury(2+)salt	10 (4.54)
Fumaric acid	5000 (2270)
Furan	100 (45.4)
Furan, tetrahydro-	1000 (454)
2-Furancarboxaldehyde	5000 (2270)
2,5-Furandione	5000 (2270)
Furfural	5000 (2270)
Furfuran	100 (45.4)
Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-	1 (0.454)
D-Glucose, 2-deoxy-2-[[methylnitrosoamino)-carbonyl]amino]-	1 (0.454)
Glycidylaldehyde	10 (4.54)
Guanidine, N-methyl-N'nitro-N-nitroso	10 (4.54)
Guthion	1 (0.454)
Heptachlor	1 (0.454)
Heptachlor epoxide	1 (0.454)
Hexachlorobenzene	10 (4.54)
Hexachlorobutadiene	1 (0.454)
Hexachlorocyclohexane (gamma isomer)	1 (0.454)
Hexachlorocyclopentadiene	10 (4.54)
Hexachloroethane	100 (45.4)
1,2,3,4,10-10-Hexachloro-1,4,4a,5,8, 8a-hexahydro-1,4:5,8-endo,exo-dimethanonaphthalene	1 (0.454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Hexachlorophene	100 (45.4)
Hexachloropropene	1000 (454)
Hexaethyl tetraphosphate	100 (45.4)
Hexamethylene-1,6-diisocyanate	100 (45.4)
Hexamethylphosphoramide	1 (0.454)
Hexane	5000 (2270)
Hydrazine	1 (0.454)
Hydrazine, 1,2-diethyl-	10 (4.54)
Hydrazine, 1,1-dimethyl-	10 (4.54)
Hydrazine, 1,2-dimethyl-	1 (0.454)
Hydrazine, 1,2-diphenyl-	10 (4.54)
Hydrazine, methyl-	10 (4.54)
Hydrazinecarbothioamide	100 (45.4)
Hydrochloric acid	5000 (2270)
Hydrocyanic acid	10 (4.54)
Hydrofluoric acid	100 (45.4)
Hydrogen chloride	5000 (2270)
Hydrogen cyanide	10 (4.54)
Hydrogen fluoride	100 (45.4)
Hydrogen phosphide	100 (45.4)
Hydrogen sulfide	100 (45.4)
Hydrogen sulfide H2S	100 (45.4)
Hydroperoxide, 1-methyl-1-phenylethyl-	10 (4.54)
Hydroquinone	100 (45.4)
2-Imidazolidinethione	10 (4.54)
Indeno(1,2,3-cd)pyrene	100 (45.4)
1,3-Isobenzofurandione	5000 (2270)
Isobutyl alcohol	5000 (2270)
Isodrin	1 (0.454)
Isophorone	5000 (2270)
Isoprene	100 (45.4)
Isopropanolamine dodecylbenzene sulfonate	1000 (454)
Isosafrole	100 (45.4)
3(2H)-Isoxazolone, 5-(aminomethyl)-	1000 (454)
Kepone	1 (0.454)
Lasiocarpine	10 (4.54)
Lead +	10 (4.54)
Lead acetate	10 (4.54)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Lead arsenate	1 (0.454)
Lead, bis(acetato-O) tetrahydroxytri	10 (4.54)
Lead chloride	10 (4.54)
Lead fluoborate	10 (4.54)
Lead fluoride	10 (4.54)
Lead iodide	10 (4.54)
Lead nitrate	10 (4.54)
Lead phosphate	10 (4.54)
Lead stearate	10 (4.54)
Lead subacetate	10 (4.54)
Lead sulfate	10 (4.54)
Lead sulfide	10 (4.54)
Lead thiocyanate	10 (4.54)
Lindane	1 (0.454)
Lithium chromate	10 (4.54)
Malathion	100 (45.4)
Maleic acid	5000 (2270)
Maleic anhydride	5000 (2270)
Maleic hydrazide	5000 (2270)
Malononitrile	1000 (454)
MDI	5000 (2270)
Melphalan	1 (0.454)
Mercaptodimethur	10 (4.54)
Mercuric cyanide	1 (0.454)
Mercuric nitrate	10 (4.54)
Mercuric sulfate	10 (4.54)
Mercuric thiocyanate	10 (4.54)
Mercurous nitrate	10 (4.54)
Mercury	1 (0.454)
Mercury, (acetato-O)phenyl-	100 (45.4)
Mercury fulminate	10 (4.54)
Methacrylonitrile	1000 (454)
Methanamine, N-methyl-	1000 (454)
Methanamine, N-methyl-N-nitroso	10 (4.54)
Methane, bromo	1000 (454)
Methane, chloro-	100 (45.4)
Methane, chloromethoxy-	10 (4.54)
Methane, dibromo-	1000 (454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Methane, dichloro-	1000 (454)
Methane, dichlorodifluoro	5000 (2270)
Methane, iodo-	100 (45.4)
Methane, isocyanato-	10 (4.54)
Methane, oxybis(chloro-	10 (4.54)
Methane, tetrachloro-	10 (4.54)
Methane, tetranitro-	10 (4.54)
Methane, tribromo-	100 (45.4)
Methane, trichloro-	10 (4.54)
Methane, trichlorofluoro-	5000 (2270)
Methanesulfenyl chloride, trichloro-	100 (45.4)
Methanesulfonic acid, ethyl ester	1 (0.454)
Methanethiol	100 (45.4)
6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro -1,5,5a,6,9, 9a-hexahydro-, 3-oxide	1 (0.454)
Methanoic acid	5000 (2270)
4,7-Methano-1H-indene, 1,4,5,6,7,8, 8-heptachloro-a,4,7,7a-tetrahydro-	1 (0.454)
4,7-Methano-1H-indene, 1,4,5,6,7,8, 8-octachloro-2,3,3a,4,7,7a-hexahydro-	1 (0.454)
Methanol	5000 (2270)
Methapyrilene	5000 (2270)
1,3,4-Metheno-2H-cyclobutal[cd]-pentalen-2 -one, 1, 1a, 3, 3a, 4, 5, 5,5a,5b,6- decachloroctahydro-	1 (0.454)
Methomyl	100 (45.4)
Methoxychlor	1 (0.454)
Methyl alcohol	5000 (2270)
Methylamine *	100 (45.4)
Methyl bromide	1000 (454)
1-Methylbutadiene	100 (45.4)
Methyl chloride	100 (45.4)
Methyl chlorocarbonate	1000 (454)
Methyl chloroform	1000 (454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Methyl chloroformate	1000 (454)
Methylchloromethyl ether *	1 (0.454)
3-Methylcholanthrene	10 (4.54)
4,4'-Methylenebis(2-chloroaniline)	10 (4.54)
Methylene bromide	1000 (454)
Methylene chloride	1000 (454)
4,4'-Methylenedianiline	10 (4.54)
Methylene diphenyl diisocyanate	5000 (2270)
Methylene oxide	100 (45.4)
Methyl ethyl ketone (MEK)	5000 (2270)
Methyl ethyl ketone peroxide	10 (4.54)
Methyl hydrazine	10 (4.54)
Methyl iodide	100 (45.4)
Methyl isobutyl ketone	5000 (2270)
Methyl isocyanate	1 (0.454)
2-Methyllactonitrile	10 (4.54)
Methyl mercaptan	100 (45.4)
Methyl methacrylate	1000 (454)
Methyl parathion	100 (45.4)
4-Methyl-2-pentanone	5000 (2270)
Methyl tert-butyl ether	1000 (454)
Methylthiouracil	10 (4.54)
Mevinphos	10 (4.54)
Mexacarbate	1000 (454)
Mitomycin C	10 (4.54)
MNNG	10 (4.54)
Monoethylamine	100 (45.4)
Monomethylamine	100 (45.4)
Muscimol	1000 (454)
Naled	10 (4.54)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
5,12-Naphthacenedione, 8-acetyl-10-[3-amino-2,3,6-trideoxy-alpha-L-lyxo- hexopyranosyl) oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-,(8S-cis)-	10 (4.54)
Naphthalenamine, N,N-bis(2-chloroethyl)-	100 (45.4)
Naphthalene	100 (45.4)
Naphthalene, 2-chloro-	5000 (2270)
1,4-Naphthalenedione	5000 (2270)
2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl-(1,1'-biphenyl)-4, 4'-diyl)-bis(azo)]bis(5-amino-4-hydroxy)-tetrasodium salt	10 (4.54)
Naphthenic acid	100 (45.4)
1,4-Naphthoquinone	5000 (2270)
alpha-Naphthylamine	100 (45.4)
beta-Naphthylamine	1 (0.454)
1-Naphthylamine	100 (45.4)
2-Naphthylamine	1 (0.454)
alpha-Naphthylthiourea	100 (45.4)
Nickel +	100 (45.4)
Nickel ammonium sulfate	100 (45.4)
Nickel carbonyl	10 (4.54)
Nickel carbonyl Ni(CO)4,(T-4)-	10 (4.54)
Nickel chloride	100 (45.4)
Nickel cyanide	10 (4.54)
Nickel cyanide Ni(CN)2	10 (4.54)
Nickel hydroxide	10 (4.54)
Nickel nitrate	100 (45.4)
Nickel sulfate	100 (45.4)
Nicotine and salts	100 (45.4)
Nitric acid	1000 (454)
Nitric acid, thallium (1+) salt	100 (45.4)
Nitric oxide	10 (4.54)
p-Nitroaniline	5000 (2270)
Nitrobenzene	1000 (454)
4-nitrobiphenyl	10 (4.54)
Nitrogen dioxide	10 (4.54)
Nitrogen oxide NO	10 (4.54)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Nitrogen oxide NO2	10 (4.54)
Nitroglycerine	10 (4.54)
Nitrophenol (mixed)	100 (45.4)
m-	
o-	
p-	
o-Nitrophenol	100 (45.4)
p-Nitrophenol	100 (45.4)
2-Nitrophenol	100 (45.4)
4-Nitrophenol	100 (45.4)
2-Nitropropane	10 (4.54)
N-Nitrosodi-n-butylamine	10 (4.54)
N-Nitrosodiethanolamine	1 (0.454)
N-Nitrosodiethylamine	1 (0.454)
N-Nitrosodimethylamine	10 (4.54)
N-Nitrosodiphenylamine	100 (45.4)
N-Nitroso-N-ethylurea	1 (0.454)
N-Nitroso-N-methylurea	1 (0.454)
N-Nitroso-N-methylurethane	1 (0.454)
N-Nitrosomethylvinylamine	10 (4.54)
n-Nitrosomorpholine	1 (0.454)
N-Nitrosopiperidine	10 (4.54)
N-Nitrosopyrrolidine	1 (0.454)
Nitrotoluene	1000 (454)
m-Nitrotoluene	
o-Nitrotoluene	
p-Nitrotoluene	
5-Nitro-o-toluidine	100 (45.4)
Octamethylpyrophosphoramide	100 (45.4)
Osmium oxide OsO4 (T-4)-	1000 (454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Osmium tetroxide	1000 (454)
7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid	1000 (454)
1,2-Oxathiolane, 2,2-dioxide	10 (4.54)
2H-1,3,2-Oxazaphosphorin-2-amine, N,N-bis(2-chloroethyl) tetrahydro-2-oxide	10 (4.54)
Oxirane	10 (4.54)
Oxiranecarboxyaldehyde	10 (4.54)
Oxirane, (chloromethyl)-	100 (45.4)
Paraformaldehyde	1000 (454)
Paraldehyde	1000 (454)
Parathion	10 (4.54)
Pentachlorobenzene	10 (4.54)
Pentachloroethane	10 (4.54)
Pentachloronitrobenzene (PCNB)	100 (45.4)
Pentachlorophenol	10 (4.54)
1,3-Pentadiene	100 (45.4)
Perchloroethylene	100 (45.4)
Perchloromethyl mercaptan *	100 (45.4)
Phenacetin	100 (45.4)
Phenanthrene	5000 (2270)
Phenol	1000 (454)
Phenol, 2-chloro-	100 (45.4)
Phenol, 4-chloro-3-methyl-	5000 (2270)
Phenol, 2-cyclohexyl-4,6-dinitro-	100 (45.4)
Phenol, 2,4-dichloro-	100 (45.4)
Phenol, 2,6-dichloro-	100 (45.4)
Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, (E)	1 (0.454)
Phenol, 2,4-dimethyl-	100 (45.4)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Phenol, 2,4-dinitro-	10 (4.54)
Phenol, methyl-	100 (45.4)
Phenol, 2-methyl-4,6-dinitro-	10 (4.54)
Phenol, 2,2'-methylenebis [3,4,6-trichloro-	100 (45.4)
Phenol, 2-(1-methylpropyl)-4,6-dinitro	1000 (454)
Phenol, 4-nitro-	100 (45.4)
Phenol, pentachloro-	10 (4.54)
Phenol, 2,3,4,6-tetrachloro-	10 (4.54)
Phenol, 2,4,5-trichloro-	10 (4.54)
Phenol, 2,4,6-trichloro-	10 (4.54)
Phenol, 2,4,6-trinitro-, ammonium salt	10 (4.54)
L-Phenylalanine, 4-[bis(2-chloroethyl)aminol]	1 (0.454)
p-Phenylenedimine	5000 (2270)
1,10-(1,2-Phenylene)pyrene	100 (45.4)
Phenyl mercaptan *	100 (45.4)
Phenylmercuric acetate	100 (45.4)
Phenylthiourea	100 (45.4)
Phorate	10 (4.54)
Phosgene	10 (4.54)
Phosphine	100 (45.4)
Phosphoric acid	5000 (2270)
Phosphoric acid, diethyl 4-nitrophenyl ester	100 (45.4)
Phosphoric acid, lead(2+) salt (2:3)	10 (4.54)
Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio) ethyl]ester	1 (0.454)
Phosphorodithioic acid, O,O-diethyl S-(ethylthio), methyl ester	10 (4.54)
Phosphorodithioic acid, O,O-diethyl S-methyl ester	5000 (2270)
Phosphorodithioic acid, O,O-dimethyl S-[2 (methylamino)-2- oxoethyl] ester	10 (4.54)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Phosphorofluoridic acid, bis(1-methylethyl) ester	100 (45.4)
Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester	10 (4.54)
Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester	100 (45.4)
Phosphorothioic acid, O,O-dimethyl O-(4-nitrophenyl) ester	100 (45.4)
Phosphorothioic acid, O,[4-[(dimethylamino) sulfonyl phenyl]O,O-dimethyl ester	1000 (454)
Phosphorus	1 (0.454)
Phosphorus oxychloride	1000 (454)
Phosphorus pentasulfide	100 (45.4)
Phosphorus sulfide	100 (45.4)
Phosphorus trichloride	1000 (454)
Phthalic anhydride	5000 (2270)
2-Picoline	5000 (2270)
Piperidine, 1-nitroso-	10 (4.54)
Plumbane, tetraethyl-	10 (4.54)
POLYCHLORINATED BIPHENYLS (PCBs)	1 (0.454)
Potassium arsenate	1 (0.454)
Potassium arsenite	1 (0.454)
Potassium bichromate	10 (4.54)
Potassium chromate	10 (4.54)
Potassium cyanide	10 (4.54)
Potassium cyanide K(CN)	10 (4.54)
Potassium hydroxide	1000 (454)
Potassium permanganate	100 (45.4)
Potassium silver cyanide	1 (0.454)
Pronamide	5000 (2270)
Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl] oxime	1 (0.454)
1-Propanamine	5000 (2270)
1-Propanamine, N-nitroso-N-propyl-	10 (4.54)
1-Propanamine, N-propyl-	5000 (2270)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Propane, 1,2-dibromo-3-chloro-	1 (0.454)
Propane, 1,2-dichloro-	1000 (454)
Propane, 2-nitro-	10 (4.54)
Propane, 2,2'-oxybis [2-chloro-	1000 (454)
1,3-Propane sultone	10 (4.54)
Propanedinitrile	1000 (454)
Propanenitrile	10 (4.54)
Propanenitrile, 3-chloro-	1000 (454)
Propanenitrile, 2-hydroxy-2-methyl-	10 (4.54)
1,2,3-Propanetriol, trinitrate-	10 (4.54)
1-Propanol, 2,3-dibromo-, phosphate (3:1)	10 (4.54)
1-Propanol, 2-methyl-	5000 (2270)
2-Propanone	5000 (2270)
2-Propanone, 1-bromo-	1000 (454)
Propargite	10 (4.54)
Propargyl alcohol	1000 (454)
2-Propenal	1 (0.454)
2-Propenamide	5000 (2270)
1-Propene, 1,3-dichloro-	100 (45.4)
1-Propene, 1,1,2,3,3,3-hexachloro-	1000 (454)
2-Propenenitrile	100 (45.4)
2-Propenenitrile, 2-methyl	1000 (454)
2-Propenoic acid	5000 (2270)
2-Propenoic acid, ethyl ester	1000 (454)
2-Propenoic acid, 2-methyl-, ethyl ester	1000 (454)
2-Propenoic acid, 2-methyl-, methyl ester	1000 (454)
2-Propen-1-ol	100 (45.4)
beta-Propioaldehyde	1000 (454)
Propionic acid	5000 (2270)
Propionic acid, 2-(2,4,5-trichlorophenoxy)-	100 (45.4)
Propionic anhydride	5000 (2270)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Propoxur (baygon)	100 (45.4)
n-Propylamine	5000 (2270)
Propylene dichloride	1000 (454)
Propylene oxide	100 (45.4)
1,2-Propyleimine	1 (0.454)
2-Propyn-1-ol	1000 (454)
Pyrene	5000 (2270)
Pyrethrins	1 (0.454)
3,6-Pyridazinedione, 1,2-dihydro-	5000 (2270)
4-Pyridinamine	1000 (454)
Pyridine	1000 (454)
Pyridine, 2-methyl-	5000 (2270)
Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)	100 (45.4)
2,4-(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl)amino]-	10 (4.54)
4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-	10 (4.54)
Pyrrolidine, 1-nitroso-	1 (0.454)
Quinoline	5000 (2270)
Reserpine	5000 (2270)
Resorcinol	5000 (2270)
Saccharin and salts	100 (45.4)
Safrole	100 (45.4)
Selenious acid	10 (4.54)
Selenious acid, dithallium(1+) salt	1000 (454)
Selenium +	100 (45.4)
Selenium dioxide	10 (4.54)
Selenium oxide	10 (4.54)
Selenium sulfide	10 (4.54)
Selenium sulfide SeS2	10 (4.54)
Selenourea	1000 (454)
L-Serine, diazoacetate (ester)	1 (0.454)
Silver	1000 (454)
Silver cyanide	1 (0.454)
Silver cyanide Ag(CN)	1 (0.454)
Silver nitrate	1 (0.454)
Silvex (2,4,5-TP)	100 (45.4)
Sodium	10 (4.54)
Sodium arsenate	1 (0.454)
Sodium arsenite	1 (0.454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Sodium azide	1000 (454)
Sodium bichromate	10 (4.54)
Sodium bifluoride	100 (45.4)
Sodium bisulfite	5000 (2270)
Sodium chromate	10 (4.54)
Sodium cyanide	10 (4.54)
Sodium cyanide Na(CN)	10 (4.54)
Sodium dodecylbenzene sulfonate	1000 (454)
Sodium fluoride	1000 (454)
Sodium hydrosulfide	5000 (2270)
Sodium hydroxide	1000 (454)
Sodium hypochlorite	100 (45.4)
Sodium methylate	1000 (454)
Sodium nitrite	100 (45.4)
Sodium phosphate, dibasic	5000 (2270)
Sodium phosphate, tribasic	5000 (2270)
Sodium selenite	100 (45.4)
Streptozotocin	1 (0.454)
Strontium chromate	10 (4.54)
Strychnidin-10-one	10 (4.54)
Strychnidin-10-one, 2,3-dimethoxy-	100 (45.4)
Strychnine and salts	10 (4.54)
Styrene	1000 (454)
Styrene oxide	100 (45.4)
Sulfur chloride *	1000 (454)
Sulfur monochloride	1000 (454)
Sulfur phosphide	100 (45.4)
Sulfuric acid	1000 (454)
Sulfuric acid, dimethyl ester	100 (45.4)
Sulfuric acid, dithallium(I+) salt	100 (45.4)
2,4,5-T	1000 (454)
2,4,5-T acid	1000 (454)
2,4,5-T amines	5000 (2270)
2,4,5-T esters	1000 (454)
2,4,5-T salts	1000 (454)
TDE	1 (0.454)
1,2,4,5-Tetrachlorobenzene	5000 (2270)
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1 (0.454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
1,1,1,2-Tetrachloroethane	100 (45.4)
1,1,2,2-Tetrachloroethane	100 (45.4)
Tetrachloroethane *	100 (45.4)
Tetrachloroethene	100 (45.4)
Tetrachloroethylene	100 (45.4)
2,3,4,6-Tetrachlorophenol	10 (4.54)
Tetraethyl lead	10 (4.54)
Tetraethyl pyrophosphate	10 (4.54)
Tetraethyldithiopyrophosphate	100 (45.4)
Tetrahydrofuran	1000 (454)
Tetranitromethane	10 (4.54)
Tetraphosphoric acid, hexaethyl ester	100 (45.4)
Thallic oxide	100 (45.4)
Thallium +	1000 (454)
Thallium(I) acetate	100 (45.4)
Thallium(I) carbonate	100 (45.4)
Thallium(I) chloride	100 (45.4)
Thallium chloride TICI	100 (45.4)
Thallium(I) nitrate	100 (45.4)
Thallium oxide T1203	100 (45.4)
Thallium selenite	1000 (454)
Thallium(I) sulfate	100 (45.4)
Thioacetamide	10 (4.54)
Thiodiphosphoric acid, tetraethyl ester	100 (45.4)
Thiofanox	100 (45.4)
Thioimidodicarbonic diamide [(H2N)C(S)]2NH	100 (45.4)
Thiomethanol	100 (45.4)
Thioperoxydicarbonic diamide [(H2N)C(S)]2S2, tetramethyl-	10 (4.54)
Thiophenol	100 (45.4)
Thiosemicarbazide	100 (45.4)
Thiourea	10 (4.54)
Thiourea, (2-chlorophenyl)-	100 (45.4)
Thiourea, 1-naphthalenyl-	100 (45.4)
Thiourea, phenyl-	100 (45.4)
Thiram	10 (4.54)
Titanium tetrachloride	1000 (454)
Toluene	1000 (454)
Toluenediamine	10 (4.54)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Toluene diisocyanate	100 (45.4)
o-Toluidine	100 (45.4)
p-Toluidine	100 (45.4)
o-Toluidine hydrochloride	100 (45.4)
Toxaphene	1 (0.454)
2,4,5-TP acid	100 (45.4)
2,4,5-TP acid esters	100 (45.4)
1H-1,2,4-Triazol-3-amine	10 (4.54)
Trichlorfon	100 (45.4)
1,2,4-Trichlorobenzene	100 (45.4)
1,1,1-Trichloroethane	1000 (454)
1,1,2-Trichloroethane	100 (45.4)
Trichloroethene	100 (45.4)
Trichloroethylene	100 (45.4)
Trichloromethanesulfenyl chloride	100 (45.4)
Trichloromonofluoromethane	5000 (2270)
Trichlorophenol	10 (4.54)
2,3,4-Trichlorophenol	
2,3,5-Trichlorophenol	
2,3,6-Trichlorophenol	
2,4,5-Trichlorophenol	
2,4,6-Trichlorophenol	
3,4,5-Trichlorophenol	
2,4,5-Trichlorophenol	10 (4.54)
2,4,6-Trichlorophenol	10 (4.54)
Triethanolamine dodecylbenzene sulfonate	1000 (45.4)
Triethylamine	5000 (2270)
Trifluralin	10 (4.54)
Trimethylamine	100 (45.4)
2,2,4-Trimethylpentane	1000 (454)
1,3,5-Trinitrobenzene	10 (4.54)
1,3,5-Trioxane, 2,4,6-trimethyl-	1000 (45.4)
Tris(2,3-dibromopropyl) phosphate	10 (4.54)
Trypan blue	10 (4.54)
Uracil mustard	10 (4.54)
Uranyl acetate	100 (45.4)
Uranyl nitrate	100 (45.4)
Urea, N-ethyl-N-nitroso-	1 (0.454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Urea, N-methyl-N-nitroso-	1 (0.454)
Vanadic acid, ammonium salt	1000 (454)
Vanadium oxide V205	1000 (454)
Vanadium pentoxide	1000 (454)
Vanadyl sulfate	1000 (454)
Vinyl acetate	5000 (2270)
Vinyl acetate monomer	5000 (2270)
Vinylamine, N-methyl-N-nitroso-	10 (4.54)
Vinyl bromide	100 (45.4)
Vinyl chloride	1 (0.454)
Vinylidene chloride	100 (45.4)
Warfarin, & salts, when present at concentrations greater than 0.3%	100 (45.4)
Xylene	100 (45.4)
m-Xylene	1000 (454)
o-Xylene	1000 (454)
p-Xylene	100 (45.4)
Xylene (mixed)	100 (45.4)
Xylenes (isomers and mixture)	100 (45.4)
Xylenol	1000 (454)
Yohimban-16-carboxylic acid, 11, 17-dimethoxy-18-[(3,4,5-trimethoxybenzoyl) oxy]-, methyl ester(3beta, 16beta, 17alpha, 18beta, 20alpha)-	5000 (2270)
Zinc +	1000 (454)
Zinc acetate	1000 (454)
Zinc ammonium chloride	1000 (454)
Zinc borate	1000 (454)
Zinc bromide	1000 (454)
Zinc carbonate	1000 (454)
Zinc chloride	1000 (454)
Zinc cyanide	10 (4.54)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
Zinc cyanide Zn(CN)2	10 (4.54)
Zinc fluoride	1000 (454)
Zinc formate	1000 (454)
Zinc hydrosulfite	1000 (454)
Zinc nitrate	1000 (454)
Zinc phenolsulfonate	5000 (2270)
Zinc phosphide	100 (45.4)
Zinc phosphide Zn3P2, when present at concentrations greater than 10%	100 (45.4)
Zinc silicofluoride	5000 (2270)
Zinc sulfate	1000 (454)
Zirconium nitrate	5000 (2270)
Zirconium potassium fluoride	1000 (454)
Zirconium sulfate	5000 (2270)
Zirconium tetrachloride	5000 (2270)
D001 Unlisted Hazardous Wastes Characteristic of Ignitability	100 (45.4)
D002 Unlisted Hazardous Wastes Characteristic of Corrosivity	100 (45.4)
D003 Unlisted Hazardous Wastes Characteristic of Reactivity	100 (45.4)
D004 - D043 Specific Hazardous Wastes with Toxicity Characteristics	
D004 Arsenic	1 (0.454)
D005 Barium	1000 (454)
D006 Cadmium	10 (4.54)
D007 Chromium	10 (4.54)
D008 Lead	10 (4.54)
D009 Mercury	1 (0.454)
D010 Selenium	10 (4.54)
D011 Silver	1 (0.454)
D012 Endrin	1 (0.454)
D013 Lindane	1 (0.454)
D014 Methoxychlor	1 (0.454)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
D015 Toxaphene	1 (0.454)
D016 2,4-D	100 (45.4)
D017 2,4,5-TP (Silvex)	100 (45.4)
D018 Benzene	10 (4.54)
D019 Carbon tetrachloride	10 (4.54)
D020 Chlordane	1 (0.454)
D021 Chlorobenzene	100 (45.4)
D022 Chloroform	10 (4.54)
D023 o-Cresol	100 (45.4)
D024 m-Cresol	100 (45.4)
D025 p-Cresol	100 (45.4)
D026 Cresol	100 (45.4)
D027 1,4-Dichlorobenzene	100 (45.4)
D028 1,2-Dichloroethane	100 (45.4)
D029 1,1-Dichloroethylene	100 (45.4)
D030 2,4-Dinitrotoluene	10 (4.54)
D031 Heptachlor (and hydroxide)	1 (0.454)
D032 Hexachlorobenzene	10 (4.54)
D033 Hexachlorobutadiene	1 (0.454)
D034 Hexachloroethane	100 (45.4)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
D035 Methyl ethyl ketone	5000 (2270)
D036 Nitrobenzene	1000 (454)
D037 Pentachlorophenol	10 (4.54)
D038 Pyridine	1000 (454)
D039 Tetrachloroethylene	100 (45.4)
D040 Tricholorethylene	100 (45.4)
D041 2,4,5-Trichlorophenol	10 (4.54)
D042 2,4,6-Trichlorophenol	10 (4.54)
D043 Vinyl chloride	1 (0.454)
F001	10 (4.54)
The following spent halogenated solvents used in degreasing; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more, (by volume) of one or more of the below listed halogenated solvents or those solvents listed in F002, F004 and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	
(a) Tetrachloroethylene	100 (45.4)
(b) Trichloroethylene	100 (45.4)
(c) Methylene chloride	1000 (454)
(d) 1,1,1-Trichloroethane	1000 (454)
(e) Carbon tetrachloride	10 (45.4)
(f) Chlorinated fluorocarbons	5000 (2270)
F002	10 (45.4)
The following spent halogenated solvents; all spent solvent mixtures/ blends containing, before use, a total of ten percent or more (by volume) of one or more of the below listed halogenated solvents or those listed in F001, F004, F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	
(a) Tetrachloroethylene	100 (45.4)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
(b) Methylene chloride	1000 (454)
(c) Trichloroethylene	100 (45.4)
(d) 1,1,1-Trichloroethane	1000 (454)
(e) Chlorobenzene	100 (45.4)
(f) 1,1,2-Trichloro-1,2,2-trifluoroethane	5000 (2270)
(g) o-Dichlorobenzene	100 (45.4)
(h) Trichlorofluoromethane	5000 (2270)
(i) 1,1,2 Trichloroethane	100 (45.4)
F003	100 (45.4)
The following spent non-halogenated solvents and solvents:	
(a) Xylene	1000 (454)
(b) Acetone	5000 (2270)
(c) Ethyl acetate	5000 (2270)
(d) Ethylbenzene	1000 (454)
(e) Ethyl ether	100 (45.4)
(f) Methyl isobutyl ketone	5000 (2270)
(g) n-Butyl alcohol	5000 (2270)
(h) Cyclohexanone	5000 (2270)
(i) Methanol	5000 (2270)

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
F004	100 (45.4)
The following spent non-halogenated solvents and the stillbottoms from the recovery of these solvents	
(a) Cresols/Cresylic acid	1000 (454)
(b) Nitrobenzene	100 (45.4)
F005	100 (45.4)
The following spent non-halogenated solvents and the stillbottoms from the recovery of these solvents:	
(a) Toluene	1000 (454)
(b) Methyl ethyl ketone	5000 (2270)
(c) Carbon disulfide	100 (45.4)
(d) Isobutanol	5000 (2270)
(e) Pyridine	1000 (454)
F006	10 (4.54)
Wastewater treatment sludges from electroplating operations except from the following processes: (1) sulfuric acid anodizing of aluminum,(2) tin plating on carbon steel, (3) zinc plating (segregated basis) on carbonsteel, (4) aluminum or zinc-aluminum plating on carbon steel, (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel, and (6) chemical etching and milling of aluminum.	
F007	10 (4.54)
Spent cyanide plating bath solutions from electroplating operations.	
F008	10 (4.54)
Plating bath residues from the bottom of plating baths from electroplating operations where cyanides are used in the process.	

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
F009	10 (4.54)
Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process.	
F010	10 (4.54)
Quenching bath residues from oil baths from metal heat treating operations where cyanides are used in the process.	
F011	10 (4.54)
Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations (except for precious metals heat treating spent cyanide solutions from salt bath pot cleaning).	
F012	10 (4.54)
Quenching wastewater treatment sludges from metal heat treating operations where cyanides are used in the process.	
F019	10 (4.54)
Wastewater treatment sludges from the chemical conversion coating of aluminum--except from zirconium phosphating in aluminum can washing when such phosphating is an exclusive conversion coating process.	

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
F020	1 (0.454)
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in formulating process) of tri- or tetrachlorophenol, or of intermediates used to produce their pesticide derivatives. (This listing does not include wastes from the production of hexachlorophene from higly purified 2,4,5,- trichlorophenol.	
F021	1 (0.454)
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of pentachlorophenol, or of intermediates used to produce its derivatives.	
F022	1 (0.454)
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzenes under alkaline conditions	
F023	1 (0.454)
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- and tetrachlorophenols. (This listing does not include wastes from equipment used only for the production or use of hexachlorophene from highly purified 2,4,5-trichlorophenol.).	
F024	1 (0.454)
Wastes, including but not limited to distillation residues, heavy ends, tars, and reactor cleanout wastes, from the production of chlorinated aliphatichydrocarbons, having carbon content from one to five, utilizing free radical catalyzed processes. (This listing does not include light ends, spent filters and filter aids, spent dessicants(sic), wastewater, wastewater treatment sludges, spent catalysts, and wastes listed in 40 CFR 261.32.).	

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
F025	1 (0.454)
Condensed light ends, spent filters and filter aids, and spent desiccant wastes from the production of certain chlorinated aliphatic with varying amounts and positions of with varying amounts and positions of chlorine substitution.	
F026	1 (0.454)
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzene under alkaline conditions.	
F027	1 (0.454)
Discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulations containing compounds derived from these chlorophenols. (This listing does not include formulations containing hexachlorophene synthesized from prepurified 2,4,5-trichlorophenol as the sole component.).	
Footnotes:	
+ The RQ for these hazardous substances is limited to those pieces of metal having a diameter smaller than 100 micrometer (0.004 inches)	
++ The RQ for asbestos is limited to	
friable forms only	
*** Indicates that the name was added by DOT because (1) the name is a synonym for a specific hazardous substance for a specific hazardous substance and (2) the name appears in the Hazardous Materials Table as a proper shipping name.**	

Hazardous Substance	Reportable Quantity (RQ) Pounds (Kilograms)
F028	1 (0.454)
Residues resulting from the incineration or thermal treatment of soil contaminated with EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, and F027.	
F032	1 (0.454)
F034	1 (0.454)
F035	1 (0.454)
F037	1 (0.454)
F038	1 (0.454)
F039	1 (0.454)

Attachment 5

CLASS 1--EXPLOSIVES AND AMMUNITION

A5.1. General Requirements. This attachment contains information concerning packaging and general handling instructions for Class 1 material.

A5.2. General Handling Instructions. Class 1 materials can function by detonation or combustion. Store away from fire hazards and handle carefully. Do not drop. Handle dropped Class 1 material according to **A3.3.1.1.**

A5.2.1. **Instructions applicable to all DoD explosives.**

A5.2.1.1. Comply with the requirements in **A3.3.1.** for forbidden material, DoD explosive classification and safety requirements.

A5.2.1.2. Package explosives according to applicable Special Packaging Instruction (SPI), technical manual, drawings, or other Service approved directives.

A5.2.2. **Chemical Munitions.** Chemical munitions are dangerous materials that are found in a variety of forms such as artillery shells, mortar shells, spray tanks, aircraft bombs, grenades, candles, rockets, and containers of chemical agents that are not high explosives or shrapnel. Chemical munitions are filled with war gases, smoke, or incendiaries. They are divided into four groups, according to the nature of fillings. These groupings are described in the service regulations referenced in **A3.3.1.3.**

A5.2.2.1. **Handling Chemical Ammunitions.** Use maximum preferential handling. Use the same materials handling equipment for high explosive munitions that is used for chemical munitions.

A5.2.2.2. **Reporting and Disposing of Chemical Ammunitions.** Immediately report any leaking chemical munitions to the agency initiating the shipment. If the leak is due to causes other than faulty munitions construction, report according to **1.9.** Dispose of leaking or damaged chemical munitions according to applicable service directives. The report should include the following:

A5.2.2.2.1. Type and amount of chemical munitions.

A5.2.2.2.2. Lot number.

A5.2.2.2.3. Date discovered.

A5.2.2.2.4. Detailed information concerning the nature and possible cause of leak.

A5.2.2.2.5. Disposition or recommendation for disposition.

A5.3. Installed Explosive Devices. Remove installed explosive devices from aircraft systems before shipment by military cargo aircraft unless a technical directive authorizes installation for military air shipment or the directive identifies the explosives are permanently imbedded in the system. When installation is authorized, ensure compliance with the following requirements:

A5.3.1. The safety devices are in place and secured to the maximum extent possible (including blocking or banding when advantageous) to prevent arming.

A5.3.2. The aircraft system's packaging provides reasonable security against tampering with the installed explosive items or the arming systems.

A5.3.3. Mark items according to **Attachment 14**, paragraph **A14.4.1.**

A5.3.4. The shipping documentation properly identifies the explosive nature of the shipment to include the proper hazard classification for each configured item. The Shipper's Declaration will identify the article's overall description as the proper shipping name (i.e., Engine, Internal Combustion for an aircraft containing the engine). Identify all installed explosive components as secondary hazards in Key 19. Reference this paragraph on the Shipper's Declaration rather than the specific paragraphs for the individual installed devices.

A5.4. Unpackaged Explosives. Unless otherwise authorized in this manual, package all explosives according to **Attachment 5**. Explosive may be removed from their required packaging to meet operational requirements of **Chapter 3** under the following:

A5.4.1. Airdrop parachute platforms configured according to TO 13C7/FM 10-500 series publications.

A5.4.2. Stored in approved racks or containers, or secured in/on tactical equipment or vehicles as operational components according to technical orders or publications.

A5.5. Captured Ammunition and Ammunition With Unknown Characteristics. Transport this ammunition on military aircraft only under the following provisions:

A5.5.1. Explosive ordinance disposal (EOD) personnel must inspect the items and complete necessary action to make them safe for air shipment, and sign a certificate to this effect.

A5.5.2. Qualified personnel assign a hazard classification. Pack and mark according to the prescribed packaging in **Table A4.1.**, including UN performance specification packaging requirements.

A5.6. Items requiring Special Approval. Ship according to a Special Approval (includes CAA or COE) issued for the particular item. See paragraphs **2.5.** and **2.6.** for more information on CAAs and COEs. Comply with the following handling instructions only when shipping items containing a fuel that is corrosive or toxic.

A5.6.1. **Handling Instructions.** Exercise extreme caution in handling this item. Keep well ventilated, away from sparks, fire hazards, and oxidizing materials. Vapors are toxic when inhaled. Liquid is corrosive. Fuel in presence of an oxidizer is self-igniting and highly reactive. Personnel exposed to this material must wear protective clothing, gloves, safety goggles, and must use a positive pressure breathing apparatus.

A5.6.2. **Shipping Requirements.** The following requirements apply:

A5.6.2.1. Load containers having an installed indicator in such a manner as to provide access to the indicator during flight. Inspect the indicator before aircraft loading, after aircraft loading, at cruise altitude, periodically during flight as cargo tiedown is inspected, and after landing. The normal color of the indicator is white or off-white. The color will change to yellow if inhibited red fuming nitric acid (IRFNA) leak occurs. The color will change to black if an amine fuel mixture (AFM) leak occurs. Changes will be obvious and will not require technical escort personnel to monitor.

A5.6.2.2. Containers that do not have an indicator installed must be preplanned under the same conditions as described in **2.9.** The shipper must contact the carrier no less than 72 hours before movement. The shipper must also furnish the following:

A5.6.2.3. Protective clothing, gloves, and a positive pressure breathing apparatus for all personnel aboard the aircraft (see also paragraph **1.12.**).

A5.6.2.4. Fume-detecting equipment.

A5.6.2.5. A qualified technical escort or courier with equipment to monitor the item for leaks and is prepared to take emergency in-flight action.

A5.6.3. **Emergency Procedures.** When a leak is detected, either by observation of the indicator or by monitoring equipment:

A5.6.3.1. Get personnel out of the cargo compartment.

A5.6.3.2. Alert pilot and crew.

A5.6.3.3. Depressurize cargo compartment and ventilate as soon as possible.

A5.6.3.4. All personnel should go on 100 percent oxygen.

A5.6.3.5. Declare an in-flight emergency.

A5.6.3.6. Be prepared to jettison cargo if possible.

A5.6.3.7. Descend and land as soon as possible.

A5.6.3.8. Aircraft must be parked in an isolated area.

A5.6.3.9. Aircraft must be unloaded by EOD personnel as soon as possible.

A5.7. Barium Azide; Barium Styphnate; Diazodinitrophenol, Wetted; Guanyl Nitrosaminoguanylidene Hydrazine, Wetted; Guanyl Nitrosaminoguanyltetrazene, Wetted; Tetrazene, Wetted; Lead Azide, Wetted; Lead Mononitroresorcinate; Lead Styphnate, Wetted; Lead Trinitroresorcinate, Wetted; and Mercury Fulminate, Wetted.

A5.7.1. Fill the intermediate and outer packagings with an appropriate water-saturated material. The outer drum must have a watertight seal (except UN0224 when shipped dry). Package as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: plastic textile, plastic coated or lined rubber textile, or rubberized textile	**Bags**: plastic textile, plastic coated or lined rubber textile, or rubberized textile bag **Receptacles**: plastic or metal	**Drums**: removable head steel (1A2) or removable head plastic (1H2)

A5.7.2. Inner packagings must not contain more than 50 g of explosive substance (quantity corresponding to dry substance); separate inner packagings from each other with dividing partitions; and do not partition within the outer packaging with more than 25 compartments. Package as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: conductive rubber or plastic **Receptacles:** conductive rubber or plastic, metal, or wood	**Dividing partitions:** metal, wood, plastic, or fiberboard	**Boxes:** natural wood, sift-proof wall (4C2), plywood (4D), or reconstituted wood (4F)

A5.8. Powder Cake or Powder Paste, Wetted; or Nitrocellulose Plasticized. Inner packagings are not required for UN0159 when metal (1A2 or 1B2) or plastic (1H2) drums are used as the outer packaging.

A5.8.1. Package as follows:

Inner packaging	Outer packaging
Bags: waterproof paper, plastic, or rubberized textile **Sheets**: plastic or rubberized textile	**Boxes**: steel (4A), aluminum (4B), fiberboard (4G), ordinary wood (4C1), natural sift-proof wood (4C2), plywood (4D), reconstituted wood (4F), expanded plastic (4H1), or solid plastic (4H2)

A5.8.2. Package as follows:

Inner packaging	Outer packaging
Bags: waterproof paper, plastic, or rubberized textile **Sheets**: plastic or rubberized textile	**Drums**: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), plywood (1D), or fiberboard (1G)

A5.9. Ammonium Picrate; Cyclotetramethylenetetranitramine, HMX, or Octogen **Wetted; Cyclotrimethylenetrinitramine and Octogen, Mixtures, Wetted or Desensitized; Cyclotrimethylenetrinitramine, Cyclonite, Hexogen, or RDX Wetted; Cyclotrimethylenetrinitramine and Cyclotetramethylenetetranitramine, Mixtures, Wetted or Desensitized; Cyclotrimethylenetrinitramine and HMX Mixtures, Wetted or Desensitized; Dinitrophenol; Dinitroresorcinol; Dipicryl Sulfide; Hexolite or Hexotol; Hexotonal; Mannitol Hexanitrate or Nitromannite, Wetted; Nitrocellulose; Nitrostarch; Nitro Urea; Nitroguanidine or Picrite Trinitrophenol or Picric Acid; Octolite or Octol; Pentolite; Pentaerythrite Tetranitrate or Pentaerythritol Tetranitrate or PETN, Wetted; or Pentaerythrite Tetranitrate or Pentaerythritol Tetranitrate or PETN, Desensitized; RDX and Cyclotetramethylenetetranitramine, Wetted or Desensitized; Trinitrobenzene; Trinitrobenzoic Acid; Trinitroresorcinol or Styphnic Acid; Trinitroresorcinol, Wetted; Trinitrotoluene or TNT Tritonal; RDX and HMX Mixtures, Wetted or Desensitized Urea Nitrate. Packaging must be lead free for UN 0004, 0076, 0078, 0154, 0216, 0219, 0386, and 0394.**

A5.9.1. **Wetted Solids.** Package as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: multiwall water resistant paper, plastic, textile, rubberized textile, woven plastic **Receptacles**: metal or plastic	**Bags**: plastics, plastic coated or lined textile **Receptacles**: metal or plastic Not required for UN0072 and UN 00226 or if leakproof drums are used as outer packaging	**Drums**: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.9.2. **Dry Solids Other Than Powders.** Package as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: kraft paper, multiwall water resistant paper, plastic, textile, rubberized plastic textile, woven plastic Not required for UN0222 and UN0223	**Bags** (required for UN 0150 only): plastics, plastic coated or lined textile	**Bags**: sift-proof woven plastic (5H2/3), plastic film (5H4), sift-proof textile (5L2), water resistant textile (5L3), multiwall water resistant paper (5M2)

A5.9.3. **Dry Solids Other Than Powders.** Package as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: kraft paper, multiwall water resistant paper, plastic, textile, rubberized plastic textile, woven plastic Not required for UN0222 and UN0223	**Bags** (required for UN 0150 only): plastics, plastic coated or lined textile	**Boxes**: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), solid plastic (4H2)

A5.9.4. **Dry Solids Other Than Powders.** Package as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: kraft paper, multiwall water resistant paper, plastic, textile, rubberized plastic textile, woven plastic. Not required for UN0222 and UN0223	**Bags** (required for UN 0150 only): plastics, plastic coated or lined textile	**Drums**: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2)

A5.9.5. **Solid Dry Powders.** Package as follows (at least one of the packagings must be sift-proof):

Inner packaging	Intermediate packaging	Outer packaging
Bags: multiwall water resistant paper, plastic, woven plastic **Receptacles**: fiberboard, metal, plastic, wood	**Bags**: multiwall water resistant paper with inner lining plastic **Receptacles**: metal or plastic	**Boxes**: steel (4A), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2)

A5.9.6. **Solid Dry Powders.** Package as follows (at least one of the packagings must be sift-proof):

Inner packaging	Intermediate packaging	Outer packaging
Not required	**Bags**: multiwall water resistant paper with inner lining plastic **Receptacles**: metal or plastic	**Drums**: removable head steel (1A2), removable head aluminum (1B2), fiber (1G)

A5.10. Ammonium Nitrate; Ammonium Perchlorate; Cyclotetramethylenetetranitramine, Octogen, or HMX Desensitized; Cyclotrimethylenetrinitramine, Cyclonite, Hexogen, or RDX Desensitized; Dinitroglycoluril or Dingu; Octonal; Tetranitroaniline; Trinitro-Meta-Cresol; Trinitroaniline or Picramide; Trinitroanisole; Trinitrobenzenesulfonic Acid; Trinitrochlorobenzene or Picryl Chloride; Trinitrofluorenone; Trinitronaphthalene; Trinitrophenetole; Trinitrotoluene and Trinitrobenzene Mixtures or TNT and Trinitrobenzene Mixtures or TNT and Hexannitrostilbene Mixtures or Trinitrotoluene and Hexanitrostilnene Mixtures; Trinitrotoluene Mixtures Containing Trinitrobenzene and Hexanitrostilbene or TNT Mixtures containing Trinitrobenzene and Hexanitrostilbene. Packaging must be lead free for UN 0004, 0076, 0078, 0154, 0216, 0219, and 0386.

A5.10.1. **Dry Solids Other Than Powders.** Package as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: kraft paper, multiwall water resistant paper, plastic, textile, rubberized plastic textile, woven plastic Not required for UN0222 and UN0223	**Bags** (required for UN 0150 only): plastics, plastic coated or lined textile	**Bags**: sift-proof woven plastic (5H2/3), plastic film (5H4), sift-proof textile (5L2), water resistant textile (5L3), multiwall water resistant paper (5M2)

A5.10.2. **Dry Solids Other Than Powders.** Package as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: kraft paper, multiwall water resistant paper, plastic, textile, rubberized plastic textile, woven plastic Not required for UN0222 and UN0223	**Bags** (required for UN 0150 only): plastics, plastic coated or lined textile	**Boxes**: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), solid plastic (4H2)

A5.10.3. **Dry Solids Other Than Powders.** Package follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: kraft paper, multiwall water resistant paper, plastic, textile, rubberized plastic textile, woven plastic Not required for UN0222 and UN0223	**Bags** (required for UN 0150 only): plastics, plastic coated or lined textile	**Drums**: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2)

A5.10.4. **Solid Dry Powders.** Package follows (at least one of the packagings must be sift-proof):

Inner packaging	Intermediate packaging	Outer packaging
Bags: multiwall water resistant paper, plastic, woven plastic **Receptacles**: fiberboard, metal, plastic, wood	**Bags**: multiwall water resistant paper with inner lining plastic **Receptacles**: metal or plastic	**Boxes**: steel (4A), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2)

A5.10.5. **Solid Dry Powders.** Package as follows (at least one of the packagings must be sift-proof):

Inner packaging	Intermediate packaging	Outer packaging
Not required	**Bags**: multiwall water resistant paper with inner lining plastic **Receptacles**: metal or plastic	**Drums**: removable head steel (1A2), removable head aluminum (1B2), fiber (1G)

A5.11. Black Powder or Gunpowder; Black Powder, Compressed or Gunpowder, Compressed; Black Powder, in Pellets or Gunpowder, in Pellets, Flash Powder. At least one of the packagings must be sift-proof. Do not package more than 50 g (1.8 oz) of flash powder (UN0094 or UN0305) in each inner packaging.

A5.11.1. Package as follows:

Inner packaging	Outer packaging
Bags: paper, plastic, or rubberized textile **Receptacles**: fiberboard, metal, plastic, wood **Sheets**: Kraft paper or waxed paper (only authorized for UN0028)	**Boxes**: steel (4A), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2)

A5.11.2. Package as follows:

Inner packaging	Outer packaging
Bags: paper, plastic, or rubberized textile **Receptacles**: fiberboard, metal, plastic, wood **Sheets**: Kraft paper or waxed paper (only authorized for UN0028) Inner packaging not required for UN0027	**Drums**: removable head steel (1A2), removable head aluminum (1B2), fiber (1G) Inner packaging not required for UN0027

A5.12. Deflagrating Metal Salts of Aromatic Nitroderivatives, N.O.S.; Dinitrophenolates; Dinitrosobenzene; Nitrocellulose, Wetted; 5-Mercaptotetrazol-1-Acetic Acid; Tetrazol-1-Acetic Acid; Powder, Smokeless; Propellant, Solid; Sodium Dinitro-O-Cresolate; Sodium Picramate; and Zirconium Picramate. Packagings must be lead free for UN0077, 0132, 0234, 0235 and 0236. Use paragraph **A5.12.1.** or **A5.12.2.** for UN0342. Use paragraph **A5.12.3.** or **A5.12.4.** for UN0132, 0160, UN0161, 0406, 0497, 0448, 0498, and 0499.

A5.12.1. **Wetted Solids.** Package as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: plastic, textile, woven plastic **Receptacles**: metal or plastic	**Bags**: plastic, plastic coated or lined textile **Receptacles**: metal or plastic	**Boxes**: steel (4A), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2)

A5.12.2. **Wetted Solids.** Package as follows:

Inner packaging	Intermediate packaging	Outer packaging
Bags: plastic, textile, woven plastic **Receptacles**: metal or plastic Not required for UN0342 when packed in outer 1A2, 1B2, or 1H2 drum	**Bags**: plastic, plastic coated or lined textile **Receptacles**: metal or plastic Not required if packed in outer leakproof removable head drum	**Drums**: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), plywood (1D), fiber (1G)

A5.12.3. **Dry Solids.** Package as follows:

Inner packaging	Outer packaging
Bags: kraft paper, plastic, sift-proof woven plastic or textile **Receptacles**: fiberboard, metal, paper, plastic	**Boxes**: ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G)

A5.12.4. **Dry Solids.** Package as follows:

Inner packaging	Outer packaging
Bags: kraft paper, plastic, sift-proof woven plastic or textile **Receptacles**: fiberboard, metal, paper, plastic Not required for UN0160 and 0161 when packed in outer 1A2 or 1B2 drum	**Drums**: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), plywood (1D), fiber (1G) For UN0160 and 0161, 1A2 and 1B2 drums must be constructed so that risk of explosion caused by increased internal pressure (from internal or external causes) is prevented

A5.13. Nitroglycerin, Desensitized; Nitroglycerin, Solution in Alcohol; and Propellant, Liquid. For liquid explosives, surround each inner packaging with sufficient amount of non-combustible absorbent cushioning material to absorb the entire contents. Cushion metal receptacles from each other in all directions. Liquid substances must not freeze at temperatures above 15 degrees C (5 degrees F). A composite packaging consisting of a plastic receptacle in a metal drum (6HA1) may be used instead of the inner and intermediate packagings.

A5.13.1. Packages as follows:

Inner packaging	Intermediate packaging	Outer packaging
Receptacles: metal or plastic Tape screw cap closures and do not exceed 5 liters capacity each (does not apply to UN 0144)	**Bags**: plastic in metal receptacles **Drums**: metal Not required for UN0144	**Boxes**: ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G) Maximum net mass 30 kg

A5.13.2. Packages as follows:

Inner packaging	Intermediate packaging	Outer packaging
Receptacles: metal or plastic	**Bags**: plastic in metal receptacles **Drums**: metal Not required for UN0144	**Drums**: removable head steel (1A2), removable head aluminum (1B2), plywood (1D), fiber (1G) Maximum net volume 120 liters

A5.14. Ammonium Nitrate-Fuel Oil Mixture; Explosive, Blasting, Type A (UN 0081); Explosive, Blasting, Type B (UN 0082); and Explosive, Blasting, Type E (UN 0241); Explosive, Blasting, Type B (UN 0331) or Agent Blasting, Type B; Explosive, Blasting, Type C (UN 0083); Explosive, Blasting, Type D (UN 0084) and Explosive, Blasting, Type E (UN 0332). Inner packaging is not required for UN 0082, 0241, 0331, and 0332 when the explosive is contained in a material impervious to liquid.

A5.14.1. Package as follows:

Inner packaging	Outer packaging
Bags: water and oil resistant paper, plastic, plastic coated or lined textile, sift-proof woven plastic **Receptacles**: water resistant fiberboard, metal, plastic, sift-proof wood **Sheets**: water resistant paper, waxed paper, plastic	**Boxes**: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2)

A5.14.2. Package as follows:

Inner packaging	Outer packaging
Bags: water and oil resistant paper, plastic, plastic coated or lined textile, sift-proof woven plastic **Receptacles**: water resistant fiberboard, metal, plastic, sift-proof wood **Sheets**: water resistant paper, waxed paper, plastic Not required for UN 0082, 0241, 0331, and 0332 if outer drum is leakproof	**Drums**: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2)

A5.14.3. Package as follows:

Inner packaging	Outer packaging
Bags: water and oil resistant paper, plastic, plastic coated or lined textile, sift-proof woven plastic **Receptacles**: water resistant fiberboard, metal, plastic, sift-proof wood **Sheets**: water resistant paper, waxed paper, plastic	**Jerricans**: removable head steel (3A2), removable head plastic (3H2)

A5.14.4. Package as follows:

Inner packaging	Outer packaging
Bags: water and oil resistant paper, plastic, plastic coated or lined textile, sift-proof woven plastic **Receptacles**: water resistant fiberboard, metal, plastic, sift-proof wood **Sheets**: water resistant paper, waxed paper, plastic Not required for UN 0331 when 5H2, 5H3 or 5H4 bags are outer packaging	**Bags**: woven plastic (5H1/2/3), multiwall water resistant paper (5M2), plastic film (5H4), sift-proof textile (5L2), water resistant textile (5L3) 5H2 or 5H3 bags only authorized for UN 0082, 0241, 0331, and 0332 Do not use for UN 0081

A5.15. Ammunition, Illuminating; Ammunition, Incendiary; Ammunition, Incendi**ary, White Phosphorus; Ammunition, Practice; Ammunition, Proof; Ammunition, Smoke; Ammunition, Smoke, White Phosphorus; Ammunition, Tear-Producing; Bombs; Bombs, Photo-Flash; Cartridges, Depth; Cartridges for Weapons; Cartridges for Weapons, Blank; Cartridges for Weapons, Inert Projectile; Cartridges, Small Arms; Cartridges, Small Arms, Blank; Charges, Bursting, Charges, Demolition; Plastic Bonded; Charges, Propelling for Cannon; Mines; Projectiles; Rocket Motors; Rockets; Rockets, Line-Throwing; Torpedoes; Warheads, Rocket; and Warheads, Torpedo.**

A5.15.1. Package as follows:

Inner packaging	Outer packaging
Not required	**Boxes**: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), solid plastic (4H2)

A5.15.2. Package as follows:

Inner packaging	Outer packaging
Not required	**Drums**: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.15.3. **Large and Robust Articles.** Large and robust articles without their means of initiation, or with their means of initiation containing at least two effective protective features, may be carried unpacked provided that a negative result was obtained in Test Series 4 of the UN Manual of Tests and Criteria on an unpackaged article. When such articles have propelling charges or are self-propelled, their ignition systems shall be protected against stimuli encountered during normal conditions of transport. Such articles may be in DOD-approved containers, crates, cradles, or other suitable han-

dling, storage, or launching devices which have been tested to show that they will not become loose during normal conditions of transport.

A5.16. Detonators, Electric: Inner packagings is not required when detonators are packed in pasteboard tubes, or when their leg wires are wound on spools with the caps either placed inside the spool or securely taped to the wire on the spool restricting movement of the caps and protecting from impact.

A5.16.1. Package as follows:

Inner packaging	Outer packaging
Bags: paper, plastic **Receptacles**: fiberboard, metal, plastic **Reels**	**Boxes**: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G)

A5.16.2. Package as follows:

Inner packaging	Outer packaging
Bags: paper, plastic **Receptacles**: fiberboard, metal, plastic **Reels**	**Drums**: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.17. Detonators, Non-electric and Detonator Assemblies, Non-electric: For detonators assemblies (UN 0360, 0361, 0500), detonators are not required to be attached to the safety fuse, metal clad mild detonating cord, detonating cord, or shock tube. Inner packagings are not required if the packing configuration restricts free movement of the caps and protects them from impact forces. For UN 0029, 0267, and 0455, bags and reels may not be used as inner packagings.

A5.17.1. Package as follows:

Inner packaging	Outer packaging
Bags: paper, plastic **Receptacles**: fiberboard, metal, plastic **Reels**	**Boxes**: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G)

A5.17.2. Package as follows:

Inner packaging	Outer packaging
Bags: paper, plastic **Receptacles**: fiberboard, metal, plastic **Reels**	**Drums**: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.18. Boosters and Charges, Supplementary Explosive.

A5.18.1. Package as follows:

Inner packaging	Outer packaging
Not required	**Boxes**: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2)

A5.18.2. Package as follows:

Inner packaging	Outer packaging
Receptacles: fiberboard, metal, plastic **Sheets**: paper, plastic	**Boxes**: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2)

A5.19. Boosters with Detonator; Bursters; Detonators for Ammunition; Grenades, Empty Primed; Primers, Cap Type; Primers, Tubular; and Tracers for Ammunition. Package as follows:

Inner packaging	Intermediate packaging	Outer packaging
Receptacles: fiberboard, metal, plastic, wood **Trays** (fitted with dividing partitions): fiberboard, plastics, wood. Do not use trays for UN 0043, 0212, 0225, 0268 or 0306.	**Receptacles**: fiberboard, metal, plastic, wood. Intermediate packaging only required when trays are used as inner packaging.	**Boxes**: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2)

A5.20. Cutters, Cable, Explosive; Cartridges, Power Device; Cartridges, Oil Well; **Fracturing Devices, Explosive; Release Devices, Explosive; Rivets, Explosive; and Sounding Devices, Explosive.**

A5.20.1. Package as follows:

Inner packaging	Outer packaging
Bags: water resistant material **Receptacles**: fiberboard, metal, plastic, wood **Sheets**: fiberboard corrugated **Tubes**: fiberboard	**Boxes**: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics

A5.20.2. Package as follows:

Inner packaging	Outer packaging
Bags: water resistant material **Receptacles**: fiberboard, metal, plastic, wood **Sheets**: fiberboard corrugated **Tubes**: fiberboard	**Drums**: removable head steel (1A2), removable head aluminum (1B2)

A5.21. Articles, Pyrotechnic; Cartridges, Flash; Cartridges, Signal; Fireworks; **Flares, Aerial; Flares, Surface; Signal Devices, Hand; Signals, Distress; Signals, Smoke; and Signals, Railway Track, Explosive.**

A5.21.1. Package as follows:

Inner packaging	Outer packaging
Bags: paper, plastic **Receptacles**: fiberboard, metal, plastic, wood **Sheets**: paper, plastic	**Boxes**: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastics (4H1), and solid plastics (4H2)

A5.21.2. Package as follows:

Inner packaging	Outer packaging
Bags: paper, plastic **Receptacles**: fiberboard, metal, plastic, wood **Sheets**: paper, plastic	**Drums**: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.22. Cases, Cartridge, Empty with Primer and Cases, Combustible, Empty, with**out Primer.**

A5.22.1. Package as follows:

Inner packaging	Outer packaging
Bags: plastic, textile **Boxes**: fiberboard, plastic, wood **Dividing partitions** within outer packaging	**Boxes**: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2)

A5.22.2. Package as follows:

Inner packaging	Outer packaging
Bags: plastic, textile **Boxes**: fiberboard, plastic, wood **Dividing partitions within outer packaging**	**Drums**: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.23. Charges, Shaped or Explosive, Commercial. For UN0059, 0439, 0440, and 0441, when shaped charges are packed singly, the conical cavity must face downwards and the package marked "THIS END UP". When shaped charges are packed in pairs, the conical cavities must face inwards. Package as follows:

Inner packaging	Outer packaging
Bags: plastic **Boxes**: fiberboard **Tubes**: fiberboard, metal, plastic **Dividing partitions within outer packaging**	**Boxes**: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G)

A5.24. Charges, Shaped, Flexible, Linear.

A5.24.1. Package as follows:

Inner packaging	Outer packaging
Bags: plastic If ends of articles are sealed, inner packaging is not required	**Boxes**: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastic (4H2)

A5.24.2. Package as follows:

Inner packaging	Outer packaging
Bags: plastic If ends of articles are sealed, inner packaging is not required	**Drums:** removable head steel (1A2) removable head aluminum (1B2)

A5.25. Cord or Fuse, Detonating; Cord or Fuse, Detonating Mild Effect. Seal and tie securely the ends of the detonating cord. Inner packaging is not required for UN 0065 and 0289 when securely fastened in coils.

A5.25.1. Package as follows:

Inner packaging	Outer packaging
Bags: plastic **Receptacles**: fiberboard, metal, plastic, wood **Sheets**: paper, plastic **Reels**	**Boxes**: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2)

A5.25.2. Package as follows:

Inner packaging	Outer packaging
Bags: plastic **Receptacles**: fiberboard, metal, plastic, wood **Sheets**: paper, plastic **Reels**	**Drums**: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), plywood (1D), fiber (1G)

A5.26. Cord, Igniter; Fuse, Igniter; Fuse, Non-detonating; or Fuse, Safety. For UN 0101, do not use steel or aluminum packaging and the packaging must be sift-proof unless the fuse is covered by a paper tube and both ends of tube are covered with removable caps.

A5.26.1. Package as follows:

Inner packaging	Outer packaging
Bags: plastic **Sheets**: kraft paper, plastic **Reels** Not required for UN 0105 if ends are sealed	**Boxes**: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2)

A5.26.2. Package as follows:

Inner packaging	Outer packaging
Bags: plastic **Sheets**: kraft paper, plastic **Reels** Not required for UN 0105 if ends are sealed	**Drums**: removable head steel (1A2), removable head aluminum (1B2), fiber (1G)

A5.27. Fuzes, Detonating; Fuzes, Igniting; Grenades; and Grenades, Practice.

A5.27.1. Package as follows:

Inner packaging	Outer packaging
Receptacles: fiberboard, metal, plastic, wood **Trays** (individual partitions): plastic wood **Dividing partitions in the outer packaging**	**Boxes**: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2)

A5.27.2. Package as follows:

Inner packaging	Outer packaging
Receptacles: fiberboard, metal, plastic, wood **Trays** (individual partitions): plastic wood **Dividing partitions in the outer packaging**	**Drums**: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.28. Igniters or Lighters, Fuse.

A5.28.1. Package as follows:

Inner packaging	Outer packaging
Bags: paper, plastic **Receptacles**: fiberboard, metal, plastic, wood **Sheets**: paper **Trays** (individual partitions): plastic	**Boxes**: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2)

A5.28.2. Package as follows:

Inner packaging	Outer packaging
Bags: paper, plastic **Receptacles**: fiberboard, metal, plastic, wood **Sheets**: paper **Trays** (individual partitions): plastic	**Drums**: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), fiber (1G)

A5.29. Charges, Propelling. Ensure metal packagings are constructed so that risk of explosion, by reason of increase in internal pressure (from internal or external causes), is prevented.

A5.29.1. Package as follows:

Inner packaging	Outer packaging
Bags: kraft paper, plastic, textile, rubberized textile **Receptacles**: fiberboard, metal, plastic **Trays** (individual partitions): plastic, wood Not required with use of 6HH2 package	**Boxes**: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), solid plastics (4H2) **Composite**: plastic receptacle with outer solid box (6HH2)

A5.29.2. Package as follows:

Inner packaging	Outer packaging
Bags: kraft paper, plastic, textile, rubberized textile **Receptacles**: fiberboard, metal, plastic **Trays** (individual partitions): plastic, wood	**Drums**: removable head steel (1A2), removable head aluminum (1B2), removable head plastic (1H2), plywood (1D), fiber (1G)

A5.30. Contrivances, Water-Activated.

A5.30.1. Package as follows:

Inner packaging	Outer packaging
Receptacles: fiberboard, metal, plastic **Dividing partitions in the outer packaging**	**Boxes**: steel (4A), aluminum (4B), ordinary natural wood (4C1), plywood (4D), reconstituted wood (4F), expanded plastic (4H1). Wooden boxes 4C1, 4D and 4F must contain a metal liner. Seal packagings against the ingress of water.

A5.30.2. **Large and Robust Articles.** Large and robust articles without their means of initiation, or with their means of initiation containing at least two effective protective features, may be carried unpacked provided that a negative result was obtained in Test Series 4 of the UN Manual of Tests and Criteria on an unpackaged article. When such articles have propelling charges or are self-propelled, their ignition systems shall be protected against stimuli encountered during normal conditions of transport. Such articles may be in DOD-approved containers, crates, cradles, or other suitable handling, storage, or launching devices which have been tested to show that they will not become loose during normal conditions of transport. Must contain at least two independent features which prevent the ingress of water.

Attachment 6

CLASS 2--COMPRESSED GASES

A6.1. General Requirements. This attachment contains information concerning the packaging and general handling instructions for Class 2.1 (flammable gas), Class 2.2 (nonflammable, nontoxic compressed gas), and Class 2.3 (toxic gas).

A6.2. General Handling Instructions for Compressed Gases. The following apply:

A6.2.1. Store compressed gases in a cool, ventilated area away from fire hazards, sources of heat, ignition, or sparks.

A6.2.2. When stored in an upright position, secure cylinders to fixed supports. Compressed gas cylinders may be palletized for shipment provided the valves are protected and cylinders are adequately secured to the pallet.

A6.2.3. Exercise care when handling compressed gases. Do not drop, jar, or slide cylinders since the gas may be toxic or asphyxiating. Personnel must know the importance of handling compressed gases properly.

A6.2.4. Ensure valves are always tightly closed and protected before offering for transportation.

A6.2.5. Do not store acetylene in a horizontal position.

A6.3. Aerosols. Prepare aerosols meeting the definition of "Consumer Commodity" as authorized under paragraph **A13.4.** Package aerosol products identified under the proper shipping name "Aerosols" as follows:

A6.3.1. **Aerosols Containing Non-Toxic Substances.** For an aerosol containing non-toxic substances, pack in inner non-refillable non-metal receptacles not exceeding 120 mL (4 fluid-ounce) capacity each, or in inner non-refillable metal or plastic receptacles not exceeding 1 L (34 fluid-ounces) provided all of the following conditions are met:

A6.3.1.1. Pressure in the aerosol container must not exceed 1245 kPa at 55 degrees C (180 psig at 130 degrees F) and each receptacle must be capable of withstanding without bursting a pressure of at least 1.5 times the equilibrium pressure of the contents at 55 degrees C (130 degrees F).

A6.3.1.2. If the pressure exceeds 970 kPa at 55 degrees C (140 psig at 130 degrees F) but does not exceed 1105 kPa at 55 degrees C (160 psig at 130 degrees F) use a DOT 2P, IP7, IP7A, or IP7B inner metal receptacle. If the pressure exceeds 1105 kPa at 55 degrees C (160 psig at 130 degrees F) but does not exceed 1245 kPa at 55 degrees C (180 psig at 130 degrees F) use a DOT 2Q, IP7A, or IP7B inner metal receptacle.

A6.3.1.3. Liquid content of the material and the gas must not completely fill the receptacle at 55 degrees C (130 degrees F).

A6.3.1.4. Each aerosol exceeding 120 mL (4 fluid ounce) capacity must have been heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the content at 55 degrees C (130 degrees F) without evidence of leakage, distortion, or other defects.

A6.3.1.5. Protect the valves by a cap or other suitable means.

A6.3.1.6. Tightly pack aerosols in a strong outer packaging capable of meeting packaging performance test outlined in **A19.3.4.** UN specification (UN marked) packaging is not required. The complete package must not exceed 30 kg (66 lbs) gross weight.

A6.3.2. **Other Aerosols.** For other aerosols (including those containing toxic substances), pack in inner non-refillable non-metal receptacles not exceeding 120 mL (4 fluid ounce) capacity each, or in inner non-refillable metal receptacles not exceeding 1 L (34 fluid ounces) provided all of the following conditions are met:

A6.3.2.1. Pressure in the aerosol container must not exceed 1500 kPa at 55 degrees C (217 psig at 130 degrees F) and each receptacle must be capable of withstanding without bursting a pressure of at least 1.5 times the equilibrium pressure of the contents at 55 degrees C (130 degrees F).

A6.3.2.2. If the pressure exceeds 970 kPa at 55 degrees C (140 psig at 130 degrees F) but does not exceed 1105 kPa at 55 degrees C (160 psig at 130 degrees F) use a DOT 2P, IP7, IP7A, or IP7B inner metal receptacle. If the pressure exceeds 1105 kPa at 55 degrees C (160 psig at 130 degrees F) but does not exceed 1245 kPa at 55 degrees C (180 psig at 130 degrees F) use a DOT 2Q, IP7A, or IP7B inner metal receptacle. If the pressure exceeds 1245 kPa at 55 degrees C (180 psig at 130 degrees F) but does not exceed 1500 kPa at 55 degrees C (217 psig at 130 degrees F) use an IP7B inner metal receptacle.

A6.3.2.3. Liquid content of the material and the gas must not completely fill the receptacle at 55 degrees C (130 degrees F).

A6.3.2.4. Each aerosol exceeding 120 mL (4 fluid ounce) capacity must have been heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the contents at 55 degrees C (130 degrees F) without evidence of leakage, distortion, or other defects.

A6.3.2.5. Protect the valves by a cap or other suitable means.

A6.3.2.6. Tightly pack aerosols in an outer fiberboard (4G), wooden (4C1, 4C2), plywood (4D), reconstituted (4F), or plastic (4H1, 4H2) box. The packaging must meet PG II requirements.

A6.3.3. For an aerosol charged with a non-toxic solution containing a biological product or medical preparation that could be deteriorated by heat and compressed gases that, except Class 6.1, PG III material, are poisonous or nonflammable, pack in inner non-refillable metal receptacles with provided all of the following conditions are met:

A6.3.3.1. The capacity of each inner receptacle must not exceed 575 mL (20 fluid ounces).

A6.3.3.2. Pressure in the receptacle must not exceed 970 kPa at 55 degrees C (140 psig at 130 degrees F).

A6.3.3.3. The liquid content of the product and gas must not completely fill the receptacle at 55 degrees C.

A6.3.3.4. One aerosol out of each lot of 500 or less, filled for shipment, must be heated until the pressure in the container is equivalent to the equilibrium pressure of the contents at 55 degrees C (130 degrees F) without evidence of leakage, distortion, or other defects.

A6.3.3.5. Protect the valves by a cap or other suitable means.

A6.3.3.6. Package inner receptacles in a strong outer packaging. The outer packaging must be capable of meeting the limited quantity performance standards outlined in **A19.3.4.** UN specification (UN marked) packaging is not required.

A6.3.3.7. The complete package must not exceed 30 kg (66 lbs) gross weight.

A6.3.4. For an aerosol containing a biological product or medical preparation that could be deteriorated by heat and is nonflammable pack in inner non-refillable metal receptacles provided all of the following conditions are met:

A6.3.4.1. The first five bullet requirements of **A6.3.3.** related to the aerosol receptacles apply.

A6.3.4.2. Tightly pack aerosol containers in an outer fiberboard (4G), wooden (4C1, 4C2), plywood (4D), reconstituted (4F), or plastic (4H1, 4H2) box. The packaging must meet PG II requirements.

A6.4. Small Receptacles Containing Compressed Gas. Package small receptacles of compressed gases, other than aerosols or Consumer Commodities, as identified in this paragraph. Unless otherwise specified, UN specification (UN marked) packaging is not required. Each package must not exceed 30 kg (66 lbs) gross weight. For unregulated compressed gases, see **A3.3.2.**

A6.4.1. Use containers, except cigarette lighters, of not more than 120 mL (4 fluid ounces, 7.22 cubic inches or less) capacity each. Package inner receptacles in strong outer packaging.

A6.4.2. Use metal containers filled with nonhazardous material not over 90 percent capacity at 21 degrees C (70 degrees F) then charged with a nonflammable, nonliquified gas. Each container must be tested to three times the gas pressure at 21 degrees C (70 degrees F). When refilled, the container must be retested to three times the gas pressure at 21 degrees C (70 degrees F) provided one of the following conditions are met:

A6.4.2.1. Container is not over 1 L (1 quart) capacity and charged to not more than 1172 kPa at 21 degrees C (170 psig at 70 degrees F.

A6.4.2.2. Container is not over 114L (30 gallon) capacity and charged to not more than 517 kPa at 21 degrees C (75 psig at 70 degrees F).

A6.4.3. Package electronic tubes of not more than 489 mL (30 cubic inch) volume charged with gas to a pressure of not more than 241 kPa (35 psig). Package in strong outer packaging.

A6.4.4. Use inside metal containers of a capacity not over 570.7 mL (35 cubic inches, 19.3 fluid ounces), charged with nonflammable, nonpoisonous or noncorrosive liquefied compressed gas designed for audible fire alarm systems. Pressure in the container must not exceed 482.6 kPa at 21 degrees C (70 psig at 70 degrees F). The completely assembled non-refillable container must be designed and fabricated with a burst pressure of not less than four times its charged pressure at 55 degrees C (130 degrees F.) Each refillable inside container must be designed and fabricated with a burst pressure of not less than five times its charged pressure at 55 degrees C (130 degrees F). The liquid portion of the gas must not completely fill the container at 55 degrees C (130 degrees F).

A6.4.5. A cylinder that is a component part of a passenger restraint system and is installed in a motor vehicle, charged with nonliquefied, nonflammable compressed gas and having no more than two actuating cartridges per valve, is exempt from the requirements of this manual with the following exceptions:

A6.4.5.1. Cylinder must comply with one of the cylinder specifications in 49 CFR, Part 178, and be authorized for use in **A6.7.** for the gas it contains.

A6.4.5.2. Cylinder must comply with the filling requirements of **A3.3.2.5.**

A6.4.6. A cylinder that is part of a tire inflation system in a motor vehicle, charged with a nonliquefied, nonflammable compressed gas, and is excepted from the requirements of this manual except the following:

A6.4.6.1. Cylinder must comply with one of the cylinder specifications in 49 CFR, Part 178, and be authorized for use in **Table A6.1.** for the gas it contains.

A6.4.6.2. Cylinder must comply with the filling requirements of **A3.3.2.5.**

A6.4.6.3. Each cylinder must be securely installed in the trunk of the motor vehicle, and the valve must be protected against accidental discharge.

A6.5. Liquefied Compressed Gases.

A6.5.1. Ship a nontoxic and nonflammable mixture (including insecticides) that contains a compressed gas according to this paragraph. Ship liquefied compressed gases in accordance with the filling, pressure, and DOT cylinder specification requirements of **Table A6.1.** If the compressed gas is not specifically identified in **Table A6.1.**, ship (except gas in solution) in DOT 3, 3A, 3AA, 3B, 3BN, 3D, 3E, 4, 4A, 4B, 4BA, 4B240ET, 4BW, 4E, 9, 25, 26, 38, 39, 40, or 41 cylinders. Ensure compliance with **A3.2.2.** Do not charge and ship DOT 4E, 9, 39, 40, or 41 cylinders with a mixture containing a pyroforic liquid, carbon bisulfide (disulfide), ethyl chloride, ethylene oxide, nickel carbonyl, spirits of nitroglycerin, or toxic material, (Class 6.1 or 2.3) unless authorized in a specific packaging paragraph. Use of existing cylinders, DOT 3, 3D, 4, 4A, 9, 25, 26, 38, 40, and 41 is authorized, but new construction of these cylinders is not authorized.

A6.5.2. **DOT 3AL Cylinders.** Use DOT 3AL cylinders to ship Carbonyl sulfide, cyclobutane, dimethyl ether, hydrogen selenide, propylene, silane, and vinyl bromide. Shipments are authorized on cargo aircraft only.

A6.5.3. **Nitrous Oxide.** Use DOT 3AL cylinders to ship nitrous oxide only under the following conditions:

A6.5.3.1. The cylinder must be equipped only with brass or stainless steel valve.

A6.5.3.2. Each cylinder must be cleaned and in compliance with the requirements of Federal Specification RR-C-901c, paragraphs **3.7.2.**, **3.8.2.**, and 4.4.2.3.

A6.5.4. **Mixtures With Class 2.3.** Ship a mixture containing any Class 2.3 material or irritating material, in such proportion that the mixture would be classed as toxic, in containers authorized in **Attachment 10**.

A6.5.5. **Refrigerant Gases.** Ship refrigerant gases that are nonpoisonous and nonflammable in cylinders prescribed in **A6.5.1.** or as follows: In DOT 2P and 2Q inside metal containers packed in a strong wooden or fiberboard box designed to protect valves from injury or accidental functioning under conditions incident to transportation. Pressure in the container must not exceed 586 kPa at 21 degrees C (85 psia at 70 degrees F). Each completed metal container filled for shipment must be heated until contents reach a minimum temperature of 55 degrees C (130 degrees F), without evidence of leakage, distortion, or other defects.

A6.5.6. **Engine Starting Fluid.** Engine-starting fluids containing compressed gas (or gases) that are flammable in cylinders prescribed in **A6.5.1.** or as follows:

A6.5.6.1. Inside nonrefillable metal containers not over 522 mL (32 cubic inch) capacity. Pressure in the container must not exceed 966 kPa at 55 degrees C (140 psia at 130 degrees F).

A6.5.6.2. If the pressure exceeds 966 kPa at 55 degrees C (140 psia at 130 degrees F) use a DOT 2P container.

A6.5.6.3. Any metal container must be capable of withstanding a pressure of 1 1/2 times the pressure of the content at 55 degrees C (130 degrees F) without bursting.

A6.5.6.4. Each container filled for shipment must have been heated until the contents reach a minimum temperature of 55 degrees C (130 degrees F) without evidence of leakage, distortion, or other defects.

A6.5.6.5. Pack inside nonrefillable metal containers in a strong tight outside packaging.

A6.5.7. **Foreign Cylinders.** Foreign cylinders meeting the requirements of **A3.3.2.7.**

A6.6. Nonliquefied Compressed Gases.

A6.6.1. Ship nonliquefied, compressed gases in accordance with the filling, pressure, and DOT cylinder specification requirements of **Table A6.1.** If the compressed gas is not specifically identified in **Table A6.1.**, ship in DOT 3, 3A, 3AA, 3B, 3C, 3D, 3E, 4, 4A, 4B, 4BA, 4BW, 4C, 25, 26, 33, or 38. Use of existing cylinders, DOT 3, 3C, 3D, 4, 4A, 4C, 25, 26, 33, and 38 is authorized, but new construction of these cylinders is not authorized.

A6.6.2. **DOT-3HT Cylinders.** DOT-3HT cylinders for use in aircraft only, having a maximum service life of 24 years, are only authorized for nonflammable gases. They must be equipped with a frangible disc safety relief device, without fusible metal backing, with a rated bursting pressure not over 90 percent of the minimum required test pressure of the cylinder with which the device is used. Pack cylinders in strong outside containers.

A6.6.3. **DOT 39 Cylinder.** Use DOT 39 cylinder. For flammable gases, the internal volume must not exceed 1.2 L (75 cubic inches). Use aluminum cylinders for oxygen only under the following conditions:

A6.6.3.1. Cylinder threads must be straight threads.

A6.6.3.2. Valves must be made of brass or stainless steel.

A6.6.3.3. Each cylinder must be cleaned to comply with the requirements of Federal Specification R-C-901c, paragraphs **3.7.2.**, **3.8.2.**, and 4.4.2.3.

A6.6.4. **DOT 3AL Cylinder.** Use DOT 3AL cylinder only for the following nonliquefied gases: air, argon, carbon monoxide, ethylene, helium, mercury free hydrogen, krypton, methane, nitrogen, neon, oxygen, and xenon. Ship flammable gases in 3AL cylinders on cargo aircraft only. When used in oxygen service, the cylinders must comply with 49 CFR 173.302(a)(5).

A6.6.5. **Carbon Monoxide.** Ship carbon monoxide in a DOT-3A, 3AX, 3AA, 3AAX, 3AL, 3, 3E, or 3T cylinder having a minimum service pressure of 12,411 kPa (1800 psig). The pressure in the cylinder must not exceed 6895 kPa at 21 degrees C (1000 psig at 70 degrees F), except that if the gas is dry

and sulfur free, the cylinder may be charged to five-sixths of the cylinder service pressure of 13,790 kPa (2000 psig), whichever is the least.

A6.6.6. **DOT 3AX, 3AAX, 3T Cylinders.** Use cylinders, DOT 3AX, 3AAX, or 3T only for the following nonliquefied gases: air, argon, boron trifluoride, carbon monoxide, ethane, ethylene, helium, hydrogen, methane, neon, nitrogen, or oxygen, except that specification 3T is not authorized for hydrogen. As used in this paragraph, methane is a nonliquefied gas which has a minimum purity of 98.0 percent methane and which is commercially free of corroding components.

A6.6.7. **Fluorine.** For fluorine gas use only DOT 3A1000, 3AA1000, or 3BN400 cylinders without a safety relief device and equipped with valve protection caps. Do not charge cylinders over 2758 kPa at 21 degrees C (400 psig at 70 degrees F) and ensure contents do not exceed 2.7 kg (6 pounds) of gas.

A6.6.8. **Recoil Mechanisms/Artillery Gun Mounts.** Pack recoil mechanisms or artillery gun mounts containing nitrogen charged to a maximum pressure of 15,858 kPa at 21 degrees C (2300 psig at 70 degrees F) in strong outer wooden containers. Ship recoil mechanisms or artillery gun mounts containing nitrogen unpackaged when securely attached to the weapon system.

A6.6.9. **Liquid Argon, Oxygen, and Nitrogen Samples.** Liquid argon, oxygen, or nitrogen samples under pressure, may be shipped in Cosmodyne Gas Samplers, Models CS 4.4 and CS 2.0 or in TTU-131/E Sampler (MIL-S-27626). See applicable technical directive for overpack instructions. Take samples in the liquid state but vaporize before shipment.

A6.6.10. **LAU-7/A Launcher-Receiver Assembly.** Ship LAU-7/A launcher-receiver assemblies charged with nitrogen not over 1724 kPa (250 psig).

A6.6.11. **Satellites, Spacecraft, and Other Articles Charged with Nitrogen or Dry Air.** These items may be transported inside a protective shipping container with a nitrogen or air purge during flight. The compressed gas must be in authorized cylinders and protected from damage during transport. The system must be equipped with a safety valve, enabling the nitrogen flow to be immediately shut off in the event of a problem while on the aircraft. Transport authorized on C-141, C-5, and C-17 aircraft only. The following limitations apply:

A6.6.11.1. Nitrogen may be purged into the shipping container at a rate not to exceed five (5) cubic feet per hour.

A6.6.11.2. Nitrogen may be purged into the shipping container at a rate not to exceed twenty (20) cubic feet per hour during transport. A technical escort must, using a portable oxygen monitor, continuously check the atmosphere inside the aircraft during flight. If the percentage of oxygen drops to 19.5% per volume, the escort must notify the aircraft commander immediately and the nitrogen purge immediately discontinued. All personnel will utilize supplemental oxygen until the percentage of oxygen exceeds 19.5% per volume. Provide maximum airflow rate in the cargo compartment during flight. Cargo doors must remain open during ground operations to provide adequate ventilation.

A6.6.11.3. Dry air may be purged into the shipping container at a rate not to exceed 70 cubic feet per hour.

A6.6.11.4. All other requirements of this manual must be met.

A6.6.11.5. See **Attachment 17** for additional certification requirements.

A6.6.12. **Foreign Cylinders.** Foreign cylinders meeting the requirements of **A3.3.2.7.**

Table A6.1. Cylinder Requirements for Compressed Gases.

Name of Gas	Maximum Permitted Filling Density in Percent (See A3.3.2.5.)	Cylinders Marked as Shown Below Must be Used
Bromotrifluoromethane (R-13B1 or H-1301)	124	DOT-3A400, DOT-3AA400, DOT-3AL400, DOT-3B400, DOT-3E1800, DOT-4A400, DOT-4AA480, DOT-4B400, DOT-4BA400, DOT-4BW400, DOT-39
Carbon dioxide (see notes 3 and 4)	68	DOT-3, DOT-3A1800, DOT-3AA1800, DOT-3AL1800, DOT-3AX1800, DOT-3AAX1800, DOT-3E1800, DOT-3HT2000, DOT-3T1800, DOT-39
Chlorine (see note 1)	125	DOT-3, DOT-3A480, DOT-3AA480, DOT-3BN480, DOT-3E1800, DOT-25
Chlorodifluroethane (R142b) or Chloro-1,1-Difluoroethane (see note 4)	100	DOT-3A150, DOT-3AA150, DOT-3AL150, DOT-3B150, DOT-3E1800, DOT-4B150, DOT-4BA225, DOT-4BW225, DOT-39
Chlorodifluoromethane (R22) (see note 4)	105	DOT-3A240, DOT-3AA240, DOT-3ALA240, DOT-3B240, DOT-3E1800, DOT-4B240, DOT-4B240ET, DOT-4BA240, DOT-4BW240, DOT-4E240, DOT-39, DOT-41
Chloropentafluorethane (R-115)	110	DOT-3A225, DOT-3AA225, DOT-3AL225, DOT-3B225, DOT-3E1800, DOT-4A225, DOT-4B225, DOT-4BA225, DOT-4BW225, DOT-39
Chlorotrifluoromethane (R-13) (see note 4)	100	DOT-3, DOT-3A1800, DOT-3AA1800, DOT-3AL1800, DOT-3E1800, DOT-39

Name of Gas	Maximum Permitted Filling Density in Percent (See A3.3.2.5.)	Cylinders Marked as Shown Below Must be Used
Cyclopropane (see notes 4 and 5)	55	DOT-3, DOT-3A225, DOT-3A480X, DOT-3AA225, DOT-3AL225, DOT-3B225, DOT-3E1800, DOT-4A225, DOT-4AA480, DOT-4B225, DOT-4B240ET, DOT-4BA225, DOT-4BW225, DOT-39
Dichlorodifluoromethane (R-12) (see note 4)	119	DOT-3A225, DOT-3AA225, DOT-3AL225, DOT-3B225, DOT-3E1800, DOT-4A225, DOT-4B225, DOT-4BA225, DOT-4BW225, DOT-4B240ET, DOT-4E225, DOT-9, DOT-39, DOT-41
Dichlorodifluoromethane and difluoroethane mixture (constant boiling mixture) (R-500) (see note 4)	Not liquid full at 54 degrees C (130 degrees F)	DOT-3A240, DOT-3AA240, DOT-3B240, DOT-3E1800, DOT-4A240, DOT-4B240, DOT-4BA240, DOT-4BW240, DOT-4E240, DOT-9, DOT-39
Difluoroethane (R-152a) (see note 4)	79	DOT-3A150, DOT-3AA150, DOT-3B150, DOT-3AL150, DOT-3E1800, DOT-4B150, DOT-4BA225, DOT-4BW225
1,1-Difluoroethylene (R-1132A)	73	DOT-3A2200, DOT-3AA2200, DOT-3AX2200, DOT-3AAX2200, DOT-3T2200, DOT-39
Dimethylamine, anhydrous	59	DOT-3A150, DOT-3AA150, DOT-3B150, DOT-4B150, DOT-4BA225, DOT-4BW225, ICC-3E1800

Name of Gas	Maximum Permitted Filling Density in Percent (See A3.3.2.5.)	Cylinders Marked as Shown Below Must be Used
Ethane (see notes 4 and 5)	35.8	DOT-3, DOT-3A1800, DOT-3AA1800, DOT-3AL1800, DOT-3AAX1800, DOT-3AX1800, DOT 3E1800, DOT-3T1800, DOT-39
Ethane (see notes 4 and 5)	36.8	DOT-3A2000, DOT-3AA2000, DOT-3AAX2000, DOT-3AL2000, DOT-3AX2000, DOT-3T2000, DOT-39
Ethylene (see notes 4 and 5)	31.0	DOT -3, DOT-3A1800, DOT -3AA1800, DOT-3AAX1800, DOT-3AL1800, DOT-3AX1800, DOT-3E1800, DOT-3T1800, DOT-39
Ethylene (see notes 4 and 5)	32.5	DOT-3A2000, DOT-3AA2000, DOT-3AAX2000, DOT-3AL2000, DOT-3AX2000, DOT-3T2000, DOT-39
Ethylene (see notes 4 and 5)	35.5	DOT-3A2400, DOT-3AA2400, DOT-3AAX2400, DOT-3AL2400, DOT-3AX2400, DOT-3T2400, DOT-39
Hydrogen chloride	65	DOT-3, DOT-3A1800, DOT-3AA1800, DOT-3AAX1800, DOT-3AX1800, DOT-3E1800, DOT-3T1800

Name of Gas	Maximum Permitted Filling Density in Percent (See A3.3.2.5.)	Cylinders Marked as Shown Below Must be Used
Hydrogen sulfide (see note 6)	62.5	DOT-3A480, DOT -3AA480, DOT-3AL480, DOT-3B480, DOT-3E1800, DOT-4A480, DOT-4B480, DOT-4BA480, DOT-4BW480, DOT-26-480
Insecticide liquefied gas (see note 4 and 8)	Not liquid full at 54 degrees C (130 degrees F)	DOT-3A300, DOT-3AA300, DOT-3B300, DOT-3E1800, DOT-4B300, DOT-4BA300, DOT-4BW300, DOT-9, DOT-40, DOT-41
Liquefied nonflammable gases, liquids other than those classified as flammable, corrosive, or poisonous, and mixtures or solutions thereof, charged with nitrogen, carbon dioxide or air (see notes 3 and 4)	Not liquid full at 54 degrees C (130 degrees F)	DOT specification cylinders identified in A6.5.1. and DOT-3HT, DOT-4D, DOT-4DA, DOT-4DS
Methylacetylene-propadiene stabilized (see note 2)	Not liquid full at 54 degrees C (130 degrees F)	DOT-3A240, DOT-3AA240, DOT-3AL240, DOT-3B240, DOT-3E1800, DOT-4, DOT-4B240, without brazed seams; DOT-4B240ET, DOT-4BA240, without brazed seams; DOT-4BW240, DOT-4E240, DOT-41
Methyl chloride	84	DOT-3, DOT-3A225, DOT-3AA225, DOT-3B225, DOT-3E1800, DOT-4, DOT-4A225, DOT-4B225, DOT-4BA225, DOT-4BW225, DOT-4B240ET, DOT-25, DOT-26-300, DOT-38, Cylinders complying with DOT-3A150, 3B150, 4A150, and 4B150 manufactured before 7 December 1936 are also authorized.

Name of Gas	**Maximum Permitted Filling Density in Percent (See A3.3.2.5.)**	**Cylinders Marked as Shown Below Must be Used**
Methyl mercaptan	80	DOT-3A240, DOT-3AA240, DOT-3B240, DOT-3E1800, DOT-4B240, DOT-4B240ET, DOT-4BA204, DOT-4BW240
Monomethylamine, anhydrous	60	DOT-3A150, DOT-3AA150, DOT-3B150, DOT-3E1800, DOT-4B150, DOT-4BA225, DOT-4BW225
Nitrosyl Chloride	110	DOT-3BN400 only
Nitrous Oxide (see notes 3, 4, and 7)	68	DOT-3, DOT-3A1800, DOT-3AA1800, DOT-3AAX1800, DOT-3AL1800, DOT-3AX1800, DOT-3E1800, DOT-3HT2000, DOT-3T1800, DOT-39
Refrigerant gas, NOS or Dispersant gas, NOS (see notes 4 and 9)	Not liquid full at 54 degrees C (130 degrees F)	DOT-3A240, DOT-3AA240, DOT-3AL240, DOT-3B240, DOT-3E1800, DOT-4A240, DOT-4B240, DOT-4BA240, DOT-4BW240, DOT-4E240, DOT-9, DOT-39
Sulfur dioxide (see note 4)	125	DOT-3, DOT-3A225, DOT-3AA225, DOT-3AL225, DOT-3B225, DOT-3E1800, DOT-4, DOT-4A225, DOT-4B225, DOT-4B240ET, DOT-4BA225, DOT-4BW225, DOT-25, DOT-26-150, DOT-38, DOT-39
Sulfur hexafluoride	120	DOT-3, DOT-3A1000, DOT-3AA1000, DOT-3AAX2400, DOT-3AL1000, DOT-3E1800, DOT-3T1800
Sulfuryl fluoride	106	DOT-3A480, DOT-3AA480, DOT-3E1800, DOT-4B480, DOT-4BA480, DOT-4BW480

Name of Gas	Maximum Permitted Filling Density in Percent (See A3.3.2.5.)	Cylinders Marked as Shown Below Must be Used
Tetrafluoroethylene, stabilized	90	DOT-3A1200, DOT-3AA1200, DOT-3E1800
Trifluorochloroethylene	115	DOT-3A300, DOT-3AA300, DOT-3B300, DOT-3E1800, DOT-4A300, DOT-4B300, DOT-4BA300, DOT-4BW300
Trimethylamine, anhydrous	57	DOT-3A150, DOT-3AA150, DOT-3B150, DOT-3E1800, DOT-4B150, DOT-4BA225, DOT-4BW225
Vinyl chloride (see note 2)	84	DOT-3A150, DOT- 3AA150, DOT-3AL150, DOT-3E1800, DOT-4B150, without brazed seams; DOT-4BA225, without brazed seams;DOT-4BW225, DOT-25
Vinyl fluoride, stabilized	62	DOT-3A1800, DOT-3AA1800, DOT-3AL1800, DOT-3E1800
Vinyl methyl ether (see note 2)	68	DOT-3A150, DOT-3AA150, DOT-3B150, DOT 3E1800, DOT-4B150, without brazed seams; DOT-4BA225, without brazed seams; DOT-4BW225, DOT-25

NOTES:

1. Cylinders purchased after 1 October 1944 for the transportation of chlorine must contain no aperture other than that provided in the neck of the cylinder for attachment of a valve equipped with an approved safety device. Cylinders purchased after November 1, 1935 and charged with chlorine must not contain over 150 pounds of gas.
2. All parts of valve and safety devices in contact with contents of cylinders must be of a metal or other material, suitably treated if necessary, which will not cause formation of any acetylides.
3. DOT-3HT cylinders are authorized for use in aircraft only for a maximum service life of 24 years. They must be equipped with a frangible disc safety relief device, without fusible metal backing, and with a rated bursting pressure not over 9 percent of the minimum required test pressure of the cylinder with which the device is used. Ship only nonflammable gases in these cylinders and pack in strong outside containers.

4. Ship DOT-2P, 2Q, 3E, 3HT, 4BA spherical type, 4D, 4DA, 9, 39, 40, 41, and 4DS spheres and cylinders in strong outside containers.
5. When used for shipment of flammable gases, the internal volume of the specification 39 cylinders must not be over 75 cubic inches.
6. Ensure each valve outlet is sealed by a threaded cap or a threaded solid plug.
7. Ensure DOT-3AL cylinders are equipped with brass or stainless steel valves and cleaned in compliance with Federal Specification RR-C-901c.
8. See **A6.5.1.** and **A6.5.5.** (except only DOT 2P is authorized).
9. See **A6.5.5.**

A6.7. Liquefied Petroleum Gas (see **A3.3.2.** for additional cylinder and filling requirements).

A6.7.1. **Use DOT 3, 3A, 3AA, 3AL, 3B, 3E, 4, 4A, 4B, 4BA, 4BW, 4B240FLW, 4B240ET, 4B240X, 4E, 9, 25, 26, 38, 39, or 41 cylinders.** Ensure the internal volume of DOT 39 cylinders is not over 1.2 L (75 cubic inches). Use of existing DOT 3, 4, 4A, 4B240X, 9, 25, 26, 38, and 41 cylinders is authorized, but new construction of these cylinders is not authorized.

A6.7.2. **DOT 4B240FLW Cylinders.** Use cylinders marked as complying with DOT 4B240FLW, bearing manufacturers symbol WCO and serial numbers 47A-1 to 47A-59200 (inclusive), and varying from the specification requirements for the physical properties of steel.

A6.7.3. **DOT 3C or 4C Cylinders.** Use DOT 3C or 4C cylinders, when the capacity of cylinders is not over 60.5 L (3,881 cubic inches, 16 gallons) with 5 percent tolerance. Do not exceed a gas pressure over 1000 kPa (145 psig) at 55 degrees C (130 degrees F). Comply with the requirements of **Table A6.1.** for the gases named.

A6.7.4. **DOT 2P or 2Q Containers.** Use inside metal containers, DOT 2P or 2Q, packed in strong wooden or fiberboard boxes designed to protect valves from injury or accidental functioning under normal transportation conditions. These containers are authorized for liquefied petroleum gas with a gas pressure of 241 kPa (35 psig) at 21 degrees C (70 degrees F) and 689.5 kPa (100 psig) at 55 degrees C (130 degrees F) (or not over 310.3 kPa (45 psig) at 21 degrees C (70 degrees F) and 724 kPa (105 psig) at 55 degrees C (130 degrees F) when equipped with safety devices which will prevent rupture of the container when it is exposed to fire.) Each completed container filled for shipment must have been heated until contents reached a minimum temperature of 55 degrees C (130 degrees F) without evidence of leakage, distortion, or other defects.

A6.7.5. **Foreign Cylinders.** Foreign cylinders meeting the requirements of **A3.3.2.7.**

A6.8. Fire Extinguishers. Fire extinguishers authorized below may be shipped secured in holders as part of a vehicle/equipment (**A13.5.**, **A13.6.**, **A13.7.**) when protected from possible accidental damage. If these fire extinguishers are not fastened in a designed holder, pack in strong outer containers. Ship fire extinguishers in DOT specification cylinders identified in paragraphs **A6.8.1.** and **A6.8.2.** Ship fire extinguishers in non-DOT specification cylinders as identified in paragraphs **A6.8.3.** and **A6.8.4.** Fire suppression bottles in DOT specification 3HT, 4D, 4DA, or 4DS, use description “Liquified Gases, UN1058”; “Compressed Gas, N.O.S., UN 1956”; or the hazard classification assigned by the manufacturer. See paragraph **A6.5.1.** and **Table A6.1.**

A6.8.1. **DOT 3A, 3AA, 3AL, 3E, 4B, 4BA, 4B240ET, or 4BW Cylinders.** Use these cylinders provided:

A6.8.1.1. Cylinders contain only fire extinguishing agents such as ammonium phosphate, sodium bicarbonate, potassium bicarbonate, potassium imido dicarboxamide and bromochlorodifluromethane or bromotriflouromethane, which is commercially free from corroding components.

A6.8.1.2. Cylinders are charged with a nonflammable, nontoxic, noncorrosive, dry gas, having a dew point at or below minus 46.7 degrees C (minus 52 degrees F) at 101 kPa (1 atmosphere), to not more than the service pressure of the cylinder.

A6.8.1.3. Cylinders have an external corrosion-resistant coating.

A6.8.1.4. Cylinders are retested in accordance with Title 49 CFR 178.209(j).

A6.8.1.5. Fire extinguisher, DOT 4BW240, on a cart does not require additional packaging.

A6.8.2. **DOT 2P or 2Q Containers.** Use DOT 2P or 2Q inner nonrefillable metal containers provided:

A6.8.2.1. The liquid portion of the gas plus any additional liquid or solid does not completely fill the container at 55 degrees C (130 degrees F).

A6.8.2.2. The pressure in the container does not exceed 1250 kPa (181 psig) at 55 degrees C (130 degrees F). If the pressure exceeds 920 kPa (141 psig) at 55 degrees C (130 degrees F), but does not exceed 1100 kPa (160 psig) at 55 degrees C (130 degrees F), use a DOT 2P inner metal container. If the pressure exceeds 1100 kPa (160 psig) at 55 degrees C (130 degrees F) use a DOT 2Q inner metal container. The metal container must be capable of withstanding, without bursting, a pressure of one and one-half times the equilibrium pressure of the contents at 55 degrees C (130 degrees F).

A6.8.2.3. Each completed inner container filled for shipment must have been heated until the pressure in the container is equivalent to the equilibrium pressure of the contents at 55 degrees C (130 degrees F) without evidence of leakage, distortion, or other defect.

A6.8.3. **Fire Extinguishers with a Small Amount of Compressed Gas.** May not contain more than 1660 kPa at 21 degrees C (241 psig at 70 degrees F). Fire extinguishers marked "MEETS DOT REQUIREMENTS" are excepted from DOT cylinder specification requirements provided:

A6.8.3.1. They are shipped as inside containers. Use original manufacturer's packaging or suitable outside packaging to protect extinguisher during normal transportation.

A6.8.3.2. The contents are not flammable, toxic, or corrosive.

A6.8.3.3. Internal volume is not over 18 L (1,100 cubic inches). For fire extinguishers not over 900 mL (55 cubic inch) capacity, the liquid portion of the gas plus any additional liquid or solid must not completely fill the container at 55 degrees C (130 degrees F). Fire extinguishers over 900 mL (35 cubic inches) may not contain liquefied compressed gas.

A6.8.3.4. Fire extinguishers manufactured on and after 1 January 1976 must be designed and fabricated with a burst pressure not less than six times its charged pressure at 21 degrees C (70 degrees F).

A6.8.3.5. Fire extinguishers are tested to three times the charged pressure at 21 degrees C (70 degrees F), but not less than 825 kPa (120 psig) without failure before the initial shipment. For any subsequent shipments, they must meet retest requirements of 29 CFR 1910.157(e).

A6.8.4. **FEU-1/M Extinguisher.** Transport extinguisher (FEU-1/M) 10 gallon (37.8 L) capacity on military aircraft without special packing and crating. Use caution during handling and transportation to avoid damage to valves.

A6.8.5. **Mounted Extinguishers.** Fire extinguishers authorized by **A6.8.** may be shipped secured in holders of non-regulated vehicles/equipment when protected from possible accidental damage. Certify according to **Attachment 17**. If these fire extinguishers are not fastened in a designed holder, pack in strong outer containers.

A6.9. Refrigerating Machines, Air Conditioners, and Accumulators.

A6.9.1. **Refrigerating Machines, Air Conditioners, and Components.** Factory-tested refrigerating machines, air conditioners, and components are exempted from specification packaging, marking, and labeling except for the name of contents on the outside container, provided (see **A3.3.2.8.** for small quantities):

A6.9.1.1. Each pressure vessel is charged to not more than 2268 kg (5,000 pounds) of Group A1 refrigerant as classified in ANSI/ASHRAE Standard 15, or not more than 22.7 kg (50 pounds) of refrigerant other than Group A1.

A6.9.1.2. Machines containing two or more charged vessels may not contain more than 907 kg (2,000 pounds) of Group 1 refrigerant, or more than 45.4 kg (100 pounds) of refrigerant other than Group 1.

A6.9.1.3. Each pressure vessel is equipped with a safety relief device meeting the requirements of ANSI/ASHRAE Standard 15.

A6.9.1.4. Each pressure vessel is equipped with an individual shut-off valve at each opening except openings used for safety devices and with no other connection. Close shut-off valves during transportation.

A6.9.1.5. Pressure vessels are manufactured, inspected, and tested according to ANSI/ASHRAE Standard 15, or when over 152.4 mm (6 inches) internal diameter, according to American Society of Mechanical Engineers (ASME) Code.

A6.9.1.6. All parts subject to refrigerant pressure during shipment are tested under ANSI/ASHRAE Standard 15.

A6.9.1.7. The liquid portion of refrigerant, if any, does not completely fill any pressure vessel at 55 degrees C (130 degrees F).

A6.9.1.8. Filling densities prescribed in **A3.3.2.5.** are not exceeded.

A6.9.2. **Accumulators.** The following apply to hydraulic accumulators containing nonliquefied, nonflammable gas, and nonflammable liquids or pneumatic accumulators containing nonliquefied, nonflammable gas, fabricated from materials that do not fragment upon rupture:

A6.9.2.1. Accumulators installed in motor vehicles, construction equipment, and assembled machinery, designed and fabricated with a burst pressure of not less than five times their charged pressure at 21 degrees C (70 degrees F) are exempt from the requirements of this manual.

A6.9.2.2. When charged to not more than 1379 kPa (200 psig) at 21 degrees C (70 degrees F), the following conditions apply:

A6.9.2.2.1. Ship each accumulator as an inside package. There are no specification requirements.

A6.9.2.2.2. Each accumulator may not have a gas space over 40.7 L (2,500 cubic inches) under stored pressure.

A6.9.2.2.3. Each accumulator must be tested, without evidence of failure or damage, to at least three times its charged pressure at 21 degrees C (70 degrees F) but not less than 120 psig (827 kPa) before initial shipment and before each refilling and reshipment.

A6.9.2.3. When charged over 1379 kPa (200 psig) at 21 degrees C (70 degrees F) the following conditions apply:

A6.9.2.3.1. Each accumulator must be in compliance with the requirements stated in **A6.9.2.2.**

A6.9.2.3.2. Each accumulator must be designed and fabricated with a burst pressure of not less than five times its charged pressure when shipped.

A6.10. Acetylene Gas.

A6.10.1. **DOT 8 or 8AL Cylinders.** Ship in DOT 8 or 8AL cylinders with the following provisions:

A6.10.1.1. Ensure cylinders are filled with a porous material charged with a suitable solvent as identified in 49 CFR, paragraph 178.59 or 178.60.

A6.10.1.2. The specific gravity of acetone solvent in acetylene cylinders must be 0.796 or over at 15.5 degrees C (60 degrees F). The amount of solvent added in the refilling operation must not cause the tare weight of the cylinder to be over its marked tare weight. The tare weight includes the weight of the cylinder shell, porous filling, safety relief devices, valve, and solvent, but without removable cap.

A6.10.1.3. The pressure in cylinders containing acetylene gas must not exceed 1724 kPa at 21 degrees C (250 psig at 70 degrees F); however, if the cylinders are marked for a lower allowable charging pressure at 21 degrees C (70 degrees F), then do not exceed that pressure.

A6.10.2. **Foreign Cylinders.** Foreign cylinders must meet the requirements of **A3.3.2.7.**

A6.11. Cigarette Lighters or Other Similar Devices Charged With Fuel. Do not ship any package containing a cigarette lighter or other similar ignition device charged with fuel and equipped with an ignition element, or any self-lighting cigarette, unless the design of the device and its packaging has been approved according to 2.3 or by the DOT. Ship a cigarette lighter or other similar device charged with a flammable gas according to the following:

A6.11.1. No more than 70 mL (2.3 fluid ounces) of liquefied gas may be loaded into each device.

A6.11.2. The liquid portion of the gas may not be over 85 percent of the volumetric capacity of each chamber at 15 degrees C (59 degrees F).

A6.11.3. Each device including closures must be capable of withstanding, without leakage or rupture, an internal pressure of at least two times the vapor pressure of the fuel at 55 degrees C (130 degrees F).

A6.11.4. Overpack devices in packaging that is designed or arranged to prevent movement of the device itself.

A6.12. Cryogenic Liquids.

A6.12.1. **Handling Instructions.** Store in cool, well-ventilated area away from fire hazards, direct rays of the sun, and organic or easily oxidizable materials such as grease and oil. Handle containers with extreme care. Avoid direct contact.

A6.12.2. **Container Requirements:**

A6.12.2.1. Do not load a cylinder with a cryogenic liquid colder than the design service temperature of the packaging.

A6.12.2.2. Do not load a cylinder with any material that may combine chemically with any residue in the packaging to produce an unsafe condition.

A6.12.2.3. The jacket covering the insulation on a cylinder used to transport any flammable cryogenic liquid must be made of steel.

A6.12.2.4. Do not install a valve or fitting made of aluminum, with internal rubbing or abrading aluminum parts that may come in contact with oxygen in the cryogenic liquid form, on any cylinder used to transport oxygen, cryogenic liquid unless the parts are anodized according to ASTM Standard B 580.

A6.12.2.5. Do not install an aluminum valve, pipe, or fitting on any cylinder used to transport any flammable cryogenic liquid.

A6.12.2.6. Provide each cylinder with one or more pressure relief devices.

A6.12.2.7. Install each pressure relief device and locate so that the cooling effect of the contents during venting will not prevent effective operation of the device.

A6.12.2.8. The maximum weight of the contents in a cylinder with a design service temperature colder than -195.5 degrees C (-320 degrees F) may not be over the design weight marked on the cylinder.

A6.12.2.9. Each cylinder containing a cryogenic liquid must have a pressure control system that conforms to 49 CFR 173.34(d) and must be designed and installed so that it will prevent the cylinder from becoming liquid full.

A6.12.3. **Venting Requirements.** Protect all containers by vent openings or safety relief devices to prevent excessive pressure buildup within the containers. The shipper must provide required equipment and specific venting instructions in the additional handling information block of the Shipper's Declaration for Dangerous Goods (see **A17.4.2.**), unless venting procedures are provided in a separate instruction accompanying the shipment or attached to the cargo. Crew members must monitor vent valves during flight. The following applies:

A6.12.3.1. Provide at least 4.6 m (15 feet) of 25.4 mm (one inch) inside diameter tubing or hose compatible with the product. Do not use rubber tubing for liquid oxygen.

A6.12.3.2. Provide sufficient clamps to attach tubing to the unit, the aircraft vent adapter, and other hoses if more than one unit is transported. Do not use sealing compound on tubing or hose connections.

A6.12.3.3. Provide T fittings and extra tubing or hose for the manifolding of two or more unit to one aircraft vent. Tubing or hose must be routed to ensure freedom from kinks, sharp bends, or restrictions that prevent free venting and cause pressure buildup in the tubing or hose.

A6.12.3.4. Small containers (net capacity of 25 liters (6.6 gallons) or less) charged with a nonflammable, nonpoisonous cryogenic liquid, are excepted from the overboard venting requirement.

A6.12.4. **Packaging Requirements.** Ensure all containers are designed to hold low temperature liquefied gases and are strong enough to withstand all shocks and loading normally incident to air shipment and associated handling. Ship cryogenic liquids of argon, helium, neon, nitrogen, and oxygen according to filling density requirements in **Figure A3.4.** Ship hydrogen (minimum 95 percent parahydrogen) according to filling density requirements in **Figure A3.5.** Protect container accessories against damage in handling.

A6.12.4.1. DOT 4L cylinders in a vertical position.

A6.12.4.2. Type TMU-27M, MIL-T-38170, or MA-1, trailer mounted, 189 L (50 gallon) capacity containers.

A6.12.4.3. C-1, 1892 L (500 gallons) capacity containers.

A6.12.4.4. Dewars, 25 L (6.6 gallon) capacity each. Not more than 6 per aircraft.

A6.12.4.5. Nonpressurized metal vacuum-type containers, dewars, 100 liter (26.42 gallon capacity) attached to nonskid base. Ship no more than one container per aircraft.

A6.12.4.6. NRU-5/E air-transportable 1514L (400 gallon tank) (MIL-T-38261).

A6.12.4.7. LS-160 container attached to shipping platform. Ship a maximum of one container per aircraft. Maximum 150 liters (39.63 gallons) nitrogen per container.

A6.12.4.8. TMU-70/M (MIL-A-85415) LOX servicing trailers. The trailers must be equipped with absolute pressure relief valve and vented to outside of aircraft.

A6.12.4.9. TMU-24E (MIL-T-27720), mounted on aircraft cargo pallet, 1514 L (400 gallons), liquid oxygen or liquid nitrogen storage and transfer tanks.

A6.12.4.10. LSHe-102, 109 L (28.79 gallon) capacity, attached to shipping skid. Container must be equipped with an absolute pressure relief valve for air shipment. Authorized for liquid helium.

A6.12.4.11. LSHe-30, 30 L (7.92 gallon) capacity, packed in a specially designed shipping container (P/N 0305-0002) equipped with plastic foam pads. Ship no more than five containers per aircraft. Authorized for liquid helium and neon.

A6.12.4.12. LSNe-75, liquid neon container, with a maximum quantity of 75 L (19.81 gallon) attached to a shipping skid. Ship not more than two containers per aircraft. Containers must be equipped with an absolute pressure relief valve.

A6.12.4.13. Liquid oxygen and liquid nitrogen in specification MIL-T-38170 containers vented to the outside of the aircraft. The container vent valve must be monitored by a crewmember to make

sure the pressure buildup within the container is not over 40 psig. The container must be vented down to 5 psig whenever necessary during flight and the valve again shut off.

A6.12.4.14. CRU-87/U, 10-liter, Portable Therapeutic Liquid Oxygen (PTLOX) Converters. Up to 25 PTLOX converters per aircraft may be shipped without overboard venting, except that C-21 aircraft is limited to 10 PTLOX converters without overboard venting.

A6.12.4.15. Foreign cylinders meeting the requirements of **A3.3.2.7.**

A6.13. Ethyl Chloride. Package ethyl chloride in any of the following single or combination nonbulk packagings which meet the PG I performance level. (Outage for all containers must be 7.5 percent or more at 21 degrees C (70 degrees F.)

A6.13.1. Package as follows:

Inner packaging	Outer packaging
Receptacles: glass, earthenware or metal ***NOTE:*** Must not be over 500 g (17.6 ounces) capacity each	**Boxes:** ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), or reconstituted wood (4F)

A6.13.2. Package as follows:

Inner packaging	Outer packaging
Not required	**Drum:** steel (1A1) not over 100 L (26 gallon) capacity each

A6.13.3. Package as follows:

Inner Packaging	Outer Packaging
Receptacles: glass, earthenware or metal ***NOTE:*** Must not be over 500 g (17.6 ounces) capacity each.	**Box:** fiberboard (4G) ***NOTE:*** Gross weight must not exceed 30 kg (66 pounds).

A6.13.4. **DOT Cylinders.** Any DOT specification cylinder prescribed for any compressed gas except acetylene.

A6.14. Ethylene Oxide. Silver mercury, or any of its alloys, or copper must not be used in any part of a packaging, valve, or other packaging appurtenance if that part, during normal conditions of transportation, may come in contact with ethylene oxide liquid or vapor. Copper alloys may be used only where gas mixtures do not contain free acetylene at any concentration that will form copper acetylene. All packaging and gaskets must be constructed of materials which are compatible with ethylene oxide and do not lower the auto-ignition temperature of ethylene oxide. Each completed package must meet PG I performance requirements.

A6.14.1. Package as follows:

Inner packaging	Outer packaging
glass ampoules / vials	**Box:** fiberboard (4G) ***NOTE:*** The total quantity of ethylene oxide must not exceed 100 g (3.5 ounces) per package.

A6.14.2. Package as follows:

Inner packaging	Outer packaging
aluminum receptacles ***NOTE:*** The inner packaging must not contain more than 135 g (4.8 ounces).	fiberboard (4G) box constructed with top and bottom pads and perimeter liner ***NOTE:*** Inner aluminum receptacles must be cushioned with an incombustible material. No more than 12 inner packagings may be packed in one fiberboard (4G) box. No more than 10 fiberboard (4G) boxes may be overpacked.

A6.14.3. Package as follows:

Inner packaging	Outer packaging
metal receptacles ***NOTE:*** The capacity of the inner packaging must not exceed 340 g (12 ounces). The inner packaging must be capable of withstanding a 1124 kPa (180 psig) burst pressure. Each inner packaging must be insulated and equipped with a relief device of the fusible plug type with a yield temperature of 69 to 77 degrees C (156 to 171 degrees F). The capacity of relief device and insulation must be such that the charged receptacle will not explode when tested by the method described in Compressed Gas Association Pamphlet C-14 or other equivalent method. No more than 12 inner packaging may be packed in one outer packaging. Each inner packaging must not be liquid full below 82 degrees C (180 degrees F)	**Boxes:** wooden (4C1, 4C2, 4D, or 4F) or fiberboard (4G)

A6.14.4. **Steel (1A1) Drums.** In steel (1A1) drums of no more than 231L (61 gallons). The drum must be lagged, of all welded construction with the inner shell having a minimum thickness of 1.7 mm (0.068 inches) and the outer shell must have a minimum thickness of 2.4 mm (0.095 inches). Drums

must be capable of withstanding a hydrostatic test pressure of 690 kPa (100 psig). Lagging must be of sufficient thickness so that the drum, when filled with ethylene oxide and equipped with the required pressure relief device, will not rupture when exposed to fire. The drum may not be liquid full below 85 degrees C (185 degrees F). Before each refilling, each drum must be pressure tested for leakage at no less than 103 kPa (15 psig). Each drum must be equipped with a fusible-type relief device with a yield temperature of 69 to 77 degrees C (157 to 170 degrees F). The capacity of the relief device and the effectiveness of the insulation must be such that the charged cylinder will not explode when tested by the method described in CGA Pamphlet C-14 or other equivalent method.

A6.14.5. **DOT Specification Cylinders.** In DOT specification cylinders, as authorized for any compressed gas except acetylene. Pressurizing valves and insulation are required for cylinders over 4 L (1 gallon) capacity. Eductor tubes must be provided for cylinders over 19 L (5 gallon) capacity. Cylinders must be seamless or welded steel (not brazed) with nominal capacity of no more than 115 L (30 gallons) and may not be liquid full below 82 degrees C (180 degrees F). Before each refilling, each cylinder must be pressure tested for leakage at no less than 103 kPa (15 psig). Each cylinder must be equipped with a fusible-type relief device with a yield temperature of 69 to 77 degrees C (157 to 170 degrees F). The capacity of the relief device and the effectiveness of the insulation must be such that the charged cylinder will not explode when tested by the method described in CGA Pamphlet C-14 or other equivalent method.

A6.15. Ethylamine (Monoethlamine, Aminoethane).

A6.15.1. Use metal drums (1A1) which meet PG I performance level requirements.

A6.15.2. Use any DOT specification cylinder prescribed for any compressed gas except acetylene.

A6.16. Arsine; Cyanogen Chloride, Stabilized; Cyanogen, Liquefied; Germane; Liquefied Gas, Toxic; Phosgene; Phosphine. See **2.9.** for additional information.

A6.16.1. **Handling Instructions.** These items are extremely dangerous. Wear approved chemical safety mask and clothing when handling this material.

A6.16.2. **Packaging Requirements.** Package in DOT specification 3A1800, 3AA1800, 3AL1800, 3D, 3E1800, and 33 cylinders. Specification 3A, 3AA, 3AL, 3D, and 33 cylinders may not exceed 57 kg (125 pounds) water capacity (nominal). Shipments of "Arsine" or "Phosphine" will not be accepted for transportation if packaged in a specification 3AL cylinder. Cylinders containing "phosgene" may not exceed a filling density of 125 percent (see **A3.3.2.5.**). The cylinder may not contain more than 68 kg (150 pounds) of phosgene. Also, each filled cylinder must be tested for leakage before it is offered for transportation and must show absolutely no leakage. This test must consist of immersing the cylinder and valve, without the protection cap attached, in a bath of water at a temperature of approximately 66 degrees C (150 degrees F) for at least 30 minutes. During which time, frequent examinations must be made to identify any escape of gas. After the test has been accomplished the valve of the cylinder must not be loosened before the cylinder is offered for transportation, and must not be loosened during transportation.

A6.17. Bromoacetone; Methyl Bromide; Chloropicrin and Methyl Bromide, or Methyl Chloride Mixtures; Insecticide Gases, Toxic, NOS. See **2.9.** for additional requirements**.**

A6.17.1. **Handling Instructions.** These materials and mixtures are extremely dangerous poisons. Wear approved chemical safety mask and clothing when handling this material.

A6.17.2. **Packaging Requirements:**

A6.17.2.1. Pack bromoacetone in ordinary wood (4C1), ordinary wood, with sift-proof walls (4C2), plywood (4D), or reconstituted wood (4F), boxes with inner glass receptacles or tubes in hermetically sealed metal receptacles in corrugated fiberboard cartons. Bottles may not contain over 500 g (17.6 ounces) of liquid each and must be cushioned in cans with at least 12.7 mm (.5 inches) of absorbent cushioning material. The total amount of liquid in the outer box must not exceed 11 kg (24 pounds). Packagings must conform to the PG I performance level.

A6.17.2.2. Pack bromoacetone, methyl bromide, chloropicrin and methyl bromide mixtures, chloropicrin and methyl chloride mixtures, and chloropicrin mixtures charged with a nonflammable, nonliquefied compressed gas in DOT specification 3A, 3AA, 3B, 3C, 3E, 4A, 4B, 4BA, 4BW, or 4C cylinders having not over 113 kg (250 pounds) water capacity (nominal). However, this capacity does not apply to shipments of methyl bromide.

A6.17.2.3. Package methyl bromide mixtures containing up to 2 percent chloropicrin in a fiberboard (4G) box with inside metal cans containing not over 0.454 kg (1 pound) each, or inside metal cans with a minimum wall thickness of 0.178 mm (0.007 inch) containing not over 0.7945 kg (1 3/4 pounds) each. The 0.454 kg (1 pound) can must be capable of withstanding an internal pressure of 896.6 kPa (130 psig) without leakage or permanent distortion. Vapor pressure of the contents must not exceed 896.6 kPa (130 psig) at 55 degrees C (130 degrees F). The 0.7945 kg (1 3/4 pound) can must be capable of withstanding an internal pressure of 965.6 kPa (140 psig) without leakage or permanent distortion. Vapor pressure of the contents must not exceed 965.6 kPa (140 psig) at 55 degrees C (130 degrees F). Cans must not be liquid full at 55 degrees C (130 degrees F). Cans must be constructed of tinplate or lined with suitable material and must have concave or pressure ends.

A6.18. Gas Identification Sets. Gas identification sets containing toxic material must meet the requirements of the PG I performance level.

A6.18.1. Pack in hermetically sealed glass inner receptacles not over 40 ml (1.4 fluid ounces). Each glass inner receptacle must be placed in a sealed fiberboard receptacle cushioned with absorbent material. Not more than 12 fiberboard receptacles may be placed in a 4G fiberboard box. No more than four fiberboard boxes, well-cushioned, may be placed in a steel cylinder. The cylinder must have a wall thickness of at least 3.7 mm (0.146 inches) and must have a hermetically sealed steel closure.

A6.18.2. When the toxic material is absorbed in a medium such as activated charcoal or silica gel, pack gas identification sets as follows:

A6.18.2.1. If the liquid toxic material does not exceed 5 ml (0.2 fluid ounces) or the solid toxic material does not exceed 5 g (0.2 ounces), they may be packed in glass inner receptacles of not over 120 ml (4.1 fluid ounces) each. Each glass receptacle, cushioned with absorbent material, must be packed in a hermetically sealed metal can. The metal can must have a wall thickness of not less than 0.30 mm (0.012 inch). Then the metal cans must be packed in wooden boxes (4C1, 4C2, 4D, or 4F) surrounded on all sides by at least 25 mm (1 inch) of dry sawdust. Not more than 100 ml (3.4 fluid ounces) or 100 g (3.5 ounces) of toxic materials may be packed in one outer wooden box.

A6.18.2.2. If the liquid toxic material does not exceed 5 ml (0.2 fluid ounces) or the solid toxic material does not exceed 20 g (0.7 ounces), they may be packed in glass inner receptacles with screw-top closures of not less than 60 ml (2 ounces) that are hermetically sealed. Twelve bottles containing toxic material not exceeding 100 ml (3.4 ounces) for liquids or 100 g (3.5 ounces) for solids may be placed in a plastic carrying case. Each glass receptacle must be surrounded by absorbent cushioning material and must also be separated from each other by sponge rubber partitions. The plastic carrying case must be placed in a tightly fitted fiberboard box and then placed in a tight fitting wooden box (4C1, 4C2, 4D, or 4F).

A6.19. Hexaethyl Tetraphosphate and Compressed Gas Mixtures; Insecticide Gases, Toxic, NOS; Parathion and Compressed Gas Mixture; Tetraethyl Dithiopyrophosphate and Gases, in Solution or Tetraethyl Dithiopyrophosphate and Gases, Mixtures (LC50 Less Than or Equal to 200 Parts Per Million (ppm)); Tetraethyl Dithiopyrophosphate and Gases, in Solution or Tetraethyl Dithiopyrophosphate and Gases, Mixtures (LC50 over 200 but not Greater Than 5000 ppm); Tetraethyl Pyrophosphate and Compressed Gas Mixture (LC50 Less Than or Equal to 200 ppm); Tetraethyl Pyrophosphate and Compressed Gas Mixture (LC50 Over 200 but not greater than 5000 ppm). See **2.9.** for additional requirements.

A6.19.1. **Handling Instructions.** These materials and mixtures are extremely dangerous poisons. Wear approved chemical safety mask and clothing when handling this material.

A6.19.2. **Packaging Requirements.**

A6.19.2.1. Hexaethyl tetraphosphate, parathion, tetraethyl dithiopyrophosphate, and tetraethyl pyrophosphate may be mixed with a nonflammable compressed gas. This mixture must not contain more than 20 percent by weight of an organic phosphate and must be packaged in DOT specification 3A240, 3AA240, 3B240, 4A240, 4B240, 4BA240, or 4BW240 cylinders meeting the following requirements:

A6.19.2.1.1. Each cylinder must not be charged with more than 5 kg (11.0pounds) of the mixture. The maximum filling density of the cylinder must not exceed 80 percent of its water capacity.

A6.19.2.1.2. Each cylinder must be charged in compliance with A3.2.2.5.

A6.19.2.1.3. No cylinder may be equipped with an eduction tube or a fusible plug.

A6.19.2.1.4. No cylinder may be equipped with any valve unless the valve is a type approved by the DOT.

A6.19.2.2. Cylinders must be overpacked in a fiberboard box (4G) and packaged in a way to protect each valve or other closing device from damage. Except as provided in A6.18.2.2, no more than four cylinders may be packed in a box. Each box with its closing device protection must be sufficiently strong to protect all parts of each inside cylinder from deformation or breakage if the completed package is dropped 1.8 m (5.9 feet) onto solid concrete impacting at the package's weakest point.

A6.19.2.3. Cylinders may be packed in a strong wooden box (4C1, 4C2, 4D, or 4F) and packed in a way to protect each valve or other closing device from damage. No more than twelve cylinders may be packed in one outer wooden box. Each wooden box with its closing device protection must be sufficiently strong to protect all parts of each inside cylinder from deformation or breakage if

the completed package is dropped 1.8 m (5.9 feet) onto solid concrete impacting at the package's weakest point.

A6.20. Packaging for Class 2.3 Materials, Poisonous by Inhalation (Hazard Zone A).

A6.20.1. **Handling Instructions.** These items are extremely dangerous. Wear approved chemical safety mask and clothing when handling this material.

A6.20.2. **Packaging Requirements.** Package Class 2.3, PG I materials with an Inhalation Hazard Zone A as follows:

A6.20.2.1. In DOT cylinders as identified in 49 CFR, part 178, subpart C, except that specification 8, 8AL, and 39 cylinders are not authorized. Cylinders must also meet the requirements of **A3.3.2.**

A6.20.2.2. Pack in an inner drum (1A1, 1B1, 1H1, 1N1, or 6HA1), then place in an outer drum (1A2 or 1H2). Both the inner and outer drum must be tested to the PG I performance level. The outer 1A2 drum must have a minimum thickness of 1.35 mm (0.053 inches). The outer 1H2 drum must have a minimum thickness of 6.30 mm (0.248 inches). The outer 1A2 and 1H2 drums must withstand a hydrostatic test pressure of 100 kPa (15 psi). The capacity of the inner drum must not exceed 220 L (58 gallons). The inner drum must also meet the following requirements:

A6.20.2.2.1. Satisfactorily withstand a hydrostatic pressure test (as outlined in 49 CFR, paragraph 178.605) of 550 kPa (80 psig).

A6.20.2.2.2. Satisfactorily withstand a leak-proofness test (as outlined in 49 CFR, paragraph 178.604) using an internal air pressure at 55 degrees C (130 degrees F) of at least twice the vapor pressure of the material to be packaged.

A6.20.2.2.3. Have screw-type closures that are:

A6.20.2.2.3.1. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A6.20.2.2.3.2. Physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during transportation.

A6.20.2.2.3.3. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psi).

A6.20.2.2.4. Meet the following minimum thickness requirements:

A6.20.2.2.4.1. If the capacity of the inner drum is less than or equal to 120 L (32 gallons) the minimum thickness of the inner drum is: 1.3 mm (0.051 inches) for 1A1 and 1N1 drums, 3.9 mm (0.154 inches) for 1B1 drums, 3.16 mm (0.124 inches) for 1H1 drums, 1.58 mm (0.0622 inches) for the plastic inner container and 0.96 mm (0.0378) for the outer steel drum of a 6HA1 drum.

A6.20.2.2.4.2. If the capacity of the inner drum is greater than 120 L (32 gallons) the minimum thickness of the inner drum is: 1.7 mm (0.067 inches) for 1A1 and 1N1 drums, 4.7 mm (0.185 inches) for 1B1 drums, 3.16 mm (0.124 inches) for 1H1 drums, 1.58 mm

(0.0622 inches) for the plastic inner container and 1.08 mm (0.0378) for the outer steel drum of a 6HA1 drum.

A6.20.2.2.5. Cushion the inner drum within the outer drum with a shock-mitigating, nonreactive material. There must be a minimum of 5.0 cm (2 inches) of cushioning material between the outer surface (side) of the inner drum and the inner surface (side) of the outer drum, and at least 7.6 cm (3 inches) of cushioning material between the outer surface (top and bottom) of the inner drum and the inner surface (top and bottom) of the outer drum.

A6.20.2.3. Pack in an inner packaging system that consists of an impact-resistant receptacle of glass, earthenware, plastic, or metal securely cushioned with a nonreactive absorbent material. The package must be packed within a leak-tight packaging of metal or plastic, then packed in a steel drum (1A2), aluminum drum (1B2), metal drum (other than steel or aluminum (1N2)), plywood drum (1D), fiber drum (1G), plastic drum (1H2), wooden barrel (2C2), steel jerrican (3A2), plastic jerrican (3H2), steel box (4A), aluminum box (4B), natural wood box (4C1 or 4C2), plywood box (4D), reconstituted wood box (4F), fiberboard box (4G), expanded plastic box (4H1), or solid plastic box (4H2.) The capacity of the inner receptacle must not exceed 4 L (1 gallon). An inner receptacle that has a closure, must have the closure held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation. Both the inner packaging system and the outer container must each meet the test requirements of the PG I performance level independently. The total amount of liquid that can be packed in the outer container must not exceed 16 L (4 gallons).

A6.21. Nitric Oxide. See **2.9.** for additional requirements.

A6.21.1. **Handling Instructions.** Nitric oxide is extremely dangerous and poisonous. Wear an approved safety mask and clothing when handling this material.

A6.21.2. **Packaging Requirements.** Pack nitric oxide in DOT 3A1800, 3AA1800, 3E1800, or 3AL1800 cylinders, charged to a pressure of not more than 5,170 kPa (750 psi) at 21 degrees C (70 degrees F). Cylinders must be equipped with a valve of stainless steel and a valve seat of material that is not deteriorated by contact with nitric oxide or nitrogen dioxide. Cylinders or valves must not be equipped with safety devices (pressure relief) of any type. Ensure valve outlets are sealed by a solid threaded cap or plug and an inert gasketing material. Each cylinder must be cleaned as identified in 49 CFR, 173.337(c).

A6.21.2.1. Pack cylinders, DOT 3E1800, in strong wooden boxes to protect valves from injury or accidental functioning under conditions incident to transportation.

A6.21.2.2. Cylinders, DOT 3A, 3AA, and 3AL, must have their valves protected by metal caps, or other equally protective guards, securely attached to the cylinders and be of sufficient strength to protect the valves from injury or accidental functioning under conditions incident to transportation.

A6.22. Ethyl Methyl Ether. Each packaging must meet the requirements of the PG I performance level.

A6.22.1. Package as follows:

Inner packaging	Outer packaging
Receptacles: glass, earthenware, plastic, metal or glass ampoules	**Drums:** steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plywood (1D), fiber (1G), or plastic (1H1 or 1H2)

A6.22.2. Package as follows:

Inner packaging	Outer packaging
Receptacles: glass, earthenware, plastic, metal or glass ampoules	**Jerricans:** steel (3A1 or 3A2), plastic (3H1 or 3H2)

A6.22.3. Package as follows:

Inner packaging	Outer packaging
Receptacles: glass, earthenware, plastic, metal or glass ampoules	**Boxes:** steel (4A1 or 4A2), aluminum (4B1 or 4B2), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), solid plastic (4H2)

A6.22.4. Package as follows:

Inner packaging	Outer packaging
Not required	**Drums:** steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2) or plastic (1H1 or 1H2)

A6.22.5. Package as follows:

Inner packaging	Outer packaging
Not required	**Jerricans:** steel (3A1 or 3A2) or plastic (3H1 or 3H2)

A6.22.6. Package in the following single composite packages:

Inner receptacle	Outer packaging
plastic	**Drums:** steel, aluminum, fiber or plastic (6HA1, 6HB1, 6HG1, 6HH)

A6.22.7. Package in the following single composite packages:

Inner receptacle	Outer packaging
plastic	**Boxes:** steel, aluminum, wooden, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, 6HG2)

A6.22.8. Package in the following single, composite packages:

Inner receptacle	Outer packaging
glass, porcelain, or stoneware	**Drums:** steel, aluminum or fiber (6PA1, 6PB1, 6PG1)

A6.22.9. Package in the following single, composite packages:

Inner receptacle	Outer packaging
glass, porcelain, or stoneware	**Boxes:** steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, 6PG2)

A6.22.10. Package in the following single, composite packages:

Inner receptacle	Outer packaging
glass, porcelain, or stoneware	solid or expanded plastic packaging (6PH1 or 6PH2)

A6.22.11. **DOT Cylinders.** Any DOT specification cylinders as prescribed for any compressed gas, except for acetylene.

A6.23. Gas Generator Assemblies. Package gas generator assemblies (aircraft) containing liquefied non-flammable, non-toxic gas and a solid propellant cartridge as follows:

A6.23.1. Package the gas in specification steel cylinders authorized for any compressed gas except acetylene not exceeding 10.5L (2.8 gallons) internal volume and having a minimum design burst pressure of 19,000 kPa (2,857 psi).

A6.23.2. Protect fittings against damage under conditions normal to transport, any trigger must be fitted with a safety locking pin, and a non-propulsive plug must be installed on the discharge tube; and

A6.23.3. Individually and tightly pack each complete unit to prevent movement in wooden boxes (4C1 or 4C2), plywood boxes (4D), reconstituted wood boxes (4F), fiberboard boxes (4G), or plastic boxes (4H1 and 4H2) of PG II performance level, or in the original manufacturer's transit box.

Attachment 7

CLASS 3--FLAMMABLE LIQUIDS

A7.1. General Requirements. This attachment contains information concerning the packaging and general handling instructions for Class 3 material (flammable liquids).

A7.2. General Handling Instructions. Store flammable liquids in cool, well-ventilated areas. Do not store near sources of heat, flames, sparks, combustible materials, or oxidizing agents. Keep containers tightly closed to prevent the evaporation of flammable liquids. Although classed as a flammable liquid, some materials in this attachment may also be described as corrosive or toxic. In the event of leakage or spillage, use rubber gloves, goggles, aprons, and respirators.

A7.3. Packaging for Class 3 Materials. See **Attachment 3** for other details concerning this class.

A7.3.1. Package as follows:

Inner packaging	Outer packaging
Receptacles: glass, earthenware, plastic, or metal	**Drums**: steel (1A1), removable head steel (1A2), aluminum (1B1), removable head aluminum (1B2), metal other than steel or aluminum (1N1), removable head metal other than steel or aluminum (1N2), plywood (1D), fiber (1G), plastic (1H1), or removable head plastic (1H2)

A7.3.2. Package as follows:

Inner packaging	Outer packaging
Receptacles: glass, earthenware, plastic, or metal	**Barrel:** wooden (2C2) ***NOTE:*** Not authorized for PG I material.

A7.3.3. Package as follows:

Inner packaging	Outer packaging
Receptacles: glass, earthenware, plastic, or metal	**Jerricans**: steel (3A1), removable head steel (3A2), plastic (3H1), plastic removable head (3H2), aluminum (3B1), or aluminum removable head (3B2)

A7.3.4. Package as follows:

Inner packaging	Outer packaging
Receptacles: glass, earthenware, plastic, or metal	**Boxes**: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), or solid plastic (4H2)

A7.3.5. Package in the following single packages:

Inner packaging	Outer packaging
Not required	**Drums**: steel (1A1), removable head steel (1A2), aluminum (1B1), removable head aluminum (1B2), metal drum other than steel or aluminum (1N1), removable head metal other than steel or aluminum (1N2), fiber (1G) with liner, or plastic (1H1 or 1H2) ***NOTE:*** Fiber drum with liner only authorized for PG III material.

A7.3.6. Package in the following single package:

Inner packaging	Outer packaging
Not required	**Barrel:** wooden (2C1) ***NOTE:*** Not authorized for PG I material.

A7.3.7. Package in the following single packages:

Inner packaging	Outer packaging
Not required	**Jerricans:** steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2)

A7.3.8. Package in the following single composite packages:

Inner receptacle	Outer packaging
plastic	**Drum:** steel, aluminum, fiber, plastic or plywood (6HA1, 6HB1, 6HG1, 6HH1, or 6HD1) ***NOTE:*** Plywood drum (6HD1) only authorized for PG II or PG III

A7.3.9. Package in the following single composite packages:

Inner receptacle	Outer packaging
plastic	**Boxes:** steel, aluminum, wooden, plywood or fiberboard (6HA2, 6HB2, 6HC, 6HD2 or 6HG2)

A7.3.10. Package as follows:

Inner packaging	Outer packaging
Receptacle: glass, porcelain or stoneware	**Drum:** steel, aluminum, fiber, plywood drum (6PA1, 6PB1, 6PG1 or 6PD1) or wickerwork hamper (6PD2) ***NOTE:*** Plywood drum (6PD1) and wickerwork hamper (6PD2) only authorized for PG II or PG III.

A7.3.11. Package in the following single, composite packages:

Inner packaging	Outer packaging
Receptacle: glass, porcelain or stoneware	**Box:** steel (6PA2), aluminum (6PB2), wooden (6PC), fiberboard (6PG2), solid plastic (6PH1), or expanded plastic packaging (6PH2)

A7.3.12. **DOT Cylinders.** DOT specification cylinders as prescribed for any compressed gas, except DOT 8 (acetylene) and DOT 3HT.

A7.3.13. **BLU-27 Firebombs.** Pack BLU-27 firebombs according to SPI 1325-912-3175. Pack BLU-32 firebombs according to SPI 1325-912-3175 or SPI 1325-483-3035. Do not stack containers more than two high for air transportation. Ship firebombs as flammable liquids, NOS.

A7.3.14. **DOT 5L Jerry Can.** DOT 5L jerry cans authorized by paragraph **3.7.** Completely drain cans for shipment.

A7.3.15. **MIL-D-23119 Drum.** MIL-D-23119 500-gallon capacity collapsible fabric drums authorized under **3.7.** Five hundred (500) gallon fabric drums shipped on other than tactical/contingency/emergency missions must be drained to the greatest extent possible.

A7.3.16. **Bulk Tanks.** Bulk storage tanks completely drained according to paragraph **3.7.9.**

A7.4. Refrigerating Machine. A refrigerating machine assembled for shipment and containing 7 kg (15 pounds) or less of flammable liquid for operation in a strong, tight receptacle is excepted from specification packaging, marking, and labeling except for the PSN of the flammable liquid.

A7.5. Aircraft Hydraulic Power Unit Fuel Tank.

A7.5.1. **Handling Instructions.** In the event of a leak during transportation of hydrazine, crew members should use their aircraft oxygen masks in a positive pressure mode.

A7.5.2. **Packaging Requirements.** Aircraft hydraulic power unit fuel tanks containing a mixture of anhydrous hydrazine and monomethyl hydrazine (M86 fuel) and designed for installation as complete units in aircraft are excepted from specification packaging requirements if the units comply with one of the following:

A7.5.2.1. The unit must consist of an aluminum pressure vessel made from tubing and having welded heads. Primary containment of the fuel within this vessel must consist of a welded aluminum bladder having a maximum internal volume of 46 L (12 gallons). The outer vessel must have a minimum design gauge pressure of 1.275 kPa (185 psi) and a minimum burst gauge pressure of 2.755 kPa (400 psi). Each vessel must be leak-checked during manufacture and before shipment and must be found leak proof. The complete inner unit must be securely packed in noncombustible cushioning material, in a strong outer tightly closed metal packaging that will adequately protect all fittings. The maximum quantity of fuel per unit and package is 42 L (11 gallons).

A7.5.2.2. The unit must consist of an aluminum pressure vessel. Primary containment of the fuel within this vessel must consist of a welded hermetically sealed fuel compartment with an elastomeric bladder having a maximum internal volume of 46 L (12 gallons). The pressure vessel must have a minimum design gauge pressure of 5.17 kPa (750 psi). Each vessel must be leak-checked during manufacture and before shipment and must be found leak proof. The complete inner unit must be securely packed in noncombustible cushioning material, in a strong outer tightly closed metal packaging that will adequately protect all fittings. The maximum quantity of fuel per unit and package is 42 L (11 gallons).

A7.6. Packaging for Class 3 Materials, Poisonous by Inhalation (Hazard Zone A or B). Package Class 3 materials with an Inhalation Hazard (Hazard Zone A and B) as follows:

A7.6.1. **DOT Cylinders.** Package in DOT specification cylinders as identified in 49 CFR, part 178, subpart C, except that specification 8, 8AL, and 39 cylinders are not authorized. Cylinders must also meet the requirements of **A3.3.2.**

A7.6.2. Pack in an inner drum (1A1, 1B1, 1N1, 1H1, or 6HA1), then place in an outer drum (1A2 or 1H2). Both the inner and outer drum must be tested to the PG I performance level. The outer 1A2 drum must have a minimum thickness of 1.35 mm (0.053 inches). The outer 1H2 drum must have a minimum thickness of 6.30 mm (0.248 inches). The capacity of the inner drum (1A1, 1B1, or 1N1) must not exceed 220 L (58 gallons). Cushion the inner drum within the outer drum with a shock-mitigating, non-reactive material. There must be a minimum of 5.0 cm (2 inches) of cushioning material between the outer surface (side) of the inner drum and the inner surface (side) of the outer drum. There must also be at least 7.6 cm (3 inches) of cushioning material between the outer surface (top and bottom) of the inner drum and the inner surface (top and bottom) of the outer drum. The inner drum must also meet all of the following requirements:

A7.6.2.1. Satisfactorily withstand a hydrostatic pressure test (as outlined in 49 CFR, paragraph 178.605) of 550 kPa (80 psig).

A7.6.2.2. Satisfactorily withstand a leak proof test (as outlined in 49 CFR, 178.604) using an internal air pressure at 55 degrees C (131 degrees F) of at least twice the vapor pressure of the material to be packaged.

A7.6.2.3. Have screw-type closures that meet all the following requirements:

A7.6.2.3.1. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A7.6.2.3.2. Physically held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation.

A7.6.2.4. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psi).

A7.6.2.5. Meet the following minimum thickness requirements:

A7.6.2.5.1. 1A1 and 1N1 drums with a capacity of less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.3 mm (0.051 inches). 1B1 drums with a capacity of less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.9 mm (0.154 inches).

A7.6.2.5.2. 1A1 and 1N1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.7 mm (0.067 inches). 1B1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 4.7 mm (0.185 inches).

A7.6.3. Pack in an inner packaging system that consists of an impact-resistant receptacle of glass, earthenware, plastic, or metal securely cushioned with a non reactive absorbent material. The package must be packed within a leak-tight packaging of metal or plastic, then packed in a steel drum (1A2), aluminum drum (1B2), metal drum (other than steel or aluminum (1N2)), plywood drum (1D), fiber drum (1G), plastic drum (1H2), wooden barrel (2C2), steel jerrican (3A2), plastic jerrican (3H2), steel box (4A), aluminum box (4B), natural wood box (4C1 or 4C2), plywood box (4D), reconstituted wood box (4F), fiberboard box (4G), expanded plastic box (4H1), or solid plastic box (4H2). The capacity of the inner receptacle must not exceed 4 L (1 gallon). An inner receptacle that has a closure must have a screw-type closure, which is held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation. Both the inner packaging system and the outer container must each meet the test requirements of the PG I performance level independently. The total amount of liquid that can be packed in the outer container must not exceed 16 L (4 gallons).

A7.6.4. This paragraph is only authorized for Crotonaldehyde, Stabilized; Diketene, Stabilized; Dimethylhydrazine, Symmetrical; Isopropyl Cloroformate and Methyl Orthosilicate. Pack in metal drums (1A1, 1B1, or 1N1), or plastic drum (1H1), then place in metal drums (1A2 or 1H2), or a plastic receptacle with outer steel drum (6HA1). Both the inner and outer drum must be tested to the PG I performance level. The outer 1A2 drum must have a minimum thickness of 1.35 mm (0.053 inches). The outer 1H2 drum must have a minimum thickness of 6.30 mm (0.248 inches). The capacity of the inner drum (1A1, 1B1, 1N1, or 1H1) must not exceed 220 L (58 gallons). Cushion the inner drum within the outer drum with a shock-mitigating, non reactive material. There must be a minimum of 5.0 cm (2 inches) of cushioning material between the outer surface (side) of the inner drum and the inner surface (side) of the outer drum. There must also be at least 7.6 cm (3 inches) of cushioning material between

the outer surface (top and bottom) of the inner drum and the inner surface (top and bottom) of the outer drum. The inner drum must meet all of the following requirements:

A7.6.4.1. Satisfactorily withstand a leak-proof test (as outlined in 49 CFR, paragraph 178.604) using an internal air pressure at 55 degrees C (131 degrees F) of at least twice the vapor pressure of the material to be packaged.

A7.6.4.1.1. Have screw-type closures that meet all the following requirements:

A7.6.4.1.2. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A7.6.4.2. Physically held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation.

A7.6.4.3. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psi).

A7.6.4.4. Meet the following minimum thickness requirements:

A7.6.4.4.1. 1A1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 0.69 mm (0.027 inches). 1B1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 2.79 mm (0.110 inches). 1H1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 1.14 mm (0.045 inches). 6HA1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 0.96 mm (0.038 inches) for the outer steel drum.

A7.6.4.4.2. 1A1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.08 mm (0.043 inches). 1B1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.9 mm (0.154 inches). 1H1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.16 mm (0.125 inches). 6HA1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 0.96 mm (0.038 inches) for the outer steel drum.

A7.6.4.4.3. 1A1 or 1N1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.35 mm (0.053 inches). 1B1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 4.7 mm (0.185 inches). 1H1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 3.16 mm (0.124 inches). 6HA1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 1.08 mm (0.43 inches) for the outer steel drum.

A7.7. Polyester Resin Kits. Polyester resin and fiberglass repair kits consist of two components: a base material in Class 3, PG II or III, and an organic peroxide activator. Only organic peroxides of Type D, E, or F not requiring temperature controls are authorized. Assign PG II or III according to the criteria for Class 3, applied to the base material. Ensure each component is separately packed in an inner packaging.

The components may be placed in the same outer packaging provided they will not react dangerous in the event of leakage.

A7.7.1. Package organic peroxides as follows:

Inner packaging	Outer packaging
plastic tube packaging flexible tube packaging ***NOTE:*** Maximum quantity of organic peroxide per inner packaging is 125 ml (4.22 ounces) for liquids and 500 g (1 lb.) for solids.	**Drums**: steel (1A2), aluminum (1B2), plywood (1D), fiber (1G), or plastic (1H2)

A7.7.2. Package organic peroxides as follows:

Inner packaging	Outer packaging
plastic tube packaging flexible tube packaging ***NOTE:*** Maximum quantity of organic peroxide per inner packaging is 125 ml (4.22 ounces) for liquids and 500 g (1 lb.) for solids.	**Jerricans**: steel (3A2) or plastic (3H2)

A7.7.3. Package organic peroxides as follows:

Inner packaging	Outer packaging
plastic tube packaging flexible tube packaging ***NOTE:*** Maximum quantity of organic peroxide per inner packaging is 125 ml (4.22 ounces) for liquids and 500 g (1 lb.) for solids.	**Boxes**: fiberboard (4G), wooden (4C1 or 4C2), reconstituted wood (4F), plywood (4D), or plastic (4H2)

A7.7.4. Package flammable liquids as follows:

Inner packaging	Outer packaging
Receptacle: glass or earthenware, plastic, metal or aluminum	**Drums**: steel (1A2), aluminum (1B2), plywood (1D), fiber (1G), or plastic (1H2)

A7.7.5. Package flammable liquids as follows:

Inner packaging	Outer packaging
Receptacle: glass or earthenware, plastic, metal or aluminum	**Jerricans**: steel (3A2) or plastic (3H2)

A7.7.6. Package flammable liquids as follows:

Inner packaging	Outer packaging
Receptacle: glass or earthenware, plastic, metal or aluminum	**Boxes**: fiberboard (4G), wooden (4C1 or 4C2), reconstituted wood (4F), plywood (4D), or plastic (4H2)

Attachment 8

CLASS 4--FLAMMABLE SOLIDS, SPONTANEOUSLY COMBUSTIBLE MATERIAL, AND DANGEROUS WHEN WET MATERIAL

A8.1. General Requirements. This attachment contains information concerning the packaging and general handling instructions for Class 4.1 (flammable solids), Class 4.2 (spontaneously combustible material), and Class 4.3 (dangerous when wet material).

A8.2. General Handling Instructions. Store Class 4 material in a cool, well-ventilated area away from moisture. Do not store near corrosives (Class 8). Tightly and securely close all containers. These items may be water reactive and spontaneously combustible. Do not pack Class 4 material in the same outside container with corrosive liquids, unless the corrosive liquids are in bottles cushioned by incombustible, nonreactive absorbent material. Place the cushioned bottles in tightly closed metal containers. Material in quantities not over 118 ml (4 ounces) in securely closed metal cans can be packed for military air transport in the same compartment with other securely packed materials necessary for a complete fumigant.

A8.3. Packaging for Class 4 Liquids. See **Attachment 3** for other details concerning this class.

A8.3.1. Package as follows:

Inner packaging	Outer packaging
Receptacles: glass or earthenware, plastic, or metal	**Drums**: steel (1A1), removable head steel (1A2), aluminum (1B1), removable head aluminum (1B2), metal other than steel or aluminum (1N1), removable head metal other than steel or aluminum (1N2), plywood (1D), fiber (1G), plastic (1H1), or removable head plastic (1H2)

A8.3.2. Package as follows:

Inner packaging	Outer packaging
Receptacles: glass or earthenware, plastic, or metal	**Barrel:** wood (2C2) ***NOTE:*** Not authorized for PG I material.

A8.3.3. Package as follows:

Inner packaging	Outer packaging
Receptacles: glass or earthenware, plastic, or metal	**Jerrican**: steel (3A1), removable head steel (3A2), plastic (3H1), plastic removable head (3H2), aluminum (3B1), or aluminum removable head (3B2)

A8.3.4. Package as follows:

Inner packaging	Outer packaging
Receptacles: glass or earthenware, plastic, or metal	**Boxes**: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expended plastic box (4H1), solid plastic (4H2)

A8.3.5. Package as follows:

Inner packaging	Outer packaging
Not required	**Drums**: steel (1A1), removable head steel (1A2), aluminum (1B1), removable head aluminum (1B2), metal other than steel or aluminum (1N1), removable head metal other than steel or aluminum (1N2), fiber (1G) with liner, plastic (1H1), and removable head plastic ***NOTE:*** Fiber drum (1G) not authorized for PG 1 materials.

A8.3.6. Package as follows:

Inner packaging	Outer packaging
Not required	**Barrel:** wood (2C1) ***NOTE:*** Not authorized for PG 1 materials.

A8.3.7. Package in the following single, composite packages:

Inner receptacle	Outer packaging
plastic	**Drum:** steel, aluminum, plywood, fiber or plastic drum (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1) ***NOTE:*** Plywood (6HD1) not authorized for PG I material.

A8.3.8. Package in the following single, composite packages:

Inner receptacle	Outer packaging
plastic	**Box:** steel, aluminum, wooden, plywood or fiberboard (6HA2, 6HB2, 6HC, 6HD2 or 6HG2)

A8.3.9. Package in the following single, composite packages:

Inner receptacle	Outer packaging
glass, porcelain or stoneware	**Drum:** steel, aluminum, fiber, plywood or wickerwork hamper (6PA1, 6PB1, 6PG1, 6PD1 or 6PD2) ***NOTE:*** Plywood drum or wickerwork hamper (6PD1 or 6PD2) not authorized for PG I material.

A8.3.10. Package in the following single, composite packages:

Inner receptacle	Outer packaging
glass, porcelain or stoneware	**Box:** steel, aluminum, wooden, fiberboard, or expanded plastic packaging (6PA2, 6PB2, 6PC, 6PG2, 6PH1, or 6PH2)

A8.3.11. **DOT Cylinders.** DOT specification cylinders as prescribed for any compressed gas, except DOT 8 (acetylene) and DOT 3HT.

A8.4. Packaging for Class 4 Solids. See also **A3.3.4.1.**

A8.4.1. Package as follows:

Inner packaging	Outer packaging
Receptacles: glass or earthenware, plastic, metal or glass ampoules	**Drums**: steel (1A1), removable head steel (1A2), aluminum (1B1), removable head aluminum (1B2), metal drum other than steel or aluminum (1N1), removable head metal other than steel or aluminum (1N2), plywood (1D), fiber (1G), plastic (1H1), or removable head plastic (1H2)

A8.4.2. Package as follows:

Inner packaging	Outer packaging
Receptacles: glass or earthenware, plastic, metal or glass ampoules	**Barrel:** wood (2C2)

A8.4.3. Package as follows:

Inner packaging	Outer packaging
Receptacles: glass or earthenware, plastic, metal or glass ampoules	**Jerrican**: steel (3A1), removable head steel (3A2), plastic (3H1), plastic removable head (3H2), aluminum (3B1) or aluminum removable head (3B2)

A8.4.4. Package as follows:

Inner packaging	Outer packaging
Receptacles: glass or earthenware, plastic, metal or glass ampoules	**Boxes**: steel (4A), aluminum (4B), ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G) or solid plastic (4H2)

A8.4.5. Package as follows:

Inner packaging	Outer packaging
Not required	**Drums**: steel (1A1), removable head steel (1A2), aluminum (1B1), removable head aluminum (1B2), metal drum other than steel or aluminum (1N1), removable head metal other than steel or aluminum (1N2), plywood (1D), fiber (1G), plastic (1H1), or removable head plastic (1H2) NOTES: Plywood (1D) not authorized for PG I material.

A8.4.6. Package as follows:

Inner packaging	Outer packaging
Not required	**Barrel:** wood (2C2) ***NOTE:*** Not authorized for PG I material.

A8.4.7. Package as follows:

Inner packaging	Outer packaging
Not required	**Jerrican**: steel (3A1), removable head steel (3A2), plastic (3H1), plastic removable head (3H2), aluminum (3B1) or aluminum removable head (3B2)

A8.4.8. Package as follows:

Inner packaging	Outer packaging
Not required	**Boxes:** steel (4A), steel (4A) with liner, aluminum (4B), , aluminum (4B) with liner, ordinary natural wood (4C1), sift-proof natural wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G) or solid plastic (4H2 or 4H1)

A8.4.9. Package as follows:

Inner packaging	Outer packaging
Not required	**Bags:** woven plastic (5H1, 5H2, or 5H3); plastic film (5H4); textile (5L1, 5L2, or 5L3); paper, multiwall, water-resistant (5M2) ***NOTE:*** Not authorized for PG I material.

A8.4.10. Package in the following single, composite packages:

Inner receptacle	Outer packaging
plastic	**Drum:** steel, aluminum, plywood, fiber or plastic drum (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1)

A8.4.11. Package in the following single, composite packages:

Inner receptacle	Outer packaging
plastic	**Box:** steel, aluminum, wooden, plywood or fiberboard (6HA2, 6HB2, 6HC, 6HD2 or 6HG2)

A8.4.12. Package in the following single, composite packages:

Inner receptacle	Outer packaging
glass, porcelain or stoneware	**Drum:** steel, aluminum, plywood or fiber (6PA1, 6PB1, 6PD1 or 6PG1)

A8.4.13. Package in the following single, composite packagings:

Inner receptacle	Outer packaging
glass, porcelain or stoneware	**Box:** steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC or 6PG2)

A8.4.14. Package as follows:

Inner receptacle	Outer packaging
glass, porcelain or stoneware	expanded plastic packaging (6PH1 or 6PH2)

A8.5. Class 4 Materials requiring CAA. Ship Class 4 materials identified in **Table A4.1.** to this paragraph according to a competent authority approval (CAA). See **2.5.** for more information on CAAs.

A8.6. Pyrophoric Liquid Materials (Class 4.2). See also **A3.3.4.1.**

A8.6.1. **Steel or Nickel Cylinders.** Specification steel or nickel cylinders prescribed for any compressed gas except acetylene having a minimum design pressure of 1206 kPa (175 psi). The following applies:

A8.6.1.1. Cylinders with valves must be equipped with steel valve protection caps or collars, or

A8.6.1.2. Pack in wooden box (4C1, 4C2, 4D, or 4F), fiberboard box (4G), or plastic box (4H1 or 4H2). Secure cylinders to prevent movement in the box and when offered for transportation, load so that the pressure relief devices remain in the vapor space of the cylinder.

A8.6.2. **Boxes.** Wooden boxes (4C1, 4C2, 4D, or 4F), or fiberboard boxes (4G) with not more than four strong, tight metal cans with inner receptacles of glass or metal. Inner receptacles must not be over 1 L (0.3 gallons) capacity each. Inner receptacles must have a positive screw cap closure with gasket. Cushion inner packagings on all sides with dry, incombustible absorbent cushioning material in a quantity sufficient to absorb the entire contents. The strong, tight metal cans must be closed by positive means, not by friction.

A8.6.3. **Drums.** Steel drums (1A2) or fiber drums (1G) not exceeding 220 L (58 gallons) capacity each with inner metal cans not over 4 L (1 gallon) capacity each, closed by positive means, not by friction. The following additional requirements must be met:

A8.6.3.1. Inner packaging must have no opening exceeding 25 mm (1 inch) in diameter and must be surrounded with non combustible absorbent cushioning material.

A8.6.3.2. Net quantity of pyrophoric liquids must not exceed two-thirds of the rated capacity of the outer drum. For example, a 220 L (58 gallon) outer drum must not contain more than 147 L (39 gallons) of pyrophoric liquids.

A8.6.3.3. A metal plate separator in addition to the noncombustible absorbent cushioning material must separate each layer of inner packagings.

A8.7. Diphenyloxide-4, 4-Disulphohydrazide; N, N Dinitroso-N, N Dimethyl Teraphthlamide (not more than 72 percent as a paste). Temperature controls are not required. Maximum gross weight must not exceed 110 pounds (50 kg).

A8.7.1. Package as follows:

Inner packaging	Outer packaging
Not required	**Drum:** fiber (1G) with a plastic liner or internal coating

A8.7.2. Package as follows:

Inner packaging	Outer packaging
Not required	**Drum:** sift-proof fiber (1G)

A8.8. 1,1 Azodi-(Hexahydrobenzonitrile); Benzene Sulfohydrazide; Benzene-1,3-Disulfohydrazide (not more than 52 percent as a paste); N,N-Dinitrosopentamethylenetetramine (not more than 82 percent with phlegmatizer). Temperature controls are not required.

A8.8.1. Package as follows:

Inner packaging	Outer packaging
Not required	**Drum:** fiber (1G) with a plastic liner or internal coating ***NOTE:*** Maximum gross weight is 50 kg (110 pounds).

A8.8.2. Package as follows:

Inner packaging	Outer packaging
Receptacle: single plastic bag	**Box:** fiberboard (4G) ***NOTE:*** Maximum gross weight is 50 kg (110 pounds).

A8.8.3. Package as follows:

Inner packaging	Outer packaging
Receptacles: plastic boxes, plastic bottles, or jars ***NOTE:*** Maximum weight of inner packaging is 5 kg (11 pounds).	**Box:** fiberboard (4G) ***NOTE:*** Maximum gross weight is 40 kg (88 pounds).

A8.8.4. Package as follows:

Inner packaging	Outer packaging
Not required	**Drum:** sift-proof fiber (1G) ***NOTE:*** Maximum gross weight is 55 kg (110 pounds).

A8.9. 3-Chloro-4-DiethylaminobenzenediazoniumZinc Chloride; 4-Dipropylaminobenzenediazonium Zinc Chloride; Sodium 2-Diazo-1Naphthol-4-Sulphonate; Sodium 2-Diazo-1-Naphthol-5-Sulphonate. Temperature controls are not required.

A8.9.1. Package as follows:

Inner packaging	Outer packaging
Not required	**Drum:** fiber (1G) with a plastic liner or internal coating ***NOTE:*** Maximum gross weight is 50 kg (110 pounds).

A8.9.2. Package as follows:

Inner packaging	Outer packaging
Receptacle: plastic bag	**Drums:** steel removable head (1A2) or an aluminum removable head (1B2) ***NOTE:*** Maximum gross weight is 55 kg (121 pounds).

A8.10. 2-Diazo-1-Naphthol-4-Sulphochloride and 2-Diazo-1-Naphhthol-5-Sulphochloride. Temperature controls are not required. Package as follows:

Inner packaging	Outer packaging
Not required	**Drum:** fiber (1G) with plastic liner or internal coating ***NOTE:*** Maximum gross weight is 50 kg (110 pounds).

A8.11. Barium Azide, Wetted (with not less than 50 percent water by mass). Pack barium azide, wetted (with not less than 50 percent water by mass) in the following packaging. Inner glass receptacles must not be over 0.5 kg (1.1 pounds) capacity each. Inner receptacles must have rubber stoppers wire-tied for securement. If transportation is to take place when freezing weather is possible, a suitable antifreeze solution must be used to prevent freezing.

A8.11.1. Package as follows:

Inner packaging	Outer packaging
Receptacles: glass	**Boxes:** wood (4C1, 4C2, 4D, or 4F)

A8.11.2. Package as follows:

Inner packaging	Outer packaging
Receptacles: glass	**Drum:** fiber (1G)

A8.12. Calcium Pyrophoric; Magnesium Diphenyl; Metal Catalyst, Dry; Pyrophoric Metals, NOS and Pyrophoric Solids, NOS.

A8.12.1. Inner receptacles must have a positive (not friction) means of closure. Inner metal receptacles must not contain more than 15 kg (33 pounds) each. Package as follows:

Inner packaging	Outer packaging
Receptacles: metal	**Boxes:** wood (4C1, 4C2, 4D, or 4F)

A8.12.2. Inner receptacles must have a positive (not friction) means of closure. Inner metal receptacles must not contain more than 7.5 kg (17 pounds) each. Package as follows:

Inner packaging	Outer packaging
Receptacles: metal	**Box:** fiberboard (4G)

A8.12.3. Package as follows:

Inner packaging	Outer packaging
Not required	**Drum:** steel (1A1 or 1A2) ***NOTE:*** Gross weight must not exceed 150 kg (331 pounds) each.

A8.12.4. Inner receptacles must have a positive (not friction) means of closure. Inner metal receptacles must not contain more than 15 kg (33 pounds) each. Package as follows:

Inner packaging	Outer packaging
Receptacles: metal	**Drums:** fiber (1G) or plywood (1D)

A8.13. Films, Nitrocellulose Base (gelatin coated [except scrap]). Each reel must be in a tightly closed inner packaging with its cover securely held in place with adhesive tape or adhesive paper.

A8.13.1. Package as follows:

Inner packaging	Outer packaging
Receptacles: metal can, polypropylene canister, or strong fiberboard	**Drums:** steel (1A1), aluminum (1B2), or plywood (1D) **Jerrican:** steel (3A2) **Boxes:** wood (4C1 or 4C2), plywood (4D), or reconstituted wood (4F)

A8.13.2. **Film Not Exceeding 600 m (1969 feet).** Package as follows:

Inner packaging	Outer packaging
Receptacles: metal can, polypropylene canister, or strong fiberboard	**Box:** fiberboard (4G) **Drum:** fiber (1G)

A8.14. Fusee (railway or highway).

A8.14.1. **General Requirements.** Fusees that are equipped with spikes must have reinforced ends to prevent penetration of the spikes through the outer packaging. Also, the packages must be capable of passing at least one drop test with the spike in a downward position. The PSN "FUSEE" is only valid for domestic movement. For international shipment you must use the PSN "SIGNAL DEVICES, HAND" and package the material as required by the packaging paragraph for signal devices, hand.

A8.14.2. **Packaging Requirements.**

A8.14.2.1. Package as follows:

Inner packaging	Outer packaging
Not required	**Drums:** steel (1A2), plywood (1D), or fiber (1G)

A8.14.2.2. Package as follows:

Inner packaging	Outer packaging
Not required	**Jerrican:** steel (3A2)

A8.14.2.3. Package as follows:

Inner packaging	Outer packaging
Not required	**Boxes:** wood (4C1, 4C2), plywood (4D), reconstituted (4F), fiberboard (4G)

A8.15. Matches, Fusee; Matches, Safety (book, card, or strike-on-box); Matches Strike-Anywhere, and Matches, Wax Vesta. Matches must be of a type that will not ignite spontaneously when subjected to a temperature of 93.3 degrees C (200 degrees F) for 8 consecutive hours in a properly conducted laboratory test.

A8.15.1. Do not pack matches, strike-anywhere, in the same outside container with any other article except safety matches or wax vesta matches. The safety matches or wax vesta matches must be packaged in separate inside containers. Each inside packaging must not contain over 700 matches. Gross weight must not be over 27.2 kg (60 pounds) for fiberboard boxes or 45.4 kg (100 pounds) for all other outer packagings.

A8.15.1.1. Package as follows:

Inner packaging	Outer packaging
Receptacles: securely closed chipboard, fiberboard, wood, or metal	**Drums:** steel (1A2), aluminum (1B2), plywood (1D) or fiber (1G)

A8.15.1.2. Package as follows:

Inner packaging	Outer packaging
Receptacles: securely closed chipboard, fiberboard, wood, or metal	**Jerrican:** steel (3A2)

A8.15.1.3. Package as follows:

Inner packaging	Outer packaging
Receptacles: securely closed chipboard, fiberboard, wood, or metal	**Boxes:** wood (4C1, 4C2), plywood (4D), reconstituted (4F) or fiberboard (4G)

A8.15.2. Do not pack fusee matches, in the same outside container with any other article except safety matches or wax vesta matches. The safety matches or wax vesta matches must be packaged in separate inside containers. Each inside packaging must not contain over 700 matches. Gross weight must not be over 27.2 kg (60 pounds) for fiberboard boxes or 45.4 kg (100 pounds) for all other outer packagings.

A8.15.2.1. Package as follows:

Inner packaging	Outer packaging
Receptacles: securely closed chipboard, fiberboard, wood, or metal	**Drums:** steel (1A2), aluminum (1B2), plywood (1D) or fiber (1G)

A8.15.2.2. Package as follows:

Inner packaging	Outer packaging
Receptacles: securely closed chipboard, fiberboard, wood, or metal	**Jerrican:** steel (3A2)

A8.15.2.3. Package as follows:

Inner packaging	Outer packaging
Receptacles: securely closed chipboard, fiberboard, wood, or metal	**Boxes:** wood (4C1, 4C2), plywood (4D), reconstituted (4F) or fiberboard (4G)

A8.15.3. Tightly pack safety matches (strike-on-box, book, and card) or wax vesta matches in securely closed inside containers then packed in an outer packaging. Safety matches may be packed in the same outside container with non hazardous materials.

A8.15.3.1. Package as follows:

Inner packaging	Outer packaging
Receptacles: securely closed chipboard, fiberboard, wood, or metal	**Drums:** steel (1A2), aluminum (1B2), plywood (1D), or fiber (1G)

A8.15.3.2. Package as follows:

Inner packaging	Outer packaging
Receptacles: securely closed chipboard, fiberboard, wood, or metal	**Jerrican:** steel (3A2)

A8.15.3.3. Package as follows:

Inner packaging	Outer packaging
Receptacles: securely closed chipboard, fiberboard, wood, or metal	**Boxes:** wooden (4C1, 4C2), plywood (4D), reconstituted (4F), fiberboard (4G)

A8.16. Pentaborane. Package in any DOT specification cylinder, except those specified for acetylene.

A8.17. Phosphorus, White or Yellow, Dry, or Under Water, or in Solution. The packaging requirements are:

A8.17.1. **Phosphorus White or Yellow.** Phosphorus white or yellow, when dry, must be cast solid and shipped in containers as follows:

A8.17.1.1. Steel drums (1A2) not over a 115 L (30 gallons) capacity each.

A8.17.1.2. In projectiles or bombs without bursting elements.

A8.17.2. **Phosphorus White or Yellow in Water or Solution.** Pack phosphorus, white or yellow, when in water or solution, in:

A8.17.2.1. Wooden boxes (4C1, 4C2, 4D, or 4F) with inside soldered or hermetically-sealed metal cans placed inside another soldered or hermetically-sealed metal can.

A8.17.2.2. Wooden boxes (4C1, 4C2, 4D, or 4F) with inside water-tight metal cans containing not over .45 kg (1 pound) of phosphorus with screw-top closures.

A8.17.2.3. Steel drums (1A1 or 1A2). 1A1 drums must not exceed 250 L (66 gallons), and 1A2 drums must not exceed 114 L (30 gallon) capacity each.

A8.17.3. **White Phosphorus Igniters.** Pack white phosphorus igniters one each in a hermetically-sealed (soldered) or watertight metal can, sealed airtight and positively fastened. Pack no more than 25 metal cans in a wooden box (4C1, 4C2, 4D, or 4F).

A8.18. Smokeless Powder for Small Arms (100 pounds or less). The PSN "SMOKELESS POWDER FOR SMALL ARMS" is only valid for domestic movement. For international shipment you must use the PSN "POWDER, SMOKELESS" and package the material as required by the packaging paragraph for powder, smokeless. The complete package must be a type examined by the Bureau of Explosives, approved by the DOT, and meet **A3.3.1.** Not more than 45.4 kg (100 pounds) is allowed on the aircraft. Only combination packaging with inner packagings not exceeding 3.6 kg (8 pounds) net mass are authorized. Arrange and protect inner packagings to prevent simultaneous ignition of the contents.

A8.19. Batteries and Cells Containing Sodium. Ensure batteries and cells do not contain any hazardous material other than sodium, sulfur, or polysulfides. Do not offer batteries or cells for transportation at a temperature at which there is any liquid elemental sodium present in the battery or cell. Ensure the external battery temperature does not exceed 55 degrees C (130 degrees F). Ensure batteries are protected from external short circuit.

A8.19.1. Batteries must consist of cells secured within and fully enclosed by a metal casing. Ship unpackaged or in nonspecification protective packagings. UN specification containers are not required.

A8.19.2. Cells must consist of hermetically sealed metal casings that completely enclose the hazardous material. Pack cells with sufficient cushioning material to secure against movement; and to prevent contact between cells and between cells and the internal surfaces of the outer packaging. Pack cells in packaging that meets the PG II performance level.

A8.19.2.1. Package as follows:

Inner packaging	Outer packaging
Not Required	**Drums:** steel (1A2), aluminum (1B2), plywood (1D), fiber (1G), or plastic (1H2)

A8.19.2.2. Package as follows:

Inner packaging	Outer packaging
Not Required	**Boxes:** ordinary wood (4C1), sift-proof wood (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), or plastic (4H2)

Attachment 9

CLASS 5--OXIDIZING MATERIALS AND ORGANIC PEROXIDES

A9.1. General Requirements. This attachment contains information concerning the packaging and general handling instructions for Class 5.1 (oxidizing material) and Class 5.2 (organic peroxides).

A9.2. General Handling Instructions. Store Class 5 materials in a cool, well-ventilated area away from moisture. Do not store near corrosives.

A9.3. Control and Emergency Temperature. Packaged items in Class 5.2 may require controlled temperature conditions during shipment. **Table A9.1.** lists the "control temperatures" for specific organic peroxide items (by technical name), when applicable, in column 6a. The following applies:

A9.3.1. The control temperature is the temperature above which a material may not be offered for transportation.

A9.3.2. The emergency temperature is the temperature at which emergency procedures must be initiated due to imminent danger resulting from overheating of the shipment.

A9.3.3. **Table A9.1.** identifies emergency temperatures, when applicable, in column 6b. If column 6a or 6b is left blank, there are no control or emergency temperature requirements.

A9.3.4. Guidance for packaging materiel requiring temperature control during shipment is contained in DLAI 4145.21/TB MED284/NAVSUPINST 4610.31/AFR 167-9*, Preparation of Medical Materiel Requiring Freeze or Chill Environment for Shipment*.

A9.4. Organic Peroxides Table. Table A9.1., Organic Peroxides Table, specifies, by technical name, the organic peroxides authorized for transportation. An organic peroxide identified by technical name in **Table A9.1.** must comply with all of the applicable provisions of the table. An organic peroxide not identified in **Table A9.1.** by technical name or a new formulation of identified organic peroxides requires written approval from the DOT according to 49 CFR 173.128 before transportation. A description of the column headings of **Table A9.1.** is as follows:

A9.4.1. **Technical Name.** The first column specifies the technical name. Use the technical name to determine the applicable UN identification number in column 2.

A9.4.2. **Identification Number.** The second column specifies the UN identification number for a corresponding technical name. Use the identification number to identify the PSN in **Table A4.1.**

A9.4.3. **Concentration of Organic Peroxide.** The third column specifies the concentration (mass percent of organic peroxide) limitations, if any, in mixtures or solutions. The number listed identifies the amount of organic peroxide (by mass) that is authorized for a mixture or solution containing the organic peroxide listed in column 1. Limitations are given as minimums, maximums, or a range, as appropriate. A range includes the lower and upper limits (i.e., 53-100 means from and including 53 percent to and including 100 percent). It is the responsibility of the party producing the material for shipment (contractor or manufacturer) to develop the material within the safe concentration range specified in the table.

A9.4.4. **Concentration of Diluents.** The fourth column specifies the concentration (mass percent) of diluent type A (column 4a), diluent type B (column 4b) or inert solid (column 4c), that must be mixed

with the organic peroxide, when required. It is the responsibility of the party producing the material for shipment (contractor or manufacturer) to comply with the safe concentration requirements specified in column 4.

A9.4.5. **Concentration of Water.** Column 5 specifies (in mass percent) the minimum amount of water required in the formulation. If the column is blank, there is no specified requirement for water content.

A9.4.6. **Control and Emergency Temperatures.** Column 6a specifies the control temperature and column 6b specifies the emergency temperature, when required. If a column is left blank, temperature controls are not required.

A9.4.7. **Notes.** Column 7 identifies additional requirements when applicable. The notes are provided at the end of the table.

Table A9.1. Organic Peroxides.

ORGANIC PEROXIDES	**See A9.4. for instructions on use of this table.**								
Technical Name	**UN #**	**Con-centra-tion**	**Dilu-ent-Mass % A**	**Dilu-ent-Mass % B**	**Dilu-ent-Mass % I**	**Water Mass %**	**Control Temp (ºC)**	**Emergency Temp (ºC)**	**Note**
ACETYL ACETONE PEROXIDE	3105	≤42	≥48			≥8			1
ACETYL ACETONE PEROXIDE as a paste	3106	≤32							9
ACETYL BENZOYL PEROXIDE	3105	≤45	≥55						
ACETYL CYCLOHEXANE-SULPHONYL PEROXIDE	3112	≤82			≥12		-10	0	
ACETYL CYCLOHEXANE-SULPHONYL PEROXIDE	3115	≤32		≥68			-10	0	
tert-AMYL HYDROPEROXIDE	3107	≤88	≥6			≥6			
tert-AMYL PEROXYACETATE	3107	≤62	≥38						
tert-AMYL PEROXYBENZOATE	3103	≤100							
tert-AMYL PEROXY-2-ETHYLHEXANOATE	3115	≤100					20	25	
tert-AMYL PEROXY-2-ETHYLHEXYL CARBONATE	3105	≤100							
tert-AMYL PEROXYNEODECANOATE	3115	≤77		≥23			0	10	
tert-AMYL PEROXYPIVALATE	3113	≤77		≥23			10	15	
tert-AMYL PEROXY-3,5,5-TRIMETHYLHEXANOATE	3101	≤100							
tert-BUTYL CUMYL PEROXIDE	3105	>42-100							
tert-BUTYL CUMYL PEROXIDE	3106	≤42			≥58				

ORGANIC PEROXIDES	See A9.4. for instructions on use of this table.								
Technical Name	**UN #**	**Con-centra-tion**	**Dilu-ent-Mass % A**	**Dilu-ent-Mass % B**	**Dilu-ent-Mass % I**	**Water Mass %**	**Control Temp (°C)**	**Emergency Temp (°C)**	**Note**
n-BYTYL-4,4-DI-(tERT-BUTYLPEROXY)-VALERATE	3103	>52-100							
n-BYTYL-4,4-DI-(tERT-BUTYLPEROXY)-VALERATE	3106	≤52			≥48				
n-BUTY-4,4-DI-(tERT-BUTYL-PEROXY)-VALERATE	3108	≤42			≥58				
tert-BUTYL HYDROPEROXIDE	3103	>73-90				≥10			
tert-BUTYL HYDROPEROXIDE	3105	≤80	≥20						3
tert-BUTYL HYDROPEROXIDE	3107	≤79				≤14			
tert-BUTYL HYDROPEROXIDE	3109	≤72				≥28			
tert-BUTYL HYDROPEROXIDE and di-tert-BUTYL PEROXIDE	3103	≤82+>9				≥7			
tert-BUTYL MONOPEROXYMALEATE	3102	>52-100							
tert-BUTYL MONOPEROXYMALEATE	3103	≤52	≥48						
tert-BUTYL MONOPEROXYMALEATE	3108	≤52			≥48				
tert-BUTYL MONOPEROXYMALEATE as a paste	3108	≤52							
tert-BUTYL MONOPEROXYMALEATE as a paste	3110	≤42							
tert-BUTYL MONOPEROXYPHTHATE	3102	≤100							
tert-BUTYL PEROXYACETATE	3101	>52-77	≥23						

ORGANIC PEROXIDES	See A9.4. for instructions on use of this table.								
Technical Name	**UN #**	**Con-centra-tion**	**Dilu-ent-Mass % A**	**Dilu-ent-Mass % B**	**Dilu-ent-Mass % I**	**Water Mass %**	**Control Temp (°C)**	**Emergency Temp (°C)**	**Note**
tert-BUTYL PEROXYACETATE	3103	>32-52	≥48						
tert-BUTYL PEROXYACETATE	3109	≤32	≥68						
tert-BUTYL PEROXYACETATE	3119	≤32		≥68			30	35	
tert-BUTYL PEROXYACETATE	3109	≤22		≥78					
tert-BUTYL PEROXYBENZOATE	3103	>77-100	≥22						
tert-BUTYL PEROXYBENZOATE	3105	>52-77	≥23						1
tert-BUTYL PEROXYBENZOATE	3106	≤52			≥48				
tert-BUTYL PEROXYBUTYL FUMARATE	3105	≤52	≥48						
tert-BUTYL PEROXYCROTONATE	3105	≤77	≥23						
tert-BUTYL PEROXYDIETHYL-ACETATE	3113	≤100					20	25	
tert-BUTYL PEROXYDIETHYL ACETATE and tert-BUTYL PEROXYBENZOATE	3105	≤33+≤33	≥33						
tert-BUTYL PEROXY-2-ETHYLHEXANOATE	3113	>52-100					20	25	
tert-BUTYL PEROXY-2-ETHYLHEXANOATE	3117	>32-52		≥48			30	35	
tert-BUTYL PEROXY-2-ETHYLHEXANOATE	3118	≤52			≥48		20	25	
tert-BUTYL PEROXY-2-ETHYLHEXANOATE	3119	≤32		≥68			30	35	
tert-BUTYL PEROXY-2-ETHYLHEXANOATE	3119	≤32		≥68			10	15	

ORGANIC PEROXIDES	See A9.4. for instructions on use of this table.								
Technical Name	**UN #**	**Con-centra-tion**	**Dilu-ent-Mass % A**	**Dilu-ent-Mass % B**	**Dilu-ent-Mass % I**	**Water Mass %**	**Control Temp (°C)**	**Emergency Temp (°C)**	**Note**
tert-BUTYL PEROXY-2-ETHYLHEXANOATE	3119	≤32		≤68			15	20	
tert-BUTYL PEROXY-2-ETHYLHEXANOATE and 2,2-DI-(TERT-BUTYLPEROXY) BUTANE	3115	≤31+≤36		≥33			35	40	
tert-BUTYL PEROXY-2-ETHYLHEXANOATE and 2,2-DI-(TERT-BUTYLPEROXY) BUTANE	3106	≤12+≤14	≥14		≥60				
tert-BUTYL PEROXY-2-ETHYLHXYLCARBONATE	3105	≤100							
tert-BUTYL PEROXYISOBUTYRATE	3111	>52-77		≥23			15	20	
tert-BUTYL PEROXYISOBUTYRATE	3115	≤52		≥48			15	20	
tert-BUTYL PEROXY ISOPROPYLCARBONATE	3103	≤77	≥23						
1-(2-tert-BUTYLPEROXY ISOPROPYL)-3-ISOPROPENYLBENZE	3105	≤77	≥23						
1-(2-tert-BUTYLPEROXY ISOPROPYL)-3-ISOPROPENYLBENZE	3108	≤42			≥58				
tert-BUTYL PEROXY-2-METHYLBENZOATE	3103	≤100							
tert-BUTYL PEROXY-NEODECANOATE	3115	>77-100					-5	5	
tert-BUTYL PEROXY-NEODECANOATE	3115	≤77		≥23			0	10	
tert-BUTYL PEROXY-NEODECANOATE [as a stable dispersion in water]	3117	≤52						0	10
tert-BUTYL PEROXY-NEODECANOATE [as a stable dispersion in water]	3119	≤42					-5	5	

ORGANIC PEROXIDES	See A9.4. for instructions on use of this table.								
Technical Name	**UN #**	**Con-centra-tion**	**Dilu-ent-Mass % A**	**Dilu-ent-Mass % B**	**Dilu-ent-Mass % I**	**Water Mass %**	**Control Temp (°C)**	**Emergency Temp (°C)**	**Note**
tert-BUTYL PEROXY-NEODECANOATE	3119	≤32	≥68				0	10	
tert-BUTYL PEROXY-NEOHEPTANOATE	3115	≤77	≥23				0	10	
tert-BUTYL PEROXY-NEODECANOATE [as a stable dispersion in water (frozen)]	3118	≤42					0	10	
3-tert-BUTYLPEROXY-3-PHENYLPHTHALIDE	3106	≤100							
tert-BUTYL PEROXYPIVALATE	3113	>67-77	≥23				0	10	
tert-BUTYL PEROXYPIVALATE	3115	≤67		≥33			0	10	
tert-BUTYL PEROXYPIVALATE	3119	≤27		≥73			30	35	
tert-BUTYL PEROXYPIVALATE	3119	≤27		≥73			10	15	
tert-BUTYL PEROXYPIVALATE	3119	≤27		≥73			5	10	
tert-BUTYLPEROXY STARYLCARBONATE	3106	≤100							
tert-BUTYL PEROXY-3,5,5-TRIMETHYLHEXANOATE	3105	>32-100							
tert-BUTYLPEROXY STARYLCARBONATE	3109	≤32	≥68						
tert-BUTYL PEROXY-3,5,5-TRIMETHYLHEXANOATE	3119	≤32		≥68			35	40	
3-CHLOROPEROXYBENZOIC ACID	3102	>57-86				≥14			
3-CHLOROPEROXYBENZOIC ACID	3106	≤77			≥6	≥17			

ORGANIC PEROXIDES	See A9.4. for instructions on use of this table.								
Technical Name	**UN #**	**Con-centra-tion**	**Dilu-ent-Mass % A**	**Dilu-ent-Mass % B**	**Dilu-ent-Mass % I**	**Water Mass %**	**Control Temp (°C)**	**Emerge ncy Temp (°C)**	**Note**
3-CHLOROPEROXYBENZOIC ACID	3106	≤57			≥3	≥40			
CUMYL HYDROPEROXIDE	3107	>90-98	≤10						
CUMYL HYDROPEROXIDE	3109	≤90	≥10						
CUMYL PEROXYNEODECANOATE	3115	≤77		≥23			-10	0	
CUMYL PEROXYNEO-HEPTANOATE [as a stable dispersion in water]	3119	≤52					-10	0	
CUMYL PEROXYNEO-NEODECANOATE [as a stable dispersion in water]	3119	≤52					-15	-5	
CUMYL PEROXYPIVALATE	3115	≤77		≥23			-5	5	
CUMYL PEROXYNEO-HEPTANOATE	3115	≤77	≥23				-10	0	
CYCLOHEXANONE PEROXIDE(S)	3104	≤91				≥9			
CYCLOHEXANONE PEROXIDE(S)	3105	≤72	≥28						4
CYCLOHEXANONE PEROXIDE(S) as a paste	3106	≤72							4,9
CYCLOHEXANONE PEROXIDE(S)	EXE MPT	≤32			≥68				
DIACETONE ALCOHOL PEROXIDES	3115	≤57		≥26		≥8	40	45	4
DIACETYL PEROXIDE	3115	≤27		≥73			20	25	5
DI-TERT-AMYL PEROXIDE	3107	≤100							
1,1DI-(TERT-AMYL-PEROXYL)CYCLO-HEXANE	3103	≤82	≥18						
DIBENZOYL PEROXIDE	3102	>51-100			≤48				2
DIBENZOYL PEROXIDE	3102	>77-94				≥6			2
DIBENZOYL PEROXIDE	3104	≤77				≥23			
DIBENZOYL PEROXIDE	3106	≤62			≥28	≥10			

ORGANIC PEROXIDES	See A9.4. for instructions on use of this table.								
Technical Name	**UN #**	**Con-centra-tion**	**Dilu-ent-Mass % A**	**Dilu-ent-Mass % B**	**Dilu-ent-Mass % I**	**Water Mass %**	**Control Temp (°C)**	**Emergency Temp (°C)**	**Note**
DIBENZOYL PEROXIDE as a paste	3106	>35-52			≥48				9
DIBENZOYL PEROXIDE	3107	>36-42	≥18			≥40			
DIBENZOYL PEROXIDE	3107	>36-42	≥58						
DIBENZOYL PEROXIDE as a paste	3106	>52-62							9
DIBENZOYL PEROXIDE as a paste	3108	≤56.5				≥15			
DIBENZOYL PEROXIDE as a paste	3108	≤52							9
DIBENZOYL PEROXIDE	EXEMPT	≤35			≥65				
DIBENZOYL PEROXIDE [as a stable dispersion in water]	3109	≤42							
DIBENZOYL PEROXYDICARBONATE	3112	≤87				≥13	25	30	
DI-(4-tert-BUTYLCYCLOHEXYL) PEROXYDICARBONATE	3114	≤100					30	35	
DI-(4-tert-BUTYLCYCLOHEXYL)PEROXYDICARBONATE as a stable dispersion in water	3119	≤42					30	35	
DI-tert-BUTYL PEROXIDE	3107	>32-100							
DI-tert-BUTYL PEROXIDE	3109	≤52		≥48					
DI-tert-BUTYL PEROXYAZELATE	3105	≤52	≥48						
2,2-DI-(tert-BUTYLPEROXY) BUTANE	3103	≤52	≥48						
1,1-DI-(tert-BUTYLPEROXY)-CYCLOHEXANE	3101	>80-100							
1,1-DI-(tert-BUTYLPEROXY)-CYCLOHEXANE	3103	>52-80	≥20						
1,1-DI-(tert-BUTYLPEROXY)-CYCLOHEXANE	3105	≤52	≥48						

ORGANIC PEROXIDES	See A9.4. for instructions on use of this table.								
Technical Name	**UN #**	**Con-centra-tion**	**Dilu-ent-Mass % A**	**Dilu-ent-Mass % B**	**Dilu-ent-Mass % I**	**Water Mass %**	**Control Temp (°C)**	**Emerge ncy Temp (°C)**	**Note**
1,1-DI-(tert-BUTYLPEROXY)-CYCLOHEXANE	3106	≤42	≥13		≥45				
1,1-DI-(tert-BUTYLPEROXY)-CYCLOHEXANE	3109	≤42	≥58						
1,1-DI-(tert-BUTYLPEROXY)-CYCLOHEXANE	3107	≤27	≥36						10
1,1-DI-(tert-BUTYLPEROXY)-CYCLOHEXANE	3109	≤25	≥25	≥50					
1,1-DI-(tert-BUTYLPEROXY)-CYCLOHEXANE	3109	≤13	≥13	≥74					
DI-N-BUTYL PEROXYDICARBONATE	3115	>27-52		≥48			-15	-5	
DI-N-BUTYL PEROXYDICARBONATE [as a stable dispersion in water (frozen)]	3118	≤42					-15	-5	
DI-N-BUTYL PEROXYDICARBONATE	3117	≤27		≥73			-10	0	
DI-SEC-BUTYLPEROXY DICARBONATE	3113	>52-100					-20	-10	
DI-SEC-BUTYL PEROXYDICARBONATE	3115	≤52		≥48			-15	-5	
DI-(2-tert-BUTYLPEROXYISO-PROPYL)-BENZENE(S)	3106	>42-100			≥57				
DI-(2-tert-BUTYLPEROXYISO-PROPYL)-BENZENE(S)	EXEMPT	≤42			≥58				
DI-(tert-BUTYLPEROXY) PHTHALATE	3105	>42-52	≥48						
DI-(tert-BUTYLPEROXY) PHTHALATE	3107	≤42	≥58						
DI-(tert-BUTYLPEROXY) PHTHALATE as a paste	3106	≤52							9

ORGANIC PEROXIDES	See A9.4. for instructions on use of this table.								
Technical Name	**UN #**	**Con-centra-tion**	**Dilu-ent-Mass % A**	**Dilu-ent-Mass % B**	**Dilu-ent-Mass % I**	**Water Mass %**	**Control Temp (°C)**	**Emerge ncy Temp (°C)**	**Note**
2,2-DI-(tert-BUTYLPEROXY)-PROPANE	3105	≤52	≥48						
2,2-DI-(tert-BUTYLPEROXY)-PROPANE	3106	≤42	≥13		≥45				
1,1-DI-(tert-BUTYLPEROXY)-3,3,5-TRIMETHYL-CYCLOHEXANE	3101	>90-100							
1,1-DI-(tert-BUTYLPEROXY)-3,3,5-TRIMETHYL-CYCLOHEXANE	3103	>57-90	≥10						
1,1-DI-(tert-BUTYLPEROXY)-3,3,5-TRIMETHYL-CYCLOHEXANE	3105	≤77		≥23					
1,1-DI-(tert-BUTYLPEROXY)-3,3,5-TRIMETHYL-CYCLOHEXANE	3106	≤57			≥43				
1,1-DI-(tert-BUTYLPEROXY)-3,3,5-TRIMETHYL - CYCLOHEXANE	3107	≤57	≥43						
1,1-DI-(tert-BUTYLPEROXY)-3,3,5-TRIMETHYL - CYCLOHEXANE	3107	≤32	≥26	≥42					
2,2-DI-(4,4-DI(TERT-BUTYLPEROXY CYCLOHEXYL) PRPANE	3107	≤22		≥78					
DICETYL PEROXYDICARBONATE	3116	≤100					30	35	
DICETYL PEROXYDICARBONATE as a stable dispersion in water	3119	≤42					30	35	
DI-4-CHLOROBENZOYL PEROXIDE	3102	≤77				≥23			
DI-4-CHLOROBENZOYL PEROXIDE as a paste	3106	≤52							9
DI-4-CHLOROBENZOYL PEROXIDE	EXEMPT	≤32			≥68				

ORGANIC PEROXIDES	See A9.4. for instructions on use of this table.								
Technical Name	**UN #**	**Con-centra-tion**	**Dilu-ent-Mass % A**	**Dilu-ent-Mass % B**	**Dilu-ent-Mass % I**	**Water Mass %**	**Control Temp (°C)**	**Emerge ncy Temp (°C)**	**Note**
DICUMYL PEROXIDE	3109	>52-100		≤48					
DICUMYL PEROXIDE	3110	>52-100			≤48				
DICUMYL PEROXIDE	EXE MPT	≤52	≥48						
DICUMYL PEROXIDE	EXE MPT	≤52			≥48				
DICYCLOHEXYL PEROXYDICARBONATE	3112	>91-100					5	10	
DICYCLOHEXYL PEROXYDICARBONATE	3114	≤91				≥9	5	10	
DIDECANOYL PEROXIDE	3114	≤100					30	35	
2,2-DI-(4,4-DI(TERT-BUTYLPEROXYCYCLO-HEXYL) PROPANE	3106	≤42			≥58				
2,2-DI-(4,4-DI(TERT-BUTYLPEROXYCYCLO-HEXYL) PROPANE	3107	≤25		≥75					
DI-2,4-DICHLOROBENZOYL PEROXIDE	3102	≤77				≥23			
DI-2,4-DICHLOROBENZOYL PEROXIDE as a paste with silicon oil	3106	≤52							
DI-(2-ETHYLHEXYL) PEROXYDICARBONATE	3113	>77-100					-20	-10	
DI-(2-ETHYLHEXYL) PEROYDICARBONATE [as a stable dispersion in water]	3119	≤52					-20	-10	
DI-(2-ETHOXYETHYL) PEROXYDICARBONATE	3115	≤52		≥42			-10	0	
DI-(2-ETHYLHEXYL) PEROXYDICARBONATE	3115	≤77		≥23			-15	-5	
DI-(2-ETHYLHEXYL) PEROXYDICARBONATE as a stable dispersion in water	3117	≤62					-15	-5	

ORGANIC PEROXIDES	See A9.4. for instructions on use of this table.								
Technical Name	**UN #**	**Con-centra-tion**	**Dilu-ent-Mass % A**	**Dilu-ent-Mass % B**	**Dilu-ent-Mass % I**	**Water Mass %**	**Control Temp (°C)**	**Emergency Temp (°C)**	**Note**
DI-(2-ETHYLHEXYL) PEROXYDICARBONATE as astable dispersion in water	3119	≤52					-15	-5	
DI-(2-ETHYLHEXYL) PEROXYDICARBONATE as astable dispersion in water (frozen)	3118	≤42					-15	-5	
DIETHYL PEROXYDICARBONATE	3115	≤27		≥73			-10	0	
2,2-DIHYDRO-PEROXYPROPANE	3102	≤27			≥73				
DI-(1-HYDRO-XYCYCLOHEXYL) PEROXIDE	3106	≤100							
DIISOBUTYRYL PEROXIDE	3111	>32-52		≥48			-20	-10	
DIISOBUTYRYL PEROXIDE	3115	≤32		≥68			-20	-10	
DI-ISOPROPYLBENZENE DIHYDROPEROXIDE	3106	≤82	≥5			≥5			
DIISOPROPYL PEROXYDICARBONATE	3112	>52-100					-15	-5	
DIISOTRIDECYL PEROXYDICARBONATE	3115	≤100					-10	0	
DILAUROYL PEROXIDE	3106	≤100							
DILAUROYL PEROXIDE as a stable dispersion in water	3109	≤42							
DI-(2-METHYLBENZOYL) PEROXIDE	3112	≤87				≥13	30	35	
DI-(4-METHYLBENZOYL) PEROXIDE as a paste with silicone oil	3106	≤52							
2,5-DIMETHYL-2,5-DI-(BENZOYL-PEROXY) HEXANE	3102	>82-100							
2,5-DIMETHYL-2,5-DI-(BENZOYL-PEROXY) HEXANE	3106	≤82			≥18				

ORGANIC PEROXIDES	See A9.4. for instructions on use of this table.								
Technical Name	**UN #**	**Con-centra-tion**	**Dilu-ent-Mass % A**	**Dilu-ent-Mass % B**	**Dilu-ent-Mass % I**	**Water Mass %**	**Control Temp (°C)**	**Emerge ncy Temp (°C)**	**Note**
2,5-DIMETHYL-2,5-DI-(BENZOYL-PEROXY) HEXANE	3104	≤82				≥18			
2,5-DIMETHYL-2,5-DI-(tert-BUTYL-PEROXY) HEXANE	3105	>52-100							
2,5-DIMETHYL-2,5-DI-(tert-BUTYL-PEROXY) HEXANE-3	3101	>87-100							
2,5-DIMETHYL-2,5-DI-(tert-BUTYL-PEROXY) HEXANE-3	3103	>52-86	≥14						
2,5-DIMETHYL-2,5-DI-(tert-BUTYL-PEROXY) HEXANE	3106	≤52			≥48				
2,5-DIMETHYL-2,5-DI-(tert-BUTYL-PEROXY) HEXANE	3109	≤52	≥48						
2,5-DIMETHYL-2,5-DI-(tert-BUTYL- PEROXY) HEXANE-3	3106	≤52			≥48				
2,5-DIMETHYL-2,5-DI-(tert-BUTYL-PEROXY) HEXANE	3108	≤47							
2,5-DIMETHYL-2,5-DIHYDROPEROXYHEXANE	3104	≤82				≥18			
2,5-DIMETHYL-2,5-DI-(3,5,5-TRIMETHYLHEXANOYL-PEROXY) HEXANE	3105	≤77	≥23						
1,1-DIMETHYL-3-HYDROXYBUTYLPEROXY-NEOHEPTANOATE	3117	≤52	≥48				0	10	
DIMYRISTYL PEROXYDICARBONATE	3116	≤100					20	25	
DIMYRISTYL PEROXYDICARBONATE as a stable dispersion in water	3119	≤42					20	25	

ORGANIC PEROXIDES	See A9.4. for instructions on use of this table.								
Technical Name	**UN #**	**Con-centra-tion**	**Dilu-ent-Mass % A**	**Dilu-ent-Mass % B**	**Dilu-ent-Mass % I**	**Water Mass %**	**Control Temp (°C)**	**Emergency Temp (°C)**	**Note**
DI-(2-NEODECANOYL PEROXYISO-PROPYL BENZENE	3115	≤52	≥48				-10	0	
DI-N-NONANOYL PEROXIDE	3116	≤100					0	10	
DI-N-OCTANOYL PEROXIDE	3114	≤100					10	15	
DIPEROXY AZELAIC ACID	3116	≤27			≥73		35	40	
DIPEROXY DODECANE DIACID	3116	>13-42			≥58		40	45	
DIPEROXY DODECANE DIACID	EXEMPT	≤13							
DI-(2-PHENOXYETHYL) PEROXYDICARBONATE	3102	>85-100							
DI-(2-PHENOXYETHYL) PEROXYDICARBONATE	3106	≤85				≥15			
DIPROPIONYL PEROXIDE	3117	≤27		≥73			15	20	
DIISOPROPYL PEROXYDICARBONATE	3115	≤52		≥48			-20	-10	
DI-(3-METHOXYBUTYL) PEROXYDICARBONATE	3115	≤52		≥48			-5	5	
DI-(3-METHYLBENZOYL) PEROXIDE + BENZOYL (3-METHYLBENZOYL) PEROXIDE+DIBENZOYL PEROXIDE	3115	≤20+≤18+≤4		≥58			35	40	
2,5 DIMETHYL 2,5 DI-2-ETHYLHEXANOYL PEROXY HEXANE	3113	≤100					20	25	
2,5-DIMETHYL-2,5-DI-(TERT-BUTYLPEROXY) HEXANE	3108	≤77			≥23				
2,5-DIMETHYL-2,5-DI-(TERT-BUTYLPEROXY) HEXYNE-3	3101	>86-100							

ORGANIC PEROXIDES	See A9.4. for instructions on use of this table.								
Technical Name	**UN #**	**Con-centra-tion**	**Dilu-ent-Mass % A**	**Dilu-ent-Mass % B**	**Dilu-ent-Mass % I**	**Water Mass %**	**Control Temp (°C)**	**Emergency Temp (°C)**	**Note**
DIMYRISTYL PEROXYDICARBONATE [as a stable dispersion in water]	3119	≤42					15	20	
DI-N-PROPYL PEROXYDICARBONATE	3113	≤100					-25	-15	
DI-N-PROPYL PEROXYDICARBONATE	3113	≤77		≥23			-20	-10	
DISTEARYL PEROXYDICARBONATE	3106	≤87			≥13				
DISUCCINIC ACID PEROXIDE	3102	>72-100							7
DISUCCINIC ACID PEROXIDE	3116	≤72				≥28	10	15	
DI-(3,5,5-TRIMETHYL-1,2-DIOXOLANYL-3) PEROXIDE as a paste	3116	≤52					30	35	9
DI-(3,5,5-TRIMETHYL-HEXANOYL) PEROXIDE	3115	>38-82	≥18				0	10	
DI-(3,5,5-TRIMETHYL-HEXANOYL) PEROXIDE	3119	≤38	≥62				20	25	
DI-(3,5,5-TRIMETHYL-HEXANOYL) PEROXIDE	3119	≤38	≥62				10	15	
DI-(3,5,5-TRIMETHYL-HEXANOYL) PEROXIDE as a stable dispersion in water	3117	≤52							
ETHYL-3,3-DI-(tert-BUTYLPEROXY) BUTRYRATE	3106	≤52			≥48				
ETHYL-3,3-DI-(tert-BUTYLPEROXY) BUTYRATE	3103	>77-100							
ETHYL-3,3-DI-(tert-BUTYLPEROXY) BUTYRATE	3105	≤77	≥23						
ETHYL-3,3-DI-(tert-AMYLPEROXY) BUTYRATE	3105	≤67	≥33						

ORGANIC PEROXIDES	See A9.4. for instructions on use of this table.								
Technical Name	**UN #**	**Con-centra-tion**	**Dilu-ent-Mass % A**	**Dilu-ent-Mass % B**	**Dilu-ent-Mass % I**	**Water Mass %**	**Control Temp (°C)**	**Emergency Temp (°C)**	**Note**
3,3,6,6,9,9-HEXAMETHYL-1, 2,4,5-TETRAOXA-CYCLONONANE	3102	>52-100							
3,3,6,6,9,9-HEXAMETHYL-1, 2,4,5-TETRAOXA-CYCLONONANE	3105	≤52	≥48						
3,3,6,6,9,9-HEXAMETHYL-1, 2,4,5- TETRAOXA-CYCLONONANE	3106	≤52			≥48				
tert-HEXYL PEROXYNEODECANOATE	3115	≤71					0	10	
tert-HEXYL PEROXYPIVALATE	3115	≤72		≥28			10	15	
ISOPROPYL SEC-BUTYL PEROXYDICARBONATE+ DISEC-BUTYL PEROXYDICARBONATE+ DI-ISOPROPYL PEROXYDICARBONATE	3111	≤52 + ≤28+≤ 22					-20	-10	
ISOPROPYLCUMYL HYDROPEROXIDE	3109	≤72	≥28						
p-METHYL HYDROPEROXIDE	3105	>572-100							
p-METHYL HYDROPEROXIDE	3109	≤72	>28						
METHYLCYCLOHEXANONE PEROXIDE(S)	3115	≤67		≥33			35	40	
METHYL ETHYL KETONE PEROXIDE(S)	3101	≤52	≥48		-				4
METHYL ETHYL KETONE PEROXIDE(S)	3105	≤45	≥55						4
METHYL ETHYL KETONE PEROXIDE(S)	3105	≤37	≥55			≥8			4
METHYL ETHYL KETONE PEROXIDE(S)	3107	≤40	≥60						4, 11

ORGANIC PEROXIDES	See A9.4. for instructions on use of this table.								
Technical Name	**UN #**	**Con-centra-tion**	**Dilu-ent-Mass % A**	**Dilu-ent-Mass % B**	**Dilu-ent-Mass % I**	**Water Mass %**	**Control Temp (°C)**	**Emerge ncy Temp (°C)**	**Note**
METHYL ISOBUTYL KETONE PEROXIDE(S)	3105	≤62	≥19						4
ORGANIC PEROXIDE, SOLID, SAMPLE, TEMPERATURE CONTROLLED	3114								6
ORGANIC PEROXIDE, LIQUID, SAMPLE	3103								6
ORGANIC PEROXIDE, LIQUID,SAMPLE, TEMPERATURE CONTROLLED	3113								6
ORGANIC PEROXIDE, SOLID, SAMPLE	3104								6
PEROXYACETIC ACID with not more than 20% hydrogen peroxide	EXE MPT	≤6				≥60			
PEROXYACETIC ACID with not more than 26% hydrogen peroxide	3109	≤17				≥27			
PEROXYACETIC ACID with 7% hydrogen peroxide	3107	≤36				≥15			
PEROXYACETIC ACID, TYPE D, STABILIZED	3105	≤43							8
PEROXYACETIC ACID, TYPE E, STABILIZED	3107	≤43							8
PEROXYACETIC ACID, TYPE F, STABILIZED	3109	≤43							8
PINANYL HYDROPEROXIDE	3105	56 - 100							
PINANYL HYDROPEROXIDE	3109	<56	>44						
TETRAHYDRONAPHTHYL HYDROPEROXIDE	3106	≤100							

ORGANIC PEROXIDES	See A9.4. for instructions on use of this table.								
Technical Name	**UN #**	**Con-centra-tion**	**Dilu-ent-Mass % A**	**Dilu-ent-Mass % B**	**Dilu-ent-Mass % I**	**Water Mass %**	**Control Temp (°C)**	**Emerge ncy Temp (°C)**	**Note**
1,1,3,3-TETRAMETHYLBUTYL HYDROPEROXIDE	3105	≤100							
1,1,3,3-TETRAMETHYLBUTYL PEROXY-2-ETHYLHEXANOATE	3115	≤100					20	25	
1,1,3,3-TETRAMETHYLBUTYL PEROXYNEODECANOATE	3115	≤72		≥28			-5	5	
1,1,3,3-TETRAMETHYLBUTYL PEROXYNEODECANOATE [as a stable dispersion in water]	3119	≤52					-5	5	
1,1,3,3-TETRAMETHYLBUTYL PEROXY PHENOXYACETATE	3115	≤37		≥63			-10	0	
3,6,9-TRIETHYL-3,6,9-TRIMETHYL-1,4,7-TRIPEROXANANE	3105	≤42	≥58						

NOTES:

1. Available oxygen must be less than 4.7 percent.
2. For concentration of less than 80 percent, Item 5 is authorized. For concentration of greater than 80 percent but less than 85 percent, Item 4 is authorized. For concentration of greater than 85 percent, maximum package quantity is Item 2.
3. The diluent may be replaced by ditert-butyl peroxide.
4. Available oxygen must be less than or equal to 9 percent.
5. Only non-metallic packagings are authorized.
6. Samples may only be offered for transportation when all available data indicates that the sample is no more dangerous than an Organic Peroxide type C, and the sample is packaged in according with **Table A9.2.** or **A9.3.**, Item 2, in quantities less than (10 kg) 22 pounds per shipment, employing all required temperature controls.
7. Addition of water to this organic peroxide will decrease its thermal stability.

8. Mixtures with hydrogen peroxide, water and acid.
9. With Diluent type A, with or without water.
10. With greater than 36 percent (by mass) ethylbenzene.
11. With greater than 19 percent (by mass) methyl isobutyl ketone.

A9.5. Packaging Requirements for Class 5.2 Organic Peroxides. With the exception of organic peroxide samples, packaging requirements for packaging paragraphs does not specify Class 5.2 organic peroxides. Determine appropriate containers by using **Table A4.1.** generic proper shipping names in conjunction with **Table A9.2.** or **Table A9.3.** Containers selected from **Table A9.2.** or **Table A9.3.** must pass PG II performance tests and must be UN marked. **Table A9.2.** applies to liquid organic peroxides. **Table A9.3.** applies to solid organic peroxides. Use paragraphs **A9.5.1.** through **A9.5.6.** to determine the packaging requirements for organic peroxides.

A9.5.1. Determine the applicable generic PSN.

A9.5.2. Locate the packaging reference (table and item number) for the generic PSN in column 8 of **Table A4.1.** The technical name and associated table or item reference will be listed in lower case letters beneath the generic PSN entry. Select the table or item reference pertaining to the technical name, but use the generic PSN (with technical name in parenthesis) to certify the shipment. The item number is the last number in the packaging reference (i.e., Table A9.2.1 is Table A9.2, Item 1). Labels, special provisions, etc., specified for the generic PSN also apply to the technical names listed beneath it.

A9.5.3. Turn to **Table A9.2.** or **Table A9.3.** as specified by column 8 of **Table A4.1.**

A9.5.4. Locate the quantity nearest to the quantity to be shipped. This number represents the maximum net quantity per package authorized. Lesser item numbers (quantities) may be used instead of the item number specified for the material. Quantities specified for greater item numbers will not be used. For example, if the packaging reference is **Table A9.3.**4, item number 4 of **Table A9.3.** represents the maximum net quantity of the material that can be shipped in one package. However, the lesser quantities listed for item numbers 1-3 could also be used; quantities listed for item numbers 5-8 could not be used for the material because the quantities exceed the maximum net quantity per package permitted for the material.

A9.5.5. Go across the row that contains the quantity to be shipped to identify the appropriate container (including applicable notes). Any container fitting the general container description in the table may be used if it has been tested to a PG II (or PG I) performance level.

A9.5.6. Column 8 of **Table A4.1.** specifies the packaging requirements (table and item number) for organic peroxides. **Table A9.2.** specifies the type of packagings and the maximum net quantity per package authorized for liquid organic peroxides. **Table A9.3.** specifies the type of packaging and the maximum net quantity per package authorized for solid organic peroxides.

Table A9.2. Packaging For Liquid Organic Peroxides.

PACKAGING FOR LIQUID ORGANIC PEROXIDES (See **A9.5.** for instructions on use of this table.)									
Maximum Quantity or Net Mass Permitted per Container									
TYPE CONTAINERS AND MATERIALS	PKG CODE	A9.2.1	A9.2.2	A9.2.3	A9.2.4	A9.2.5	A9.2.6	A9.2.7	A9.2.8
STEEL DRUM	1A1							60L	225L
STEEL DRUM (1)	1A2							50Kg	200Kg
ALUMINUM DRUM	1B1							60L	225L
FIBER DRUM	1G	0.5Kg	0.5/ 10Kg	5Kg	5/ 25Kg	25Kg	50Kg	50Kg	200Kg
PLASTIC DRUM	1H1	0.5L	0.5L	5L	5L	30L	60L	60L	255L
PLASTIC JERRICAN	3H1	0.5L	0.5L	5L	5L	30L	60L	60L	60L
WOOD BOX (1)	4C1	0.5Kg	0.5/ 10Kg	5Kg	5/ 25Kg	25Kg	50Kg	50Kg	100Kg
PLYWOOD BOX (1)	4D	0.5Kg	0.5/ 10Kg	5Kg	5/ 25Kg	25Kg	50Kg	50Kg	100Kg
FIBERBOARD BOX (1)	4G	0.5Kg	0.5/ 10Kg	5Kg	5/ 25Kg	25Kg	50Kg	50Kg	100Kg
PLASTIC RECEPTACLE WITH OUTER STEEL DRUM	6HA1							60L	225L
PLASTIC RECEPTACLE WITH OUTER ALUMINUM DRUM	6HB1							60L	225L
PLASTIC RECEPTACLE WITH OUTER FIBER DRUM	6HG1	0.5L	0.5L	5L	5L	30L	60L	60L	225L
PLASTIC RECEPTACLE WITH OUTER FIBERBOARD BOX	6HG2	0.5L	0.5L	5L	5L	30L	60L	60L	60L
PLASTIC RECEPTACLE WITH OUTER PLASTIC DRUM	6HH1	0.5L	0.5L	5L	5L	30L	60L	60L	225L
PLASTIC RECEPTACLE WITH OUTER SOLID PLASTIC BOX	6HH2	0.5L	0.5L	5L	5L	30L	60L	60L	60L

Notes applicable to Table A9.2

NOTES:

1. Packaging only authorized as part of a combination packaging. Inner receptacles must be suitable for liquids.
2. For Items 1 through 6, combination packagings containing organic peroxide type B or C, only plastic bottles, plastic jars, glass bottles, or glass ampules may be used as inner packagings. However, glass may only be used for inner receptacles for Items 1 and 2.
3. Where two values are given (i.e. .5/10 kg), the first applies to the maximum net quantity per inner receptacle and the second applies to the maximum net quantity of the complete package.
4. If no entry for an item number appears in a specific row, then the type of packaging specified for the row is not authorized for the item number.

Table A9.3. Packaging For Solid Organic Peroxides.

PACKAGING FOR SOLID ORGANIC PEROXIDES (See **A9.5.** for instructions on use of this table.)									
Maximum Quantity or Net Mass Permitted per Container									
TYPE CONTAINERS AND MATERIALS	PKG CODE	A.9.3.1	A.9.3.2	A9.3.3	A.9.3.4	A9.3.5	A9.3.6	A9.3.7	A9.3.8
STEEL DRUM	1A2							50Kg	200Kg
ALUMINUM DRUM	1B2							50Kg	200Kg
FIBER DRUM	1G	0.5Kg	0.5/ 10Kg	5Kg	5/25Kg	25Kg	50Kg	50Kg	200Kg
PLASTIC DRUM	1H2	0.5Kg	0.5/ 10Kg	5Kg	5/25Kg	25Kg	50Kg	50Kg	200Kg
WOOD BOX	4C1	0.5Kg	0.5/ 10Kg	5Kg	5/25Kg	25Kg	50Kg	50Kg	100Kg
PLYWOOD BOX	4D	0.5Kg	0.5/ 10Kg	5Kg	5/25Kg	25Kg	50Kg	50Kg	100Kg
FIBERBOARD BOX	4G	0.5Kg	0.5/ 10Kg	5Kg	5/25Kg	25Kg	50Kg	50Kg	100Kg
PLASTIC RECEPTACLE WITH OUTER STEEL DRUM	6HA1							50Kg	200Kg
PLASTIC RECEPTACLE WITH OUTER ALUMINUM DRUM	6HB1							50Kg	200Kg
PLASTIC RECEPTACLE WITH OUTER FIBER DRUM	6HG1	0.5Kg	0.5Kg	5Kg	5Kg	25Kg	50Kg	50Kg	200Kg
PLASTIC RECEPTACLE WITH OUTER FIBERBOARD BOX	6HG2	0.5Kg	0.5Kg	5Kg	5Kg	25Kg	50Kg	50Kg	75Kg
PLASTIC RECEPTACLE WITH OUTER PLASTIC DRUM	6HH1	0.5Kg	0.5Kg	5Kg	5Kg	25Kg	50Kg	50Kg	200Kg

PACKAGING FOR SOLID ORGANIC PEROXIDES (See **A9.5.** for instructions on use of this table.)									
Maximum Quantity or Net Mass Permitted per Container									
TYPE CONTAINERS AND MATERIALS	PKG CODE	A.9.3.1	A.9.3.2	A9.3.3	A.9.3.4	A9.3.5	A9.3.6	A9.3.7	A9.3.8
PLASTIC RECEPTACLE WITH OUTER SOLID PLASTIC BOX	6HH2	0.5Kg	0.5Kg	5Kg	5Kg	25Kg	50Kg	50Kg	75Kg

Notes applicable to **Table A9.3.**

NOTES:

1. For Items 1 through 6, combination packagings containing organic peroxide type B or C, only nonmetallic packagings are authorized. However, glass may only be used for inner receptacles for Items 1 and 2.
2. Where two values are given (i.e. .5/10 kg) the first applies to the maximum net quantity per inner receptacle and the second applies to the maximum net quantity of the complete package.
3. If no entry for an item number appears in a specific row, then the type of packaging in that row is not authorized for that item number.
4. If fire retardant partitions are used, the maximum net weight of the complete package for Item 2 may be 25 kg.

A9.6. Samples of Organic Peroxides. Samples of new organic peroxides or new formulations of identified organic peroxides for which complete test data is not available, and which are being transported for testing and evaluation, may be transported and assigned a PSN for organic peroxide, type C. Data available to the person offering the material for transportation must indicate that the sample would pose a threat no greater than that of an organic peroxide, type B, and that the control temperature, if any, is sufficiently low to prevent any dangerous decomposition and sufficiently high to prevent any dangerous phase separation. Packaging requirements are as follows:

A9.6.1. The sample must be packaged according to **Table A9.2.** or **Table A9.3.**

A9.6.2. The maximum quantity must not exceed 10 kg (22 pounds) per shipment.

A9.6.3. The PSN must be organic peroxide type C, liquid; organic peroxide type C, solid; organic peroxide type C, liquid, temperature controlled; or organic peroxide type C, solid, temperature controlled, as applicable.

A9.7. Packaging for Class 5.1 Liquids. See **A3.3.5.** for additional packaging requirements.

A9.7.1. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass or earthenware, plastic or metal	**Drums:** steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal drum other than steel or aluminum (1N1 or 1N2), plywood (1D), fiber (1G) or plastic drum (1H1 or 1H2)

A9.7.2. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass or earthenware, plastic or metal	**Barrel:** wood (2C2) ***NOTE:*** Not authorized for PG I material.

A9.7.3. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass or earthenware, plastic or metal	**Jerricans:** steel (3A1 or 3A2) or plastic (3H1 or 3H2

A9.7.4. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass or earthenware, plastic or metal	**Boxes:** steel (4A), aluminum (4B), natural (4C1 or 4C2), plywood (4D), or reconstituted (4F), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2)

A9.7.5. Package as follows:

Inner packaging	Outer packaging
Not required	**Drums:** steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), or plastic drum (1H1 or 1H2)

A9.7.6. Package as follows:

Inner packaging	Outer packaging
Not required	**Barrel:** wood (2C1) ***NOTE:*** Not authorized for PG I material.

A9.7.7. Package as follows:

Inner packaging	Outer packaging
Not required	**Jerricans:** steel (3A1 or 3A2) or plastic (3H1 or 3H2

A9.7.8. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Plastic	**Drums:** steel, aluminum, fiber, plastic, or plywood (6HA1, 6HB1, 6HG1, 6HH, or 6HD1) ***NOTE:*** Plywood drum not authorized for PG I material.

A9.7.9. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Plastic	**Box:** steel, aluminum, wooden, plywood, or fiberboard box (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A9.7.10. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	**Drums:** steel, aluminum, or fiber (6PA1, 6PB1, or 6PG1)

A9.7.11. Package the following single, composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	**Boxes:** steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, or 6PG2)

A9.7.12. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	solid or expanded plastic packaging (6PH1 or 6PH2)

A9.7.13. **DOT Cylinders.** DOT specification cylinders as prescribed for any compressed gas, except DOT 8 (acetylene) and DOT 3HT.

A9.8. Packaging for Class 5.1 Solids. See **A3.3.5.** for additional packaging information.

A9.8.1. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass or earthenware, plastic or metal	**Drums:** steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plywood (1D), fiber (1G) or plastic (1H1 or 1H2)

A9.8.2. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass or earthenware, plastic or metal	**Barrel:** wood (2C2)

A9.8.3. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass or earthenware, plastic or metal	**Jerricans:** steel (3A1 or 3A2) or plastic (3H1 or 3H2

A9.8.4. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass or earthenware, plastic or metal	**Boxes:** steel (4A), aluminum (4B), natural (4C1 or 4C2), plywood (4D), or reconstituted (4F), fiberboard (4G), or solid plastic (4H2)

A9.8.5. Package as follows:

Inner packaging	Outer packaging
Not required	**Drums:** steel (1A1 or 1A2), aluminum (1B1 or 1B2), plywood (1D), metal other than steel or aluminum (1N1 or 1N2), plastic (1H1 or 1H2) or fiber (1G) ***NOTE:*** Plywood drum not authorized for PG I material.

A9.8.6. Package as follows:

Inner packaging	Outer packaging
Not required	**Barrel:** wood (2C1 or 2C2). ***NOTE:*** Not authorized for PG I material.

A9.8.7. Package as follows:

Inner packaging	Outer packaging
Not required	**Jerrican:** steel (3A1 or 3A2) or plastic (3H1 or 3H2)

A9.8.8. Package as follows:

Inner packaging	Outer packaging
Not required	**Boxes:** steel (4A), steel with liner (4A), aluminum (4B), aluminum with liner (4B), natural wood (4C1), natural wood, siftproof (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2) ***NOTE:*** Steel (4A), aluminum (4B), plywood (4D), reconstituted wood (4F), natural wood (4C1) or fiberboard (4G) not authorized for PG I material.

A9.8.9. Package as follows:

Inner packaging	Outer packaging
Not required	**Bags:** woven plastic (5H1, 5H2, or 5H3)**;** plastic film (5H4); textile (5L1, 5L2, or 5L3); paper, multiwall, water-resistant (5M2) ***NOTE:*** Not authorized for PG I material.

A9.8.10. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Plastic	**Drums:** steel, aluminum, plywood, fiber, or plastic (6HA1, 6HB1, 6HD1, 6HG1, or 6HH)

A9.8.11. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Plastic	**Boxes:** steel, aluminum, wood, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A9.8.12. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	**Drums:** steel, aluminum, plywood, or fiber (6PA1, 6PB1, 6PD1, or 6PG1)

A9.8.13. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	**Boxes:** steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, or 6PG2)

A9.8.14. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	expanded or solid plastic (6PH1 or 6PH2)

A9.9. Iodine Pentafluoride. Package in any DOT specification cylinder, except those specified for acetylene.

A9.10. Oxidizing Substances, Solid, Self-Heating, NOS; Oxidizing Substances, Solid, Flammable, NOS; Oxidizing Substances, Solid, Water Reactive, NOS. Ship according to a competent authority approval (CAA). See **2.5.** for more information on CAAs.

A9.11. Bromine Pentafluoride or Bromine Trifluoride.

A9.11.1. **Handling Instructions.** These items are extremely dangerous. Wear approved chemical safety mask and clothing when handling this material.

A9.11.2. **Packaging Requirements.** Package bromine pentafluoride or bromine trifluoride in specification cylinders, 3A150, 3AA150, 3B240, 3BN150, 3E1800, 4B240, 4BA240, or 4BW240. Seal each valve outlet by a threaded cap or a threaded plug. No cylinder may be equipped with any pressure relief device. Overpack specification 3E1800 cylinders in a strong wooden box.

A9.12. Oxygen Generators, Chemical. Ship according to a competent authority approval (CAA) when means of initiation is attached. See **2.5.** for more information on CAAs. Ship according to **A9.8.** when means of initiation is not attached.

Attachment 10

CLASS 6-- TOXIC (POISONOUS) MATERIALS AND INFECTIOUS SUBSTANCES

A10.1. General Requirements. This attachment contains information concerning the packaging and general handling instructions for Class 6.1 toxic material. The term "toxic" and "poisonous" are used synonymously in this manual.

A10.2. General Handling Instructions.

A10.2.1. Toxic material can react through the skin, respiratory tract, or gastrointestinal tract. In general, solid toxic material that is improperly packaged will present an ingestion hazard. Dust and mists result primarily in an inhalation hazard. Liquids may be ingested, inhaled as a vapor, or absorbed through the skin.

A10.2.2. Keep cool and away from direct rays of the sun and high temperature. Store away from sources of ignition and fire hazards. Avoid direct contact with the material. Storage areas must be plainly marked with the appropriate placards.

A10.2.3. Keep away from oxidizing materials.

A10.2.4. Make sure personnel exposed to leaking materials wear a protective mask or self-contained breathing apparatus (specific recommendations can be obtained from the medical services.)

A10.2.5. Store away from acids or acid fumes.

A10.3. Packaging for Certain Packing Group I Class 6.1 Toxic Materials.

A10.3.1. **Handling Instructions.** These items are extremely dangerous. Wear approved chemical safety mask and clothing when handling this material. See **2.9.** for additional information.

A10.3.2. **Packaging Requirements.** Package in DOT specification 3A1800, 3AA1800, 3AL1800, 3D, 3E1800, and 33 cylinders meeting the requirements of **A3.3.2.** Specification 3A, 3AA, and 3AL cylinders may not exceed 57 kg (125 pounds) water capacity (nominal). Specification 3D and 33 cylinders may not exceed 127 kg (280 pounds) water capacity (nominal). Shipments of arsine or phosphine will not be accepted for transportation if packaged in a specification 3AL cylinder. Cylinders containing phosgene may not exceed a filling density of 125 percent (see **A3.3.2.5.**). The cylinder may not contain more than 68 kg (150 pounds) of phosgene. Also, each filled cylinder must be tested for leakage before it is offered for transportation and must show absolutely no leakage. This test must consist of immersing the cylinder and valve, without the protection cap attached, in a bath of water at a temperature of approximately 66 degrees C (150 degrees F) for at least 30 minutes. During which time, frequent examinations must be made to identify any escape of gas. After the test has been accomplished the valve of the cylinder must not be loosened before the cylinder is offered for transportation, and must not be loosened during transportation.

A10.4. Bromoacetone, Methyl Bromide, Chloropicrin, and Methyl Bromide or **Methyl Chloride Mixtures.**

A10.4.1. **Handling Instructions.** These materials and mixtures are extremely dangerous poisons. Wear approved chemical safety mask and clothing when handling this material. See **2.9.** for additional requirements.

A10.4.2. **Packaging Requirements.**

A10.4.2.1. Package bromoacetone in a wooden box (4C1, 4C2, 4D, or 4F) with an inner glass receptacle or tube in an hermetically-sealed metal receptacle in a corrugated fiberboard carton. A bottle may not contain over 500 g (17.6 ounces) of liquid and must be cushioned inside the can with at least 12.7 mm (0.5 inch) of absorbent material. The total amount of liquid in the outer box must not exceed 11 kg (24 pounds). The package must be tested to the PG I performance level.

A10.4.2.2. Package bromoacetone in DOT specification 3A, 3AA, 3B, 3C, 3E, 4A, 4B, 4BA, 4BW, or 4C cylinder with a water capacity (nominal) not exceeding 113 kg (250 pounds). All cylinders must meet the requirements of **A3.3.2.**

A10.4.2.3. Package methyl bromide, chloropicrin and methyl bromide mixtures, chloropicrin and methyl chloride mixtures, and chloropicrin mixtures charged with nonflammable, nonliquefied compressed gas in DOT specification 3A, 3AA, 3B, 3C, 3E, 4A, 4B, 4BA, 4BW, or 4C cylinder with a water capacity (nominal) not exceeding 113 kg (250 pounds). All cylinders must meet the requirements of **A3.3.2.**

A10.5. Packaging for Liquid Class 6.1 Materials. See also **Attachment 3**.

A10.5.1. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, metal, or glass ampoules	**Drums:** steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plywood (1D), fiber (1G), or plastic (1H1 or 1H2)

A10.5.2. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, metal, or glass ampoules	**Barrel:** wood (2C2) ***NOTE:*** Not authorized for PG I material.

A10.5.3. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, metal, or glass ampoules	**Jerricans:** steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2)

A10.5.4. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, metal, or glass ampoules	**Boxes:** steel (4A), aluminum (4B), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2)

A10.5.5. Package as follows:

Inner packaging	Outer packaging
Not required	**Drums:** steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plastic (1H1 or 1H2), or fiber (1G) with liner ***NOTE:*** Fiber drum with liner only authorized for PG III material.

A10.5.6. Package as follows:

Inner packaging	Outer packaging
Not required	Barrel: wood (2C1). ***NOTE:*** Not authorized for PG I material.

A10.5.7. Package as follows:

Inner packaging	Outer packaging
Not required	**Jerricans:** steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2).

A10.5.8. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Plastic	**Drums:** steel, aluminum, fiber, or plastic (6HA1, 6HB1, 6HG1, or 6HH1)

A10.5.9. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Plastic	**Boxes:** steel, aluminum, wooden, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A10.5.10. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	**Drums:** steel, aluminum, or fiber (6PA1, 6PB1, or 6PG1)

A10.5.11. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	**Boxes:** steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, or 6PG2)

A10.5.12. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	solid or expanded plastic packaging (6PH1 or 6PH2)

A10.5.13. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	plywood drum or wickerwork hamper (6PD1 or 6PD2)

A10.5.14. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Plastic	**Drum:** plywood (6HD1). ***NOTE:*** Not authorized for PG I material.

A10.5.15. **DOT Cylinders.** DOT specification cylinders as prescribed for any compressed gas, except DOT 8 (acetylene) and DOT 3HT.

A10.6. Packaging for Solid Class 6.1 Materials.

A10.6.1. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic or metal	**Drums:** steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plywood drum (1D), fiber (1G), or plastic (1H1 or 1H2)

A10.6.2. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic or metal	**Barrel:** wood (2C2)

A10.6.3. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic or metal	**Jerricans:** steel (3A1 or 3A2) or plastic (3H1 or 3H2)

A10.6.4. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic or metal	**Boxes:** steel (4A), aluminum (4B), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G) or solid plastic (4H2)

A10.6.5. Package as follows:

Inner packaging	Outer packaging
Not required	**Drums:** steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plywood (1D), plastic (1H1 or 1H2), or fiber drum (1G) ***NOTE:*** Plywood (1D) not authorized for PG I material.

A10.6.6. Package as follows:

Inner packaging	Outer packaging
Not required	**Barrel:** wood (2C1 or 2C2). ***NOTE:*** Not authorized for PG I material.

A10.6.7. Package as follows:

Inner packaging	Outer packaging
Not required	**Jerricans:** steel (3A1 or 3A2) or plastic (3H1 or 3H2)

A10.6.8. Package as follows:

Inner packaging	Outer packaging
Not required	**Boxes:** steel with liner (4A), aluminum with liner (4B), natural wood sift-proof (4C2) **Boxes (not authorized for PG I material):** steel (4A), aluminum (4B), plywood (4D), reconstituted wood (4F), natural wood (4C1), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2)

A10.6.9. Package as follows:

Inner packaging	Outer packaging
Not required	**Bags:** woven plastic (5H1, 5H2, or 5H3), plastic film (5H4), textile (5L1, 5L2, or 5L3), or paper, multiwall, water-resistant (5M2) ***NOTE:*** Not authorized for PG I material.

A10.6.10. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Plastic	**Drums:** steel, aluminum, plywood, fiber, or plastic (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1)

A10.6.11. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Plastic	**Boxes:** steel, aluminum, wood, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A10.6.12. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	**Drums:** steel, aluminum, plywood, or fiber drum (6PA1, 6PB1, 6PD1, or 6PG1).

A10.6.13. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	**Boxes:** steel, aluminum, wooden, or fiberboard box (6PA2, 6PB2, 6PC, or 6PG2)

A10.6.14. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	expanded or solid plastic packaging (6PH1 or 6PH2)

A10.7. Class 6.1, PG I, Hazard Zone A and B (Poisonous by Inhalation).

A10.7.1. **Handling Instructions.** These items are extremely dangerous. Wear approved chemical safety mask and clothing when handling this material.

A10.7.2. **Packaging Requirements.** Package Class 6.1, PG I materials with an Inhalation Hazard (Hazard Zone A and B) as follows:

A10.7.2.1. In DOT specification cylinders that conform to one of the specifications for cylinders in 49 CFR, part 178, subpart C, except that specification 8, 8AL, and 39 cylinders are not authorized. Cylinders must also meet the requirements of **A3.3.2.**

A10.7.2.2. In an inner drum (1A1, 1B1, 1N1, 1H1, or 6HA1), then place in an outer drum (1A2 or 1H2). Both the inner and outer drum must be tested to the PG I performance level. The outer 1A2 drum must have a minimum thickness of 1.35 mm (0.053 inches). The outer 1H2 drum must have a minimum thickness of 6.30 mm (0.248 inches). The capacity of the inner drum must not exceed 220 L (58 gallons). The outer drum (1A2 or 1H2) must withstand a hydrostatic test pressure of 100kPa (15 psi). Cushion the inner drum within the outer drum with a shock-mitigating, nonreactive material. There must be a minimum of 5.0 cm (2 inches) of cushioning material between the outer surface (side) of the inner drum and the inner surface (side) of the outer drum, and at least

7.6 cm (3 inches) of cushioning material between the outer surface (top and bottom) of the inner drum and the inner surface (top and bottom) of the outer drum. The inner drum must also meet the following requirements:

A10.7.2.2.1. Satisfactorily withstand a hydrostatic pressure test (as outlined in 49 CFR, paragraph 178.605) of 550 kPa (80 psig).

A10.7.2.2.2. Satisfactorily withstand a leakproofness test (as outlined in 49 CFR, paragraph 178.604) using an internal air pressure at 55 degrees C (131 degrees F) of at least twice the vapor pressure of the material to be packaged.

A10.7.2.2.3. Have screw-type closures that meet all the following requirements:

A10.7.2.2.3.1. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A10.7.2.2.3.2. Physically held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation.

A10.7.2.2.3.3. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psi).

A10.7.2.2.4. Meet the following minimum thickness requirements:

A10.7.2.2.4.1. 1A1 and 1N1 drums with a capacity of less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.3 mm (0.051 inches). 1B1 drums with a capacity of less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.9 mm (0.154 inches).

A10.7.2.2.4.2. 1A1 and 1N1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.7 mm (0.067 inches). 1B1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 4.7 mm (0.185 inches).

A10.7.2.3. Pack in an inner packaging system that consists of an impact-resistant receptacle of glass, earthenware, plastic, or metal, securely cushioned with a nonreactive absorbent material. The package must be packed within a leak-tight packaging of metal or plastic, then packed in a steel drum (1A2), aluminum drum (1B2), metal drum (other than steel or aluminum (1N2)), plywood drum (1D), fiber drum (1G), plastic drum (1H2), wooden barrel (2C2), steel jerrican (3A2), plastic jerrican (3H2), steel box (4A), aluminum box (4B), natural wood box (4C1 or 4C2), plywood box (4D), reconstituted wood box (4F), fiberboard box (4G), expanded plastic box (4H1), or solid plastic box (4H2). The capacity of the inner receptacle must not exceed 4 L (1 gallon). An inner receptacle that has a closure must have a closure that is held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation. Both the inner packaging system and the outer container must each meet the test requirements of the PG I performance level independently. The total amount of liquid that can be packed in the outer container must not exceed 16 L (4 gallons).

A10.7.2.4. Pack in a metal drum (1A1, 1B1, or 1N1), or plastic drum (1H1), then placed in a metal drum (1A2 or 1H2), or a plastic receptacle with outer steel drum (6HA1). Both the inner and outer drum must be tested to the PG I performance level. The outer 1A2 drum must have a minimum thickness of 1.35 mm (0.053 inches). The outer 1H2 drum must have a minimum thickness

of 6.30 mm (0.248 inches). The capacity of the inner drum (1A1, 1B1, 1N1, or 1H1) must not exceed 220 L (58 gallons). The outer drum (1A2 or 1H2) must withstand a hydrostatic test pressure of 100kPa (15 psi). This package is only authorized for Class 6.1, PG I, Hazard Zone B material. Cushion the inner drum within the outer drum with a shock-mitigating, nonreactive material. There must be a minimum of 5.0 cm (2 inches) of cushioning material between the outer surface (side) of the inner drum and the inner surface (side) of the outer drum, and at least 7.6 cm (3 inches) of cushioning material between the outer surface (top and bottom) of the inner drum and the inner surface (top and bottom) of the outer drum. The inner drum must also meet the following requirements:

A10.7.2.4.1. Satisfactorily withstand a leakproofness test (as outlined in 49 CFR, paragraph 178.604) using an internal air pressure at 55 degrees C (131 degrees F) of at least twice the vapor pressure of the material to be packaged.

A10.7.2.4.2. Have screw-type closures that are:

A10.7.2.4.2.1. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A10.7.2.4.2.2. Physically held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation.

A10.7.2.4.2.3. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psi).

A10.7.2.4.3. Meet the following minimum thickness requirements:

A10.7.2.4.3.1. 1A1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 0.69 mm (0.027 inches). 1B1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 2.79 mm (0.110 inches). 1H1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 1.14 mm (0.045 inches). 6HA1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 0.70 mm (0.027 inches) for the outer steel drum.

A10.7.2.4.3.2. 1A1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.08 mm (0.043 inches). 1B1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.9 mm (0.154 inches). 1H1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.16 mm (0.125 inches). 6HA1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 0.96 mm (0.038 inches) for the outer steel drum.

A10.7.2.4.3.3. 1A1 or 1N1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.35 mm (0.053 inches). 1B1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 4.7 mm (0.185 inches). 1H1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of

3.16 mm (0.124 inches). 6HA1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 1.08 mm (0.43 inches) for the outer steel drum.

A10.8. Tear Gas Candles. Any newly developed packaging must be approved by the DOT before initial transportation from the manufacturer. Package tear gas candles, tear gas grenades, and similar devices (with more than 2 percent tear gas substance by mass).

A10.8.1. Pack in a metal-strapped natural wood box (4C1 or 4C2), metal-strapped plywood box (4D), or metal-strapped reconstituted wood box (4F). Functioning elements not assembled in grenades or devices must be packed in a separate compartment within the box, packed in inner boxes, then placed inside the outer box, or packed in a separate outside wooden (4C1, 4C2, 4D, or 4F) box. Pack and cushion the elements so they cannot come into contact with each other or in contact with the walls of the box during transportation. No more than 50 items and 50 functioning elements can be packed in one outer container. The gross weight of the outer container must not exceed 35 kg (77 pounds). Tear gas devices can be shipped completely assembled provided the functioning elements are packed so that they cannot accidentally function. Package items completely assembled as specified in this paragraph.

A10.8.2. Pack in steel drum (1A2.) Pack functioning elements in a separate inner packaging or separate compartment. Pack no more than 24 items and 24 functioning elements in one outer drum. The gross weight of the outer container must not exceed 35 kg (77 pounds).

A10.8.3. **DOT 2P and 2Q.** Pack in inner containers meeting the DOT 2P or 2Q specification (inside nonrefillable metal containers), then packaged in a fiberboard box (4G). Place each inside container into fiberboard tubes with metal ends or a fiberboard box with suitable padding. Pack no more than 30 inner packagings in one outer fiberboard box. The gross weight must not exceed 16 kg (35 pounds).

A10.9. Infectious Substances (Etiologic Agent).

A10.9.1. The following requirements apply to all shipments of infectious substances:

A10.9.1.1. Use inner packagings that consist of a watertight primary receptacle, then place in a watertight secondary packaging.

A10.9.1.2. Place absorbent material between the primary receptacle and the secondary packaging. If multiple primary receptacles are placed in a single secondary packaging they must be separated with enough absorbent material to make sure there is no contact between the primary receptacles. There must be sufficient absorbent material to absorb the entire contents of all primary receptacles.

A10.9.1.3. This inner packaging must then be placed in an outer packaging of adequate strength for its capacity, mass, and intended use.

A10.9.1.4. Each package for infectious substances must be capable of passing the tests specified in 49 CFR 178.609.

A10.9.1.5. Each package must be at least 100 mm (3.9 inches) in the smallest overall external dimensions.

A10.9.1.6. Each package of infectious substances must have an itemized list of the contents enclosed between the secondary packaging and the outer packaging.

A10.9.1.7. Whatever the intended temperature of shipment, the primary receptacle and the secondary packaging used for infectious substances must be capable of withstanding without leakage an internal pressure (which produces a pressure differential) of not less then 95 kPa (14 psi). Also, the primary receptacle and the secondary packaging must be capable of withstanding temperatures of -40 degrees C to +55 degrees C (-40 degrees F to +131 degrees F).

A10.9.1.8. The commander of the shipping agency can request a technical escort, security escort, military guard, other technically qualified personnel, or a knowledgeable representative of the shipper or recipient to accompany the shipment. If a knowledgeable representative of the shipper or recipient is used, they must be authorized by the Surgeon General, US Department of Health and Human Services, or the Administrator of the Agricultural Research Service, US Department of Agriculture. The commander may make this request if in their opinion inherent factors of public relations, security, economics, or expeditious handling indicates this to be in the best interest of the DoD.

A10.9.1.9. In addition to the requirements of this paragraph, the requirements of 42 CFR, Public Health, chapter 1, part 72 must be followed.

A10.9.2. In addition to the requirements identified above, package infectious substances as specified below. Exceptional cases, such as whole organs, may require special packaging. Guidance for packaging materiel that requires temperature control during shipment is contained in DLAI 4145.21/TB MED 284/NAVSUPINST 4610.31/AFJI 41-208, Preparation of Medical Materiel Requiring Freeze or Chill Environment for Shipment."

A10.9.2.1. Lyophilized substances. Primary receptacles must be flame-sealed glass ampoules or rubber stopped glass vials fitted with metal seals.

A10.9.2.2. Liquid or solid substances shipped at ambient temperatures or higher. Primary receptacles must be glass, metal, or plastic. Provide a positive means of ensuring a leak proof seal, such as a heat seal, skirted stopper, or metal crimp seal. If screw caps are used, they must be reinforced with adhesive tape.

A10.9.2.3. Liquid or solid substances shipped refrigerated or frozen (ice, prefrozen packs, or dry ice.) Place ice or dry ice outside the secondary packagings. Provide interior supports to secure the secondary packagings in their original position after the ice or dry ice has dissipated. If ice is used, the outer packaging must be leak proof. If dry ice is used, the outer packaging must permit the release of carbon dioxide gas.

A10.9.2.4. Liquid or solid substances shipped in liquid nitrogen. Primary receptacles must be plastic, capable of withstanding very low temperatures. The secondary packaging must also withstand very low temperatures and in most cases will need to be fitted over individual primary receptacles. All requirements for shipment of liquid nitrogen must also be met.

A10.9.3. **Damaged Packages.** Upon discovering damage to the package, which indicates damage to the primary container, the carrier must isolate the container and notify the Director, Center for Disease Control, 1600 Clifton Road NE, Atlanta GA 30333 (telephone number (404) 633-5313), and the shipper.

A10.10. Diagnostic Specimens and Used Health Care Products.

A10.10.1. Except as listed below, diagnostic specimens are exempted from all other requirements of this manual when offered for transportation or transported in accordance with this paragraph. A diagnostic specimen meeting the definition of a hazard class other than Division 6.2 must be transported as required for that class. The following requirements apply:

A10.10.1.1. Use packaging consisting of a primary receptacle, a secondary packaging, and an outer packaging.

A10.10.1.2. The primary receptacles must be packed in secondary packaging in such a way that, under normal conditions of transport, it cannot break, be punctured, or leak the contents into the secondary packaging.

A10.10.1.3. Secondary packagings must be secured in outer packagings with suitable cushioning material such that any leakage of the contents will not impair the protective properties of the cushioning material or the outer packaging.

A10.10.1.4. Completed package must be capable of successfully passing the drop test in 49 CFR 178.603 at a drop height of at least 1.2 meters (3.9 feet). The outer packaging must be clearly and durably marked with the words ``Diagnostic Specimen."

A10.10.2. **Liquid Diagnostic Specimens.** Liquid diagnostic specimens must be packaged as follows:

A10.10.2.1. The primary receptacle must be leakproof with a volumetric capacity of not more than 500 mL (16.9 ounces).

A10.10.2.2. Place absorbent material between the primary receptacle and secondary packaging. If several fragile primary receptacles are placed in a single secondary packaging, they must be individually wrapped or separated so as to prevent contact between them. The absorbent material must be of sufficient quantity to absorb the entire contents of the primary receptacles.

A10.10.2.3. The secondary packaging must be leakproof.

A10.10.2.4. The primary receptacle or the secondary packaging must be capable of withstanding without leakage an internal pressure producing a pressure differential of not less than 95 kPa (0.95 bar, 14 psi).

A10.10.2.5. The outer packaging must not exceed 4 L (1 gallon) capacity.

A10.10.3. **Solid Diagnostic Specimens.** Solid diagnostic specimens must be packaged as follows:

A10.10.3.1. The primary receptacle must be siftproof with a capacity of not more than 500 g (1.1 pounds).

A10.10.3.2. If several fragile primary receptacles are placed in a single secondary packaging, they must be individually wrapped or separated so as to prevent contact between them.

A10.10.3.3. The outer packaging must not exceed 4 kg (8.8 pounds) capacity.

A10.10.4. **Used Health Care Products.** A used health care product being returned to the manufacturer or the manufacturer's designee is excepted from the requirements of this regulation when transported as follows:

A10.10.4.1. For purposes of this section, a health care product is used when it has been removed from its original inner packaging. Used health care products contaminated with or suspected of contamination with a Risk Group 4 infectious substances may not be transported under these provisions.

A10.10.4.2. Each used health care product must be drained of free liquid to the extent practicable and placed in a watertight primary container designed and constructed to assure that it remains intact under conditions normally incident to transportation.

A10.10.4.3. For a used health care product capable of cutting or penetrating skin or packaging material, the primary container must be capable of retaining the product without puncture of the packaging under normal conditions of transport. Each primary container must be marked with a BIOHAZARD marking conforming to 29 CFR 1910.1030(g)(1)(i).

A10.10.4.4. Each primary container must be placed inside a watertight secondary container designed and constructed to assure that it remains intact under conditions normally incident to transportation. The secondary container must be marked with a BIOHAZARD marking conforming to 29 CFR 1910.1030(g)(1)(i).

A10.10.4.5. The secondary container must be placed inside an outer packaging with sufficient cushioning material to prevent movement between the secondary container and the outer packaging. An itemized list of the contents of the primary container and information concerning possible contamination with a Division 6.2 material, including its possible location on the product, must be placed between the secondary container and the outside packaging.

A10.11. Regulated Medical Waste. Package regulated medical waste (containing Risk Group 2 and 3 material) in packagings that meet the PG II performance level. Additionally, ensure the packaging is:

A10.11.1. Rigid, leak resistant, and impervious to moisture.

A10.11.2. Of sufficient strength to prevent tearing or bursting under normal conditions of handling and use.

A10.11.3. Sealed to prevent leakage during transport.

A10.11.4. Puncture-resistant for sharps and sharps with residual fluids, break-resistant, and tightly lidded or stoppered for fluids in quantities greater than 20 cubic centimeters.

A10.12. Biomedical Waste. Package biomedical waste in packaging that meet the PG II performance level. Additionally, packagings must conform to the bulleted requirements in **A10.11.**

A10.12.1. Package as follows:

Inner packaging	Outer packaging
Not required	**Drums:** aluminum (1B2), plywood (1D), fiberboard (1G), plastic (1H2), or steel (1A2)

A10.12.2. Package as follows:

Inner packaging	Outer packaging
Not required	**Jerricans:** steel (3A2) or plastic (3H2)

A10.12.3. Package as follows:

Inner packaging	Outer packaging
Not required	**Boxes:** natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F) or fiberboard (4G)

Attachment 11

CLASS 7--RADIOACTIVE MATERIALS

A11.1. General Requirements. This attachment contains information concerning the packaging and general handling instructions for Class 7 (Radioactive Material).

A11.2. General Handling Instructions. Handle radioactive material carefully to ensure there is no contamination of personnel or the transport vehicle. A person may not remain unnecessarily in the immediate vicinity of any package containing radioactive material.

A11.3. Activity Limits for Type A and Type B Packages:

A11.3.1. A Type A package must not contain a quantity of radioactivity greater than A_1 (for special form radioactive material) or A_2 (for normal form radioactive material) as listed in **A11.5.** Activity limits not listed in **A11.5.** are determined per 49 CFR 173.433.

A11.3.2. The limits on activity contained in a Type B(U) or Type B(M) package are those prescribed in **A11.7.** and **A11.8.** or in the applicable approval certificate in accordance with 49 CFR 173.471, 173.472 or 173.473.

A11.4. Determining A1 and A2 Values for Radionuclides:

A11.4.1. For single radionuclides of known identity, the values of A_1 and A_2 are those given in **A11.5.** The values of A_1 and A_2 are also applicable for radionuclides contained in (a,n) or (h,n) neutron sources.

A11.4.2. For any single radionuclide of known identity, that is not listed in **A11.5.**, the values of A_1 and A_2 must be determined according to 49 CFR 173.433.

A11.5. Table A11.1. This table gives A_1 and A_2 values for radionuclides. This table also gives values on exempt material activity concentrations and exempt consignment activity limits for radionuclides.

Table A11.1. Table of A1 and A2 Values for Common Radionuclides.

Symbol	Element and Atomic Number	A_1 (TBq) (Special form)	A_2 (TBq) (Other form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Ac-225[a]	Actinium (89)	0.8	0.006	1×10^{1}	1×10^{4}
Ac-227[a]		0.9	0.00009	1×10^{-1}	1×10^{3}
Ac-228		0.6	0.5	1×10^{1}	1×10^{6}
Ag-105	Silver (47)	2	2	1×10^{2}	1×10^{6}
Ag-108m[a]		0.7	0.7	1×10^{1}[b]	1×10^{6}[b]
Ag-110m[a]		0.4	0.4	1×10^{1}	1×10^{6}
Ag-111		2	0.6	1×10^{3}	1×10^{6}
Al-26	Aluminum (13)	0.1	0.1	1×10^{1}	1×10^{5}
Am-241	Americium (95)	10	0.001	1×10^{0}	1×10^{4}
Am-242m[a]		10	0.001	1×10^{0}[b]	1×10^{4}[b]
Am-243[a]		5	0.001	1×10^{0}[b]	1×10^{3}[b]
Ar-37	Argon (18)	40	40	1×10^{6}	1×10^{8}
Ar-39		40	20	1×10^{7}	1×10^{4}
Ar-41		0.3	0.3	1×10^{2}	1×10^{9}
As-72	Arsenic (33)	0.3	0.3	1×10^{1}	1×10^{5}
As-73		40	40	1×10^{3}	1×10^{7}
As-74		1	0.9	1×10^{1}	1×10^{6}
As-76		0.3	0.3	1×10^{2}	1×10^{5}
As-77		20	0.7	1×10^{3}	1×10^{6}
At-211	Astatine (85)	20	0.5	1×10^{3}	1×10^{7}
Au-193	Gold (79)	7	2	1×10^{2}	1×10^{7}
Au-194		1	1	1×10^{1}	1×10^{6}
Au-195		10	6	1×10^{2}	1×10^{7}
Au-198		1	0.6	1×10^{2}	1×10^{6}
Au-199		10	0.6	1×10^{2}	1×10^{6}
Ba-131[a]	Barium (56)	2	2	1×10^{2}	1×10^{6}
Ba-133		3	3	1×10^{2}	1×10^{6}
Ba-133m		20	0.6	1×10^{2}	1×10^{6}
Ba-140[a]		0.5	0.3	1×10^{1}[b]	1×10^{5}[b]

Symbol	Element and Atomic Number	A_1 (TBq) (Special form)	A_2 (TBq) (Other form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Be-7	Beryllium (4)	20	20	1×10^3	1×10^7
Be-10		40	0.6	1×10^4	1×10^6
Bi-205	Bismuth (83)	0.7	0.7	1×10^1	1×10^6
Bi-206		0.3	0.3	1×10^1	1×10^5
Bi-207		0.7	0.7	1×10^1	1×10^6
Bi-210		1	0.6	1×10^3	1×10^6
Bi-210m[a]		0.6	0.02	1×10^1	1×10^5
Bi-212[a]		0.7	0.6	1×10^{1}[b]	1×10^{5}[b]
Bk-247	Berkelium (97)	8	0.0008	1×10^0	1×10^4
Bk-249[a]		40	0.3	1×10^3	1×10^6
Br-76	Bromine (35)	0.4	0.4	1×10^1	1×10^5
Br-77		3	3	1×10^2	1×10^6
Br-82		0.4	0.4	1×10^1	1×10^6
C-11	Carbon (6)	1	0.6	1×10^1	1×10^6
C-14		40	3	1×10^4	1×10^7
Ca-41	Calcium (20)	Unlimited	Unlimited	1×10^5	1×10^7
Ca-45		40	1	1×10^4	1×10^7
Ca-47[a]		3	0.3	1×10^1	1×10^6
Cd-109	Cadmium (48)	30	2	1×10^4	1×10^6
Cd-113m		40	0.5	1×10^3	1×10^6
Cd-115 [a]		3	0.4	1×10^2	1×10^6
Cd-115m		0.5	0.5	1×10^3	1×10^6
Ce-139	Cerium (58)	7	2	1×10^2	1×10^6
Ce-141		20	0.6	1×10^2	1×10^7
Ce-143		0.9	0.6	1×10^2	1×10^6
Ce-144[a]		0.2	0.2	1×10^{2}[b]	1×10^{5}[b]
Cf-248	Californium (98)	40	0.006	1×10^1	1×10^4
Cf-249		3	0.0008	1×10^0	1×10^3
Cf-250		20	0.002	1×10^1	1×10^4
Cf-251		7	0.0007	1×10^0	1×10^3

Symbol	Element and Atomic Number	A_1 (TBq) (Special form)	A_2 (TBq) (Other form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Cf-252		0.05	0.003	1×10^1	1×10^4
Cf-253[a]		40	0.04	1×10^2	1×10^5
Cf-254		0.001	0.001	1×10^0	1×10^3
Cl-36	Chlorine (17)	10	0.6	1×10^4	1×10^6
Cl-38		0.2	0.2	1×10^1	1×10^5
Cm-240	Curium (96)	40	0.02	1×10^2	1×10^5
Cm-241		2	1	1×10^2	1×10^6
Cm-242		40	0.01	1×10^2	1×10^5
Cm-243		9	0.001	1×10^0	1×10^4
Cm-244		20	0.002	1×10^1	1×10^4
Cm-245		9	0.0009	1×10^0	1×10^3
Cm-246		9	0.0009	1×10^0	1×10^3
Cm-247[a]		3	0.001	1×10^0	1×10^4
Cm-248		0.02	0.0003	1×10^0	1×10^3
Co-55	Cobalt (27)	0.5	0.5	1×10^1	1×10^6
Co-56		0.3	0.3	1×10^1	1×10^5
Co-57		10	10	1×10^2	1×10^6
Co-58m		40	40	1×10^4	1×10^7
Co-58		1	1	1×10^1	1×10^6
Co-60		0.4	0.4	1×10^1	1×10^5
Cr-51	Chromium (24)	30	30	1×10^3	1×10^7
Cs-129	Cesium (55)	4	4	1×10^2	1×10^5
Cs-131		30	30	1×10^3	1×10^6
Cs-132		1	1	1×10^3	1×10^6
Cs-134		0.7	0.7	1×10^1	1×10^4
Cs-134m		40	0.6	1×10^3	1×10^5
Cs-135		40	1	1×10^4	1×10^7
Cs-136		0.5	0.5	1×10^1	1×10^5
Cs-137[a]		2	0.6	1×10^1[b]	1×10^4[b]
Cu-64	Copper (29)	6	1	1×10^2	1×10^6
Cu-67		10	0.7	1×10^2	1×10^6

Symbol	Element and Atomic Number	A_1 (TBq) (Special form)	A_2 (TBq) (Other form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Dy-159	Dysprosium (66)	20	20	1×10^3	1×10^7
Dy-165		0.9	0.6	1×10^3	1×10^6
Dy-166[a]		0.9	0.3	1×10^3	1×10^6
Er-169	Erbium (68)	40	1	1×10^4	1×10^7
Er-171		0.8	0.5	1×10^2	1×10^6
Eu-147	Europium (63)	2	2	1×10^2	1×10^6
Eu-148		0.5	0.5	1×10^1	1×10^6
Eu-149		20	20	1×10^2	1×10^7
Eu-150 (short lived)		2	0.7	1×10^3	1×10^6
Eu-150 (long lived)		0.7	0.7	1×10^1	1×10^6
Eu-152		1	1	1×10^1	1×10^6
Eu-152m		0.8	0.8	1×10^2	1×10^6
Eu-154		0.9	0.6	1×10^1	1×10^6
Eu-155		20	3	1×10^2	1×10^7
Eu-156		0.7	0.7	1×10^1	1×10^6
F-18	Fluorine (9)	1	0.6	1×10^1	1×10^6
Fe-52[a]	Iron (26)	0.3	0.3	1×10^1	1×10^6
Fe-55		40	40	1×10^4	1×10^6
Fe-59		0.9	0.9	1×10^1	1×10^6
Fe-60[a]		40	0.2	1×10^2	1×10^5
Ga-67	Gallium (31)	7	3	1×10^2	1×10^6
Ga-68		0.5	0.5	1×10^1	1×10^5
Ga-72		0.4	0.4	1×10^1	1×10^5
Gd-146[a]	Gadolinium (64)	0.5	0.5	1×10^1	1×10^6
Gd-148		20	0.002	1×10^1	1×10^4
Gd-153		10	9	1×10^2	1×10^7
Gd-159		3	0.6	1×10^3	1×10^6
Ge-68[a]	Germanium (32)	0.5	0.5	1×10^1	1×10^5
Ge-71		40	40	1×10^4	1×10^8
Ge-77		0.3	0.3	1×10^1	1×10^5

Symbol	Element and Atomic Number	A_1 (TBq) (Special form)	A_2 (TBq) (Other form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Hf-172[a]	Hafnium (72)	0.6	0.6	1×10^1	1×10^6
Hf-175		3	3	1×10^2	1×10^6
Hf-181		2	0.5	1×10^1	1×10^6
Hf-182		Unlimited	Unlimited	1×10^2	1×10^6
Hg-194[a]	Mercury (80)	1	1	1×10^1	1×10^6
Hg-195m[a]		3	0.7	1×10^2	1×10^6
Hg-197m		10	0.4	1×10^2	1×10^6
Hg-197		20	10	1×10^2	1×10^7
Hg-203		5	1	1×10^2	1×10^5
Ho-166	Holmium (67)	0.4	0.4	1×10^3	1×10^5
Ho-166m		0.6	0.5	1×10^1	1×10^6
I-123	Iodine (53)	6	3	1×10^2	1×10^7
I-124		1	1	1×10^1	1×10^6
I-125		20	3	1×10^3	1×10^6
I-126		2	1	1×10^2	1×10^6
I-129		Unlimited	Unlimited	1×10^2	1×10^5
I-131		3	0.7	1×10^2	1×10^6
I-132		0.4	0.4	1×10^1	1×10^5
I-133		0.7	0.6	1×10^1	1×10^6
I-134		0.3	0.3	1×10^1	1×10^5
I-135[a]		0.6	0.6	1×10^1	1×10^6
In-111	Indium (49)	3	3	1×10^2	1×10^6
In-113m		4	2	1×10^2	1×10^6
In-114m[a]		10	0.5	1×10^2	1×10^6
In-115m		7	1	1×10^2	1×10^6
Ir-189[a]	Iridium (77)	10	10	1×10^2	1×10^7
Ir-190		0.7	0.7	1×10^1	1×10^6
Ir-192		1[c]	0.6	1×10^1	1×10^4
Ir-194		0.3	0.3	1×10^2	1×10^5
K-40	Potassium (19)	0.9	0.9	1×10^2	1×10^6

Symbol	Element and Atomic Number	A_1 (TBq) (Special form)	A_2 (TBq) (Other form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
K-42		0.2	0.2	1×10^2	1×10^6
K-43		0.7	0.6	1×10^1	1×10^6
Kr-81	Krypton (36)	40	40	1×10^4	1×10^7
Kr-85m		8	3	1×10^3	1×10^{10}
Kr-85		10	10	1×10^5	1×10^4
Kr-87		0.2	0.2	1×10^2	1×10^9
La-137	Lanthanum (57)	30	6	1×10^3	1×10^7
La-140		0.4	0.4	1×10^1	1×10^5
LSA		Note 4	Note 4		
Lu-172	Lutetium (71)	0.6	0.6	1×10^1	1×10^6
Lu-173		8	8	1×10^2	1×10^7
Lu-174m		20	10	1×10^2	1×10^7
Lu-174		9	9	1×10^2	1×10^7
Lu-177		30	0.7	1×10^3	1×10^7
MFP	Mixed Fission Products	Note 3	Note 3		
Mg-28[a]	Magnesium (12)	0.3	0.3	1×10^1	1×10^5
Mn-52	Manganese (25)	0.3	0.3	1×10^1	1×10^5
Mn-53		Unlimited	Unlimited	1×10^4	1×10^9
Mn-54		1	1	1×10^1	1×10^6
Mn-56		0.3	0.3	1×10^1	1×10^5
Mo-93	Molybdenum (42)	40	20	1×10^3	1×10^8
Mo-99[a]		1	0.6	1×10^2	1×10^6
N-13	Nitrogen (7)	0.9	0.6	1×10^2	1×10^9
Na-22	Sodium (11)	0.5	0.5	1×10^1	1×10^6
Na-24		0.2	0.2	1×10^1	1×10^5
Nb-93m	Niobium (41)	40	30	1×10^4	1×10^7
Nb-94		0.7	0.7	1×10^1	1×10^6
Nb-95		1	1	1×10^1	1×10^6
Nb-97		0.9	0.6	1×10^1	1×10^6
Nd-147	Neodymium (60)	6	0.6	1×10^2	1×10^6

Symbol	Element and Atomic Number	A_1 (TBq) (Special form)	A_2 (TBq) (Other form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Nd-149		0.6	0.5	1×10^2	1×10^6
Ni-59	Nickel (28)	Unlimited	Unlimited	1×10^4	1×10^8
Ni-63		40	30	1×10^5	1×10^8
Ni-65		0.4	0.4	1×10^1	1×10^6
Np-235	Neptunium (93)	40	40	1×10^3	1×10^7
Np-236 (short lived)		20	2	1×10^3	1×10^7
Np-236 (long lived)		9	0.02	1×10^2	1×10^5
Np-237		20	0.002	1×10^{0}[b]	1×10^{3}[b]
Np-239		7	0.4	1×10^2	1×10^7
Os-185	Osmium (76)	1	1	1×10^1	1×10^6
Os-191m		40	30	1×10^3	1×10^7
Os-191		10	2	1×10^2	1×10^7
Os-193		2	0.6	1×10^2	1×10^6
Os-194[a]		0.3	0.3	1×10^2	1×10^5
P-32	Phosphorus (15)	0.5	0.5	1×10^3	1×10^5
P-33		40	1	1×10^5	1×10^8
Pa-230[a]	Protactinium (91)	2	0.07	1×10^1	1×10^6
Pa-231		4	0.0004	1×10^0	1×10^3
Pa-233		5	0.7	1×10^2	1×10^7
Pb-201	Lead (82)	1	1	1×10^1	1×10^6
Pb-202		40	20	1×10^3	1×10^6
Pb-203		4	3	1×10^2	1×10^6
Pb-205		Unlimited	Unlimited	1×10^4	1×10^7
Pb-210[a]		1	0.05	1×10^{1}[b]	1×10^{4}[b]
Pb-212 [a]		0.7	0.2	1×10^{1}[b]	1×10^{5}[b]
Pd-103	Palladium (46)	40	40	1×10^3	1×10^8
Pd-107		Unlimited	Unlimited	1×10^5	1×10^8
Pd-109		2	0.5	1×10^3	1×10^6
Pm-143	Promethium (61)	3	3	1×10^2	1×10^6
Pm-144		0.7	0.7	1×10^1	1×10^6

Symbol	Element and Atomic Number	A_1 (TBq) (Special form)	A_2 (TBq) (Other form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Pm-145		30	10	1×10^3	1×10^7
Pm-147		40	2	1×10^4	1×10^7
Pm-148m[a]		0.8	0.7	1×10^1	1×10^6
Pm-149		2	0.6	1×10^3	1×10^6
Pm-151		2	0.6	1×10^2	1×10^6
Po-210	Polonium (84)	40	0.02	1×10^1	1×10^4
Pr-142	Praseodymium (59)	0.4	0.4	1×10^2	1×10^5
Pr-143		3	0.6	1×10^4	1×10^6
Pt-188[a]	Platinum (78)	1	0.8	1×10^1	1×10^6
Pt-191		4	3	1×10^2	1×10^6
Pt-193m		40	0.5	1×10^3	1×10^7
Pt-193		40	40	1×10^4	1×10^7
Pt-195m		10	0.5	1×10^2	1×10^6
Pt-197m		10	0.6	1×10^2	1×10^6
Pt-197		20	0.6	1×10^3	1×10^6
Pu-236	Plutonium (94)	30	0.003	1×10^1	1×10^4
Pu-237		20	20	1×10^3	1×10^7
Pu-238		10	0.001	1×10^0	1×10^4
Pu-239		10	0.001	1×10^0	1×10^4
Pu-240		10	0.001	1×10^0	1×10^3
Pu-241[a]		40	0.06	1×10^2	1×10^5
Pu-242		10	0.001	1×10^0	1×10^4
Pu-244[a]		0.4	0.001	1×10^0	1×10^4
Ra-223[a]	Radium (88)	0.4	0.007	1×10^{2}[b]	1×10^{5}[b]
Ra-224 [a]		0.4	0.02	1×10^{1}[b]	1×10^{5}[b]
Ra-225 [a]		0.2	0.004	1×10^2	1×10^5
Ra-226 [a]		0.2	0.003	1×10^{1}[b]	1×10^{4}[b]
Ra-228 [a]		0.6	0.02	1×10^{1}[b]	1×10^{5}[b]
Rb-81	Rubidium (37)	2	0.8	1×10^1	1×10^6

Symbol	Element and Atomic Number	A_1 (TBq) (Special form)	A_2 (TBq) (Other form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Rb-83[a]		2	2	1×10^2	1×10^6
Rb-84		1	1	1×10^1	1×10^6
Rb-86		0.5	0.5	1×10^2	1×10^5
Rb-87		Unlimited	Unlimited	1×10^4	1×10^7
Rb (natural)		Unlimited	Unlimited	1×10^4	1×10^7
Re-184	Rhenium (75)	1	1	1×10^1	1×10^6
Re-184m		3	1	1×10^2	1×10^6
Re-186		2	0.6	1×10^3	1×10^6
Re-187		Unlimited	unlimited	1×10^6	1×10^9
Re-188		0.4	0.4	1×10^2	1×10^5
Re-189[a]		3	0.6	1×10^2	1×10^6
Re (natural)		Unlimited	Unlimited	1×10^6	1×10^9
Rh-99	Rhodium (45)	2	2	1×10^1	1×10^6
Rh-101		4	3	1×10^2	1×10^7
Rh-102		0.5	0.5	1×10^1	1×10^6
Rh-102m		2	2	1×10^2	1×10^6
Rh-103m		40	40	1×10^4	1×10^8
Rh-105		10	0.8	1×10^2	1×10^7
Rn-222[a]	Radon (86)	0.3	0.004	1×10^{1}[b]	1×10^{8}[b]
Ru-97	Ruthenium (44)	5	5	1×10^2	1×10^7
Ru-103[a]		2	2	1×10^2	1×10^6
Ru-105		1	0.6	1×10^1	1×10^6
Ru-106 [a]		0.2	0.2	1×10^{2}[b]	1×10^{5}[b]
S-35	Sulphur (16)	40	3	1×10^5	1×10^8
Sb-122	Antimony (51)	0.4	0.4	1×10^2	1×10^4
Sb-124		0.6	0.6	1×10^1	1×10^6
Sb-125		2	1	1×10^2	1×10^6
Sb-126		0.4	0.4	1×10^1	1×10^5
Sc-44	Scandium (21)	0.5	0.5	1×10^1	1×10^5
Sc-46		0.5	0.5	1×10^1	1×10^6

Symbol	Element and Atomic Number	A_1 (TBq) (Special form)	A_2 (TBq) (Other form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Sc-47		10	0.7	1×10^2	1×10^6
Sc-48		0.3	0.3	1×10^1	1×10^5
SCO		Note 5	Note 5		
Se-75	Selenium (34)	3	3	1×10^2	1×10^6
Se-79		40	2	1×10^4	1×10^7
Si-31	Silicon (14)	0.6	0.6	1×10^3	1×10^6
Si-32		40	0.5	1×10^3	1×10^6
Sm-145	Samarium (62)	10	10	1×10^2	1×10^7
Sm-147		Unlimited	Unlimited	1×10^1	1×10^4
Sm-151		40	10	1×10^4	1×10^8
Sm-153		9	0.6	1×10^2	1×10^6
Sn-113[a]	Tin (50)	4	2	1×10^3	1×10^7
Sn117m		7	0.4	1×10^2	1×10^6
Sn-119m		40	30	1×10^3	1×10^7
Sn-121m[a]		40	0.9	1×10^3	1×10^7
Sn-123		0.8	0.6	1×10^3	1×10^6
Sn-125		0.4	0.4	1×10^2	1×10^5
Sn-126[a]		0.6	0.4	1×10^1	1×10^5
Sr-82[a]	Strontium (38)	0.2	0.2	1×10^1	1×10^5
Sr-85m		5	5	1×10^2	1×10^7
Sr-85		2	2	1×10^2	1×10^6
Sr-87m		3	3	1×10^2	1×10^6
Sr-89		0.6	0.6	1×10^3	1×10^6
Sr-90[a]		0.3	0.3	1×10^{2}[b]	1×10^{4}[b]
Sr-91[a]		0.3	0.3	1×10^1	1×10^5
Sr-92[a]		1	0.3	1×10^1	1×10^6
T (All Forms) (see note)	Tritium (1)	40	40	1×10^6	1×10^9
Ta-178 (long lived)	Tantalum (73)	1	0.8	1×10^1	1×10^6
Ta-179		30	30	1×10^3	1×10^7

Symbol	Element and Atomic Number	A_1 (TBq) (Special form)	A_2 (TBq) (Other form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Ta-182		0.9	0.5	1×10^1	1×10^4
Tb-157	Terbium (65)	40	40	1×10^4	1×10^7
Tb-158		1	1	1×10^1	1×10^6
Tb-160		1	0.6	1×10^1	1×10^6
Tc-95m [a]	Technetium (43)	2	2	1×10^1	1×10^6
Tc-96m [a]		0.4	0.4	1×10^3	1×10^7
Tc-96		0.4	0.4	1×10^1	1×10^6
Tc-97m		40	1	1×10^3	1×10^7
Tc-97		Unlimited	Unlimited	1×10^3	1×10^8
Tc-98		0.8	0.7	1×10^1	1×10^6
Tc-99m		10	4	1×10^2	1×10^7
Tc-99		40	0.9	1×10^4	1×10^7
Te-121m	Tellurium (52)	5	3	1×10^2	1×10^5
Te-121		2	2	1×10^1	1×10^6
Te-123m		8	1	1×10^2	1×10^7
Te-125m		20	0.9	1×10^3	1×10^7
Te-127m[a]		20	0.5	1×10^3	1×10^7
Te-127		20	0.7	1×10^3	1×10^6
Te-129m[a]		0.8	0.4	1×10^3	1×10^6
Te-129		0.7	0.6	1×10^2	1×10^6
Te-131m[a]		0.7	0.5	1×10^1	1×10^6
Te-132[a]		0.5	0.4	1×10^2	1×10^7
Th-227	Thorium (90)	10	0.005	1×10^1	1×10^4
Th-228[a]		0.5	0.001	1×10^{0b}	1×10^{4b}
Th-229		5	0.0005	1×10^{0b}	1×10^{3b}
Th-230		10	0.001	1×10^0	1×10^4
Th-231		40	0.02	1×10^3	1×10^7
Th-232		Unlimited	Unlimited	1×10^1	1×10^4
Th-234[a]		0.3	0.3	1×10^{3b}	1×10^{5b}
Th (natural)		Unlimited	Unlimited	1×10^{0b}	1×10^{3b}

Symbol	Element and Atomic Number	A_1 (TBq) (Special form)	A_2 (TBq) (Other form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Ti-44[a]	Titanium (22)	0.5	0.4	1×10^1	1×10^5
Tl-200	Thallium (81)	0.9	0.9	1×10^1	1×10^6
Tl-201		10	4	1×10^2	1×10^6
Tl-202		2	2	1×10^2	1×10^6
Tl-204		10	0.7	1×10^4	1×10^4
Tm-167	Thulium (69)	7	0.8	1×10^2	1×10^6
Tm-170		3	0.6	1×10^3	1×10^6
Tm-171		40	40	1×10^4	1×10^8
U-230 (fast lung absorption)[a, d]	Uranium (92)	40	0.1	1×10^{1}[b]	1×10^{5}[b]
U-230 (medium lung absorbtion)[a, e]		40	0.004	1×10^1	1×10^4
U-230 (slow lung absorbtion)[a, f]		30	0.003	1×10^1	1×10^4
U-232 (fast lung absorbtion)[d]		40	0.01	1×10^{0}[b]	1×10^{3}[b]
U-232 (medium lung absorbtion)[e]		40	0.007	1×10^1	1×10^4
U-232 (slow lung absorbtion)[f]		10	0.001	1×10^1	1×10^4
U-233 (fast lung absorbtion)[d]		40	0.09	1×10^1	1×10^4
U-233 (medium lung absorbtion)[e]		40	0.02	1×10^2	1×10^5
U-233 (slow lung absorbtion)[f]		40	0.006	1×10^1	1×10^5
U-234 (fast lung absorbtion) [d]		40	0.09	1×10^1	1×10^4
U-234 (medium lung absorbtion)[e, f]		40	0.02	1×10^2	1×10^5
U-234 (slow lung absorbtion)[f]		40	0.006	1×10^1	1×10^5

Symbol	Element and Atomic Number	A_1 (TBq) (Special form)	A_2 (TBq) (Other form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
U-235 (all lung absorbtion types) [a, d, e, f]		Unlimited	Unlimited	1×10^{1} [b]	1×10^{4} [b]
U-236 (fast lung absorbtion) [d]		Unlimited	Unlimited	1×10^{1}	1×10^{4}
U-236 (medium lung absorbtion)[e]		40	0.02	1×10^{2}	1×10^{5}
U-236 (slow lung absorbtion)[f]		40	0.006	1×10^{1}	1×10^{4}
U-238(all lung absorbtion types)[d, e, f]		Unlimited	Unlimited	1×10^{1} [b]	1×10^{4} [b]
U (natural)		Unlimited	Unlimited	1×10^{0} [b]	1×10^{3} [b]
U (enriched 20% or less)[g]		Unlimited	Unlimited	1×10^{0}	1×10^{3}
U (depleted)		Unlimited	Unlimited	1×10^{0}	1×10^{3}
V-48	Vanadium (23)	0.4	0.4	1×10^{1}	1×10^{5}
V-49		40	40	1×10^{4}	1×10^{7}
W-178	Tungsten (74)	9	5	1×10^{1}	1×10^{6}
W-181		30	30	1×10^{3}	1×10^{7}
W-185		40	0.8	1×10^{4}	1×10^{7}
W-187		2	0.6	1×10^{2}	1×10^{6}
W-188[a]		0.4	0.3	1×10^{2}	1×10^{5}
Xe-122[a]	Xenon (54)	0.4	0.4	1×10^{2}	1×10^{9}
Xe-123		2	0.7	1×10^{2}	1×10^{9}
Xe-127		4	2	1×10^{3}	1×10^{5}
Xe-131m		40	40	1×10^{4}	1×10^{4}
Xe-133		20	10	1×10^{3}	1×10^{4}
Xe-135		3	2	1×10^{3}	1×10^{10}
Y-87[a]	Yttrium (39)	1	1	1×10^{1}	1×10^{6}
Y-88		0.4	0.4	1×10^{1}	1×10^{6}
Y-90		0.3	0.3	1×10^{3}	1×10^{5}

Symbol	Element and Atomic Number	A_1 (TBq) (Special form)	A_2 (TBq) (Other form)	Activity concentration for exempt material (Bq/g)	Activity limit for an exempt consignment (Bq/g)
Y-91m		2	2	1×10^2	1×10^6
Y-91		0.6	0.6	1×10^3	1×10^6
Y-92		0.2	0.2	1×10^2	1×10^5
Y-93		0.3	0.3	1×10^2	1×10^5
Yb-169	Ytterbium (70)	4	1	1×10^2	1×10^7
Yb-175		30	0.9	1×10^3	1×10^7
Zn-65	Zinc (30)	2	2	1×10^1	1×10^6
Zn-69m		3	0.6	1×10^2	1×10^6
Zn-69		3	0.6	1×10^4	1×10^6
Zr-88	Zirconium (40)	3	3	1×10^2	1×10^6
Zr-93		Unlimited	Unlimited	1×10^{3b}	1×10^{7b}
Zr-95[a]		2	0.8	1×10^1	1×10^6
Zr-97[a]		0.4	0.4	1×10^{1b}	1×10^{5b}

NOTES:

[a] A_1 and/or A_2 values include contributions from daughter nuclides with half-lives less than 10 days.

[b] Parent nuclides and their progeny included in secular equilibrium are listed in the following:

Sr-90 - Y-90

Zr-97 - Nb-97

Cs-137 - Ba-137m

Ce-144 - Pa-144

Bi-212 -Ta-208 (0.36), Po-212 (0.64)

Pb-212 - Bi-212, Ti-208 (0.36), Po-212 (0.64)

Ra-228 - Ac-228

Rn-222 - Po-218, Pb-214, Bi-214, Po-214

U-235 - Th-231

Th-234 - Pa-234m

U-240 - Np-240m

Am-242m - Am-242

Zr-93 - Nb-93m

Ru-106 - Rh-106

Ce-134 - La-134

Ba-140- La-140

Pb-21 - Bi-210, Po-210

Rn-220 - Po-216

Th-226 - Ra-222, Rn-218, Po-214

Ra-223 - Rn-219, Po-215, Pb-211, Bi-211, Tl-207

U-238 - Th-234, Pa-234m

U-230 - Th-226, Ra-222, Rn-218, Po-214

Np-237- Pa-233

Am-243 - Np-239

Ra-224 - Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)

Ra-226 - Rn-222, Po-218, Pb-214, Bi-214, Po-214, Pb-210, Bi-210, Po-210

Th-228 - Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)

Th-229 - Ra-225, Ac-225, Fr-221, At-217, Bi-213, Po-213, Pb-209

Th-nat - Ra-228, Ac-228, Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)

U-232 - Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)

U-nat - Th-234, Pa-234m, U-234, Th-230, Ra-226, Rn-222, Po-218, Pb-214, Bi-214, Po-214, Pb-210, Bi-210, Po-210

[c] The quantity may be determined from a measurement of the rate of decay or a measurement of the radiation level at a prescribed distance from the source.

[d] These values apply only to compounds of uranium that take the chemical form of UF_6, $U0_2F_2$ and $UO_2(NO_3)_2$ in both normal and accident conditions of transport.

[e] These values apply only to compounds of uranium that take the chemical form of $U0_3$, UF_4, UCI_4 and hexavalent compounds in both normal and accident conditions of transport.

[f] These values apply to all compounds of uranium other than those specified in (d) and (e) above.

[g] These values apply to unirradiated uranium only.

NOTES:

1. In Table A11.8, the symbols for the various radionuclides are styled thus "Ir-192". The alternative form of "192 Ir" is equally acceptable.
2. Tritium (T) is a synonym for the radionuclide Hydrogen-3.
3. For Mixed Fission Products values for A_1 and A_2 are calculated using the formula for mixtures.
4. For Low Specific Activity (LSA) material please consult IATA, sections 10.3.5.1. through 10.3.5.4.
5. For Surface Contaminated Objects (SCO) consult IATA, sections 10.3.6.1. through 10.3.6.3.
6. Type A packages must not contain activities greater than the following values: for special form radioactive material: A_1; or for all other radioactive materials: A_2.

A11.6. Authorized Type A Packages. Use the following packages for shipment, if they do not contain quantities over A_1 or A_2 as appropriate:

A11.6.1. **DOT 7A Type A General Packaging.**

A11.6.1.1. Each shipper of a DOT 7A package must maintain on file for at least 1 year after the latest shipment complete documentation of tests and an engineering evaluation or comparative data showing that the construction methods, packaging design, and materials of construction comply with that specification. Unless otherwise required, the shipper is exempt from maintaining this documentation if it is maintained by the Inventory Control Point (national stock number managing activity).

A11.6.1.2. DOT 7A packaging designed according to the requirements of 49 CFR 178.350 in effect on 30 June 1983 are not authorized for shipment.

A11.6.1.3. Any other Type A packaging that also meets the applicable standards for fissile materials in 10 CFR Part 71 and authorized in 49 CFR 173.471.

A11.6.2. **Type B, B(U), or B(M) Packaging.** Any Type B, B(U), or B(M) packaging, authorized in **A11.7.**

A11.6.3. **Foreign-Made Packaging.** Any foreign-made packaging that meets the standards of IAEA "*Regulations for the Safe Transport of Radioactive Materials*, *No. TS-R-1*" and bears the marking "Type A" used for the import of radioactive materials. Such packaging may be used later for domestic and export shipments of radioactive materials only if the offeror obtains the applicable documentation specified in **A11.6.1.** The packaging must conform to the requirements of the country of origin (as indicated by the packaging marking) and the IAEA regulations applicable to Type A packaging.

A11.7. Authorized Type B Packages. Use the following packages for shipment of quantities over A_1 or A_2, as appropriate:

A11.7.1. Any Type B, Type B(U), or Type B(M) packaging that meets the applicable requirements in 10 CFR part 71 and has been approved by the US Nuclear Regulatory Commission may be shipped per 49 CFR 173.471.

A11.7.2. Any Type B, B(U) or B(M) packaging that meets the applicable requirements of the regulations of the IAEA "*Regulations for the Safe Transport of Radioactive Materials*, *No. TS-R-1*" and for which the foreign competent authority certificate has been revalidated by DOT according to 49 CFR 173.473. Authorized only for export and import shipments.

A11.7.3. **DOT 6M.** DOT 6M metal packaging, only for solid or gaseous radioactive materials that will not undergo pressure generating decomposition at temperatures up to 121 degrees C (250 degrees F) and do not generate more than 10 watts of radioactive decay heat. This package is authorized for use until 1 Oct 2008.

A11.7.4. **DOT 20WC with Inner DOT 2R.** DOT 20WC, wooden protective jacket, when used with a single, snug-fitting inner DOT 2R. For liquid contents, the inner packaging must comply with 49 CFR 173.412. Not authorized for special form radioactive material. This package is authorized for use until 1 Oct 2008.

A11.7.5. **DOT 20WC with Inner Type A Packaging.** DOT 20WC, wooden protective jacket, with a single, snug-fitting inner Type A packaging that has a metal outer wall. Radioactive decay heat must not be over 100 watts. Authorized only for special form radioactive material. This package is authorized for use until 1 Oct 2008.

A11.7.6. **DOT 21WC.** DOT 21WC, wooden protective overpack, with a single inner DOT 2R. Contents must be loaded within the inner packaging in a manner to prevent loose movement during transportation. The inner packaging must be securely positioned and centered within the overpack so that there will be no significant displacement of the inner packaging if subjected to the 9 meter (30 feet) drop test described in 10 CFR Part 71. Authorized only for special form radioactive material. This package is authorized for use until 1 Oct 2008.

A11.8. Authorized Packaging-Fissile Materials.

A11.8.1. Except as provided in **A3.3.7.8.**, package fissile materials containing not more than A_1 or A_2 (as appropriate) in:

A11.8.1.1. DOT 6L, metal packaging, for materials in **A11.8.2.1.**

A11.8.1.2. DOT 6M, metal packaging, for materials in **A11.8.2.2.**

A11.8.1.3. Any packaging listed in **A11.6.**, limited to radioactive materials specified in 10 CFR Part 71, Subpart C.

A11.8.1.4. Any other Type AF, Type BF, Type B(U)F, or Type B(M)F packaging for fissile radioactive materials that also meets the applicable standards for fissile materials in 10 CFR Part 71.

A11.8.1.5. Any other Type AF, Type B(U)F, or Type B(M)F packaging that also meets the applicable requirements for fissile material packaging in section VI of the IAEA "*Regulations for the Safe Transport of Radioactive Materials*, *No. TS-R-1*" and for which the foreign competent authority certificate has been revalidated by the DOT according to 49 CFR 173.473. Authorized only for export and import shipments.

A11.8.1.6. A 208 L (55 gallon) steel drum (1A2), subject to the following conditions:

A11.8.1.6.1. Packaging must meet the PG I performance requirements.

A11.8.1.6.2. The quantity may not exceed 350 grams of uranium 235 in any nonpyrophoric form, enriched to any degree in the uranium 235 isotope.

A11.8.1.6.3. Each drum must have a minimum 18-gauge body and bottom head and 16-gauge removable top head with one or more corrugations in the cover near the periphery.

A11.8.1.6.4. Closures must conform to 49 CFR 178.352.

A11.8.1.6.5. At least four equally spaced 12 mm (0.5 inch) diameter vent holes must be provided on the sides of the drum near the top, each covered with weatherproof tape or equivalent device.

A11.8.1.6.6. Appropriate primary inner containment of the contents and sufficient packaging material, such as plastic or metal jars or cans, must be provided so that DOT 7A provisions are satisfied by the inner packaging.

A11.8.1.6.7. Each inner container must be capable of venting if subjected to the thermal test described in 10 CFR Part 71.

A11.8.1.6.8. Liquid contents must be packaged per 49 CFR 173.412.

A11.8.1.6.9. The maximum weight of contents including internal packaging must not be over 91 kgs (200 pounds) with fissile material content limited as shown in **Table A11.2.**

A11.8.1.7. Any metal cylinder that meets the performance requirements of **A11.6.** and 49 CFR 178.350 for DOT 7A Type A packaging may be used for the transport of residual "heels" of enriched solid uranium hexafluoride without a protective overpack per **Table A11.3.**:

Table A11.2. Fissile Material Content and Transport Index for UN 1A2 Package.

Maximum U-235 per Package (grams)	MinimumTransport Index per Package as Fissile Class II	Maximum Number of Packages Transported as a Fissile Material Controlled Shipment
350	1.8	72
300	1.0	129
250	0.5	256
200	0.3	500
150	0.1	500
100	0.1	500
50	Note 1	Note 2

NOTES:

1. Transport index is limited by the external radiation levels.
2. Maximum number is limited by the total transport index.

A11.8.1.8. DOT 20PF-1, 20PF-2, 20PF-3 or 21PF-1A, 21PF-1B, or 21PF-2 phenolic-foam insulated overpacks with snug fitting inner metal cylinders meeting all of the applicable requirements of **A3.1.**, **A3.3.7.1.**, **A3.3.7.2.**, **A11.18.** and the following:

A11.8.1.8.1. Handling procedures and packaging criteria must comply with US Enrichment Corporation Report Number USEC-651 or ANSI N14.1.

A11.8.1.8.2. Quantities of uranium hexafluoride are authorized as shown in **Table A11.6.**, with each package assigned a minimum transport index as also shown.

Table A11.3. Allowable Content of Uranium Hexafluoride (UF6) "Heels" in a Specification 7A Cylinder.

Maximum Cylinder Diameter		Cylinder Volume		Maximum Uranium 235 Enrichment (Weight %)	Maximum "Heel" Weight Per Cylinder UF_6 Uranium ^{235}			
Inches	**Centimeters**	**Cubic Feet**	**L**		**kg**	**(lb)**	**kg**	**(lb)**
5	12.7	0.311	8.8	100.0	0.045	0.1	0.031	0.07
8	20.3	1.359	39	12.5	0.227	0.5	.019	0.04
12	30.5	2.410	68	5.0	0.454	1.0	.015	0.03
30	76	25.64	725	5.0	11.3	25	.383	0.84
48	122	108.9	3084	4.5	22.7	50	.690	1.52
		(10 ton)						
48	122	142.7	4041	4.5	22.7	50	.690	1.52
		(14 ton)						

A11.8.2. **Fissile Radioactive Materials with Radioactive Content Over A1 or A2.** Package in either:

A11.8.2.1. DOT 6L Metal Packaging. This package is authorized for use until 1 Oct 2008.

A11.8.2.1.1. Authorized only for uranium-235, plutonium-239, or plutonium-241, as metal oxide, or compounds that do not decompose at temperatures up to 149 degrees C (300 degrees F).

A11.8.2.1.2. Radioactive decay heat output must not be more than 5 watts.

A11.8.2.1.3. Radioactive materials in normal form must be packaged in one or more tightly-sealed metal cans or polyethylene bottles within a DOT 2R containment vessel.

A11.8.2.1.4. Authorized contents are limited per **Table A11.4.**

Table A11.4. Authorized Contents in Kilograms (Kg) and Conditions for Specification 6L Packages.

Uranium-235		**Plutonium (Note 1)**		**Minimum Fissile Transport Index**	**Maximum Number of Packages Transported as a Fissile Material Control Shipment**
H/X<=3 (Note 2)	3 H/X<=10	H/X<=10	10<=H/X<=20		
14	3.6 (Note 3)	....	....	1.3	80
....	....	2.5	2.4	1.8	50

NOTES:

1. Plutonium solutions are not authorized.
2. H/X is the ratio of hydrogen to fissile atoms in the inner containment with all sources of hydrogen in the containment considered.
3. Volume must not be over 3.6 liters.

A11.8.2.2. DOT 6M Metal Packaging. Authorized only for solid radioactive materials that do not decompose at temperatures up to 121 degrees C (250 degrees F). Radioactive decay heat output must not exceed 10 watts. Radioactive materials in other than special form must be packaged in one or more tightly-sealed metal cans or polyethylene bottles within a DOT specification 2R containment vessel. This package is authorized for use until 1 Oct 2008. The following applies:

A11.8.2.2.1. Limit packages of fissile material with a criticality TI equal to 0.0 to 1.6 kg of uranium 235; 0.9 kg of plutonium (except that due to the 10-watt thermal decay heat limitation, the limit for plutonium-238 is 0.02 kg); and 0.5 kg of uranium-233. The maximum ratio of hydrogen to fissile material must not be greater than three, including all of the sources of hydrogen within the DOT 2R containment vessel.

A11.8.2.2.2. Use **Table A11.5.** to determine maximum quantities of fissile material and other restrictions for materials with a criticality TI if greater than 0.0. The minimum transport index to be assigned per package and, for fissile material, controlled shipments, the allowable number of similar packages per transport vehicle is shown in **Table A11.5.** Where a maximum ratio of hydrogen to fissile material is specified in **Table A11.5.**, only the hydrogen interspersed with the fissile material has to be considered. For a uranium-233 shipment, the maximum inside diameter of the inner containment vessel must not be over 12.1 cm (4.75 inches). Where necessary, use a tight-fitting steel insert to reduce a larger diameter inner containment vessel specified in 49 CFR 178.354 to the 12 centimeters (4.75 inches) limit.

A11.8.2.3. Type B(U) or B(M) packaging that meets the standards for packaging of fissile materials in 10 CFR Part 71, and is approved by the US Nuclear Regulatory Commission per 49 CFR 173.471.

A11.8.2.4. Type B(U) or B(M) packaging that meets the applicable requirements for fissile radioactive materials in section VI of the IAEA "*Regulations for the Safe Transport of Radioactive Materials*, *No. TS-R-1*" and for which the foreign competent authority certificate has been revalidated by the DOT according to 49 CFR 173.473. Authorized only for export and import shipments.

A11.8.2.5. DOT 20PF-1, 20PF-2, 20PF-3, 21PF-1A, or 21PF-1B phenolic-foam insulated overpacks with snug fitting inner metal cylinders meeting all of the applicable requirements of **A3.1.**, **A3.3.7.1.**, and **A3.3.7.2.**, and the following:

A11.8.2.5.1. Handling procedures and packaging criteria must comply with US Enrichment Corporation Report Number USEC-651 or ANSI Standard N14.1.

A11.8.2.5.2. Quantities of uranium hexafluoride are authorized as shown in **Table A11.6.**, with each package assigned a minimum transport index as also shown.

Table A11.5. Authorized Contents for Specification 6M Packages (note 1)

Uranium-233 (note 5)			Uranium-235 (note 4 and 7)			Plutonium (note 2, 3, and 4)			Minimum Transport Index	Maximum Number of Packages Transported as a Fissile Material Control Shipment
Metal or Alloy	Compounds		Metal or Alloy	Compounds		Metal or Alloy	Compounds			
H/X = 0 (note 8)	H/X = 0	H/X <=3	H/X = 0	H/X = 0	H/X <=3	H/X = 0	H/X = 0	H/X <=3		
0.5	0.5	0.5	1.6	1.6	1.6	0.9 (note 9)	0.9 (note 9)	0.9 (note 9)	0	NA
3.6	4.4	2.9	7.2	7.6	5.3	3.1	4.1	3.4	0.1	1,250
4.2 (note 6)	5.2	3.5	8.7	9.6	6.4	3.4	4.5	4.1	0.2	625
5.2 (note 6)	6.8	4.5	11.2	13.9	8.3	4.2	---	4.5	0.5	250
---	---	---	13.5	16.0	10.1	4.5	---	---	1.0	125
---	---	---	---	26.0	16.1	---	---	---	5.0	25
---	---	---	---	32.0	19.5	---	---	---	10.0	12

NOTES:

1. Quantity in kg.
2. Minimum percentage of plutonium-240 is 5 weight percent.
3. 4.5 kilogram limitation of plutonium due to 10 watt decay heat limitation.
4. For a mixture of uranium-235 and plutonium, an equal amount of uranium-235 may be substituted for any portion pf plutonium authorized.
5. Maximum inside diameter of Specification 2R containment vessel must not be greater than 12.1 cm (4.75 inch) see **A11.8.2.**
6. Granulated or powdered metal with any particle less than 8 mm (0.25 inch) in the smallest dimension is not authorized.

7. Except for material with a criticality TI of 0.0, the maximum permitted uranium-235 enrichment is 93.5 percent.
8. H/X is ratio of hydrogen to fissile atoms in the inner containment.
9. For Pu-238, the limit is 0.02 kg due to the 10 watt thermal decay heat limitation.

Table A11.6. Authorized Quantities of Uranium Hexafluoride (UF6) as Fissile Class II.

	Maximum Inner Cylinder Diameter		**Maximum Weight of UF_6 Contents**			
Protective Overpack Specification Number	**Centimeter**	**Inch**	**Kilograms**	**Pounds**	**Maximum U^{235}** Enrichment (weight %)	**Minimum Transport Index**
20PF-1	12.7	5	25	55	100.0	0.1
20PF-2	20.3	8	116	255	12.5	0.4
20PF-3	30.5	12	209	460	5.0	1.1
21PF-1A or 21PF-1B (Note 1)	76 (Note 2)	30 (Note 2)	2,250	4,950	5.0	5.0
21PF-1A or 21PF-1B (Note 1)	76 (Note 3)	30 (Note 3)	2,282	5,020	5.0	5.0
21PF-2 (Notes 1)	76 (Note 2)	30 (Note 2)	2,250	4,950	5.0	5.0
21PF-2 (Note 1)	76 (Note 3)	30 (Note 3)	2,282	5,020	5.0	5.0

NOTES:

1. For 76 cm cylinders, the maximum permitted H/U atomic ratio is 0.088.
2. Model 30A inner cylinder (reference: USEC-651).
3. Model 30B inner cylinder (reference: USEC-651).

A11.9. Authorized Packaging-Pyrophoric Radioactive Materials. Package pyrophoric radioactive materials in quantities not over A_2 per package in DOT Type 7A packagings constructed of materials that do not react nor be decomposed by the contents. Contents must be:

A11.9.1. In solid form and must not be fissile unless excepted by **A3.3.7.9.**

A11.9.2. Contained in sealed and corrosion resistant receptacles with positive closures (friction or slip-fit covers or stoppers are not authorized).

A11.9.3. Free of water and any contaminants that increase the reactivity of the material.

A11.9.4. Made inert to prevent self-ignition during transport by either:

A11.9.4.1. Mixing with large volumes of inerting materials such as graphite or dry sand, or other suitable inerting material, or blended into a matrix of hardened concrete.

A11.9.4.2. Filling the innermost receptacle with an appropriate inert gas or liquid.

A11.10. Authorized Packaging-Oxidizing Radioactive Materials. Package certain oxidizing radioactive materials, which are not fissile materials and not in quantities over A_2, in DOT Type 7A packaging. The following requirements apply to the contents and packaging:

A11.10.1. Pack in suitable inside packagings of glass, metal, or compatible plastic.

A11.10.2. Suitably cushion with a material which will not react with the contents.

A11.10.3. Inner packaging and cushioning must be enclosed within an outside packaging of wood, metal, or plastic.

A11.10.4. The package must be capable of meeting the applicable test requirements of 49 CFR 173.465 without leakage of contents.

A11.10.5. The maximum quantity in any package must not be over 11.3 kg (25 pounds).

A11.11. Excepted Packages for Limited Quantities of Radioactive Materials. Radioactive materials whose activity per package is not over the limits specified in **A11.15.** are excepted from the specification packaging, marking, labeling and, if not a hazardous substance or a hazardous waste, shipping paper certification requirements if:

A11.11.1. The materials are packaged in strong, tight packages that will not leak any of the radioactive materials under normal transportation conditions. Packaging must meet the requirements of **A3.3.7.1.**

A11.11.2. The radiation level at any point on the external surface of the package is not over 0.005 mSv/h (0.5 mrem/h).

A11.11.3. The nonfixed (removable) radioactive surface contamination on the external surface of the package is not over the limits specified in **A3.3.7.11.**

A11.11.4. Except as provided in **A11.16.**, the package does not contain more than 15 grams of uranium^{235}.

A11.11.5. The material is otherwise prepared for shipment as specified in **A11.12.**

A11.12. Additional Requirements for Excepted Packages Containing Class 7 (Radioactive Materials).

A11.12.1. An excepted package of radioactive materials prepared for shipment under **A11.11.**, **A11.14.**, or **A11.16.** is not subject to any additional requirements except as follows:

A11.12.2. The outside of each package must be marked with the UN identification number for the material preceded by the letters “UN”.

A11.12.3. A limited quantity of radioactive material classed as Class 7 and prepared for shipment under provisions of **A11.11.**, **A11.13.**, **A11.14.**, or **A11.16.** is not subject to the requirements of this manual except for **A3.3.7.4.**, and incident reporting.

A11.12.4. Annotate the Military Shipping Label (MSL) with the word "Nonhazardous."

A11.13. Multiple Hazard Limited Quantity of Radioactive Materials.

A11.13.1. Except as provided in **A11.13.2.**, when a limited quantity radioactive material meets the definition of another hazard class, it must be:

A11.13.1.1. Classed for the additional hazard.

A11.13.1.2. Packaged to conform to requirements specified in **A11.11.** or **A11.14.** as appropriate.

A11.13.1.3. Offered for transportation per requirements applicable to the hazard for which it is classed.

A11.13.2. When a limited quantity radioactive material meets the definition of Class 9 material, or is a combustible liquid in a packaging having a rated capacity of 110 gallons (416 L) or less, it must be:

A11.13.2.1. Classed as a radioactive material if the material is not a hazardous waste or hazardous substance.

A11.13.2.2. Classed as a Class 9 material if the material is a hazardous waste or hazardous substance.

A11.13.2.3. Packaged to conform to requirements specified in **A11.11.** or **A11.14.** as appropriate.

A11.13.2.4. Offered for transportation according to requirements applicable to the hazard for which it is classed.

A11.13.3. When a limited quantity radioactive material which is classed other than a radioactive material under provisions **A11.13.** or **A11.13.1.**, it is excepted from requirements of **A11.12.1.**, and **Attachment 17**, if the entry "Limited quantity radioactive material" appears on the shipping paper in association with the basic description.

A11.14. Excepted Packages for Instruments and Articles. Instruments and manufactured articles (including clocks, electronic tubes, or apparatus) or similar devices having radioactive materials in gaseous or nondispersible solid form as a component part are excepted from the specification packaging, marking, labeling, and shipping paper certification requirements if:

A11.14.1. Each package meets the requirements of **A3.3.7.1.**

A11.14.2. The activity of the instrument or article is not over the applicable limit listed in **Table A11.7.**

A11.14.3. The total activity per package is not over the applicable limit listed in **Table A11.7.**

A11.14.4. The active material is completely enclosed by a nonactive component.

A11.14.5. The radiation level at 10 cm (4 inches) from any point on the external surface of any unpackaged instrument or article is not over 0.1 mSv/h (10 mrem/h).

A11.14.6. The radiation level at any point on the external surface of a package bearing the article or instrument is not over 0.005 mSv/h (0.5 mrem/h); or, for exclusive use domestic shipments, 0.02 mSv/h (2 mrem/h).

A11.14.7. The nonfixed (removable) radioactive surface contamination on the external surface of the package is not over the limits specified in **A3.3.7.11.**

A11.14.8. Except as provided in **A11.16.**, the package does not contain more than 15 grams of uranium^{235}.

A11.14.9. The instrument or article is otherwise prepared for shipment as specified in **A11.12.**

A11.15. Table of Activity Limits-Excepted Quantities and Articles. The limits that apply to instruments, articles, and limited quantities subject to exceptions under **A11.11.** and **A11.14.** are shown in **Table A11.7.**

A11.16. Excepted Articles Containing Natural Uranium or Thorium. Manufactured articles, in which the sole radioactive material content is natural or unirradiated depleted uranium or natural thorium, are excepted from the specification packaging, marking, labeling, and shipping paper certification requirements if:

A11.16.1. Each package meets the requirements of **A3.3.7.1.**

A11.16.2. The outer surface of the uranium or thorium is enclosed in an inactive sheath made of metal or other durable protective material.

A11.16.3. The conditions specified in **A11.11.** are met.

A11.16.4. The article is otherwise prepared for shipment as specified in **A11.12.**

A11.17. Transport Requirements for Low Specific Activity (LSA) Radioactive Materials and Surface Contaminated Objects (SCO).

A11.17.1. In addition to other applicable requirements, prepare LSA materials and SCO as follows:

A11.17.1.1. The external dose rate must not exceed an external radiation level of 10 mSv/h (1rem/h) at 3 meters from the unshielded material.

A11.17.1.2. LSA material or SCO that are or contain fissile material must meet all applicable requirements for fissile material.

A11.17.1.3. The nonfixed (removable) radioactive surface contamination on the external surface of the package is not over the limits specified in **A3.3.7.11.**

A11.17.1.4. Ensure external radiation levels comply with **A3.3.7.2.**

A11.17.1.5. Do not exceed 100 A_2 for SCO or LSA-II and LSA III, combustible solids and all liquids and gases.

A11.17.2. Pack in a DOT 7A Type A packaging.

A11.17.3. Pack in any Type B, B(U), or B(M), packaging meeting the requirements of 49 CFR 173.416.

A11.17.4. Pack in nonbulk industrial packaging (IP) as authorized in 49 CFR 173.427.

Table A11.7. Activity Limits for Limited Quantities Instruments and Articles.

	Instruments and Articles (note 1)		
Nature of Contents	**Limits for each instrument and article**	**Package Limits**	**Materials Package Limits**
Solids			
Special Form	10^{-2} A_1	A_1	10^{-3} A_1
Normal Form	10^{-2} A_2	A_2	10^{-3} A_2
Liquids			
Tritiated Water:			
<0.0037 TBq/liter (0.1 Ci/L)			37 TBq (1000 Ci)
0.0037 TBq to 0.037 TBq/L (0.1 Ci to 1.0 Ci/L)			3.7 TBq (100 Ci)
>0.037 TBq/L (1.0 Ci/L)			0.037 TBq (1 Ci)
Other Liquids	10^{-3} A_2	10^{-1} A_2	10^{-4} A_2
Gases			
Tritium (Note 2)	2×10^{-2} A_2	2×10^{-1} A_2	2×10^{-2} A_2
Special Form	10^{-3} A_1	10^{-2} A_1	10^{-3} A_1
Normal Forms	10^{-3} A_2	10^{-2} A_2	10^{-3} A_2

NOTES:

1. For mixture of radionuclides see 49 CFR 173.433(b).
2. These values also apply to tritium in activated luminous paint and trtium absorbed on solid carriers.

A11.18. Uranium Hexaflouride (fissile, fissile excepted, and nonfissile). Prepare this material for military air shipment according to 49 CFR 173.420.

Attachment 12

CLASS 8--CORROSIVE MATERIALS

A12.1. General Requirements. This attachment contains information concerning the packaging and general handling instructions for Class 8 (corrosive materials).

A12.2. General Handling Instructions for Corrosive Materials.

A12.2.1. Store corrosive materials in a cool, well ventilated area away from sources of heat and oxidizing agents.

A12.2.2. Both the vapor and the liquid are corrosive and irritating and cause burns to the body and damage to the aircraft.

A12.2.3. Properly placard the storage area.

A12.2.4. Ensure protective masks or respirators, rubber gloves, goggles, and other protective clothing as required are readily available.

A12.3. Packaging for Liquid Class 8 Materials. See also **Attachment 3**.

A12.3.1. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	**Drums:** steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plywood (1D), fiber (1G) or plastic (1H1 or 1H2)

A12.3.2. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	**Barrel:** wood (2C2) ***NOTE:*** Not authorized for PG I material.

A12.3.3. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	**Jerricans:** steel (3A1 or 3A2), aluminum (3B1 or 3B2) or plastic (3H1 or 3H2)

A12.3.4. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	**Boxes:** steel (4A), aluminum (4B), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2)

A12.3.5. Package as follows:

Inner packaging	Outer packaging
Not required	**Drums:** steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plastic (1H1 or 1H2) or fiber (1G) with liner ***NOTE:*** fiber (1G) with liner only authorized for PG III material.

A12.3.6. Package as follows:

Inner packaging	Outer packaging
Not required	Barrel: wood (2C1) ***NOTE:*** Not authorized for PG I material.

A12.3.7. Package as follows:

Inner packaging	Outer packaging
Not required	**Jerricans:** steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2)

A12.3.8. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Plastic	**Drums:** Steel, aluminum, fiber, plastic, or plywood (6HA1, 6HB1, 6HG1, 6HH1, or 6HD1) ***NOTE:*** plywood drum not authorized for PG I material.

A12.3.9. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Plastic	**Boxes:** steel, aluminum, wooden, plywood or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A12.3.10. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	**Drums:** steel, aluminum or fiber (6PA1, 6PB1, or 6PG1)

A12.3.11. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	**Boxes:** steel, aluminum, wooden or fiberboard (6PA2, 6PB2, 6PC, or 6PG2)

A12.3.12. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	solid or expanded plastic packaging (6PH1 or 6PH2)

A12.3.13. **DOT Cylinders.** DOT specification cylinders as prescribed for any compressed gas, except DOT 8 (acetylene) and DOT 3HT.

A12.3.14. **DS2.** Package as described below.

A12.3.14.1. Wooden box (4C1) or fiberboard box (4G) with inside original 1.3 L (1 1/3 quart) capacity containers. Arrange in snugly fitting cells not more than 12 per box. Place full box size pads against all inside faces of the box. Maximum gross weight is 45.4 kg (100 pounds).

A12.3.14.2. Wooden box (4C1) or fiberboard box (4G) with an inside 19 L (5 gallon) metal drum. Overpack DS2 containers that are not in good condition in metal drums. Cushion the cans with a minimum of 76 mm (3 inches) of vermiculite on all sides.

A12.4. Packaging for Solid Class 8 Materials.

A12.4.1. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	**Drums:** steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plywood (1D), fiber (1G) or plastic (1H1 or 1H2)

A12.4.2. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	**Barrel:** wood (2C2)

A12.4.3. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	**Jerricans:** steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2)

A12.4.4. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	**Boxes:** steel (4A), aluminum (4B), Natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G) or solid plastic box (4H2)

A12.4.5. Package as follows:

Inner packaging	Outer packaging
Not required	**Drums:** steel (1A1 or 1A2), aluminum (1B1 or 1B2), metal other than steel or aluminum (1N1 or 1N2), plywood (1D), plastic (1H1 or 1H2) or fiber (1G) ***NOTE:*** Plywood (1D) is not authorized for PG I material.

A12.4.6. Package as follows:

Inner packaging	Outer packaging
Not required	**Barrel:** wood (2C1 or 2C2) ***NOTE:*** Not authorized for PG I material.

A12.4.7. Package as follows:

Inner packaging	Outer packaging
Not required	**Jerricans:** steel (3A1 or 3A2), aluminum (3B1 or 3B2), or plastic (3H1 or 3H2)

A12.4.8. Package as follows:

Inner packaging	Outer packaging
Not required	**Boxes:** steel with liner (4A), aluminum with liner (4B), steel (4A1), aluminum (4B1), natural wood sift-proof (4C2), plywood (4D), reconstituted wood (4F), natural wood (4C1), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2) ***NOTE:*** Steel (4A1), aluminum (4B1), natural wood (4C1), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2) is not authorized for PG I material.

A12.4.9. Package as follows:

Inner packaging	Outer packaging
Not required	**Bags:** woven plastic (5H1, 5H2, or 5H3); plastic film (5H4); textile (5L1, 5L2, or 5L3); or paper, multiwall, water-resistant (5M2) ***NOTE:*** Not authorized for PG 1 material.

A12.4.10. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Plastic	**Drums:** steel, aluminum, plywood, fiber, or plastic (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1)

A12.4.11. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Plastic	**Boxes:** steel, aluminum, wood, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A12.4.12. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	**Drums:** steel, aluminum, plywood, or fiber (6PA1, 6PB1, 6PD1, or 6PG1)

A12.4.13. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	**Boxes:** steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, or 6PG2)

A12.4.14. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	expanded or solid plastic packaging (6PH1 or 6PH2)

A12.5. Batteries, Wet, Filled with Acid; Batteries, Wet, Filled with Alkali; or Batteries, Wet, Non-spillable.

A12.5.1. The following applies.

A12.5.1.1. Completely protect against short circuit and securely cushion electric storage batteries containing electrolyte acid or alkali corrosive battery fluid within the outer container.

A12.5.1.2. Place batteries inside an acid-proof liner (not mandatory for nonspillable batteries), adequately sealed to prevent leakage in the event of a spill, within the outer container.

A12.5.1.3. Pack batteries so that the fill openings or vents, if any, are upward.

A12.5.1.4. Do not pack with other articles unless authorized by a specific packaging paragraph.

A12.5.1.5. However, batteries may be packed with portable searchlights, battery parts, or hydrometers, if properly cushioned and securely packed in a separate container.

A12.5.2. **Batteries Packed without other Materials.**

A12.5.2.1. Package as follows:

Inner packaging	Outer packaging
Not required	**Boxes:** wooden (4C1, 4C2, 4D, 4F) or fiberboard (4G) ***NOTE:*** Must meet PG II performance standards.

A12.5.2.2. Package as follows:

Inner packaging	Outer packaging
Not required	**Drums:** plywood (1D), fiber (1G), or plastic (1H2) ***NOTE:*** Must meet PG II performance standards.

A12.5.2.3. Package as follows:

Inner packaging	Outer packaging
Not required	**Jerrican:** plastic (3H2) ***NOTE:*** Must meet PG II performance standards.

A12.5.2.4. Package as follows:

Inner packaging	Outer packaging
Not required	**Box:** solid plastic (4H2) ***NOTE:*** Must meet PG II performance standards.

A12.5.3. **Non-Spillable Batteries.** Pack in strong outer packagings. To consider a battery non-spillable, it must withstand without leakage the vibration and pressure differential tests specified in 49 CFR 173.159(d). Batteries meeting the additional requirement of Special Provision A67 are considered dry, and are not subject to any other requirements of this manual.

A12.5.4. **Electrolyte, Acid, or Alkali Corrosive Battery Fluid, Packed with Storage Batteries Wet or Dry** . Package as described below.

A12.5.4.1. Package as follows:

Inner packaging	Outer packaging
Glass receptacles ***NOTE:*** Not over 4.0 L (1 gallon) capacity each.	wooden box (4C1, 4C2, 4D, 4F) ***NOTE:*** Maximum quantity is 8.0 L (2 gallons) each. Cushion and separate the inside containers from batteries by a strong solid wooden partition.

A12.5.4.2. Package as follows:

Inner packaging	Outer packaging
Plastic bottles ***NOTE:*** Not over 1 L (1 quart) capacity each.	wooden box (4C1, 4C2, 4D, 4F) ***NOTE:*** Pack no more than 24 bottles, securely separated from storage batteries and filling kits in each package.

A12.5.4.3. Package dry storage batteries or battery charger devices in fiberboard boxes (4G) with inner receptacles containing battery fluid. Complete package must conform to PG II requirements. Pack no more than 12 inner receptacles in one outer box. Maximum authorized gross weight is 34 kg (75 pounds).

A12.5.5. **Batteries Packed without other materials (Domestic Shipments Only).** The following nonspecification packagings are authorized for domestic only shipments of batteries packed without other materials:

A12.5.5.1. One to three batteries of not over 11.3 kg (25 pounds) each, packed in an outside box. Gross weight must not exceed 34 kg (75 pounds).

A12.5.5.2. A maximum of four batteries not over 7 kg (15 pounds) each may be packed in strong outside fiberboard or wooden boxes. They must be cushioned and packed to prevent short circuits. Gross weight must not be over 30 kg (65 pounds).

A12.5.5.3. A maximum of five batteries not over 4.5 kg (10 pounds) each may be packed in an outside fiberboard or wooden box. They must be securely cushioned and packed to prevent short circuits. Gross weight must not exceed 30 kg (65 pounds).

A12.5.5.4. Single batteries not over 34 kg (75 pounds) each, packed in five-sided slipcovers or in completely closed fiberboard boxes. Slipcovers and boxes must be of single or double-faced corrugated fiberboard of at least 91 kg (200 pounds) test strength. The slipcover or the fiberboard box must fit snugly and provide an inside top clearance of at least 1.3 cm (one-half inch) above battery terminals and filler caps with reinforcements in place. When assembled for shipment, the bottom edges of the slipcover may extend to the base of the battery and must not expose more than 25.4 mm (1 inch). The completed package (battery and box or slipcover) must be capable of withstanding a top-to-bottom compression test without damage to the battery terminals, cell covers, or filler caps.

A12.5.5.5. Single batteries exceeding 34 kg (75 lbs) each may be packed in completely closed fiberboard boxes. Boxes must be double-wall corrugated fiberboard of at least 181 kg (400 lbs) test, or solid fiberboard testing at least 181 kg (400 lbs). A box may have holes in its ends provided that the handholes will not materially weaken the box. Sides and ends of the box must not be less than 1.3 cm (0.5 inch); and cushioning must be excelsior pads, corrugated fiberboard, or other suitable cushioning material. Protect the bottom of the battery by a minimum of one excelsior or double-wall corrugated fiberboard pad. Protect the top of the battery by a wood frame, corrugated trays or scored sheets of corrugated fiberboard having minimum test of 91 kg (200 lbs), or other equally effective cushioning material. Ensure the top protection bears evenly on connectors and/or edges of the battery cover to facilitate stacking of batteries. No more than one battery may be placed in one box. The maximum authorized gross weight is 91 kg (200 lbs).

A12.5.5.6. Large electric storage batteries protected against short circuit and firmly secured to skids or pallets capable of withstanding the shocks normally incident to transportation. The height of the completed unit must not be greater than 1.5 times the width of the skid or pallet. The unit must weigh not less than 136 kg (300 lbs) gross and must not fail under a superimposed weight equal to two times the weight of the unit. If the weight of the unit is greater than 907 kg (2,000 lbs), it must not fail with a superimposed weight of 1814 kg (4,000 lbs). Battery terminals must not be relied on to support any part of the superimposed weight. Each skid or pallet must be mark and labeled as required by **Attachment 14** and **Attachment 15**.

A12.5.6. Ship batteries, which are an integral component of tactical shelters, secured upright in authorized holders. Disconnect terminal leads and completely protect against short circuit.

A12.6. Bombs, Smoke, Nonexplosive. Ship bombs, smoke, nonexplosive provided they are without ignition elements, bursting charges, detonating fuses, or other explosive components. Packaging must meet PG II performance standards. Package in an outer wooden box (4C1, 4C2, 4D, 4F) or plywood drum (1D).

A12.7. Chemical or First Aid Kits. This description is intended for boxes, cases, etc., containing small amounts of various hazardous materials used for medical, analytical, or testing purposes. Mark containers in accordance with **A14.4.7.** and label in accordance with **A15.4.5.**

A12.7.1. Chemical kits shipped domestically as NA 1760 are excepted from specification packaging if the following requirements are met:

A12.7.1.1. The kit may contain only corrosive liquids.

A12.7.1.2. Liquid is contained in inner receptacles of not over 177 ml (6 fluid ounces) capacity each.

A12.7.1.3. Cushion the inside containers with sufficient absorbent cushioning material to completely absorb the contents of the individual containers, and protect from damage by other materials in the kit.

A12.7.1.4. The contents of the kit must be of such a nature and packed so there will be no possibility of the mixture of contents causing dangerous evolution of heat or gas.

A12.7.1.5. The kit must be a strong wooden or metal container or be packed in a strong wooden or metal container.

A12.7.2. Package chemical kits shipped domestically as NA 1760 and containing corrosive liquids in a fiberboard box (4G) with inner glass receptacles not over 1 L (1 quart) capacity each, securely cushioned and separated from other inside containers. The contents of the kit must be of such a nature and so packed that there will be no possibility of the mixture of contents causing dangerous evolution of heat or gas.

A12.8. Gallium. Package gallium metal in semi-rigid plastic inside packaging of not more than a 2.5 kg (5.5 pound) net capacity each, then individually enclosed in a sealed bag of strong, leak-tight, and puncture-resistant material impervious to liquid gallium. Place the sealed bag in a wooden box (4C1, 4C2, 4D, or 4F), fiberboard box (4G), plastic box (4H1 or 4H2), fiber drum (1G), or steel drum (1A2) lined with a strong, leak-tight, and puncture resistant material impervious to liquid gallium. If necessary to keep in a solid state, enclose this packaging in a strong, water-resistant outer packaging that contains dry ice or other means of refrigeration. The refrigeration must be sufficient to maintain the gallium in a completely solid state during the entire anticipated time it will be in transportation to its destination. If a refrigerant is used, all packaging materials must be chemically and physically resistant to the refrigerant and must have impact resistance at the low temperatures of the refrigerant used. If dry ice is used, the outer package must permit the release of carbon dioxide gas. Packaging must meet PG I performance standards. Manufactured articles, each not containing more than 100 mg (0.0035 oz) of gallium and packaged so that the quantity per package does not exceed 1 g (0.35 oz) are not subject to any other requirements of this manual (see paragraph **1.10.3.**).

A12.9. Hydrogen Fluoride. Package hydrogen fluoride (hydrofluoric acid, anhydrous) in cylinders, DOT 3, 3A, 3AA, 3B, 3BN, 3C, 3E, 4, 4A, 25, or 38; also DOT 4B, 4BA, 4BW, or 4C, if not brazed. Filling density must not exceed 85 percent of the water weight capacity of the cylinder. Cylinders used exclusively in this manner, may, instead of the periodic hydrostatic retest required by 49 CFR 173.34(e), be given a complete external visual inspection and so documented according to 49 CFR 173.163.

A12.10. Mercury (Metallic and Articles Containing Mercury).

A12.10.1. **Handling Instructions.** Mercury is poisonous in liquid and vapor form and can be absorbed through the skin at room temperature. It is corrosive to aluminum and its alloys. It expands on freezing, and may crack glass containers.

A12.10.2. **Packaging Requirements.** Packaging must meet the PG I performance level. Pack inner containers with sufficient cushioning material to prevent breakage. Either the inner packaging or the outer packaging must have an inner liner or bags of strong leak-proof and puncture-resistant material, impervious to mercury, completely surrounding the contents and sealed which will prevent the escape of mercury from the package irrespective of its position. Manufactured articles, each containing not more than 100 mg (0.0035 oz) of mercury and packaged so that the quantity of mercury per package does not exceed 1 g (0.0035 oz) are not subject to any other requirements of this manual (see paragraph **1.10.4.**). Package mercury as follows:

A12.10.2.1. In inner earthenware, glass, or suitable plastic receptacles containing not more than 3.5 kg (7.7 lbs), glass ampoules containing not more than 0.5 kg (1.1 lbs), or iron or steel quicksilver flasks containing not more than 35 kg (77 lbs) of mercury. Package in outer wooden box (4C1, 4C2, 4D, or 4F), fiberboard box (4G), plastic box (4H2), steel drum (1A2), plywood drum (1D), fiber drum (1G), or steel jerrican (3A2).

A12.10.2.2. Use welded steel bottles with inner vaulted bottoms as single packagings. The closure must be a bolt with a conical thread and the opening must not exceed 20 mm (0.79 inches). The maximum authorized net quantity is 35 kg (77 pounds).

A12.10.2.3. Specification packagings are not required for manufactured articles or apparatuses containing mercury when packaged as follows:

A12.10.2.3.1. Manufactured articles or apparatus of which metallic mercury is a component part (manometers, pumps, thermometers, switches, etc.), except as otherwise covered in **A12.10.** These items must be packaged in a strong outer packaging. The inner liner and cushioning requirements of **A12.10.2.** apply.

A12.10.2.3.2. Mercury switches and relays are excepted from this manual if they are of the totally enclosed leak-proof type in sealed metal or plastic units. Thermometers, switches, and relays each containing a total quantity of not more than 15 g (0.53 ounces) of mercury, are also excepted if installed as an integral part of a machine or apparatus and so fitted that damage or leakage of mercury is unlikely to occur under conditions normally incident to transport.

A12.10.2.4. Package electrons tubes, mercury vapor tubes, and similar tubes as follows:

A12.10.2.4.1. In strong outer packagings with all seams and joints sealed with self adhesive, pressure-sensitive tape that will prevent the escape of mercury from the package. The maximum net quantity is 450 g (15.9 ounces) of mercury per package.

A12.10.2.4.2. Package tubes with more than 450 g (15.9 ounces) of mercury in strong outer packagings having sealed inner liners or bags of strong leak-proof and puncture-resistant material impervious to mercury, completely surrounding the contents which will prevent the escape of mercury from the package irrespective of its position.

A12.10.2.4.3. Tubes which do not contain more than 5 g (0.2 ounces) of mercury each and that are packed in the manufacturer's original packaging. Maximum total net quantity is 30 g (1.1 ounces) of mercury per package.

A12.10.2.4.4. Tubes which are completely jacketed in sealed leak-proof metal cases and are packed in the manufacturer's original packaging.

A12.10.2.5. Mercurial barometers complying with **A12.10.2.3.1.**, that are loaded and unloaded from an aircraft under the supervision of, and are accompanied in flight by a US weather official or a similar US agency official (for example, Air Weather Service personnel), are excepted from any other requirements of this manual.

A12.11. Nitrating Acid Mixtures; Nitrating Acid Mixtures, Spent; or Nitric Acid. Do not package nitric acid exceeding 40 percent concentration with any other material. Package nitric acid as follows:

A12.11.1. Pack nitric acid in any concentration, which does not contain sulfuric acid or hydrochloric acid as impurities, in:

A12.11.1.1. Stainless steel drum (1A1). Do not ship containers weighing less than 85 percent of their original marked weight. Stainless steel used in drums must be at least 0.9 mm (.035 inches) for 55 L (15 gallon) nominal capacity, 1.2 mm (.047 inches) for 115 L (30 gallon) nominal capacity, and 1.5 mm (.059 inches) for 210 L (55 gallon) nominal capacity. Type 304 or other grades of equivalent corrosion-resistant steel in as-welded condition are authorized for nitric acid concentra-

tions of up to and including 78 percent. In addition to the UN specification markings, the marking as specified in 49 CFR 173.158(b)(1) must be included on the drum. An example of this marking is: 304HT/1.9/2.7/TW55. For all other concentrations of nitric acid the following are authorized:

A12.11.1.1.1. Type 304 heat-treated (quenched in water at 1040 degrees C [1900 degrees F]).

A12.11.1.1.2. Stabilized type 347 in the as-welded condition.

A12.11.1.1.3. Stabilized type 347 stress-relieved (845-900 degrees C [1550-1650 degrees F]).

A12.11.1.1.4. Stabilized type 347 heat-treated (quenched in water at 1040 degrees C [1900 degrees F]).

A12.11.1.1.5. Other grades of equivalent corrosion resistance.

A12.11.1.2. Expanded plastic box (4H1), with inner glass receptacles not over 2.5 L (0.66 gallons) capacity each. Pack no more than four glass inner receptacles in one outer packaging.

A12.11.2. Pack nitric acid of 90 percent or greater concentration in a wooden box (4C1, 4C2, 4D, or 4F), with inner glass bottles not over 2.5 L (0.66 gallons) capacity each. The inside containers must be individually overpacked and cushioned in tightly closed metal containers, then packed in the outer container.

A12.11.3. Pack nitric acid, of 80 percent or greater concentration that does not contain sulfuric acid or hydrochloric acid as impurities, in an aluminum drum (1B1). Maximum quantity is 38 L (10 gallons).

A12.11.4. Package nitric acid of less than 90 percent concentration in a wooden box (4C1, 4C2, 4D, or 4F) or fiberboard box (4G) with inside glass bottles not over 2.5 L (0.66 gallons) capacity each.

A12.11.5. Package nitric acid of more than 70 percent concentration in outer wooden box (4C1, 4C2, 4D, or 4F), fiberboard box (4G), steel drum (1A2), aluminum drum (1B2), plastic drum (1H2), plywood drum (1D), fiber drum (1G), or plastic jerrican (3H2) with inside containers:

A12.11.5.1. Glass or earthenware containers not over 1 L (1 quart) capacity each

A12.11.5.2. Glass ampoules not over 0.5 L (1 pint) capacity each..

A12.11.6. Pack nitric acid of 70 percent or less concentration in outer wooden box (4C1, 4C2, 4D, or 4F), fiberboard box (4G), steel drum (1A2), aluminum drum (1B2), plastic drum (1H2), plywood drum (1D), fiber drum (1G), or plastic jerrican (3H2) with inside containers:

A12.11.6.1. Glass or earthenware not over 2.5 L (0.66 gal) capacity each

A12.11.6.2. Plastic not over 2.5 L (0.66 gal) capacity each further individually placed into tightly closed metal packaging

A12.11.6.3. Glass ampoules not over 0.5 L(0.1 gal) capacity each

A12.11.7. Pack nitric acid of 70 percent or less concentration in composite packaging (6PA1, 6PA2, 6PB1, 6PB2, 6PC, 6PD1, 6PH1, 6PH2). Composite packaging 6HH1 and 6HA1 meeting the compatibility requirements of 49 CFR 173.24(e) are also authorized.

A12.11.8. Pack nitric acid of 70 percent or less concentration in outer plastic box (4H1) with inside glass packaging containing not more than 2.5 L (0.66 gal) each.

A12.12. Packaging for Class 8 Materials With an Inhalation Hazard (Hazard Zone A and B).

A12.12.1. **Handling Instructions.** These items are extremely dangerous. Wear approved chemical safety mask and clothing when handling this material. (Handling instruction only required for Hazard Zone A material).

A12.12.2. **Packaging Requirements.** Package Class 8 materials with an Inhalation Hazard (Hazard Zone A and B) as follows:

A12.12.2.1. In DOT cylinders as identified in 49 CFR, part 178, subpart C, except that specification 8, 8AL, and 39 cylinders are not authorized. Cylinders must also meet the requirements of **A3.3.2.**

A12.12.2.2. Packed in an inner drum (1A1, 1B1, 1N1, 1H1, or 6HA1), then placed in an outer drum (1A2 or 1H2). Both the inner and outer drum must be tested to the PG I performance level. The outer 1A2 drum must have a minimum thickness of 1.35 mm (0.053 inches). The outer 1H2 drum must have a minimum thickness of 6.30 mm (0.248 inches). The capacity of the inner drum must not exceed 220 L (58 gallons). Cushion the inner drum within the outer drum with a shock-mitigating, nonreactive material. There must be a minimum of 5.0 cm (2 inches) of cushioning material between the outer surface (side) of the inner drum and the inner surface (side) of the outer drum, and at least 7.6 cm (3 inches) of cushioning material between the outer surface (top and bottom) of the inner drum and the inner surface (top and bottom) of the outer drum. The inner drum must also meet the following requirements:

A12.12.2.2.1. Satisfactorily withstand a hydrostatic pressure test (as outlined in 49 CFR, paragraph 178.605) of 550 kPa (80 psig).

A12.12.2.2.2. Satisfactorily withstand a leakproofness test (as outlined in 49 CFR, paragraph 178.604) using an internal air pressure at 55 degrees C (131 degrees F) of at least twice the vapor pressure of the material to be packaged.

A12.12.2.2.3. Have screw-type closures that meet all the following requirements:

A12.12.2.2.3.1. Closed tightly to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A12.12.2.2.3.2. Physically held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation.

A12.12.2.2.3.3. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psig).

A12.12.2.2.4. Meet the following minimum thickness requirements:

A12.12.2.2.4.1. 1A1 and 1N1 drums with a capacity of less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.3 mm (0.051 inches). 1B1 drums with a capacity of less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.9 mm (0.154 inches).

A12.12.2.2.4.2. 1A1 and 1N1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.7 mm (0.067 inches). 1B1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 4.7 mm (0.185 inches).

A12.12.2.3. Pack in an inner packaging system that consists of an impact-resistant receptacle of glass, earthenware, plastic, or metal securely cushioned with a nonreactive absorbent material. The package must be packed within a leak-tight packaging of metal or plastic, then packed in a steel drum (1A2), aluminum drum (1B2), metal drum other than steel or aluminum (1N2), plywood drum (1D), fiber drum (1G), plastic drum (1H2), wooden barrel (2C2), steel jerrican (3A2), plastic jerrican (3H2), steel box (4A), aluminum box (4B), natural wood box (4C1 or 4C2), plywood box (4D), reconstituted wood box (4F), fiberboard box (4G), expanded plastic box (4H1), or solid plastic box (4H2). The capacity of the inner receptacle must not exceed 4 L (1 gallon). An inner receptacle that has a closure must have a screw-type closure, which is held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation. Both the inner packaging system and the outer container must each meet the test requirements of the PG I performance level independently. The total amount of liquid that can be packed in the outer container must not exceed 16 L (4 gallons).

A12.12.2.4. Pack in a metal drum (1A1, 1B1, or 1N1), or plastic drum (1H1), then placed in a metal drum (1A2 or 1H2), or a plastic receptacle with outer steel drum (6HA1). Both the inner and outer drum must be tested to the PG I performance level. The outer 1A2 drum must have a minimum thickness of 1.35 mm (0.053 inches.) The outer 1H2 drum must have a minimum thickness of 6.30 mm (0.248 inches). The capacity of the inner drum (1A1, 1B1, 1N1, or 1H1) must not exceed 220 L (58 gallons). This packaging is only authorized for Class 8, Hazard Zone B material. Cushion the inner drum within the outer drum with a shock-mitigating, nonreactive material. There must be a minimum of 5.0 cm (2 inches) of cushioning material between the outer surface (side) of the inner drum and the inner surface (side) of the outer drum, and at least 7.6 cm (3 inches) of cushioning material between the outer surface (top and bottom) of the inner drum and the inner surface (top and bottom) of the outer drum. The inner drum must also meet the following requirements:

A12.12.2.4.1. Satisfactorily withstand a leakproofness test (as outlined in 49 CFR, paragraph 178.604) using an internal air pressure at 55 degrees C (131 degrees F) of at least twice the vapor pressure of the material to be packaged.

A12.12.2.4.2. Have screw-type closures that meet all the following requirements:

A12.12.2.4.2.1. Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

A12.12.2.4.2.2. Physically held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation.

A12.12.2.4.2.3. Provided with a cap seal that is properly applied according to the cap seal manufacturer's recommendations. The cap seal must be capable of withstanding an internal pressure of at least 100 kPa (15 psig).

A12.12.2.4.3. Meet the following minimum thickness requirements:

A12.12.2.4.3.1. 1A1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 0.69 mm (0.027 inches). 1B1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 2.79 mm (0.110 inches). 1H1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 1.14 mm (0.045 inches). 6HA1 drums with a capacity of less than or equal to 30 L (7.9 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches)

for the inner plastic drum and a minimum thickness of 0.70 mm (0.027 inches) for the outer steel drum.

A12.12.2.4.3.2. 1A1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.08 mm (0.043 inches). 1B1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.9 mm (0.154 inches). 1H1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 3.16 mm (0.124 inches). 6HA1 drums with a capacity greater than 30 L (7.9 gallons) but less than or equal to 120 L (32 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 0.96 mm (0.038 inches) for the outer steel drum.

A12.12.2.4.3.3. 1A1 or 1N1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.35 mm (0.053 inches). 1B1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 4.7 mm (0.185 inches). 1H1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 3.16 mm (0.124 inches). 6HA1 drums with a capacity greater than 120 L (32 gallons) must have a minimum thickness of 1.58 mm (0.0625 inches) for the inner plastic drum and a minimum thickness of 1.08 mm (0.043 inches) for the outer steel drum.

Attachment 13

CLASS 9--MISCELLANEOUS HAZARDOUS MATERIAL

A13.1. General Requirements. This attachment cotnains information concerning the packaging and general handling instructions for Class 9 (Miscellaneous Hazardous Materials).

A13.2. General Handling Instructions.

A13.2.1. Class 9 material is generally considered less hazardous than other hazard classes due to the final form of the packaged material or item for transportation. However, Class 9 materials present a unique and equally hazardous situation during air transport. Personnel must exercise care when handling this material and ensure specific handling instructions located in the packaging paragraphs are observed.

A13.2.2. Do not use halon fire extinguishers to combat fires involving Lithium-Sulfur Dioxide ($Li\text{-}SO_2$), Lithium-Manganese Dioxide ($Li\text{-}Mn\ O_2$), or Lithium-Thionyl Chloride ($Li\text{-}SoCi_2$) batteries. Use a chemical or Class D fire extinguisher, or deluge area with water or CO_2 fire extinguisher to prevent spread of fire.

A13.3. Ammonium Nitrate Fertilizers; Benzaldehyde; Dibromodifluoromethane (Difluorodibromomethane); Environmentally Hazardous Substances, NOS; Hazardous Waste, NOS; Other Regulated Substances; Polycholorinated Biphenyls (PCB); Zinc Dithionite, Zinc Hydrosulfite.

A13.3.1. **Handling Instructions.**

A13.3.1.1. Do not expose Dibromodifluoromethane to high temperature because, when it decomposes, toxic fumes are emitted. Store in a cool, ventilated area away from flame.

A13.3.1.2. Contains Otto Fuel II as a liquid propellant. In the event of a leak, avoid direct skin contact, ingestion, or inhalation of vapors. Vapors are toxic and may cause severe headache and nausea.

A13.3.2. **Packaging (Liquids).**

A13.3.2.1. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	**Drums:** steel (1A1 or 1A2), aluminum (1B1 or 1B2), or metal drum, other than steel or aluminum (1N1 or 1N2), plywood (1D), fiber (1G), or plastic (1H1 or 1H2)

A13.3.2.2. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	**Barrel**: wooden (2C2)

A13.3.2.3. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	**Jerricans**: steel (3A1 or 3A2) or plastic (3H1 or 3H2)

A13.3.2.4. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	**Boxes**: steel (4A1 or 4A2), aluminum (4B1 or 4B2), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1), or solid plastic (4H2)

A13.3.2.5. Package as follows:

Inner packaging	Outer packaging
Not required	**Drums**: steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum, other than steel or aluminum (1N1 or 1N2), or plastic drum (1H1 or 1H2)

A13.3.2.6. Package as follows:

Inner packaging	Outer packaging
Not required	**Barrel**: wooden (2C1)

A13.3.2.7. Package as follows:

Inner packaging	Outer packaging
Not required	**Jerricans**: steel (3A1 or 3A2) or plastic (3H1 or 3H2).

A13.3.2.8. Package in following single, composite package:

Inner receptacle	Outer packaging
Plastic	**Drums**: steel, aluminum, fiber, or plastic (6HA1, 6HB1, 6HG1, or 6HH).

A13.3.2.9. Package in following single, composite package:

Inner receptacle	Outer packaging
Plastic	**Boxes**: steel, aluminum, wooden, plywood, or fiberboard (6HA2, 6HB2, 6HC, 6HD2, or 6HG2).

A13.3.2.10. Package in following single, composite package:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	**Drums**: steel, aluminum, or fiber (6PA1, 6PB1, or 6PG1).

A13.3.2.11. Package in the following single, composite package:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	**Boxes**: steel, aluminum, wooden, or fiberboard (6PA2, 6PB2, 6PC, or 6PG2).

A13.3.2.12. Package in the following single, composite package:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	expanded plastic packaging (6PH1 or 6PH2).

A13.3.2.13. Package in the following single, composite package:

Inner receptacle	Outer packaging
plastic	**Drum**: plywood (6HD1)

A13.3.2.14. **DOT Cylinders.** DOT specification cylinders as prescribed for any compressed gas, except DOT 8 (acetylene) and DOT 3HT.

A13.3.2.15. Fired exercise torpedoes or rockets, with no explosive components, containing Otto fuel II. Package in original or similar container authorized in **Attachment 5**.

A13.3.3. **Packaging (Solids).**

A13.3.3.1. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	**Drums**: steel (1A1 or 1A2), aluminum (1B1 or 1B2), or metal, other than steel or aluminum (1N1 or 1N2), plywood (1D), fiber (1G), or plastic (1H1 or 1H2)

A13.3.3.2. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	**Barrel:** wooden (2C2)

A13.3.3.3. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	**Jerricans:** steel (3A1 or 3A2) or plastic (3H1 or 3H2),

A13.3.3.4. Package as follows:

Inner packaging	Outer packaging
Receptacles: Glass, earthenware, plastic, or metal	**Boxes:** steel (4A1 or 4A2), aluminum (4B1 or 4B2), natural wood (4C1 or 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), or solid plastic (4H2)

A13.3.3.5. Package as follows:

Inner packaging	Outer packaging
Not required	**Drums: s**teel (1A1 or 1A2), aluminum (1B1 or 1B2), metal (other than steel or aluminum) (1N1 or 1N2), plywood (1D), plastic (1H1 or 1H2), or fiber (1G)

A13.3.3.6. Package as follows:

Inner packaging	Outer packaging
Not required	**Barrel:** wooden (2C1 or 2C2)

A13.3.3.7. Package as follows:

Inner packaging	Outer packaging
Not required	**Jerricans:** steel (3A1 or 3A2) or plastic (3H1 or 3H2)

A13.3.3.8. Package as follows:

Inner packaging	Outer packaging
Not required	**Boxes:** steel (4A1), steel with liner (4A2), aluminum with liner (4B2), natural wood (4C1), natural wood, sift-proof (4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), expanded plastic (4H1) or solid plastic (4H2)

A13.3.3.9. Package as follows:

Inner packaging	Outer packaging
Not required	**Bags:** bag, woven plastic (5H1, 5H2, or 5H3), plastic film (5H4), textile (5L1, 5L2, or 5L3), or paper, multiwall, water-resistant (5M2)

A13.3.3.10. Package in the following single, composite packages:

Inner receptacle	Outer packaging
Plastic	steel, aluminum, plywood, fiber, or plastic drum (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1)

A13.3.3.11. Package in the following single. composite packages:

Inner receptacle	Outer packaging
Plastic	steel, aluminum, wood, plywood, or fiberboard box (6HA2, 6HB2, 6HC, 6HD2, or 6HG2)

A13.3.3.12. Package in the following single, composite package:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	steel, aluminum, plywood, or fiber drum (6PA1, 6PB1, 6PD1, or 6PG1)

A13.3.3.13. Package in the following single, composite package:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	steel, aluminum, wooden, or fiberboard box (6PA2, 6PB2, 6PC, or 6PG2)

A13.3.3.14. Package in the following single, composite package:

Inner receptacle	Outer packaging
Glass, porcelain, or stoneware	expanded or solid plastic packaging (6PH1 or 6PH2)

A13.3.4. **PCB Transformers.** Palletize and tightly seal large transformers (over 400kg [886 pounds]) with PCB to prevent leakage. Place a large sheet of polyethylene under the transformer and extend it at least one quarter of the way up its sides. Provide enough vermiculite to absorb any leakage. These type transformers are exempt from UN specification packaging requirements.

A13.4. Consumer Commodities.

A13.4.1. The following applies:

A13.4.1.1. Items must meet the definition of a consumer commodity (see **Attachment 1**).

A13.4.1.2. Use a strong outside package. UN specification packaging is not required.

A13.4.1.3. Each final completed package must not exceed 25 kg (55 lbs) for international shipment or must not exceed 30 kg (66 lbs) for domestic shipment.

A13.4.1.4. Completed packages containing breakable or brittle inner packages must be capable of withstanding a 4 ft drop on solid concrete.

A13.4.2. **Class 2 (Non-Toxic Aerosols).** Must meet the following provisions:

A13.4.2.1. Limit Class 2 substances to inner non-refillable non-metal receptacles not exceeding 120 ml (4 Fl. oz) capacity each, or in inner non-refillable metal receptacles not exceeding 820 ml (28 Fl. oz) capacity each. Flammable aerosols must not exceed 500 ml (17 Fl. oz) capacity each). The following provisions apply to all aerosols under this paragraph:

A13.4.2.1.1. The pressure in the aerosol must not exceed 1,500 kPa at 55°C (217 psi at 130°F) and each receptacle must be capable of withstanding without bursting a pressure of at least 1.5 times the equilibrium pressure of the contents at 55°C (130°F);

A13.4.2.1.2. If the pressure in the aerosol exceeds 970 kPa at 55°C (160 psi at 130° F) but does not exceed 1105 kPa at 55°C (160 psi at 130°F), use an inner metal IP7, IP7A, or IP7B receptacle.

A13.4.2.1.3. If the pressure in the aerosol exceeds 1,105 kPa at 55°C (160 psi at 130°F) but does not exceed 1245 kPA at 55 ^{o}C (180 psi at 130°F), use an inner metal IP7A or IP7B receptacle.

A13.4.2.1.4. If the pressure in the aerosol exceeds 1,245 kPa at 55°C (180 psi at 130°F), use an inner metal IP7B receptacle. IP7B metal receptacles having a minimum burst pressure of 1,800 kPa may be equipped with an inner capsule charged with a non-flammable, non-toxic compressed gas to provide the propellant function. In this case, the pressures indicated above do not apply to the pressure within the capsule. The quantity of gas contained in the capsule must be so limited that the minimum burst pressure of the receptacle would not be exceeded if the entire gas content of the capsule were released into an aerosol.

A13.4.2.1.5. The liquid content must not completely fill the closed receptacle at 55°C (130°F).

A13.4.2.1.6. Each aerosol exceeding 120 ml (4 Fl. oz) capacity must have been heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the contents at 55°C (130°F) without evidence of leakage, distortion or other defect.

A13.4.2.1.7. Protect the valves by a cap or other suitable means during transport.

A13.4.2.2. For aerosols containing a biological or medical preparation that will be deteriorated by a heat test and which are non-toxic and non-flammable, packed in inner non-refillable receptacles not exceeding 575 ml (19.4 Fl. oz) capacity each, the following provisions apply:

A13.4.2.2.1. The pressure in the aerosol must not exceed 970 kPa at 55° C (140.7 psi at 130°F).

A13.4.2.2.2. The liquid contents must not completely fill the closed receptacle at 55° C (130°F).

A13.4.2.2.3. One aerosol out of each lot of 500 or less, must be heated until the pressure in the aerosol is equivalent to the equilibrium pressure of the contents at 55° C (130°F) without evidence of leakage, distortion or other defect.

A13.4.2.2.4. Protect the valves by a cap or other suitable means during transport.

A13.4.3. **Class 3.** The following applies to Class 3 material:

A13.4.3.1. For domestic shipment, the contents of each inner package will not exceed the following: Packing Group I, 0.5 L (0.1 gallon); Packing Group II, 1.0 L (0.3 gallon); and Packing Group III, 5.0 L (1.3 gallons).

A13.4.3.2. For international shipment, each inner package must not exceed 500 ml (17 Fl. oz).

A13.4.4. **Class 4.1.**

A13.4.4.1. For substances in Packing Group II, each inner package must not exceed 1.0 kg (2.2 lbs) net capacity each.

A13.4.4.2. For substances in Packing Group III, each inner package must not exceed5.0 kg (11 lbs) net capacity each.

A13.4.5. **Class 5.1.**

A13.4.5.1. For substances in Packing Group II, each inner package must not exceed 1.0 L (0.3 gal) net capacity for liquids or 1.0 kg (2.2 lbs) net capacity for solids.

A13.4.5.2. For substances in Packing Group III, each inner package must not exceed 5 L (1.3 gal) net capacity for liquids or 5.0 kg (11 lbs) net capacity for solids.

A13.4.6. **Class 5.2. (Non-Temperature Controlled).**

A13.4.6.1. For Type D, E, or F, each inner package must not exceed 125 ml (4.22 fl. oz.) net capacity for liquids or 500 g (17.64 ounces) net capacity for solids.

A13.4.6.2. For Type B or C, each inner package must not exceed 25 ml (0.845 fl. oz.) net capacity for liquids or 100 g (3.528 oz.) net capacity for solids.

A13.4.7. **Class 6.1.**

A13.4.7.1. For domestic shipment, the contents of each inner package will not exceed the following: Liquids in Packing Group III, each inner package must not exceed 5.0 L (1.3 gallons) net capacity each, and for solids, each inner package must not exceed 5.0 kg (11 lbs) net capacity each..

A13.4.7.2. For international shipment, each inner package must not exceed 500 ml (17 Fl. oz) net capacity for liquids and 500 g (18 oz.) net capacity for solids.

A13.4.8. **Class 8.**

A13.4.8.1. For substances in Packing Group II, each inner package must not exceed 1.0 L (0.3 gallon) net capacity each for liquids or 1.0 kg (2.2 lbs) net capacity for solids.

A13.4.8.2. For substances in Packing Group III, each inner package must not exceed 5.0 L (1.3 gallon) net capacity each for liquids, or 5.0 kg (11 lbs) net capacity for solids.

A13.4.9. **Class 9.**

A13.4.9.1. For liquids, each inner package must not exceed 5.0 L (1.3 gallon) net capacity.

A13.4.9.2. For solids, each inner package must not exceed 5.0 kg (11 lbs) net capacity.

A13.5. Motor Vehicles and Self-Propelled Units.

A13.5.1. The following requirements apply:

A13.5.1.1. Use service technical manuals to prepare items for shipment.

A13.5.1.2. Protect installed batteries to prevent short circuit and secure so that battery fluid will not leak. To secure the battery from short circuit, completely protect the terminal posts from contact (i.e., tape, rubber boots, etc.). If battery cables are disconnected, they must be secured away from terminals. Terminals must also be taped or covered/protected.

A13.5.1.3. Securely fasten original installed equipment in properly configured and approved holders. Do not remove other hazardous materials from their packaging and store in the racks or containers of vehicles or equipment unless authorized by paragraph **A5.4.**

A13.5.1.4. Prepare the item to protect against leakage of fuel during loading, unloading, and transport. Drain and cap units if the unit is susceptible to fuel spills or leakage (see also **Attachment 28**). Unless otherwise stated, purging is not required.

A13.5.1.5. Fuel servicing vehicles will have refueling system bulk tank and lines purged (for liquids with a flash point less than 38 degrees C (100 degrees F) or drained to the maximum extent possible (for liquids with a flash point at or above 38 degrees C (100 degrees F) according to technical directives (technical orders, field manuals, etc.) so that no more than 5 gallons of fuel remains in the tank/lines (see paragraph **3.7.2.**).

A13.5.1.6. Engines, generators, and other equipment mounted or attached to a vehicle must be drained to the greatest extent possible (not to exceed 17 oz.) Purging is not necessary unless required by the item's technical instructions.

A13.5.1.7. Provide calibrated dip stick with any vehicle or engine powered support equipment without an operational fuel gauge if fuel level cannot be otherwise determined. If positive means is not available to accurately determine fuel level, drain or siphon the tank. The tank may be refilled to appropriate level in the presence of an inspector (see paragraph **A28.1.2.**).

A13.5.1.8. Drain fuel tanks of palletized units. Units palletized due to the aircraft's subfloor requirements may contain fuel in tank.

A13.5.1.9. Units rigged for airdrop on an airdrop mission may contain fuel in tank.

A13.5.1.10. Air-bag modules installed as a vehicle component are not subject to any other requirements of this manual.

A13.5.1.11. When fuel in tank is authorized below, ship only the minimum quantity consistent with operational requirements (see paragraph **1.8.**). The following fuel in tank requirements apply:

A13.5.2. **Fuel for Channel Airlift Operations.** Vehicles and self-propelled units may contain fuel in tank not to exceed one-half tank full. Ensure tanks are securely closed. For dual powered vehicles, also comply with the requirements of **A13.5.4.** or **A13.5.5.** as appropriate.

A13.5.3. **Fuel for Mobility (Chapter 3) Operations.** Vehicles and self-propelled units may contain fuel in tank not to exceed three-fourths tank full when transported under the authority of paragraph **3.7.** Ensure tanks are securely closed. For dual powered vehicles, also comply with the requirements of **A13.5.4.** or **A13.5.5.** as appropriate.

A13.5.3.1. Do not exceed one-half tank full for units loaded on the aircraft cargo ramp and units loaded aboard aircraft with a steep angle of ascent (i.e.,KC-10, KC-135).

A13.5.3.2. Position units loaded on an aircraft cargo ramp with the fuel tank openings located on the high side of the ramp.

A13.5.3.3. When loaded in a containerization unit, the fuel tank must be drained. Unit must also be purged if required by the item's technical directive, or if the flash point of the fuel is under 38 degrees C (100 degrees F) (see paragraph **1.13.1.**). In the absence of specific draining and purging procedures:

A13.5.3.3.1. Completely drain all fuel

A13.5.3.3.2. Run engine until it stalls

A13.5.3.3.3. Allow fuel tanks and lines to remain open for 24 hours.

A13.5.3.4. When loaded in a containerization unit, disconnect nonspillable gel-type batteries and tape the ends of the cables/terminals to prevent short circuit. These batteries may remain in the vehicle or equipment holder, but ensure they are firmly secured and remain upright in the shipping container. Remove batteries with acid or alkali and package according to **A12.5.** Do not ship packaged wet-cell batteries inside containerization unit unless accessible during flight.

A13.5.4. **Liquefied Petroleum Gas or Compressed Gas Powered Vehicles with Non-DOT Specification Fuel Tanks.** Liquefied petroleum gas or compressed gas powered vehicles must have the gaseous fuel completely emptied from any non-DOT specification pressurized vessel (fuel tank), lines, and regulator. Ensure tanks are securely closed. Purging is not required.

A13.5.5. **Liquefied Petroleum Gas or Compressed Gas Powered Vehicles with a DOT Specification Fuel Tank.** Liquefied petroleum gas or compressed gas powered vehicles containing a DOT specification cylinder as the gaseous fuel tank do not require draining. Comply with all requirements of **Attachment 6** for the material and cylinder specification. Tightly close and secure cylinder shut off valve. Lines and regulator must be completely emptied of flammable gas and vapors.

A13.5.6. **Boats and Watercraft.** Boats and watercraft that are loaded on trailers or palletized must be drained to the greatest extent possible. Units prepared for airdrop and shipped under the authority of paragraph **3.7.**, may contain fuel in tank not to exceed three-quarters tank full.

A13.5.7. **Aircraft and Helicopters.** Prepare aircraft and helicopters for transportation according to the requirements of the respective aircraft's shipping manual. The following applies.

A13.5.7.1. Remove all munitions and explosives, other than those installed as permanent-type aircraft equipment, according to the pertinent aircraft technical order and **A5.3.**

A13.5.7.2. Fasten batteries securely in the holder provided, with the terminals protected in such a manner as to prevent damage or short circuits. When batteries are removed and shipped with the aircraft, accomplish packaging and certification according to **A12.5.**

A13.5.7.3. Completely drain fuel tanks within wings when removed from the aircraft body. Purging is not required. When transported with the original aircraft body, consider all pieces as a single unit for identification on the Shipper's Declaration form.

A13.5.7.4. Transport fueled helicopters and aircraft with fuel in each tank not to exceed 150 gallons or three-fourths full, whichever amount is least. Do not exceed one-half tank full for units loaded on the aircraft cargo ramp. Fuel leakage must not occur during shipment. No special venting is required other than to maintain a normal aircraft ventilation during flight. Seal vents according to service technical directives. Load tanks to prevent fuel leakage when the loading configuration requires removal of external fuel tanks. When removed in this manner, the tanks are still considered a component of the aircraft or helicopter.

A13.5.8. **Drained and Purged Units.** Units drained, purged and containing no other hazardous material are nonhazardous for transportation. Fuel systems including carburetors, pumps, controls, and fuel tanks must be completely drained, purged, and sealed with appropriate pressure seal type plug and caps with gaskets and "O" rings. Prepare drained and purged aircraft and helicopters according to the appropriate technical directive. If the engine's entire fuel system is purged with MIL-O-6081 grade 1010 oil and sealed with appropriate pressure seal-type metal plugs or caps, gaskets, and O-rings, the item is considered unfueled. Comply with **1.10.4.**

A13.6. Internal Combustion Engines and Support Equipment. Comply with the bullet requirements of **A13.5.** The following fuel in tank requirements apply:

A13.6.1. **Fuel for Channel Airlift Operations.** Completely drain engine-powered support equipment of fuel. Up to 500 ml (17 ounces) of fuel may be left in engine components and fuel lines provided all lines and fuel tanks are securely closed to prevent leakage of fuel.

A13.6.2. **Large Fuel Systems.** Engine-powered support equipment with large fuel systems that the shipper determines can not be drained to meet the requirements of A13.6.1 must be drained within the mechanical limits of the equipment to the extent no free standing liquid remains in the fuel tank, lines, or system.

A13.6.3. **Fuel for Mobility (Chapter 3) Operations.** Wheeled-engine powered support equipment may contain up to one-half tank of fuel when transported under the authority of paragraph **3.7.** Ship only the minimum quantity of fuel consistent with operational requirements. Ship the Hobart-86 with no more than one-quarter tank of fuel and load with filler neck facing forward. Ensure tanks are securely closed.

A13.6.4. **Single Axle Equipment.** Completely drain single axle equipment loaded with the tongue resting on the aircraft floor. The requirements of **A13.6.1.** or **A13.6.2.** apply depending on the type and size of equipment.

A13.6.5. **Damaged or Inoperable Engines.** Internal combustion engines that are damaged or inoperable and purging can not be accomplished, or proper purging facilities are unavailable must be drained to the maximum extent possible and install plugs, caps, and covers over all openings as required by technical directives. All other internal combustion engines must comply with **A13.6.7.**

A13.6.6. **Aerial Bulk Fuel Delivery System (ABFDS).** Ship the Aerial Bulk Fuel Delivery System (ABFDS) consisting of 3000 gallon bladders under the following conditions:

A13.6.6.1. Completely drain the bulk fuel bladders. Due to bladder construction there will be residual fuel remaining. Ensure bladders are drained as much as possible.

A13.6.6.2. Completely drain the pump module. No more than 500 ml (17 ounces) of fuel may be left in engine components.

A13.6.6.3. Securely close all vents and valves to prevent residual fuel leaks.

A13.6.6.4. When prepared in this manner, ABFDS may be stacked for shipment.

A13.6.7. **Aircraft Engines.** Use service technical manuals to prepare items for shipment. New aircraft engines which are drained and purged according to the responsible technical manual, and containing no other hazardous material, are nonhazardous for transportation. Comply with **1.10.4.** The following requirements apply:

A13.6.7.1. Inoperable or damaged engines that cannot be purged must be drained to the maximum extent possible. Install plugs, caps, and covers over all openings as required by technical directives.

A13.6.7.2. Engines that cannot be purged due to unavailability of proper purging facilities must be drained to the maximum extent possible. Install plugs, caps, and covers over all openings as required by technical directives.

A13.6.7.3. Prepare and completely drain engine as required by technical directive.

A13.6.8. **Liquefied Petroleum Gas or Compressed Gas Powered Engines or Equipment.** Liquefied petroleum gas or compressed gas powered engines or equipment must have the gaseous fuel completely emptied from any non-DOT specification pressurized vessel (fuel tank), lines, and regulator. Ensure tanks are securely closed. Purging is not required.

A13.7. Battery Powered Equipment and Vehicles. Prepare items powered by wet cell or non-spillable batteries and shipped with the batteries installed as follows:

A13.7.1. Use service technical manuals to prepare items for shipment.

A13.7.2. Securely fasten battery in an upright position so that battery fluid will not leak. Remove the battery and ship according to **A12.5.** if the item is likely to be shipped in other than an upright position.

A13.7.3. Protect installed batteries to prevent short circuit. To secure the battery from short circuit, completely protect the terminal posts from contact (i.e., tape, rubber boots, etc.). When prepared in this manner, it is not required to disconnect the battery or remove it from the equipment.

A13.7.4. Securely fasten original installed equipment in properly configured and approved holders. Do not remove other hazardous materials from their packaging and store in the racks or containers of vehicles or equipment.

A13.7.5. Wheelchairs equipped with non-spillable batteries must have the batteries protected against short circuits and securely attached to the wheelchair or removed and boxed. Specification packaging is not required.

A13.7.6. Wheelchairs equipped with spillable batteries for carriage on aircraft in cargo compartments that can accommodate upright loading and storage of the wheelchairs must be secured in an upright position in the cargo compartment. Batteries must remain installed and be securely attached to the chair. Protect the terminals against short circuits. Wheelchairs must be deactivated by removing connections at battery terminals or by otherwise disconnecting their power source. Remove the battery and ship according to **A12.5.** if the item is likely to be shipped in other than an upright position.

A13.8. Lithium Batteries and Cells.

A13.8.1. The following general requirements apply:

A13.8.1.1. Do not transport damaged batteries or those suspected of damage.

A13.8.1.2. No cell may contain more than 12 g (0.42 ounces) of lithium or lithium alloy and no battery may contain more than 500 grams (17.6 ounces).

A13.8.1.3. Each cell and battery must be equipped with an effective means of preventing external short circuit.

A13.8.1.4. Each cell and battery must incorporate a safety venting device or be designed in such a manner that will preclude a violent rupture under any condition incident to transportation, such as a dead short. Batteries containing cells or series of cells connected in parallel must be equipped with diodes to prevent reverse current flow.

A13.8.1.5. Cells and batteries must meet test requirements prescribed in 49 CFR 173.185(e)(6). Army-procured lithium batteries are manufactured according to MIL-B-49430 and meet the test requirements. These batteries are identified by the following battery numbers: BA-5093/U, BA-5112/U, BA-5372/U, BA-5513/U, BA-5557/U, BA-5567/U, BA-5588/U, BA-5590/U, BA-5598/U, BA-5599/U, BA-5600/U, BA-5800/U, BA-5847/U, BA-6598/U.

A13.8.1.6. Completely protect against short circuit and secure within the outer packaging or article.

A13.8.2. **Used Batteries.** The following applies.

A13.8.2.1. Cells or batteries may not be offered for transportation or transported if any cell has been discharged to the extent that the open circuit voltage is less than two volts or is less than two-thirds of the voltage of the fully charged cell, whichever is less.

A13.8.2.2. Used batteries may be transported by military air as authorized by paragraph **3.8.** Individually wrap batteries in nonconductive material and place in a strong outer container with at least one-inch of inert material surrounding each battery.

A13.8.3. **New Batteries.** Package cells and batteries in strong inner packagings containing not more than 500 grams of lithium or lithium alloy per inner packaging. Pack inner packaging inside an outer metal box (4A or 4B), wooden box (4C1, 4C2, 4D, or 4F), fiberboard box (4G), or solid plastic box (4H2), fiber drum (1G), metal drum (1A2 or 1B2), plywood drum (1D), plastic jerrican (3H2), or metal jerrican (3A2 or 3B2). Packaging must meet PG II performance level.

A13.8.4. **Batteries Contained in or Packed with Equipment.** The following applies.

A13.8.4.1. Pack equipment with installed lithium batteries in a strong waterproof outer packaging or in an outer packaging made waterproof through the use of a liner (unless the equipment is made waterproof by nature of its construction). Secure the equipment within the outer packaging to prevent movement, short circuit, or accidental operation during transport. UN specification packaging is not required.

A13.8.4.2. Cells and batteries packed with equipment must be packed in inner packagings as identified above in paragraph **A13.8.2.** Secure to prevent movement and short circuits. Do not pack more than 5 kg of cells or batteries with each item of equipment.

A13.8.4.3. The requirements of **A13.8.1.** apply to equipment containing used batteries. The shipper must verify the battery is above the acceptable voltage discharge level (not required when transporting under the authority of paragraph **3.8.**).

A13.8.5. **Non-Regulated Lithium Batteries.** Lithium batteries are not subject to any other requirements of this manual (except paragraph **1.10.4.**) if they meet the lithium quantity and testing requirements specified in 49 CFR 173.185, or if they meet the following:

A13.8.5.1. Each cell with a liquid cathode may contain no more than 0.5 g (.02 ounces) of lithium content, each cell of a solid cathode may contain no more than 1.0 g (.04 ounces) of lithium content, and each lithium ion cell may contain no more than 1.5g (.05 ounces) of lithium content.

A13.8.5.2. Each battery with a solid cathode must contain a total quantity of no more than 2 g (.07 ounces) of lithium content, each battery with a liquid cathode must contain a total quantity of no more than 1.0 g (.04 ounces) of lithium content, and each lithium ion battery may contain no more than 8g (.28 ounces) of lithium content.

A13.8.5.3. Each cell or battery containing a liquid cathode must be hermetically sealed.

A13.8.5.4. Cells must be separated to prevent short circuit. Batteries must be separated to prevent short circuit and must be packed in strong outside containers, except when installed in electronic devices.

A13.8.5.5. If a liquid cathode battery contains more than 0.5 g (.02 ounces) of lithium or lithium alloy, or a solid cathode battery contains more than 1.0 g (.04 ounces) of lithium or lithium alloy,

it may not contain a liquid or gas that is a hazardous material unless the liquid or gas, if free, would be completely absorbed or neutralized by other material in the battery.

A13.8.5.6. Lithium batteries installed in consumer use articles (laptops, cameras, watches, etc)

A13.9. Carbon Dioxide, Solid (Dry Ice).

A13.9.1. **Handling Instructions.** Dry ice is extremely cold and will damage human tissue on contact. Store only in well ventilated areas. Never store in hermetically or tightly sealed containers. To minimize carbon dioxide concentration within the aircraft during ground operations, open the cargo/access doors and emergency escape hatches for maximum ventilation.

A13.9.2. **Properties of Carbon Dioxide, Solid.** At temperatures above -78.5 degrees C (-109.3 degrees F) dry ice will sublimate and release carbon dioxide fumes. If the carbon dioxide concentration in the aircraft is over 0.5 percent, crewmembers may suffer shortness of breath. Carbon dioxide concentrations of 3.0 percent are endurable from 1/2 to 1 hour. Concentrations of 5.0 percent are dangerous from 1/2 to 1 hour and concentrations of 9.0 percent are fatal from 5 to 10 minutes. Carbon dioxide is heavier than air; therefore, the highest concentration is at or near floor level. Caution crewmembers against lying on the cargo compartment floor or remaining in the cargo compartment for a prolonged period. If symptoms of overexposure are noted, the use of oxygen and increased ventilation should provide rapid relief.

A13.9.3. **Packaging Requirements.** Wrap in kraft paper, secure with tape, and pack in fiberboard boxes, polystyrene foam containers or other suitable packaging designed and constructed to permit the release of carbon dioxide gas and to prevent a build-up of pressure that could rupture the packaging. UN specification packaging is not required. Packagings must meet the general requirements of **A3.1.**

A13.10. Magnetized Material.

A13.10.1. **Handling Instructions.** Do not store magnetic materials suitable for military airlift closer than 4.6 m (15 feet) to compass sensing devices or other devices unduly affected by magnetic fields.

A13.10.2. **Packaging Requirements.** Shield magnetic materials (MIL-S-4473) when required to reduce magnetic field strength to not greater than 5.25 milligauss or two degrees deviation of a magnetic compass at a distance of 15 feet (4.6 m). Ensure that meters used to measure the magnetic field are properly operational, and whenever possible, that the item be measured by two different devices. Provide blocking and bracing as required. Additional packaging details are included in TO 00-25-251. Package magnetic tubes individually in compliance with MIL-E-75. Package magnetically susceptible items to make sure that the distance between the magnetic surface and outside of the innermost container is no less than the protective distance required, and in no instance less than 102 mm (4 inches). UN specification packaging is not required. Magnetic material that has a magnetic field strength greater than 0.00525 gauss at 4.6m (15 feet) is forbidden for air movement.

A13.11. Life-Saving Appliances. Life-saving appliances, self-inflating or nonself-inflating, include (but are not limited to) life raft kits, life vest kits, survival kit assemblies, ejection seats, non-ejection seats, and parachutes that contain small quantities of hazardous material that are required as part of the survival equipment. Kit contents may include, but are not limited to, flammable items (fire starter and matches), ammunition items (cartridges and shells), pyrotechnics (signal flares), and nonflammable compressed gas cylinders (carbon dioxide and breathing oxygen).

A13.11.1. **Handling Instructions.** Store in cool, well-ventilated areas away from fire hazards and sources of heat or ignition. Do not drop or rough handle.

A13.11.2. **Packaging Requirements:**

A13.11.2.1. Pack kits in weather-resistant fiberboard or other securely closed strong outer container. Pack hazardous materials contained in the kit in inner packaging that is adequate to prevent accidental activation. Suitably cushion the inner packagings to prevent movement. Packagings must meet the general requirements of **A3.1.** UN specification packaging is not required.

A13.11.2.2. **Individually assigned kit hand carried by a crewmember.** The following applies.

A13.11.2.2.1. This paragraph applies only to support operations involving recovery of inoperable aircraft or return of a flight crewmember as a passenger to maintain accountability of an individually assigned kit. For unit deployments see paragraph **3.4.2.** or transport as palletized cargo according to **A13.11.2.1.** This does not apply to contract passenger or commercial aircraft.

A13.11.2.2.2. Package life-saving appliances in a strong outer container or A-3 bag. The requirements of A13.11.2.1 for inner packing and cushioning apply.

A13.11.2.2.3. Individual assigned kits may be handcarried by crew members. Crew members must inform the Air Terminal Operations Center, when transporting life-saving appliances in this manner. Items will be stored as directed by the transporting aircraft commander.

A13.11.2.2.4. When prepared and handcarried according to this paragraph, the marking and labeling requirements of **Attachment 14** and **Attachment 15** do not apply. Shipper's Declaration certification is required.

A13.12. Dangerous Goods in Apparatus or Machinery. Apply this description only to apparatus or machinery containing hazardous material as an integral component of the item. This description may also be used for items that are normally a part of an end item or required to serve an operational function, but are removed and shipped separately (i.e., fuel tanks or bladders). Do not use this description for items in which a PSN already exists in **Table A4.1.** The following applies.

A13.12.1. Apparatus or machinery may only contain hazardous materials permitted as limited quantities under **A19.3.**

A13.12.2. If more than one hazardous material is present, the material must not be capable of reacting dangerously together.

A13.12.3. The total net quantity of hazardous materials contained in one package must not exceed the following:

–1 kg (2.2 lbs) for solids

–500 ml (17 ounces) for liquids

–0.5 kg (1.1 lbs) for Class 2.2 gases

A13.12.4. Secure or cushion receptacles containing hazardous material to prevent breakage or leakage and to control movement within the item during transport. Cushioning material must not react dangerously with or have protective properties adversely affected by any leakage.

A13.12.5. Ensure that, in the event of damage to receptacles, no leakage of the hazardous material from the apparatus or machinery is possible. A leak-proof liner is required for articles that are completed drained of liquid but not purged. All openings and lines must be capped or sealed according to applicable technical directives.

A13.12.6. Class 2.2 gases must be in authorized cylinders according to **Attachment 6**.

A13.12.7. Pack in strong outer packagings unless the receptacles containing the hazardous material are adequately protected by the construction of the apparatus or machinery. UN specification packaging is not required.

A13.13. General Packaging Requirements for Class 9 Materials. UN specification packaging is not required. Use any appropriate non-bulk packaging that meets the requirements of **Attachment 3** to ship liquid or solid materialal. The following applies.

A13.13.1. Provide enough outage for packagings of 208 L (55 gallon) capacity or less, so that the packaging will not be liquid full at 54 degrees C (130 degrees F).

A13.13.2. Make sure that when a liquid or solid has an absolute vapor pressure over 110 kPa (16 psi) at 38 degrees C (100 degrees F) the primary packaging is capable of withstanding the inside vapor pressure at 54 degrees C (130 degrees F) without leakage.

A13.13.3. Package material that may cause a hazard in transportation due to it's reaction with water in either an inner or outer waterproof packaging.

A13.14. Air Bag Inflators, Air Bag Modules, Seat-belt Pretensioners, and Seat-Belt Modules. Item classification as Class 9 or Division 2.2 must be approved by DOT according to 49 CFR 173.166. Package as follows:

Inner packaging	Outer packaging
Not required	**Boxes:** fiberboard (4G), wooden (4C1 or 4C2), reconstituted wood (4F), or solid plastic (4H2) **Drums:** steel (1A2), aluminum (1B2), fiber (1G), or plastic (1H2) **Jerricans:** steel (3A2) or plastic (3H2)

A13.15. Asbestos (Hydrated Mineral Silicates.) Asbestos blue, brown, or white, includes any of the following hydrated mineral silicates: chrysotile, crocidolite, amosite, anthophyllite asbestos, tremolite asbestos, actinolite asbestos, and every product containing any of these materials. Asbestos that is immersed or fixed in a natural or artificial binder material (such as cement, plastic, asphalt, resins, or mineral ore) and manufactured products containing asbestos are not subject to this paragraph. Asbestos must be loaded, handled, unloaded, and any contamination of aircraft removed in such a manner that will minimize occupational exposure to airborne particles released incident to transportation. Packaging must meet the general packaging requirements of **A3.1.** UN specification packaging is not required. Package asbestos in:

A13.15.1. Rigid, leak tight packaging such as metal, plastic, or fiber drums.

A13.15.2. Bags or other nonrigid packaging that are dust and sift-proof. The packages must be palletized and unitized by methods such as shrink-wrapping in plastic or wrapping in fiberboard secured by strapping.

A13.15.3. Bags or other nonrigid packaging that are dust and sift-proof in strong outside fiberboard or wooden boxes.

A13.16. Polymeric Beads, Expandable and Plastic Molding Compound. Pack polymeric beads or granules, expandable, evolving flammable vapor and plastic molding compound in dough, sheet or extruded rope form, evolving flammable vapor as follows:

Inner packaging	Outer packaging
Sealed plastic liner	**Boxes:** wood (4C1 or 4C2), plywood (4D), fiberboard (4G), or reconstituted wood (4F) **Drums:** plywood (1D) or fiber (1G) ***NOTE:*** Vapor tight metal or plastic drums (1A1, 1A2, 1B1, 1B2, 1H1 or 1H2) may also be used (without liner).

A13.17. Chemical or First Aid Kits.

A13.17.1. This description is intended for boxes, cases, ect., containing small amounts of various hazardous materials used for medical, analytical, or testing purposes.

A13.17.1.1. The PG assigned to the kit as a whole must be the most stringent PG assigned to any individual substance in the kit.

A13.17.1.2. The contents of the kit must be of such a nature and so packed that there will be no possibility of the mixture of contents causing dangerous evolution of heat or gas.

A13.17.1.3. The only hazardous materials authorized in the kits are substances authorized as limited quantities according to **A19.3.2.**, and excepted quantities according to **A19.2.**, provided the inner packaging requirements of **A19.2.3.** are met.

A13.17.2. Package as follows:

A13.17.2.1. In inner receptacles of no more than 250 mL (8.5 fluid ounces) for liquids or 250 g (9 ounces) for solids.

A13.17.2.2. The total quantity of hazardous material in any one kit must not exceed 1 L (1 quart) for liquids or 1 kg (2.2 pounds) for solids.

A13.17.2.3. Protect inner receptacles from other materials in the kit and pack in one of the following outer packagings:

–Wood (4C1 or 4C2), plywood (4D), or reconstituted wood (4F) box.

–Expanded plastic (4H1) or solid plastic (4H2) box.

–Fiberboard (4G) box.

–Steel (4A) or Aluminum (4B) box.

A13.17.3. Package limited quantities or hazardous material in Chemical or First Aid Kits as follows:

A13.17.3.1. In inner receptacles of no more than 30 ml for liquids or 100 g for solids. The total quantity of hazardous materials in any one kit must not exceed 1 kg.

A13.17.3.2. Protect inner receptacles from other material in the kit and package in strong outer packaging. UN specification packaging is not required.

A13.18. Polystyrene Beads, Expandable, Evolving Flammable Vapors. Pack polystyrene beads or granules, expandable, evolving flammable vapor and plastic molding compound in dough, sheet or extruded rope form, evolving flammable vapor as follows:

Inner packaging	Outer packaging
Sealed plastic liner	**Boxes:** wood (4C1 or 4C2), plywood (4D), fiberboard (4G), or reconstituted wood (4F) **Drums:** plywood (1D) or fiber (1G) ***NOTE:*** Vapor tight metal or plastic drums (1A1, 1A2, 1B1, 1B2, 1H1 or 1H2) may also be used (without liner).

Attachment 14

MARKING HAZARDOUS MATERIALS

A14.1. General Requirements. Mark hazardous materials according to MIL-STD-129 and this manual. Labels may be used to meet marking requirements to the extent they meet all application, placement, size, legibility, and durability requirements for marking.

A14.2. United Nations (UN) Packaging Specification Markings. UN specification markings are mandatory for all packages of hazardous materials unless exempted by 1.7 or a separate approval. A description of the codes and sequence of information contained in the UN specification marking is identified in **Figure A14.1.** A sample of how the UN specification markings look is in **Figure A14.2.** and **Figure A14.3.**

A14.2.1. **Grandfathered Items.** Containers packaged before January 1, 1990 may be shipped internationally by military air without the UN specification markings. Annotate the shipping papers with the words, "Government-owned goods packaged before January 1, 1990."

Figure A14.1. UN Specification Marking Codes and Sequence of Instruction.

U N	The symbol used to certify that the packaging complies with United Nations recommendations. For embossed metal packagings the capital "UN" can be applied as the symbol.
4G	This is a two to four position code. The first position indicates the type of packaging and will be one of the following numbers: 1 = Drum 2 = Wooden barrel 3 = Jerrican 4 = Box 5 = Bag 6 = Composite packaging 7 = Pressure receptacle The second position indicates the type of material that the container is made of. For composite packagings, two capital letters (second and third positions) will be used to indicate the type of materials. The first letter indicates the material of the inner receptacle and the second letter indicates the material of the outer packaging. For combination packagings, only the code for the outer packaging will be used. The following letters indicate the type of materials: A = Steel (all types and surface treatments) B = Aluminum C = Natural wood

	D = Plywood F = Reconstituted wood G = Fiberboard H = Plastic materials L = Textile M = Paper, multi-wall N = Metal (other than steel or aluminum) P = Glass, porcelain, or stoneware
	The third position (fourth position for composite packagings) will be a number indicating the category of packaging within the same type (i.e., 1A1 [non-removable head steel drum], 1A2 [removable head steel drum], 6HG1 [plastic receptacle with outer fiber drum] 6HG2 [plastic receptacle with outer fiberboard box]). NOTE: 4B1 and 4B2 are obsolete UN codes, but may continue to appear as part of the markings.
	The following special codes may follow the packaging type code:
V	Special packaging meeting the tests specified in 49 CFR 178.601(g)(2).
W	Packaging of the same type as specified by the UN requirements, but not meeting the same general construction requirements. The transport of such packagings is subject to written approval from the competent authority. For approval see 49 CFR 178.601(h).
X1.4 or X15	Identified first is the PG the configuration has been successfully tested too. X is used for PG I. Y is used for PG II. Z is used for PG III. Items of a lesser (less hazardous) PG may be packaged in a packaging that has been tested to a higher PG provided the requirements of the test report are complied with. For single packagings, the relative density, rounded off to the first decimal will follow the PG, for which the container has been tested. This may be omitted when the relative density does not exceed 1.2. For packagings intended to contain solids or inner packagings, the PG will be followed by the maximum gross weight, in kilograms, that the packaging configuration has been tested.
100 or S	For single packagings intended to contain liquids, the next marking indicates the maximum test pressure, in kPa, rounded off to the nearest 10 kPa which the container was tested (hydraulic test). For packagings intended to contain solids or inner packagings, use the letter "S." For air shipment of packagings intended to contain inner packagings, see **A3.2.1.** Also, if the inner packaging is plastic ensure the requirements of **A3.1.2.** are met.
	The last two digits of the year during which the packaging was manufactured. Packagings of types 1H1, 1H2, 3H1, and 3H2 must also be marked with the month of manufacture. The month of manufacture may be marked on the packaging in a different place than the UN specification packaging marking.
	The country authorizing the allocation of the mark.

***	The symbol of the party responsible for ensuring that the UN requirements have been met. The symbol must be registered with the US DOT, Office of Hazardous Materials Transportation. In place of a symbol, the in-the-clear name of the party responsible for ensuring the UN requirements have been met can be used. The Department of Defense uses the symbol "DoD."
	Reconditioned packagings must be marked to indicate they have been properly reconditioned. This marking must be applied near the initial marking and must replace the country and symbol of the party responsible for ensuring the UN requirements have been met, or be in addition to the initial marking. After reconditioning a packaging, the reconditioner must apply the following markings in sequence:
USA	The country in which the reconditioning was conducted.
***	The name or registered symbol of the reconditioner.
93	The year the packaging was reconditioned.
R	Enter the letter "R."
L	Enter the letter "L" for every packaging successfully passing the leakproofness test.

Figure A14.2. Sample of UN Non-bulk Specification Packaging Marking for Solids.

Example of a Single or Combination Marking:

a b c d e f g h

u
n

4G / Y 7.4/ S /99/USA /DOD

(a) The United Nations Symbol
(b) Type of Packaging Code
(c) Packing Group:

X = PG I, II and III
Y = PG II and III
Z = PG III Only

(d) Maximum Gross Mass (In Kilograms)
(e) Letter "S" , Solid or Inner Packagings
(f) Year of Manufacture or assembly
(g) State (Country) authorizing mark
(h) Symbol of Manufacturer/Certifier

Figure A14.3. Sample of UN Non-bulk Specification Packaging Marking for Liquids.

```
Example of marking for single packaging to
contain liquid:
   a     b     c     d     e     f     g     h

   u
   n   1A1 / Y  1.3 / 95 /99 /USA / DOD

        (a)  The United Nations Symbol
        (b)  Type of Packaging Code
        (c)  Packing Group:

                  X = PG I, II and III
                  Y = PG II and III
                  Z = PG III Only

        (d)  Relative Density
                  (Show if >1.2)
        (e)  Test Pressure (in Kilopascals)
                  PG I-not less than 250 kPa
                  PG II & III-not less than 95 kPa
        (f)  Year of Manufacture or assembly
        (g)  State (Country) authorizing mark
        (h)  Symbol of Manufacturer/Certifier
```

A14.3. General Hazard Communication and Handling Markings.

A14.3.1. **Proper Shipping Name and Identification Number.** Unless otherwise specified, mark all packages, including overpacks, containing hazardous materials with the PSN and identification number shown in the alphabetical listing of items in **Table A4.1.**

A14.3.1.1. Mark the appropriate technical name in parenthesis following the proper shipping name when required by **A4.2.2.**

A14.3.1.2. Italicized descriptive words (see **A4.2.2.**) used as part of the PSN are optional.

A14.3.1.3. Secondary hazards do not require marking.

A14.3.1.4. Do not use abbreviations (except "w" (with), "w/o" (without), and "ORM" [other regulated material]).

A14.3.1.5. Aerosols (UN1950) may be marked with a PSN authorized by 49CFR, IATA, or ICAO, not identified in **Table A4.1.**

A14.3.1.6. A PSN is not required if the UN number is within a square-on-point border according to **A14.4.9.**

A14.3.2. **Hazardous Substance.** Mark all packages containing a hazardous substance with the letters "RQ" in association with the PSN. If the PSN does not identify the hazardous substance by name, mark one of the following descriptions on the package, in parentheses, in association with the PSN:

A14.3.2.1. The technical name of the hazardous substance.

A14.3.2.2. The waste stream number.

A14.3.2.3. The letters "EPA" followed by the word "ignitability," "corrosivity," "reactivity," or "EP toxicity," as appropriate, or the corresponding "D" number, as appropriate.

A14.3.3. **Hazardous Waste.** Mark hazardous waste shipments according to this manual, 49 CFR 172, 40 CFR 262.32, and MIL-STD-129.

A14.3.4. **Inhalation Hazard.** Mark each package containing any material that is poisonous by inhalation "Inhalation Hazard." The marking is not required if the words “INHALATION HAZARD” appear on the label.

A14.3.5. **Exemptions, CAAs, and COEs.** Mark each package authorized by a DOT Exemption or a COE with exemption or COE number. CAAs must be marked with the approval number in association with the PSN and ID number, if required by the CAA.

A14.3.6. **Air Eligible Marking.**

A14.3.6.1. Mark the outer container of a combination package containing liquid hazardous material "Air Eligible" to verify the inner containers meet internal pressure requirements of **A3.2.1.**

A14.3.6.2. Mark "Air Eligible" on outer containers used to meet pressure requirements of **A3.2.3.**, if air eligibility is not already identified by the POP marking.

A14.3.6.3. Mark “Air Eligible” on overpacks of one or more air eligible packages (see **1.13.**).

A14.3.6.4. Commercial marking/labeling to indicate air eligibility (e.g., “AIR APPROVED”, “AIR APPROVED”, etc. or aircraft symbol) of combination packages may be used in lieu of above wording, provided package meets all other air eligibility requirements of this manual (e.g., pressure requirements, absorbent material, etc.).

A14.3.7. **Orientation Marking (This Side Up).** Pack inside containers used to ship liquid hazardous material within a combination packaging or overpack with filling holes up.

A14.3.7.1. Mark with orientation arrows meeting the requirements of 49 CFR 172.312 on two opposite sides of the package and ensure the arrows point in the correct upright direction. Orientation labels may be used to meet this marking requirement. The lettering "THIS SIDE UP", "THIS END UP" or "UP" may be used in conjunction with orientation labels.

A14.3.7.2. This requirement does not apply to materials in inside metal cans of the nonrefillable type with spun-in head and base without replaceable caps or other closing device, liquids contained in manufactured articles which are leak-tight in all orientations, and packages with hermetically-sealed inner packagings.

A14.3.7.3. Orientation Markings are not required for single packaging when package orientation is obvious (e.g., drums, barrels, etc) or consolidation units.

A14.3.8. **Overpacks.** Mark overpacks (generally wooden or fiberboard) with the same information required by this manual for individual containers, with the exception of UN specification markings. At a minimum, larger containerization units (e.g., ISU, CONEX, MILVAN, etc.) must be marked with PSNs, UN Numbers, and primary/subsidiary hazard class labels. Markings may be applied using a marking board in lieu of applying directly to a containerized unit (see **A14.3.12.**). Mark overpacks and containerized units "INNER PACKAGES COMPLY WITH PRESCRIBED SPECIFICATIONS" when:

A14.3.8.1. Overpacking one or more air eligible packages to form a single unit for convenience of handling or storage during transportation (**1.13.**).

A14.3.8.2. This statement may be used in place of the statement required by **A14.4.2.**

A14.3.9. **Chemically Contaminated Cargo.** Mark chemically contaminated cargo shipped under the authority of **3.9.** with the words, "Contaminated - Do Not Open." Apply by any means that is visible and legible.

A14.3.10. **Dangerous Goods in Machinery or Apparatus.** For items shipped under the PSN "Dangerous Goods in Machinery" or "Dangerous Goods in Apparatus" mark the PSN and UN number on the machinery, apparatus, or packaging (unless exempted by **A14.4.8.**).

A14.3.11. **Unitized Cargo.** Identical hazardous materials unitized on a warehouse pallet or skid must have at least one package with the UN specification markings exposed on the outside of the unit load (unless exempt by paragraph **1.7.**).

A14.3.12. **Marking Boards.** Marking boards may only be used in lieu of individual package markings required by this attachment, and labels required by **Attachment 15** when the following requirements are met:

A14.3.12.1. It is determined to be impractical or uneconomical to mark/remark each package on a pallet or skid, and the entire pallet/skid will be shipped to the customer (i.e., the pallet/skid will not be broken down at any time during transportation).

A14.3.12.2. Marking boards, when firmly attached, may also be used in lieu of applying required marking/labeling directly on containerized loads. Individual packages within the containerized load must be marked/labeled according to this manual.

A14.4. Marking Requirements Applicable to Class.

A14.4.1. **Class 1.**

A14.4.1.1. Mark packages of explosives with an EX number or National Stock Number (as listed in the Joint Hazard Classification System) for each explosive. This does not apply if the explosive has an interim hazard classification issued according to **A3.3.1.2.** The EX number is an explosive classification approval number, it is not the same as a DOT-Exemption number.

A14.4.1.2. Mark "THIS SIDE UP" on the top of packages of explosives containing liquids.

A14.4.1.3. When explosives are installed according to **A5.3.**, mark the following statement near each explosive device: "WARNING - EXPLOSIVE DEVICE EMBEDDED IN ***" (*** identifies location of device; i.e., window, door, frame, etc).

A14.4.1.4. Explosives authorized by this manual to be shipped unpacked, must display the PSN and UN number. That marking may be on the item, its cradle, or handling, storage, or launching device. This marking is not required for items hand-carried (see **3.4.2.**), unpackaged for airdrop (see **A5.4.1.**), or secured in a tactical vehicle or equipment (see **A5.4.2.**).

A14.4.1.5. For palletized unit loads, a marking board may be used when positioning of marking on individual containers prevents the PSN or UN number from being visible. A marking board may also be used to identify current PSN and UN number for those items "Grandfathered" according to paragraph **1.7.2.** with individual packages marked with hazard communication information no longer in **Table A4.1.** As a minimum, position two marking boards at opposite sides of the pallet.

A14.4.1.6. For Grandfathered shipments, mark packages with DOT or military/federal specification number when specified by packaging paragraph in **Attachment 27**.

A14.4.2. **Class 2.**

A14.4.2.1. For ethylene oxide prepared and certified according to **A6.13.4.**, mark the top head of the drum "THIS END UP."

A14.4.2.2. Mark fire extinguishers prepared and certified according to **A6.8.3.** to indicate year of test and "MEETS DOT REQUIREMENTS." The words "This extinguisher meets all requirements of 49 CFR 173.306" may be displayed in place of "MEETS DOT REQUIREMENTS" on extinguishers manufactured before January 1, 1976.

A14.4.2.3. Each outside container of cryogenic liquids prepared and certified according to **A6.12.** must have arrows to indicate upright position and must be marked "KEEP UPRIGHT" and "DO NOT DROP." Hydrogen, cryogenic liquid must meet the marking requirements in 49 CFR 178.57-20. The total rate of venting in standard cubic feet per hour (SCFH) must be marked on the top head or valve protection band in letters at least one-half inch high as follows "VENT RATE**SCFH" (with the asterisks replaced by the number representing the total rate of venting, in SCFH).

A14.4.2.4. For nitric oxide prepared and certified according to **A6.20.** and the DOT 3A, 3AA, 3AL, or 3E1800 cylinders are overpacked, mark the outer wooden box "INSIDE CONTAINERS COMPLY WITH PRESCRIBED SPECIFICATIONS."

A14.4.2.5. For compressed gases prepared and certified according to **A6.3.**, mark the outside packaging "INSIDE CONTAINERS COMPLY WITH PRESCRIBED SPECIFICATIONS".

A14.4.2.6. Refrigerant gases or engine-starting fluid prepared and certified according to **A6.5.5.** and **A6.5.6.**, mark the outside shipping container "INSIDE CONTAINERS COMPLY WITH PRESCRIBED SPECIFICATIONS."

A14.4.3. **Class 3.** When shipping flammable liquids, mark the shipping container with the flash point.

A14.4.4. **Class 5.** For bromine pentafluoride or bromine trifluoride prepared and certified according to **A9.11.** using a DOT 3E1800 cylinder, mark the outside container "INSIDE CONTAINERS COMPLY WITH PRESCRIBED SPECIFICATIONS."

A14.4.5. **Class 6.**

A14.4.5.1. Permanently mark outside plastic containers used for toxic (poisonous materials), by embossment or other durable means, with the word "POISON" in letters of at least 6.3 mm (1/4 inch) in height. Additional text or symbols may be included in the marking. The marking must be located within 15 cm (6 inches) of the packaging's closure.

A14.4.5.2. Mark the packages of infectious substances with:

A14.4.5.2.1. The United Nations packaging symbol

A14.4.5.2.2. The text “CLASS 6.2”

A14.4.5.2.3. The last two digits of the year of manufacture of the packaging

A14.4.5.2.4. The State authorizing the allocation of the mark (i.e., USA)

A14.4.5.2.5. The name or registered symbol of the manufacturer

A14.4.5.3. Mark outer packagings of diagnostic specimen with the words “Diagnostic Specimen.”

A14.4.6. **Class 7.**

A14.4.6.1. Mark each package of radioactive materials over 50 kg (110 pounds) to show the gross weight including the unit of measurement marked on the outside of the package.

A14.4.6.2. Mark each package of radioactive material that meets the requirements for Type A, Type B(U) or Type B(M) packaging on the outside of the package in letters at least 13mm (1/2 inch) high, with the words "TYPE A" "TYPE B(U)" or "TYPE B(M)" as appropriate. Do not mark a package that does not meet these requirements.

A14.4.6.3. Mark on the outside of the packaging with the international vehicle registration code of the country of origin of the design. The international vehicle registration code for packages designed in the United States is the symbol "USA."

A14.4.6.4. For limited quantities prepared and certified according to **A11.11.**, the package is not required to be marked with the PSN provided it is marked with the identification number preceded by the letters "UN".

A14.4.6.5. Mark each Type B(U) or Type B(M) outer packaging with a trefoil radiation symbol meeting the requirements of 49 CFR Appendix B to Part 172.

A14.4.7. **Class 8.** Mark the outer container of chemical kits prepared and certified according to **A12.7.** "CHEMICAL KITS" or "FIRST AID KITS" as applicable.

A14.4.8. **Class 9.**

A14.4.8.1. Wheelchairs for which the battery is removed and boxed for shipment according to **A13.7.**, mark the outer container containing the battery "THIS SIDE UP." This applies any time a battery is authorized to be removed from its holder, boxed, and shipped with equipment.

A14.4.8.2. Unless packaged, crated, or otherwise enclosed to prevent ready identification, the marking of the article or equipment of Class 9 with the proper shipping name and identification number is not required.

A14.4.9. **Limited Quantities.** Mark packages used for dangerous goods in limited quantities in one of the following manners:

A14.4.9.1. "Limited Quantity" or "LTD QTY"

A14.4.9.2. N Number of contents within a square-on-point border

A14.4.10. **Consumer Commodity and ORM Markings.** Plainly, durably, and legibly mark each package containing a hazardous material meeting the definition of Consumer Commodities and classified as ORM-D with either "ORM-D" or "ORM-D-AIR". Place the marking on at least one side or end immediately following or below the PSN within a rectangle that is approximately 6.3 mm (1/4 inch) larger on each side than the ORM designation. Use the ORM designation for domestic shipments only.

A14.5. Consumer Product Warnings. An article, package, or container may bear a manufacturer's consumer warning symbol or statement. Presence of such a symbol or statement does not necessarily mean the article or contents meet the classification criteria as a hazardous material for military air transportation. Reference the Hazardous Material Information Resource System (HMIRS) or the product's Material Safety Data Sheet if hazard classification information is needed.

Attachment 15

LABELING HAZARDOUS MATERIALS

A15.1. General Requirements. Unless otherwise specified in this manual, apply the appropriate labels to the outside container of packages containing hazardous materials.

A15.1.1. Use labels meeting the commercial color and specifications outlined in 49 CFR 172.411 through 172.450, ICAO, or IATA. Do not use labels that are easily confused by their use, shape, and color, with the standard labels prescribed.

A15.1.2. Labels must be diamond-shaped with each side at least 10 cm (4 inches) long and have a solid line border 6.3 mm (0.25 inches) from the edge.

A15.1.3. The hazard class and division number must be at least 6.3 mm (0.25 inches) and not greater than 12.7 mm (0.5 inches). The label text must be at least 7.6 mm (0.3 inches) and will be in capitalized Roman letters.

A15.1.4. It is the shipping activity's responsibility to establish procedures to locally fund for and procure hazardous material labels and commercial forms.

A15.1.5. Secondary hazards do not require labels.

A15.2. Hazard Labels.

A15.2.1. Place on the outer packaging or (overpack) a primary hazard label and a subsidiary risk label based on the hazard classification/subsidiary risk provided in columns 3 and 6 of **Table A4.1.** Include the hazard class or division number in the bottom corner of the label(s). Labels that do not have the class or division number preprinted may be stamped or overprinted with the appropriate hazard class/division number in the bottom corner of the label.

A15.2.1.1. For explosives, include the division number and compatibility group letter. Ensure the compatibility group letter is a capitalized Roman letter.

A15.2.1.2. For Division 5.1 oxidizers and Division 5.2 organic peroxides, include the division number in the bottom corner of the label.

A15.2.2. Attach labels to the part of the package bearing the PSN if package size is adequate.

A15.2.3. Do not place labels over any identifying data on the container. Remove or obliterate any irrelevant labeling already on the packaging.

A15.2.4. When hazardous materials having different classes are packed in the same packaging or outside container, the outside container (or overpack) must be labeled as required for each material (including subsidiary risks). If the primary hazard or subsidiary risk label of another component already adequately identifies a primary or subsidiary risk, it is not required to repeat this warning by applying another label. Marking boards may be used (See **A14.3.12.**)

A15.2.5. When hazardous materials are palletized on a 463L or warehouse pallet, ensure the label is clearly visible.

A15.2.6. Position hazardous cargo loaded in the back of a vehicle so the labels are clearly visible, or apply the labels for each hazard loaded in the back of the vehicle to a marker board that is clearly visible.

A15.2.7. Label each Limited Quantity package for each dangerous good contained in the package.

A15.2.8. Excepted Quantities container only requires a completed "Dangerous Goods in Excepted Quantities" label attached to the container.

A15.2.9. Label hazardous waste with the appropriate hazard label and properly completed hazardous waste label.

A15.2.10. For items shipped under the PSN "Dangerous Goods in Machinery" or "Dangerous Goods in Apparatus" apply primary and subsidiary risk hazard labels for each hazard contained therein on the machinery, apparatus, or packaging (unless exempted by **A15.4.6.**). Apply Package Orientation (This Way Up) labels to opposite vertical sides when required to ensure liquid hazardous materials remain in their intended orientation.

A15.2.11. A label(s) is not required for domestic shipments when use is exempted by a DOT exemption (DOT-E). For international shipments, the correct label(s) must be applied.

A15.2.12. Do not apply hazard labels to a package containing material that is not regulated.

A15.3. Handling Labels.

A15.3.1. Apply a "Cargo Aircraft Only" label on packagings not permitted on passenger aircraft as identified in column 7 of **Table A4.1.** The "Cargo Aircraft Only" label is not required on cargo shipped according to **Chapter 3** (see **Attachment 17** for certification).

A15.3.2. Apply the "Cargo Aircraft Only" label on packagings shipped according to **Chapter 3** if diverted as identified in paragraph **3.11.**

A15.3.3. Apply a "Magnetized Material" label on packages containing magnetized material. An additional Class 9 label is not required.

A15.3.4. Apply an "Empty" label when the packaging meets the requirements of **1.10.** Any container or cylinder shipped as empty must have the previously applied hazard labels removed, obliterated, destroyed, or completely covered by the "EMPTY" label.

A15.4. General Requirements Applicable to Hazard Classes.

A15.4.1. **Class 2.**

A15.4.1.1. For packages containing oxygen, compressed; or oxygen, refrigerated liquid, a label with the word "OXYGEN" may be used in place of a label with the word "OXIDIZER," if the letter size and color are the same as those required for oxidizer. Alternatively, an "OXYGEN" label may be used in place of the "NONFLAMMABLE GAS" and "OXIDIZER" labels required in **Table A4.1.**

A15.4.1.2. Recoil mechanisms or artillery gun mounts prepared and certified according to **A6.6.8.**, must have a nonflammable compressed gas label applied to each exterior container. However, when shipped as an integral part of the complete weapon system, the nonflammable compressed gas label may be on the weapon or its exterior cover.

A15.4.2. **Class 3.** All flammable liquids, whose vapor pressure (Reid test) is more than 110 kPa (16 psi) at 38 degrees C (100 degrees F), must have a "white bung label," 76 x 127 mm (3 by 5 inches), affixed near the bung or closure of the container.

A15.4.3. **Class 6.**

A15.4.3.1. Label PG I or II material with either a "TOXIC" or "TOXIC INHALATION HAZARD" label as appropriate.

A15.4.3.2. Label hazard zone A or B material with a "TOXIC INHALATION HAZARD" label.

A15.4.3.3. Material classified as an infectious substance, that also meets the definition of a Class 2.3 toxic material or a radioactive material, must also be labeled with a "TOXIC GAS" (or INHALATION HAZARD) label or "RADIOACTIVE" label as appropriate.

A15.4.3.4. For PG III material, the "Keep Away from Food" label may be used for domestic shipments.

A15.4.4. **Class 7.**

A15.4.4.1. Label each package of radioactive materials, unless excepted by **Attachment 11**. The proper label to affix to a package of radioactive material is based on the radiation level at the surface of the package and the transport index. The proper category of label is determined according to **Table A15.1.** The limits for an individual package must not exceed 10. The maximum radiation level at any point on any external surface of the package must not exceed 2 mSv/h. The first step is to determine the maximum radiation level at a distance of 1 meter from the external surfaces of the package, overpack or freight container, the value determined must be multiplied by 100. The final step is the figure obtained in step 1 must be rounded up to the first decimal place, except that a value of 0.05 or less may be considered as zero. Apply the highest category label required for any of the two determining conditions. Radioactive white-I is the lowest category and radioactive yellow-III is the highest. For example: a package with a transport index of 0.8 and a maximum surface radiation level of 0.6 mSv/h (60 mrem/h) must bear a radioactive yellow-III label (see **Table A15.1.**)

Table A15.1. Radioactive Label Requirements. (See Note 1).

Transport Index (TI)	**Maximum Radiation Level at any Point on the External Surface**	**Label Category**
0 (see Note 1)	Less than or equal to 0.005 mSv/h (0.5 mrem/h)	white-I
More than 0 but not more than 1 (see Note 2)	More than 0.005 mSv/h (0.5 mrem/h) but less than or equal to 0.5 mSv/h (50 mrem/h)	yellow-II
More than 1 but not more than 10	More than 0.5 mSv/h (50 mrem/h) but less than or equal to 2 mSv/h (200 mrem/h)	yellow-III

NOTES:

1. The category of label must be shown in Key 17 of the Shipper's Declaration for Dangerous Goods form and must also be applied to radioactive materials packages. Any package containing a "highway route controlled quantity" must be labeled as radioactive yellow-III.
2. If the measured TI is not greater than 0.05, the value quoted may be zero.

A15.4.4.2. Label each package containing a radioactive material that also meets the definition of one or more additional hazards, as required by this attachment for the radioactive material and for each additional hazard. For example:

A15.4.4.2.1. Label solid nitrates of uranium or thorium, "RADIOACTIVE" and "OXIDIZER."

A15.4.4.2.2. Label nitric acid solution of radioactive material "RADIOACTIVE" and "CORROSIVE."

A15.4.4.3. Each package requiring a "RADIOACTIVE" label must have two of these labels affixed to opposite sides of the package. Enter the following information in the blank spaces by legible printing (manual or mechanical), using a durable weather resistant means of marking:

A15.4.4.3.1. **"Contents."** The name of the radionuclides as taken from the listing of radionuclides in **Table A11.1.** Symbols that conform to established radiation protection terminology are authorized, (i.e., 99_{Mo}, 60_{Co}, etc). For mixtures of radionuclides, list the most restrictive radionuclides, on the basis of radiotoxicity, as space on the label allows. If an overpack is used to consolidate individual packages, this entry may state "MIXED" unless each inside package contains the same radionuclides.

A15.4.4.3.2. **"Activity."** Express units in appropriate international units of Becquerals (Bq) or Terabecquerals (Tbq). The customary units, i.e., curies (Ci), mullicuries (mCi), or microcuries (uCi) may be included in parenthesis following the international units. Abbreviations are authorized. For a fissile material, the weight in grams or kilograms of the fissile radioisotope also may be inserted. If an overpack is used to consolidate individual packages, this entry must be determined by adding together the number of curies of the radioactive materials packages contained in the overpack.

A15.4.4.3.3. **"Transport Index."** See **Attachment 1**.

A15.4.4.4. When one or more packages of radioactive material are placed within an overpack, the overpack must be labeled as prescribed in this paragraph except as follows:

A15.4.4.4.1. The content entry on the label may state mixed in place of the names of the radionuclides unless each inside package contains the same radionuclide(s).

A15.4.4.4.2. The activity entry on the label must be determined by adding together the number of bequerals of the radioactive materials packages contained in the overpack.

A15.4.4.4.3. For an overpack, the TI must be determined by adding together the transport indexes of the radioactive materials packages contained in the overpack. For a rigid overpack, the TI may alternatively be determined by direct measurement as prescribed in this paragraph; however, it must be taken by the person who initially offered the packages contained within the overpack for shipment.

A15.4.4.4.4. The category of Class 7 label for the overpack must be determined from **Table A15.1.** using the TI derived from the requirements in this paragraph and the maximum surface radiation level on the surface of the overpack.

A15.4.4.4.5. The category of the Class 7 label of the overpack and not that of any contained packages must be used in accordance with Table 1 of 49 CFR 172.504(E) to determine when the transport vehicle must be placarded.

A15.4.4.4.6. For fissile material, the criticality safety index which must be entered on the overpack FISSILE label is the sum of the criticality safety indexes of the individual packages in the overpack as stated in the certificate of approval for the package design issued by the NRC or the US Competent Authority.

A15.4.5. **Class 8.**

A15.4.5.1. Wet-cell batteries prepared and certified according to **A12.5.** must have "Package Orientation" labels indicating the upright position (top) of the container, if not already marked on the container as specified in **A14.3.7.**

A15.4.5.2. Label Chemical or First Aid Kits prepared in accordance with **A12.7.** with the primary hazard label and any subsidiary risk labels applicable to each individual hazard within the kit.

A15.4.6. **Class 9.**

A15.4.6.1. Equipment or articles of Class 9 do not require a label unless packaged, crated, or otherwise enclosed to prevent ready identification.

A15.4.6.2. Certify items containing both limited quantity radioactive and magnetic characteristics to the radioactive material. Although limited quantity radioactive material is exempt from labeling, a magnetic material label must be applied to the shipping container.

Attachment 16

AREA PLACARDING

A16.1. General Requirements. Placard the area surrounding aircraft transporting any hazardous materials when parked according to **Table A16.1.** or Service directives. If Service directives do no contain specific procedures for placarding, use the following guidance:

A16.1.1. Use placards that meet the general design, size, and color specifications of 49 CFR 172.519.

A16.1.2. For explosives, fire and chemical hazard symbols specified in DoD 6055.9-STD may be used in place of placards.

A16.1.3. Conspicuously display placards at the front, rear, and both sides of the aircraft unless emergency response access is restricted. Then post placards at entry points.

A16.1.4. Park aircraft transporting DoD Class 1.1, 1.2, and 1.3 explosives and any material identified as Inhalation hazard zone A in a remote area. Placarding is still required for these materials when parked in a designated restricted, posted, and traffic controlled parking or loading and unloading area.

A16.1.5. Park aircraft transporting all other types of hazardous materials in a placarded area. However, placarding is not required for these materials when parked in a designated restricted, posted, and traffic controlled parking or loading and unloading area.

A16.2. Responsibility for Placards.

A16.2.1. Military hosts are responsible for placarding at military bases.

A16.2.2. At nonmilitary airfields, the agency delivering cargo to the aircraft, or off loading cargo is responsible for making arrangements with the airport manager for identifying the cargo, isolating parking and loading, placarding, firefighting, and disaster response. Arrangements for using en route nonmilitary airfields is the responsibility of the activity having operational control of the aircraft.

A16.2.3. It is the shipping activity's responsibility to establish procedures to locally procure and fund for hazardous material placards.

A16.2.4. A description of the placards is shown in **Table A16.1.**

Table A16.1. Placard Requirements. (see notes)

Placards Required for Parked Area Aircraft Containing Hazardous Cargo	
Hazard Class or Division (any quantity)	**Type of Placard**
1.1	EXPLOSIVES 1.1
1.2	EXPLOSIVES 1.2
1.3	EXPLOSIVES 1.3
2.3	TOXIC GAS
4.3	DANGEROUS WHEN WET
5.2 (Organic peroxide, Type B, liquid or solid temperature controlled)	ORGANIC PEROXIDE
6.1 (Inhalation hazard Zone A or B)	TOXIC INHALATION HAZARD
7 (Radioactive yellow-III label only)	RADIOACTIVE
Hazard Class or Division (1,001 pounds or more aggregate gross weight)	**Type of Placard**
1.4	EXPLOSIVES 1.4
1.5	EXPLOSIVES 1.5
1.6	EXPLOSIVES 1.6
2.1	FLAMMABLE GAS
2.2	NONFLAMMABLE GAS
3	FLAMMABLE
4.1	FLAMMABLE SOLID
4.2	SPONTANEOUSLY COMBUSTIBLE
5.1	OXIDIZER
5.2 (Other than organic peroxide, Type B, liquid or solid, temperature controlled)	ORGANIC PEROXIDE
6.1 (other than inhalation hazard, Zone A or B)	TOXIC
6.2	NONE REQUIRED
8	CORROSIVE

NOTES:

1. The quantity limitation will be the total gross weight of the packages comprising the shipment

or different shipments of the same classification. When cargo contains two or more hazardous articles (other than explosives 1.1, 1.2, and 1.3) which are compatible (see **Attachment 18**), combine the gross weight and quantity for this purpose.

2. Use the explosive placard representing highest hazard. For example, if the area contains both Class 1.1 and 1.2, use the Explosive 1.1 placard.

3. For those hazard classes located in the lower portion of the table, placarding is not required if the aggregate gross weight of the packages of those classes is less than 454 kg (1001 lbs). A "DANGEROUS" placard may be used in place of the separate placards for two or more categories of hazardous material found in the lower portion of the table. When 1000 kg (2205 lbs) or more of one category of material from the lower portion of the table is loaded, the specific placard for that material is required, and a "DANGEROUS" placard may not be used to represent that material.

Attachment 17

CERTIFYING HAZARDOUS MATERIALS

A17.1. Shipper's Certification. Unless specifically exempted in this manual, the shipping activity must complete a shipper's certification according to this attachment for all military air shipments of hazardous materials.

A17.1.1. **Certifying Official.**

A17.1.1.1. An individual qualified according to **A25.3.** must accomplish the Shipper's Declaration for Dangerous Goods form.

A17.1.1.2. When transportation personnel are required to certify an item that requires special preparation (munitions, engines, etc), the item specialist or preparing activity will provide documentation indicating that the item is prepared properly for air shipment. Develop local procedures to determine acceptable documentation.

A17.1.2. **Certification Reference.** Certify hazardous materials to a packaging reference in this manual. Hazardous material may be certified to the ICAO, IATA, or Title 49 CFR under the following conditions:

A17.1.2.1. Comply with all requirements of the certifying document and with this manual.

A17.1.2.2. Do not exceed the passenger quantity limitations of the certifying document. If the passenger quantity limitations of the certifying document are exceeded or the material is forbidden on passenger aircraft, then the shipment must be certified to this manual.

A17.1.2.3. Comply with requirements in **Attachment 20** for absorbent material in combination packages containing liquid hazardous materials.

A17.1.2.4. Include handling instructions identified in this manual for specific proper shipping names on the certification form in the "Additional Handling Information" block.

A17.1.2.5. Certify vehicles and support equipment to this manual.

A17.1.2.6. Certify compressed gas cylinders to this manual.

A17.1.2.7. See **A17.2.6.** for multiple mode shipments.

A17.2. Shipper's Declaration for Dangerous Goods Certification.

A17.2.1. **Forms Required.** Complete shipper's certification on the "Shipper's Declaration for Dangerous Goods" standard commercial form. Two styles of the commercial form may be used. One style is designed with the "Nature and Quantity of Dangerous Goods" section left open for continuous printing. The other style is designed in a columnar format with the "Nature and Quantity of Dangerous Goods" section blocked and formatted with headings specifying each key entry (**Figure A17.3.**). It is the shipping activity's responsibility to establish procedures to locally procure and fund for the Shipper's Declaration for Dangerous Goods form.

A17.2.1.1. Obtain the form through the procurement system from commercial vendors specializing in hazardous material transportation supplies.

A17.2.1.2. The form may be locally produced depending on local capabilities and economic feasibility.

A17.2.1.3. The form must meet the format, size, and color specifications outlined in IATA, Section 8-*Documentation.*

A17.2.2. **Copies Required.** Complete and sign at least three Shipper's Declaration for Dangerous Goods forms.

A17.2.2.1. Attach one certification form to the copy of the manifest that is placed on the aircraft.

A17.2.2.2. Attach one certification form to the originating station file manifest. Intransit or enroute terminals may reproduce (photocopy) the Shipper's Declaration for Dangerous Goods form for their station file if required.

A17.2.2.3. Place one certification form in a waterproof envelope and attach to the number one piece of the shipment.

A17.2.2.4. The three original forms used to offer hazardous material for military air transportation must have the vertical red hatch border and certifying official's signature. Carbon signatures are acceptable.

A17.2.2.5. Additional copies may be forwarded with the shipment. Vertical red hatch border is not required for any additional copies.

A17.2.3. **Form Completion.** Complete the Shipper's Declaration for Dangerous Goods form either manually (hand printed) or mechanically (typewriter, computer, etc.). The form may be completed by a combination of manual and mechanical means, as required, providing all entries are clear and legible. However, when possible, the shipping activity should complete the form entirely manually or entirely mechanically. Incorrect punctuation or entries that touch column separating lines on the form is not justification for frustrating hazardous cargo.

A17.2.3.1. Hazardous materials with different proper shipping names/UN numbers will not be shipped under the same transportation control number (TCN). Complete a Shipper's Declaration for Dangerous Goods according to this attachment to identify each proper shipping name/UN number identified by the TCN (see **A17.2.8.** and **A17.3.** for exceptions). A single Shipper's Declaration for Dangerous Goods will be used for multiple like items shipped under one TCN.

A17.2.3.2. The certifying official may make pen and ink changes to any key. Someone other than the certifying official may make pen and ink changes to Keys 1 (only to the telephone number and not to the address), 2, 3, 5, 8, 9, and 19 without affecting the certification. Personnel making a change to any key must sign above the change. All entries must be durable, clear, and legible on all copies. Shipments may be frustrated if any entry on the form is not clear and legible. If the Shipper's Declaration for Dangerous Goods form is rejected, the correction must be accomplished as described in this paragraph or an entirely new form must be completed and presented to the shipping activity.

A17.2.3.3. Leave blank any key that does not require an entry (i.e., Key 15 when there is no subsidiary risk).

A17.2.3.4. If the Shipper's Declaration for Dangerous Goods does not contain sufficient space in any one key to accommodate all of the required information, use an additional Shipper's Declara-

tion as an extension page. Each page must show the page number and total number of pages (Key 4). All pages must have the vertical red hatch border.

A17.2.4. **Not Enough Copies or No Copies.** In instances where there are not enough copies of the Shipper's Declaration for Dangerous Goods, a certified "true copy" may be placed with the station file manifest. When making a true copy:

A17.2.4.1. Annotate all the information verbatim from the original Shipper's Declaration for Dangerous Goods.

A17.2.4.2. Use the information in the signature block from the original form and annotate it on the true copy, (i.e., John Doe, 2 Oct 90). On the reverse side of the form, type or clearly print the words "True Copy" and the name of the individual who is certifying the form to be a true copy. This official must sign the form in longhand above the typed or printed name. The individual preparing a "true copy" need not be qualified according to **A25.3.** to certify the Shipper's Declaration for Dangerous Goods is a true copy.

A17.2.5. **Split Shipments.** When a shipment is split according to procedures identified in DoD 4500.9R, DTR.

A17.2.5.1. Someone other than the certifying official may change key 5 and key 16 entry for number of packages only. The individual making the change must sign above it.

A17.2.5.2. All other entries in key 16 (i.e., type of packaging and net quantity) will only be changed by the certifying official.

A17.2.5.3. Prepare a "true copy" according to **A17.2.4.** The original shipper's certification form will accompany the aircraft manifest with the first shipment. Attach a split shipment "true copy" to aircraft manifest and station manifest for subsequent shipments. Each Shipper's Declaration must reflect the correct TCN and number of packages.

A17.2.5.4. Enter statement, "Shipment split at XXX (use Air terminal three letter code) IAW DTR, Part II" on reverse side of all Shipper's Declaration forms.

A17.2.6. **Multiple Mode Shipments.** Shipments certified to the ICAO, IATA, or 49 CFR that do not exceed the passenger quantity limitations of the certifying document may use the same Shipper's Declaration for Dangerous Goods for both the commercial and military segments of air transport. Include any information required by **A17.1.** For shipments that exceed the passenger quantity limitations of the ICAO, IATA, or 49 CFR:

A17.2.6.1. Complete a Shipper's Declaration for Dangerous Goods according to the ICAO, IATA, or 49 CFR for the commercial segment and a separate Shipper's Declaration for Dangerous Goods according to this manual for the military segment.

A17.2.6.2. Place copies of the Shipper's Declaration for Dangerous Goods needed for subsequent movement in a waterproof envelope on the number one piece of the shipment.

A17.2.6.3. DoD aerial port personnel will remove the copies of the Shipper's Declaration for Dangerous Goods from the waterproof envelope and obliterate the "cargo aircraft only" label if not required for military transport.

A17.2.7. **Classified Information.** Follow DoD 4500.9-R, Defense Transportation Regulation, Part II, Chapter 205 and MIL-STD-129 for marking and documenting classified hazardous materials. If the information to be entered on the Shipper's Declaration is classified, the following procedures apply:

A17.2.7.1. Complete the signed original in detail, including essential classified data, and attach to the manifest that is placed on the aircraft. Once the classified information is applied, the Shipper's Declaration for Dangerous Goods must carry the same classification as the highest classification of the entered information.

A17.2.7.2. The manifest on the aircraft must carry the same classification as the classified information until the classified Shipper's Declaration for Dangerous Goods is detached and handled according to applicable security regulations.

A17.2.7.3. Complete the station file copy in detail except for the classified information. Enter the following statement in "Additional Handling Information" (Key 19): "See aircraft commander's copy of Shipper's Declaration for Dangerous Goods for complete information."

A17.2.8. **Kits.**

A17.2.8.1. If shipping a kit consisting of more than one container, enter in Key 19 the statement: "contained in kit piece number ***" (replace "***" with the piece number which contains the hazardous material).

A17.2.8.2. When more than one PSN is authorized to be packaged in a single container(s) as a "kit" (see **Attachment 1**, definition of "Kit"), complete information in Keys 11-18 for each PSN. Identify in Key 19 that the item is a kit. This does not apply to an item classified and described in **Table A4.1.** as a "KIT" (e.g. FIRST AID KITS, CHEMICAL KITS, POLYESTER RESIN KITS, etc).

A17.2.8.3. When an item is described in **Table A4.1.** as a "KIT", enter the aggregate quantity of hazardous materials in Key 16.

A17.2.9. **Secondary Load.** Complete a Shipper's Declaration of Dangerous Goods according to this attachment for each secondary load.

A17.3. Exceptions for Operations Conducted According to DoD 4500.9R, DTR, Part III (Mobility). Prepare the Shipper's Declaration for Dangerous Goods according to this manual for mobility operations. The following exceptions may be used for tactical, contingency, and emergency operations (to include exercises) and other deployment operations conducted according to DTR, Part III..

A17.3.1. **Key 1.** Enter the address of the station where the cargo was certified and the telephone number of the certifier's assigned unit.

A17.3.2. **Key 2 and Key 9.** Enter worldwide mobility.

A17.3.3. **Key 5.** Enter the transportation control number (TCN), developed according to DoD 4500.9R, DTR *Part III – Appendix Z.*

A17.3.4. **Key 7.** Although the label is not required on the cargo, Key 7 must have the "Passenger and Cargo Aircraft" block deleted if the material is cargo aircraft only.

A17.3.5. Complete and sign at least two copies of the Shipper's Declaration for Dangerous Goods Form. Attach one form to the copy of the manifest that is placed on the aircraft and one copy to the originating station file manifest.

A17.3.6. A single Shipper's Declaration for Dangerous Goods may be used to identify and certify more than one type of hazardous material. All hazardous material certified on a single form must be considered a single shipment and controlled by one mobility TCN (only if authorized by DoD 4500.9R).

A17.3.7. Certification is not required for hand-carried hazardous materials authorized according to paragraph **3.4.2.**

A17.3.8. **Keys 11-18.** Different hazardous materials may be entered when prepared as a single shipment unit.

A17.3.9. Complete Key 19 according to this attachment and **Figure A17.1.** for individual items.

A17.3.10. Complete and sign at least 2 copies of the Shipper's Declaration of Dangerous Goods form. Attach one form to the copy of the manifest that is placed on the aircraft, and one copy to the originating station file manifest.

A17.3.11. Certification is not required for hand-carried hazardous materials authorized according to paragraph **3.4.2.**

A17.3.12. See paragraph **3.11.** for use with non-mobility/nontactical airlift.

A17.4. Certification Requirements for Specific Items.

A17.4.1. **Class 1.**

A17.4.1.1. For captured ammunition and ammunition with unknown characteristics shipped according to **A5.5.**, include in key 17 the reference to **A5.5.** and the applicable packaging paragraph from **Table A4.1.** (for example, "**A5.5.**/A5.59."). Include a copy of the EOD safety certification. Comply with **A17.2.7.** for classified information.

A17.4.1.2. Identify any munition or ordnance item containing OTTO Fuel II as a propellant with the following entry in Key 19: "Contains Otto Fuel II as a liquid propellant. In the event of a leak, avoid direct skin contact, ingestion, or inhalation of vapors. Vapors are toxic and may cause severe headache and nausea."

A17.4.1.3. Identify fired exercise torpedoes or rockets, no longer containing explosive components, with OTTO Fuel II residue remaining as "Environmentally Hazardous Substance Liquid, N.O.S. (OTTO Fuel II)" and prepare according to A13.3.2.20.

A17.4.1.4. When prepared for air drop in authorized packaging, cite appropriate packaging reference from **Attachment 5**. When removed from authorized packaging and configured on airdrop parachute platforms, cite **A5.4.1.** as packaging reference.

A17.4.1.5. When removed from authorized packaging and stored in approved racks or containers, or secured in/on as operational components of a tactical vehicle according to specified procedures in a technical manual or publication, cite **A5.4.2.** as packaging reference.

A17.4.1.6. When secured in authorized packaging and loaded on a tactical vehicle as an operational component according to specified procedures in a technical manual or publication, cite appropriate packaging reference from **Attachment 5**.

A17.4.1.7. When packaging requirements are included as part of a classification of explosives approval, cite **A5.6.** in Key 17. A copy of the classification approval must accompany the shipment.

A17.4.1.8. Use the DoD Joint Hazard Classification System (JHCS) to complete certification information unless a final/interim hazard classification or a DOT approved classification is used according to **A3.3.1.2.**

A17.4.2. **Class 2.**

A17.4.2.1. **Cryogenic Liquids.** For cryogenic liquids prepared according to **A6.12.** provide venting instructions in Key 19. This is not required if venting procedures are provided in a separate instruction accompanying the shipment. Include the location and description of the vent valve. If the cylinder is empty and purged, venting is not required; comply with paragraph **1.10.4.** For regulated cylinders, include one of the following statements for venting the unit:

A17.4.2.1.1. "Vent container to outside of aircraft."

A17.4.2.1.2. "Container is excepted from venting."

A17.4.2.2. **Fire Extinguishers.** Fire extinguishers removed from an authorized holder of a vehicle or equipment being airdropped do not require separate certification. Identify as a secondary hazard of the vehicle or equipment. Package the fire extinguisher in a strong outer container. This only applies to the fire extinguisher that is assigned as an installed component of the vehicle or equipment. Package and certify spare/stowed cylinders according to this manual.

A17.4.3. **Class 3.** Spare fuel in UN Specification jerricans and DOT 5L jerricans (see paragraph **3.7.** for DOT 5L limitations) when transported in approved, permenantly configured and mounted holders may be certified as part of a vehicle or support equipment (see **A17.4.4.1.**).

A17.4.4. **Class 6.**

A17.4.4.1. Infectious substances, affecting humans or animals and requiring a technical escort according to **Attachment 24** will be identified as "CARGO ONLY AIRCRAFT" in key 7 of the shippers declaration.

A17.4.4.2. Enter in Key 19 the Risk Code assigned to an "Infectious Material" UN 2814 or UN 2900 (e.g., "Risk Code :3")

A17.4.5. **Class 9.**

A17.4.5.1. **Vehicles, Engines Internal Combustion, Fuel Devices, and Other Equipment.**

A17.4.5.1.1. For items prepared according to **A13.5.** or **A13.6.**, identify the primary hazard Class 9 description in keys 11-14. In key 19 show:

A17.4.5.1.1.1. The PSN, hazard class, and net quantity of flammable fuel, and any other secondary hazards (batteries, mounted fire extinguishers, installed engine starting fluid, etc.). When an item is completely drained (but not purged) so that the quantity of fuel does not exceed 500 ml (17 ounces), the shipper's estimate of the quantity of fuel remaining in the unit may be entered.

A17.4.5.1.1.2. Identify mounted engines and generators that are by design an approved part of an M-Series vehicle in Key 19 as a secondary hazard (also identify hazardous components such as batteries).

A17.4.5.1.1.3. Engines and generators mounted to a vehicle, support equipment or trailor for convenience of movement or handling are considered secondary loads, and will require a separate certification.

A17.4.5.1.1.4. The name and quantity of any non-hazardous fuel in vehicles or equipment tanks.

A17.4.5.1.1.5. When an item is drained and purged of any flammable liquid, but is being certified due to another hazard, enter "Drained and Purged."

A17.4.5.1.1.6. Include the statement "non-hazardous battery installed" if applicable.

A17.4.5.1.1.7. Reference to the technical directive used to prepare the item for military air shipment is not required, except for fuel servicing equipment and vehicles drained in accordance with technical directives (technical orders, field manuals, etc.). In this case, indicate the directive used: "Drained IAW T.O. XX-XX-XX"

A17.4.5.1.1.8. Identify jerricans secured in permanently configured and approved holders of vehicles or equipment as a secondary hazard in Key 19 of the Shipper's Declaration form (i.e., 4 jerricans x 11 liters). A separate certification is not required. Fuel quantity limits are restricted for the DOT 5L jerrican (see paragraph **3.7.**).

A17.4.5.1.2. Drained and purged repairable engines and fuel devices prepared according to **A13.5.6.** and **A13.6.7.** are not hazardous for transportation. Follow procedures specified in **1.10.4.**

A17.4.5.1.3. Certification is not required for movement of wheelchairs with patients.

A17.4.5.1.4. Dual-powered vehicles (designed to operate on both flammable liquid and gas) must meet the requirements of **A13.5.** for each fuel tank. Describe as "Vehicle, Flammable Liquid Powered".

A17.4.5.1.5. Describe vehicles fueled with a combustible liquid (flashpoint greater than 60.5 degrees C) as "Vehicle, Flammable Liquid Powered".

A17.4.5.2. **Life-Saving Appliances.** For life-saving appliances, Class 9, prepared according to **A13.11.**, show:

A17.4.5.2.1. A specific description and the number of the items packaged for shipment in Key 16. For example; "1 wooden box x 3 self-inflating life vests".

A17.4.5.2.2. The PSN, hazard class and net quantity of each hazardous component within the shipping container in Key 19.

A17.4.5.3. **Dry Ice.** When dry ice is used as a refrigerant for another hazardous material, identify the dry ice as a secondary hazard by PSN, hazard class, and net quantity in Key 19 of the Shipper's Declaration form. Ensure packaging meets the requirements of **A13.9.**

A17.4.5.4. **Consumer Commodity.** The hazard classification "ORM-D" may be used in Key 12 for domestic shipments only.

A17.4.6. **Competent Authority Approvals (CAA).** If the shipment is packaged and transported under the authority of a CAA (Packaging or Hazard Classification), cite the CAA number in Key 17. Annotate the shipping papers, "PACKAGING AUTHORIZED BY COMPETENT AUTHORITY OF THE UNITED STATES OF AMERICA (USA)." If the CAA is from a country other than the USA, that country must be annotated in place of USA on the shipping papers. If the CAA does not have a number assigned to it, certify the shipment to **A5.6.** (see **2.5.2.**). A copy of the CAA must accompany the shipment.

A17.4.7. **Empty Packaging.** Packagings considered empty according to **1.10.** do not require a Shipper's Declaration for Dangerous Goods form. Follow procedures specified in **1.10.4.**

A17.4.8. **Excepted Quantities.** A Shipper's Declaration for Dangerous Goods is not required for excepted quantities prepared according to **A19.2.** Annotate the shipping papers "Dangerous Goods in Excepted Quantities" and use a Dangerous Goods in Excepted Quantities" label (see **A15.2.**). Passenger restrictions do not apply to items in excepted quantities.

A17.4.9. **Label Exempt Shipments.** When use of hazard class label(s) are exempted by a DOT-exemption (DOT-E) for a domestic shipment, annotate Key 19: "Hazard Class Label (or Labels) exempted by DOT-E (enter exemption number, e.g., DOT-E XXXX).

A17.4.10. **Grandfathered Shipments.** Certify grandfathered munitions shipments according to the applicable paragraph in **Attachment 27**.

A17.4.11. **Consumer Commodity.** Enter "**A13.4.**" in Key 17 of the Shipper's Declaration for Dangerous Goods when an item is classified as a "Consumer Commodity" regardless of the original hazard classification of the substance within an individual inner packaging or receptacles.

A17.5. Completing the Shipper's Declaration for Dangerous Goods. Use **Figure A17.1.** for detailed instructions on accomplishing the shipper's certification form for nonradioactive and radioactive shipments. Use **Figure A17.2.** to determine if a Shipper's Declaration for Dangerous Goods is required for radioactive shipments.

A17.5.1. For forms with the "Nature and Quantity of Dangerous Goods" in columnar format, enter information in the appropriate column.

A17.5.2. For forms with the "Nature and Quantity of Dangerous Goods" open for continuous printing, the basic description may be alternately shown with the Identification (ID) Number entered in the key 11 position, the PSN in key 12 and the Class/Division in key 13. Additionally, any subsidiary risk(s) may be entered following the hazard class/division but must be enclosed in brackets. Completion of key 15 is not required if subsidiary risks are in brackets. Example: "UN2744, Cyclobutyl chloroformate, 6.1, (8,3), PG II."

A17.5.3. For forms with the "Nature and Quantity of Dangerous Goods" open for continuous printing, use two oblique strokes, i.e. "//", to separate sequences of information or place each sequence on a separate line. Separate information within a sequence with a comma. See **Figure A17.3.** to identify separation of each sequence.

Figure A17.1. Step-by step Instructions for Completing Shipper's Declaration for Dangerous Goods Form.

Key 1. Shipper. Enter the address and telephone number where the hazardous material was certified.

Key 2. Consignee. Enter the six-digit Department of Defense Activity Address Code (DODAAC) and/or the in-the-clear geographical location of the ultimate consignee (if known.)

For shipments of infectious substances, enter also the name and telephone number of a responsible person for contact in an emergency.

Key 3. Air Waybill No. The aircraft manifest number to which the Shipper's Declaration for Dangerous Goods will be attached may be entered in this key. This number need not be entered by the shipper. It may be entered by the accepting operator at the time it is assigned. This key may also be left blank.

Key 4. Page...of...Pages. Enter the page number and total number of pages of the Shipper's Declaration for Dangerous Goods form. Enter "Page 1 of 1 Pages" or leave blank if there are no extension pages.

Key 5. Shipper's Reference Number. Enter the 17-character transportation control number (TCN).

Key 6. Optional Block. Inspection activity will annotate date of inspection and acceptance for air movement according to **A28.1.2.** Shipper unit cargo identification information may also be entered.

Key 7. Shipment Within Passenger Aircraft and Cargo Aircraft Limitations. Use the following to determine limitations:

– If the shipment is acceptable for movement on both passenger and cargo aircraft ("P5" in **Table A4.1.**, Column 7), delete "Cargo Aircraft Only."

– If the shipment is allowed only by cargo aircraft ("P1" – "P4" in **Table A4.1.**, Column 7), delete "Passengers and Cargo Aircraft."

– If the shipment is certified to a special approval document which identifies the mode of transportation as Cargo Aircraft Only, delete "Passengers and Cargo Aircraft." This applies even if the PSN is identified as a "P5" in **Table A4.1.**, Column 7.

– If the shipment is certified to a Special Approval document which identifies the mode of transportation as acceptable by either Passenger Aircraft or Cargo Aircraft Only, use the "P" code from **Table A4.1.**, Column 7 to determine passenger limitations.

Key 8. Airport of Departure. Enter the three-digit Port of Embarkation (POE) and/or the in-the-clear geographical location of the airport of departure.

Key 9. Airport of Destination. Enter the three-digit Port of Debarkation (POD) and/or the in-the-clear geographical location of the airport of destination.

Key 10. Shipment Type.

– Delete "Radioactive" if the shipment contains no radioactive material.

– Delete “Nonradioactive” if the shipment contains radioactive material.

Key 11. Proper Shipping Name. Enter the PSN shown in **Table A4.1.** Enter the following information, if applicable, in association with the basic description:

– Technical name, in parentheses, when required by **Attachment 4**.

– The letters “RQ” preceding the PSN for a hazardous substance (see **A4.5.**).

– For materials which are toxic (poisonous) by inhalation, enter the words "TOXIC-INHALATION

HAZARD" and "ZONE A", "ZONE B", "ZONE C", or "ZONE D" for gases, or "ZONE A" or "ZONE B"

for liquids, as appropriate. The word "TOXIC" need not be repeated if it is already identified in the PSN

(i.e. enter "INHALATION HAZARD" and the appropriate zone).

– The word "Waste" preceding the PSN for a hazardous material that is a hazardous waste.

Key 12. Class and Division. Enter the hazard class and division number given in column 3 of **Table A4.1.**

– For Class 1 material, enter either the Inhabited Building Distance (IBD) or Subdivision if assigned in the DoD Joint Hazard Classification System (JHCS) or classification approval document (i.e., IBD: “(18)” or Subdivision: “1.2.1”). The words “Subdivision” and “IBD” are optional.

– For Class 1 material, include the compatibility group letter. A compatibility group letter for non-Class 1 material, when assigned in JHCS for storage, is optional.

– For a single item with more than one hazard, enter the hazard class number of the item's primary hazard.

Key 13. UN, NA, OR ID No. Enter the United Nations (UN), North American (NA), or identification number (ID) given in column 4 of **Table A4.1.** Include the UN, NA, or ID prefix and the number.

Key 14. Packing Group. Enter the applicable Packing Group (PG) given in column 5 of **Table A4.1.** Entry of packing group for Hazard Class 1 is optional.

Key 15. Subsidiary Risk. Enter the subsidiary risk if given in column 6 of **Table A4.1.**

Key 16. Quantity and Type of Packing.

- Nonradioactive shipments enter:
  - The number of packages (of same type and content) and their type of packaging.
  - Type of packaging listed in this key is the authorized packaging identified in the packaging paragraph. Identify the type of packaging by specification code or text description of the outer packaging. For example: fiberboard box or 4G; steel drum or 1A2; DOT 3A or cylinder.
  - For specifically named self-propelled vehicle and mechanical apparatus enter nomenclature or basic description of the item (i.e., truck, generator, etc.).
- The weight, volume, or other applicable measure of the actual hazardous material (per package).
  - Do not include any nonhazardous content of the shipment.
  - Enter the net quantity in metric measurement units. The equivalent English unit of measure may be entered in parenthesis immediately following the metric unit.
  - Show the quantity per package immediately following the number and type of package (i.e., 2 wooden boxes x 4.5 kg (10 pounds); 1 4G x 5 L (1.3 gallons)).
  - Batteries (UN3028, UN2794, UN 2795, and UN2800) may be identified by the gross weight of the batteries per outer container (e.g., 1 fiberboard box (4G) x 25 kg gross)
  - For explosives enter the "Net Explosive Weight (NEW)" in metric weight per package or per warehouse pallet or skid (i.e., 3 wooden boxes x 120 kg (264.6 pounds) NEW; or 1 warehouse pallet x 200 kg (441 pounds) NEW). Entry of pounds in association with metric weight is preferred but not required.
  - For items classified as a non-explosive that contain explosive components (e.g., 3L, 3J, 8S, etc.) use the quantity of the assigned predominate hazard.

- Express in kilograms (pounds), not pounds per square inch, the quantity of compressed gas unless otherwise specified in this instruction. When certifying to **A6.3.** "Aerosols," **A6.4.** "Small Receptacles Containing Compressed Gases," **A6.8.** "Fire Extinguishers," **A6.10.** "Cigarette Lighter or Other Similar Devices Charged with Fuel," and **A13.4.** "Consumer Commodity" (Aerosols) other units of measure; (i.e., fluid ounces, gallons, or ounces) are specified and may be shown on this form. See also **A26.4.**

- When an overpack is used for handling purposes and prevents identification of contents and/or UN specification markings, enter the words "Overpack Used". Identify the number of overpacks if more than one is used.

- For magnetized material, enter the number and type of packaging. No entry for net quantity is required. Weight or size of container is optional.

– Radioactive shipments enter:

- Name or symbol of the radionuclide in the material.

- Description of the physical and chemical form of the material, if it is not in special form (generic chemical description is acceptable for chemical form). If special form, enter "Special Form."

- The number of packages (of same type and content), the type of package, and the activity contained in each package in terms of Becquerel or Terabecquerel. The equivalent customary unit of measure (i.e., Ci, mCi, or uCi) may be included in parenthesis.

Key 17. Packaging Instructions.

– Nonradioactive shipments enter:

- The packaging paragraph from the applicable packaging reference (**A17.1.2.**) used to prepare the material for shipment.

- If the packaging has been approved by a DOT-Exemption, CAA, COE, or waiver cite the approval number (i.e., AFMC 24-204-96-09; COE NA-84-505; DOT-E 3849; etc.) See **A17.4.1.** when the packaging requirement is included as part of the explosives hazard classification approval document.

- If a UN packaging specification certified package is overpacked to meet air eligibility requirements, cite **A3.2.3.** and the applicable packaging paragraph for the material. Cite the applicable packaging paragraph for the material when packing inner containers into a 1A2 drum to meet air eligible and UN specification configuration requirements.

– Radioactive shipments enter (see **Figure A17.2.**, steps 5 and 6 for assistance):

- Packaging paragraph used to prepare the material for shipment.

- Category of the package (i.e., "white-I," "yellow-II," or "yellow-III").

– The transport index, preceded by the prefix "Ti", assigned each package having a "Radioactive Yellow-II" or "Radioactive Yellow-III" label and dimensions of each package, including dimensional units (for drums, the capacity is acceptable (i.e. 55 gallons)).

– The fissile class. If the package is exempt enter the words "Fissile Exempt."

Key 18. Authorization.

– Nonradioactive shipments enter:

– When applicable, enter the words "Limited Quantity" or "LTD. QTY."

– Radioactive shipments enter Approval Identification Markings (if relevant). List the package identification markings of any of the documents listed below issued by a competent authority. Include the words "attached" to indicate that the documents are attached to the declaration form.

– Special form approval certificate.

– Type B package design approval certificate.

– Type B(M) package shipment approval certificate.

– Fissile material package design approval certificate.

– Fissile material package shipment approval certificate.

– Special arrangement approval certificate.

– Any similar documents.

Key 19. Additional Handling Information. Enter:

–The PSN, hazard class, and net quantity of each secondary hazard for items with multiple hazards.

–Handling instructions, when specified by a packaging paragraph. Only enter if the handling instruction applies to the material being shipped.

–The 24-hour Emergency Response number for the hazardous material listed on the Shipper's Declaration for Dangerous Goods. Enter the words "EMERGENCY CONTACT:" followed by the number. See 2.8 for Emergency Response numbers used by DoD activities.

– The control and emergency temperatures for temperature controlled Class 4.1 and 5.2 materials.

Key 20. Name/Job Title of Signatory. Enter the name and job title of the official signing the form.

Key 21. Place and Date. Enter the place and date the material was certified (i.e., Hill AFB, 1 Jan 97).

Key 22. Signature. The official who certifies that the shipment complies with the requirements of this instruction must sign the form in longhand.

Figure A17.2. Determining Certification Requirements for Class 7.

Step 1. Determine the radionuclide and type of package. Turn to **A11.4.** Find the radionuclide, its name, and the maximum radioactive quantity (TBq or Ci) that can be shipped in a type A package. If a type B container is required, go to Step 3.

Step 2. Determine if a Shipper's Declaration for Dangerous Goods is Required. Turn to **Table A11.7.** Determine the maximum quantity that can be shipped as a limited quantity. This amount will be a fraction of the quantity listed in **Table A11.1.** If the item shipped qualifies as an excepted package, a Shipper's Declaration for Dangerous Goods is not required, but you must comply with **A11.11.**, **A11.12.**, **A11.13.**, or **A11.14.** Go to Step 3 if the material is not a limited quantity.

Step 3. Enter the Information Required in Key 16. Make a note of the transport index, but do not enter it in Key 16.

Step 4. Determine the Proper Shipping Name (PSN). Select the applicable PSN from **Table A4.1.** Complete the appropriate keys using the information found in **Table A4.1.**, columns 2 through 4. Do not complete Key 17 at this point. Make a note of all the basic paragraphs listed in column 8.

Step 5. Select the Packaging Paragraph. Determine the correct packaging paragraph from the list you made in Step 4 based on the type of package used (type A or type B). Determine the paragraph based on the particular container used. Enter this information as the first entry in Key 17.

Step 6. Determine the Label Requirements. Use the transport index, the surface reading, and fissile class, if appropriate, to determine the labels required by **Attachment 15**. Enter the label required as the category of package entry in Key 17, immediately following the packaging paragraph. Enter the transport index and any remaining information required to complete Key 17.

Step 7. Complete the Remaining Keys of the Shipper's Declaration for Dangerous Goods. Step-by-step instructions for completing the Shipper's Declaration for Radioactive Material are identified in **Figure A17.1.**

Figure A17.3. Completed Samples of the Shipper's Declaration for Dangerous Goods.

SHIPPER'S DECLARATION FOR DANGEROUS GOODS

Shipper Key 1	Air Waybill No. Key 3 Page of Pages Key 4 Shipper's Reference Number *(optional)* Key 5
Consignee Key 2	(Company logo, name and address optional) Key 6
Two completed and signed copies of this Declaration must be handed to the operator	**WARNING** **Failure to comply in all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties. This Declaration must not, in any circumstances, be completed and/or signed by a consolidator, a forwarder or an IATA cargo agent.**

TRANSPORT DETAILS

This shipment is within the limitations prescribed for: *(delete non-applicable)* Key 7 PASSENGER AND CARGO AIRCRAFT / CARGO AIRCRAFT ONLY	Airport of Departure Key 8
Airport of Destination: Key 9	Shipment type: *(delete non-applicable)* NON-RADIOACTIVE / RADIOACTIVE Key 10

NATURE AND QUANTITY OF DANGEROUS GOODS
Proper Shipping Name, Class or Division, UN Number or Identification Number, Packing Group (if required), number of packages, and all other required information.

Keys 11, 12, 13, 14, 15 // 16 // 17 // 18

Additional Handling Information

Key 19

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.	Name/Title of Signatory Key 20 Place and Date Key 21 Signature *(see warning above)* Key 22

Shipper

Key 1

Air Waybill No — Key 3

Page of Pages — Key 4

Shipper's Reference Number (optional) — Key 5

Consignee

Key 2

(Company logo, name and address optional)

Key 6

Two completed and signed copies of this Declaration must be handed to the operator

WARNING

Failure to comply in all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties. This Declaration must not, in any circumstances, be completed and/or signed by a consolidator, a forwarder or an IATA cargo agent.

TRANSPORT DETAILS

This shipment is within the limitations prescribed for *(delete non-applicable)* Key 7

PASSENGER AND CARGO AIRCRAFT	CARGO AIRCRAFT ONLY

Airport of Departure

Key 8

Airport of Destination — Key 9

Shipment type *(delete non-applicable)*

NON-RADIOACTIVE	RADIOACTIVE

Key 10

NATURE AND QUANTITY OF DANGEROUS GOODS

Dangerous Goods Identification							
Proper Shipping Name	Class or Division	UN or ID No.	Packing Group	Subsidiary Risk	Quantity and type of packing	Packing Inst.	Authorization
Key 11	Key 12	Key 13	Key 14	Key 15	Key 16	Key 17	Key 18

Additional Handling Information

Key 19

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Name/Title of Signatory — Key 20

Place and Date — Key 21

Signature *(see warning above)* — Key 22

SHIPPER'S DECLARATION FOR DANGEROUS GOODS

Shipper
TRAFFIC MANAGEMENT OFFICE
1000 CHIDLAW ROAD
ELMENDORF AFB, AK 99056

Air Waybill No.
Page 1 of 1 Pages
Shipper's Reference Number FB500011703122XXX
(optional)

Consignee
TRAFFIC MANAGEMENT OFFICE
HILL AFB, UT 84056

Two completed and signed copies of this Declaration must be handed to the operator

WARNING

Failure to comply in all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties. This Declaration must not, in any circumstances, be completed and/or signed by a consolidator, a forwarder or an IATA cargo agent.

TRANSPORT DETAILS

This shipment is within the limitations prescribed for: *(delete non-applicable)*

PASSENGER AND CARGO AIRCRAFT | XXXXXXXXXX ~~CARGO AIRCRAFT ONLY~~

Airport of Departure
EDF
Elmendorf AFB, AK

Airport of Destination: Hill AFB, UT

Shipment type: *(delete non-applicable)*
NON-RADIOACTIVE | ~~RADIOACTIVE~~

NATURE AND QUANTITY OF DANGEROUS GOODS
Proper Shipping Name, Class, UN Number or Identification Number, Packing Group (if required), number of packages, packing instructions and all other required information as detailed in Subsections 6.6 and 8.1 of IATA Dangerous Goods Regulations.

NICOTINE, 6.1, UN1654, II
1 1A1 X 20L
A10.5.5

Additional Handling Information

24 hr. Emergency Contact Tel. No. 800-851-8061

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Name/Title of Signatory
K.C. Davis, Foreman
Place and Date
Elmendorf AFB, AK 25 Jan 03
Signature
(see warning above)

SHIPPER'S DECLARATION FOR DANGEROUS GOODS

Shipper
TRAFFIC MANAGEMENT OFFICE
2020 KOE AVENUE
BROOKS AFB TX 78235
210-356-9999

Air Waybill No.

Page 1 of 1 Pages

Shipper's Reference Number FB2059511302XXX
(optional)

Consignee
TRAFFIC MANAGEMENT OFFICE
WRIGHT-PATTERSON AFB OH 45433

Two completed and signed copies of this Declaration must be handed to the operator

TRANSPORT DETAILS

This shipment is within the limitations prescribed for:
(delete non-applicable)

PASSENGER AND CARGO AIRCRAFT | ~~CARGO AIRCRAFT ONLY~~

Airport of Departure
Brooks AFB, OH

Airport of Destination: Wright-Patterson AFB OH

WARNING

Failure to comply in all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties. This Declaration must not, in any circumstances, be completed and/or signed by a consolidator, a forwarder or an IATA cargo agent.

Shipment type: *(delete non-applicable)*
NON-RADIOACTIVE | ~~RADIOACTIVE~~

NATURE AND QUANTITY OF DANGEROUS GOODS
Proper Shipping Name, Class, UN Number or Identification Number, Packing Group (if required), number of packages, packing instructions and all other required information as detailed in Subsections 6.6 and 8.1 of IATA Dangerous Goods Regulations.

MERCURY CONTAINED IN MANUFACTURED ARTICLES, 8, UN2809, I // ONE 1A1 x 15 GRAMS // A12.10.2.4.1

Additional Handling Information Mercury, metallic is silver, white, odorless, liquid metal. Mercury is poisonous in liquid and vapor form and can be absorbed through the skin at room temperature. It is corrosive to aluminum and its alloy. It expands on freezing and may crack glass containers.

24 hr. Emergency Contact Tel. No. 800-851-8061

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name and are respects in proper condition for transport according to applicable international and national governmental regulations.

Name/Title of Signatory
MSgt M. Ferguson, Supervisor

Signature M Ferguson
(see warning above)

NATURE AND QUANTITY OF DANGEROUS GOODS

Proper Shipping Name, Class, UN Number or Identification Number, Packing Group (if required), number of packages, packing instructions and all other required information as detailed in Subsections 6.6 and 8.1 of IATA Dangerous Goods Regulations.

METHANE COMPRESSED, 2.1, UN1971//TWO CYLINDERS IN CASE X 10KG OVERPACK USED//DOT-E 10147

Additional Handling Information

24 hr. Emergency Contact Tel. No. **1-800-851-8061**

NATURE AND QUANTITY OF DANGEROUS GOODS

Proper Shipping Name, Class, UN Number or Identification Number, Packing Group (if required), number of packages, packing instructions and all other required information as detailed in Subsections 6.6 and 8.1 of IATA Dangerous Goods Regulations.

VEHICLES, FLAMMABLE LIQUID POWERED, 9, UN3166 // 1 TRUCK // A13.5.1

Additional Handling Information

DIESEL FUEL, 3, 30L (DRAINED BUT NOT PURGED)
NON-HAZARDOUS BATTERY INSTALLED

24 hr. Emergency Contact Tel. No. **1-800-851-8061**

NATURE AND QUANTITY OF DANGEROUS GOODS

Proper Shipping Name, Class, UN Number or Identification Number, Packing Group (if required), number of packages, packing instructions and all other required information as detailed in Subsections 6.6 and 8.1 of IATA Dangerous Goods Regulations.

RADIOACTIVE MATERIAL, SPECIAL FORM, N.O.S., RQ, 7, UN2794
S-35, 1 TYPE A x 100CI
A11.6.1, YELLOW II, TI 0.80, PKG DIMENSION 25x25x30 cm
SPECIAL FORM CERTIFICATE NO 9999 ATTACHED

Additional Handling Information

202-767-4011 COLLECT

24 hr. Emergency Contact Tel. No. _____

Attachment 18

COMPATIBILITY

A18.1. General Requirements. Do not load packages containing hazardous materials that might react dangerously with one another or transport in a position that would allow interaction between the material in the event of leakage. Segregation requirements for hazardous material on military aircraft are identified in **Table A18.1.** and **Table A18.2.**.

A18.1.1. **Table A18.1.** details segregation requirements for all hazardous materials.

A18.1.2. **Table A18.2.** specifies compatibility requirements for Class 1.

A18.1.3. **A18.4.** specifies compatibility requirements for tactical and contingency operations under the authority of **Chapter 3**.

A18.2. Segregation Requirements for All Hazardous Materials. Table A18.1. indicates the explosives and other hazardous materials that must not be loaded, transported, or stored together.

A18.2.1. Only the primary hazard class or division are considered for segregation. Subsidiary-risks and secondary hazards will not be used to determine segregation requirements when using **Table A18.1.**

A18.2.2. The absence of any hazard class or a blank space in the table indicates that no restrictions apply.

A18.2.3. The letter "X" at an intersection of horizontal and vertical columns indicates that these articles must not be loaded, transported , or stored together. For example, in **Table A18.1.**, Class 3 flammable liquids, must not be loaded, transported, or stored with Class 1.1.

A18.2.4. The letter "O" at an intersection of horizontal and vertical columns indicates that these articles must not be loaded, transported, or stored together unless separated by a distance of 2.2 m (88 inches) in all directions. For example, in **Table A18.1.**, Class 8 corrosive liquids, must not be loaded, transported, or stored with Class 4.1 flammable solids unless separated by 2.2 m (88 inches) in all directions.

A18.2.5. The "*" at an intersection of horizontal and vertical columns indicates that segregation among different Class 1 materials is identified in **Table A18.2.**

A18.2.6. Be sure to check notes for compatibility.

A18.3. Segregation Requirements for Class 1 Materials. Table A18.2. identifies Class 1 materials that must not be loaded, transported, or stored together.

A18.3.1. A blank space in the table indicates that no restrictions apply.

A18.3.2. The letter "X" at an intersection of horizontal and vertical columns shows that these articles must not be loaded or stored together. For example, do not load or store Class 1.2C with Class 1.2H.

A18.3.3. Unless otherwise authorized, do not pack explosives in the same outside container with other articles. Explosives of the same compatibility group or authorized combination of compatibility groups but a different class number may be packed together, provided that the whole package is treated as though its entire contents were comprised of the lower class number (higher hazard). For

example, treat a mixed package of Class 1.2D explosives and Class 1.4D explosives as Class 1.2D explosives. However, when Class 1.5D is packed together with Class 1.2D, treat the whole package as Class 1.1D (for compatibility).

A18.3.4. Incompatible explosives may be packed together when approved according to TB 700-2/ NAVORDINST 8020.8B/TO 11A-1-47/DLAR 8220.1, *DoD Explosive Hazard Classification Procedures* or **2.3.2.**

A18.3.5. Subsidiary-risks will not be used to determine compatibility requirements when using **Table A18.2.**

A18.3.6. Be sure to check notes for compatibility.

A18.4. Chapter 3 Segregation/Compatibility. The requirements of **Table A18.1.** and **Table A18.2.** may be deviated from when transporting cargo approved to be airlifted using provisions of **Chapter 3**, consistent with operational requirements. Normally incompatible hazardous materials may be transported on the same aircraft when separated to the maximum extent possible. Compatibility waivers are not required. The following restrictions are mandatory:

A18.4.1. Explosives in compatibility groups A, J, K, and L can only be shipped with material in compatibility group S and Class 9.

A18.4.2. Fissile class III radioactive materials (Class 7) cannot be loaded, transported, or stored on the same aircraft with any other hazardous material.

A18.4.3. Class 1.1, 1.2, and 1.3 cannot be shipped with any Inhalation hazard zone A material .

A18.4.4. Class 1.1, 1.2, and 1.3 cannot be shipped with Class 6.1 poisonous liquids, PG I.

A18.4.5. Cyanides or cyanide mixtures (Class 6.1) cannot be loaded, transported, or stored with any corrosive Class 8 material.

Table A18.1. Segregation Table for Hazardous Materials.

Class or Division Note 7	Notes	1.1 1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3 Gas Zone A	2.3 Gas Other than Zone A	3	4.1	4.2	4.3	5.1	5.2	6.1 Liquid PG I Zone A	7	8 Liquid Only
Notes		**1 6**					**9**								**1**		**4**	**2 3**	**4, 5 6, 7, 8**
1.1 and 1.2	1 6	*	*	*	*	*	X		X	X	X	X	X	X	X	X	X	X	X
1.3		*	*	*	*	*	X		X	X	X	X	X	X	X	X	X	0	X
1.4		*	*	*	*	*	0		0	0	0		0				0		0
1.5		*	*	*	*	*	0		0	0	0		0				0		0
1.6		*	*	*	*	*	0		0	0	0		0				0		0
2.1	9	X	X	0	0	0			X	0			0	0	0	0	0	0	0
2.2																			
2.3 Zone A		X	X	0	0	0	X				X	X	X	X	X	X			X
2.3 Other than Zone A		X	X	0	0	0	0				0	0	0	0	0	0			0
3		X	X	0	0	0			X	0		0	0	0	0	0	X		
4.1		X	X						X	0	0						X		0
4.2		X	X	0	0	0	0		X	0	0						X		X
4.3		X	X				0		X	0	0						X		0
5.1	1	X	X				0		X	0	0						X		0
5.2		X	X				0		X	0	0						X		0
6.1 Liquid PG I Zone A	4	X	X	0	0	0	0				X	X	X	X	X	X			X
7	2 3	X	0				0												
8 Liquid Only	4 5 6 7 8	X	X	0	0	0	0		X	0		0	X	0	0	0	X		

NOTES:

1. Ammonium nitrate fertilizer may be loaded, transported, or stored with Class 1.1 materials.
2. Do not load, transport, or store fissile class III radioactive material (Class 7) on the same aircraft with any other hazardous material.
3. Normal uranium, depleted uranium, and thorium metal in solid form radioactive materials (Class 7) may be loaded and transported with Class 1.1, 1.2, and 1.5 (explosives).

4. Do not load, transport, or store cyanides or cyanide mixtures (Class 6.1) with any Class 8 materials.
5. Separate nitric acid (Class 8) in carboys by 2.2 m (88 inches) in all directions from other corrosives materials in carboys when loaded on the same aircraft.
6. Do not load, transport, or store charged electric storage batteries (Class 8) on the same aircraft with any Class 1.1 or 1.2.
7. Ship the following materials with each other and with all other hazardous materials without compatibility restrictions (ensure compliance with notes 4, 5, and 6):
   –Class 6.1 toxic solids and liquids (other than PG I, zone A) See Note 4 concerning restrictions for cyanides or cyanide mixtures.
   –Class 8 solids
   –Class 9 (including ORM-D)
   –Excepted Quantities
   –Containers or articles drained but not purged containing 500 ml (17 oz) or less of Class 3
8. Class 8 corrosive liquids must not be loaded above Class 4 (flammable solid) material or Class 5 (oxidizing) material.
9. Class 2.1 aerosol cans may be shipped with other incompatible items when separated in all directions by a minimum of 88 inches.
10. Items classified by a predominate hazard other than Class 1 but contain small amounts of explosive materials and assigned an explosive compatibility letter for storage may be shipped with Class 1 material according to **Table A18.2.** For example Class 4.2G may be shipped with Class 1.3G.

Table A18.2. Compatibility Table for Class 1 (Explosive) Materials.

Compatibility Group	A	B	C	D	E	F	G	H	J	K	L	N	S
NOTES A		X	X	X	X	X	X	X	X	X	X	X	X
B 1, 2,	X		X	X	X	X	X	X	X	X	X	X	
C	X	X				X	X	X	X	X	X		
D	X	X				X	X	X	X	X	X		
E	X	X				X	X	X	X	X	X		
F 3	X	X	X	X	X		X	X	X	X	X	X	
G 4, 5, 7	X	X	X	X	X	X		X	X	X	X	X	
H	X	X	X	X	X	X	X		X	X	X	X	
J	X	X	X	X	X	X	X	X		X	X	X	
K	X	X	X	X	X	X	X	X	X		X	X	
L 6	X	X	X	X	X	X	X	X	X	X		X	X
N	X	X				X	X	X	X	X	X		
S 7	X										X		

NOTES:

1. Group "B" explosives UN 0255, 0257, UN0267, and UN0361 may be loaded and transported with groups "C," "D," and "E" explosives.
2. Group "B" explosives packaged in an EOD MK 663, MOD O container may be loaded and transported with groups "C" through "H" and group "S" explosives.
3. Group "F" explosives UN 0292 may be loaded and transported with groups "C," "D," and "E" explosives.
4. Group "G" explosives UN 0019, UN 0300, UN 0301, and UN 0325 may be loaded and transported with all other explosives compatible with group "S" explosives.
5. Group "G" explosives UN 0009, UN 0018, UN 0314, UN 0315, UN 0317, UN 0319, and UN 0320 may be transported with groups "C," "D," and "E" explosives.
6. Group "L" explosives must only be loaded and transported with an identical item.

A18.5. Classification Codes and Compatibility Groups of Explosives. The classification code for an explosive consists of the class number followed by the compatibility group letter. Compatibility group letters are used to specify the controls required for transportation and storage and to prevent the additional hazard that might occur if certain types of explosives are transported or stored together. All explosives entering the Defense Transportation System must be assigned a final or interim hazard classification according to **A3.3.1.2.** Compatibility groups and classification codes for the various types of explosive

substances and articles are identified in **Table A18.3.** Compatibility groups assigned to non-class 1 items are used for permanent storage and do not apply while item is in the Defense Transportation System.

Table A18.3. Classification Codes.

Description of Substances or Article to be Classified	Compatibility Group	Classification Code
Primary explosive substance	A	1.1A
Article containing a primary explosive substance and not containing two or more effective protective features	B	1.1B 1.2B 1.4B
Propellant explosive substance or other deflagrating explosive substance or article containing such explosive substance	C	1.1C 1.2C 1.3C 1.4C
Secondary detonating explosive substances or black powder or article containing a secondary detonating explosive substance, in each case without means of initiation and without a propelling charge, or article containing a primary explosive substance and containing two or more effective protective features	D	1.1D 1.2D 1.4D 1.5D
Article containing a secondary detonating explosive substance,without means of initiation, with a propelling charge (other than one containing flammable liquid or hypergolic liquid)	E	1.1E 1.2E 1.4E
Article containing a secondary detonating explosive substance with its means of initiation, with a propelling charge (other than one containing flammable liquid or hypergolic liquid) or without propelling charge.	F	1.1F 1.2F 1.3F 1.4F
Pyrotechnic substance or article containing a pyrotechnic substance, or article containing both an explosive substance and illuminating, incendiary, tear-producing or smoke producing substance (other than a water-activated article or one containing white phosphorus, phosphide or flammable liquid or gel or hypergolic liquid.	G	1.1G 1.2G 1.3G 1.4G
Article containing both an explosive and white phosphorus	H	1.2H 1.3H

Description of Substances or Article to be Classified	Compatibility Group	Classification Code
Article containing both an explosive substance and flammable liquid or gel	J	1.1J 1.2J 1.3J
Article containing both an explosive substance and a toxic chemical agent	K	1.2K 1.3K
Explosive substance or article containing an explosive substance and presenting a special risk (e.g., due to water-activation or presence of hybergolic liquids phosphides or pyrophoric substances) needing isolation of each type.	L	1.1L 1.2L 1.3L
Articles containing only extremely insensitive detonating substances	N	1.6N
Substance or article so packed or designed that any hazardous effects arising from accidental functioning are limited to the extent that they do not significantly hinder or prohibit fire fighting or other emergency response efforts in the immediate vicinity of the package.	S	1.4S

Attachment 19

EXCEPTED AND LIMITED QUANTITIES

A19.1. Quantities. Excepted and limited quantities are authorized on military aircraft according to **2.7.** These small quantities of hazardous materials are exempted from certain requirements of this manual as identified in this attachment. The provisions in this attachment do not apply to radioactive materials. See **Attachment 11** for requirements applicable to radioactive material in accepted packaging or limited quantity of material.

A19.2. Excepted Quantities. Small quantities of hazardous materials are exempt from the specification packaging, marking, labeling, certification and compatibility requirements of this manual if the provisions of this paragraph are met.

A19.2.1. Do not ship the following material as an excepted quantity:

A19.2.1.1. Class 1 material.

A19.2.1.2. Class 2, division 2.1 and 2.3; or division 2.2 material having a subsidiary risk.

A19.2.1.3. Material having a primary or subsidiary risk of Class 4 in PG I.

A19.2.1.4. Class 4.1 self-reactive material.

A19.2.1.5. Material having a primary or subsidiary risk of Class 5 in PG I.

A19.2.1.6. Material having a primary or subsidiary risk of Class 6.1, in PG I, by reason of inhalation toxicity.

A19.2.1.7. Class 6.2 material.

A19.2.1.8. Class 7 material.

A19.2.1.9. Material having a primary or secondary risk of Class 8 in PG I, UN2803 and UN2809.

A19.2.1.10. Magnetized material (Class 9).

A19.2.1.11. Hazardous material contained within a device that is a component part of an otherwise nonhazardous item (except for temperature sensing devices) such as mercury switches in electrical equipment. Prepare the hazardous material according to the requirements for the hazard. If the material is not regulated as a hazardous material, ship the item as general cargo.

A19.2.1.12. Material identified as “Cargo Aircraft Only” in **Table A4.1.**

A19.2.2. **Maximum Net Quantity for Excepted Quantities.** The maximum net quantity of hazardous material that is allowed in each inner packaging and the total net quantity allowed in each outer packaging are given in **Table A19.1.** Refer to **A19.2.1.** to determine if the material qualifies for the excepted quantities provision and that **Table A19.1.** is applicable. If the quantity limitations of **Table A19.1.** are exceeded, the excepted quantity provision must not be used and the material must be prepared according to the requirements for the individual material.

Table A19.1. Excepted Quantity Limits for Inner and Outer Packaging.

Class of Primary or Subsidiary Risk	Packing Group	Quantity Limits	
		Inner Packagings	Outer Packagings
2.2	See (note 1) and (note 2)	See (note 1) and (note 2)	See (note 1) and (note 2)
3	Packing Group I, II and III	30 mL	PG I – 300 mL PG II – 500 mL PG III – 1 L
4	Packing Group II and III	30 mL or 30 g	PG II – 500 g or 500 mL PG III – 1 kg or 1 L
5 (note 3)	Packing Group II and III	30 mL or 30 g	PG II – 500 g or 500 mL PG III – 1 kg or 1 L
6	Packing Group I, II and III	PG I – 1g or 1 mL PG II – 1g or 1 mL PG III – 30g or 30 mL	PG I – 300g or 300 mL PG II – 500g or 500 mL PG III – 1 kg or 1 L
8	Packing Group II and III	30 mL or 30 g	PG II – 500 g or 500 mL PG III – 1 kg or 1 L
9 (note 4)	Packing Group II and III	30 mL or 30 g	PG II – 500 g or 500 mL PG III – 1 kg or 1 L

NOTES:

1. Packing groups are not used for this hazard class.
2. For inner packaging, the quantity contained in each receptacle must not exceed a water capacity of 30 ml. For outer packaging, the sum of the water capacities of all the inner packaging must not exceed 1 L.
3. Applies only to organic peroxides when contained in a chemical kit or a first aid kit.
4. For Class 9 material, if no PG is given in **Table A4.1.**, PG II quantities must be used.

A19.2.3. **Inner Packaging.** Each inner packaging must be plastic (with a minimum thickness of 0.2 mm), glass, earthenware, or metal. The inner packaging must not react with, or be decomposed by, the material contained therein.

A19.2.4. **Closures.** Closures must be held securely, tightly, and effectively in place with tape, self-shrink plastic, wire, or other positive means.

A19.2.5. **Liquids.** Liquids must not completely fill inner packaging at a temperature of 55 degrees C (130 F).

A19.2.6. **Intermediate Packaging.** Securely pack each inner packaging in an intermediate packaging with cushioning material. The intermediate packaging must completely contain the contents in case of breakage or leakage, regardless of packaging orientation. For liquid hazardous material, the intermediate packaging must contain sufficient absorbent cushioning material to absorb the entire contents of the inner packaging.

A19.2.7. **Outer Packaging.** Securely pack the intermediate packaging in a strong, rigid, outer packaging (i.e., fiberboard, wood).

A19.2.8. **Overpacks.** Overpacks may be used and may contain packages of nonhazardous material. All material in the same outer packaging and overpack must be compatible.

A19.2.9. **Dimensions of Outer Package.** Two of three outside dimensions of the outer package must measure at least 100 mm (4 inches). If the outer package is in the shape of a cylinder, it must have a minimum height and diameter of 100 mm (4 inches) each.

A19.2.10. **Other Hazardous Materials and Materials in Excepted Quantities.** A package containing hazardous material in excepted quantities must not contain other hazardous material that are regulated by this manual (requires a Shipper's Declaration for Dangerous Goods).

A19.2.11. **Different Materials in One Outer Packaging.** When different hazardous materials are contained in one outer packaging, use the formula listed below to determine the quantities that can be included in one outer packaging. The quantities of different hazardous materials contained in each outer packaging must be such that "Q" is less than or equal to 1.0, "Q" is calculated using the formula:

$$nl/Ml + n2/M2 + n3/M3 \ldots = Q$$

(nl, n2, etc. is the actual net quantity of each different hazardous material. Ml, M2, etc. is the maximum net quantity permitted for the material and packing group in the outer packaging according to **Table A19.1.**) For example:

A19.2.11.1. There are 15 inner packages at 20 ml each of Class 3, PG II , and 5 inner packages at 30 ml each of Class 8, PG II in one outer packaging: 300 ml/500 ml + 150 ml/500 ml = 0.6 + 0.3 = 0.9. The result is less than 1.0, so the material can be shipped in one outer packaging.

A19.2.11.2. There are 5 inner packages at 30 ml each of Class 3, PG II, and 15 inner packages at 30 g each of Class 8, PG II in one outer packaging: 150 ml/500 ml + 450 g/500 g = 0.3 + 0.9 = 1.2. The result is greater than 1.0, so the item can not be shipped in one outer packaging.

A19.2.12. **Package Performance Tests.** The complete package (inner plus outer packaging), must be capable of withstanding the test specified in **A19.2.12.1.** without breakage or leakage of the inner packaging and without significant reduction in effectiveness. Tests must be carried out on the packaging prepared as for transport. Inner receptacles must contain at least 95 percent of their capacity for solids and 98 percent of their capacity for liquids. The material to be transported in the packaging may be replaced by another material, except where this would invalidate the results of the tests. When another material is substituted for a solid, the material must have the same physical characteristics (i.e., mass, grain size) as the material to be shipped. When another material is substituted in the drop test for liquids, its relative density (specific gravity) and viscosity shall be similar to the material to be shipped.

A19.2.12.1. For packaging with six sides (i.e., fiberboard box), the following free drops onto a solid, unyielding, flat, and horizontal surface from 1.8 m (6 ft) is required. Each test may be performed on different but identical containers.

A19.2.12.1.1. One drop flat on the bottom.

A19.2.12.1.2. One drop flat on the top.

A19.2.12.1.3. One drop flat on the long side.

A19.2.12.1.4. One drop flat on the short side.

A19.2.12.1.5. One drop on a corner at the junction of three intersecting edges.

A19.2.12.2. For cylindrical packaging, the following free drops onto a solid, unyielding flat and horizontal surface from 1.8 m (6 ft) is required:

A19.2.12.2.1. One drop diagonally on chime or circumferential seam edge.

A19.2.12.2.2. One drop on the weakest part (i.e., a closure) not tested by the first drop.

A19.2.12.3. A force applied to the top surface for a duration of 24 hours, equivalent to the weight of identical packages if stacked to a height of 3 m (10 ft), including the test sample.

A19.3. Dangerous Goods in Limited Quantities. Limited quantities may be certified to this paragraph or to the most current ICAO or IATA. Comply with all requirements of the document used including the inner packaging and outer packaging quantity limits. Pack limited quantities in good quality combination packagings using only the inner and outer packaging combinations authorized. The packagings must also meet the general packaging requirements of **Attachment 3**. Single packagings, including composite packagings, are not permitted. The gross weight of a "limited quantity" package must not exceed 30 Kg (66 pounds). Quantity limits must not exceed the amounts authorized by **Table A19.2.** If all the requirements of this paragraph and the quantity limits of **Table A19.2.** are met, the combination packaging need not meet (or be marked) with the UN packaging specification requirements.

A19.3.1. **Dangerous Goods not Permitted in Limited Quantities:**

A19.3.1.1. Materials forbidden in **Table A4.1.**

A19.3.1.2. Materials identified as "Cargo Aircraft Only" in **Table A4.1.**

A19.3.1.3. All materials in PG I.

A19.3.1.4. Class 1 and 7 materials.

A19.3.1.5. Class 2.3 and 6.2.

A19.3.1.6. Class 2.1 materials (other than aerosols).

A19.3.1.7. Refrigerated liquefied gases.

A19.3.1.8. Class 4.1 self-reactive substances.

A19.3.1.9. Class 4.2 or any material with a subsidiary risk of 4.2.

A19.3.1.10. Materials with UN numbers of 2794, 2795, 2803, 2809 or 3028.

A19.3.1.11. Class 9 materials except those specifically authorized in **A19.3.2.**

A19.3.2. **Dangerous Goods Permitted in Limited Quantities:**

A19.3.2.1. Aerosols of Class 2.1 and 2.2.

A19.3.2.2. Gases of Class 2.2 without a subsidiary risk (excluding refrigerated liquefied gases).

A19.3.2.3. Class 3 (excluding PG I).

A19.3.2.4. Class 4.1 (excluding PG I and Class 4.1 self-reactive substances).

A19.3.2.5. Class 4.3 solids only (excluding PG I).

A19.3.2.6. Class 5.1 (excluding PG I).

A19.3.2.7. Class 5.2 only when contained in a "Polyester Resin Kit (UN 3269)," Chemical Kit (NA 1760)" or "First Aid Kit (" (excluding PG I).

A19.3.2.8. Class 6.1 (excluding PG I).

A19.3.2.9. Class 8 (excluding PG I, UN2794, UN2795, UN2803, UN2809 and UN3028).

A19.3.2.10. Only the following items of Class 9: Ammonium Nitrate Fertilizers (UN2071), Benzaldehyde (UN1990), Environmentally Hazardous Substance Solid N.O.S. (UN3077), Environmentally Hazardous Substance Liquid N.O.S. (UN3082), Chemical Kit or First Aid Kit (UN3316) and Dibromodifluoromethane (UN1941).

A19.3.3. **Different Dangerous Goods in Limited Quantities in one Package.** When different dangerous goods in limited quantities are packed together in one outer packaging, the quantities must be as follows:

A19.3.3.1. Class 3 and 8, and Class 4.1, 4.3 (solid), 5.1, 5.2, and 6.1 must not exceed the lowest net quantity per package (of the most restrictive single material in the package) as listed in **Table A19.2.** For calculation purposes, when a package contains both liquid and solids, convert the quantities for the liquids into kilograms in order to determine that the permitted maximum net quantity per package has not been exceeded. The "Q" value formula is not applicable for limited quantities.

A19.3.3.2. Class 2 and 9, when packed without any other dangerous goods, the gross weight of the package must not exceed 30 Kg (66 pounds).

A19.3.3.3. Class 2 and 9, when packed with other dangerous goods, must meet the requirements of **A19.3.3.2.** In addition, the maximum net quantity of all the other dangerous goods (other than class 2 and 9) must not exceed the requirements of **A19.3.3.1.**

A19.3.4. **Package Performance Tests.** Limited quantity packages must meet the following test requirements:

A19.3.4.1. The package, as prepared for transport, must be capable of withstanding a 1.2 m (4 ft) drop test onto a rigid, nonresilient, flat, horizontal surface, in a position most likely to cause the most damage. After the test, the package must not show any damage that is likely to affect safety during transport and there must be no leakage from the inner packagings.

A19.3.4.2. Each package offered for transport must be capable of withstanding a force applied to the top surface of the package (for a duration of 24 hours) equivalent to the total weight of identical packages if stacked to a height of 3 m (9.8 ft). The stack height includes the test sample. There

cannot be any significant reduction in the package's effectiveness and there cannot be any breakage or leakage of any inner packaging.

A19.3.4.3. Liquids must meet air-eligible requirements of **A3.2.**

Table A19.2. Limited Quantity Limits - Classes 2 – 9.

Class or Division	PackingGroup	PhysicalState	Inner Packaging	Per Package
2	--	Gas (note 1)	120 mL (note 2)	30 kg G
3	II	Liquid	500 mL	1 L
	III	Liquid	5 L	10 L
4.1	II	Solid	500 g	5 kg
	III	Solid	1 kg	10 kg
4.3	II	Solid	500 g	5 kg
	III	Solid	1 kg	10 kg
5.1	II	Liquid	100 mL	500 mL
	II	Solid	500 g	2.5 kg
	III	Liquid	500 mL	1 L
	III	Solid	1 kg	10 kg
5.2	--	Liquid	30 mL	500 mL
	--	Solid	100 g	1 kg
6.1	II	Liquid	100 mL	1 L
	II	Solid	500 g	1 kg
	III	Liquid	500 mL	2 L
	III	Solid	1 kg	10 kg
8	II	Liquid	100 mL	500 mL
	II	Solid	500 g	5 kg
	III	Liquid	500 mL	1 L
	III	Solid	1 kg	5 kg
9	III	Liquid/Solid	5 L	30 kg G

NOTES:

1. For gases, the quantity is the water capacity of the inner packaging.
2. Aerosols containing only a nontoxic substance or substances in inner nonrefillable metal or plastic receptacles, the capacity of the inner packaging must not exceed 1000 mL (34 fl oz).

Attachment 20

ABSORBENT CUSHIONING REQUIREMENTS

A20.1. Absorbent Material General Requirements. For combination packagings, use cushioning materials suitable for the absorption of liquid hazardous materials in the event of leakage from the primary receptacle. Ensure cushioning materials used are satisfactory in all respects. Ensure the material is not capable of reacting adversely with the contents of the package and is noncombustible. Do not use asbestos. The following requirements apply to the use of absorbent cushioning material for combination packagings containing liquid hazardous materials:

A20.1.1. Each package containing a liquid in PG I must include sufficient cushioning material to absorb the entire contents of the inner containers.

A20.1.2. Each package containing a liquid in PG II must include sufficient cushioning material to absorb the contents of any one inner container. If the inner containers vary in size, include sufficient cushioning material to absorb the contents of the inner receptacle containing the greatest quantity of liquid.

A20.1.3. Absorbent cushioning material is not required for:

A20.1.3.1. Paint in PG II

A20.1.3.2. Liquids in PG III (if inner receptacles are other than glass or earthenware)

A20.1.3.3. Consumer Commodities (if inner receptacles are other than glass or earthenware)

A20.1.4. When overpacking containers of liquids that do not meet pressure requirements into containers that meet the pressure requirement, use absorbent cushioning material as stipulated above.

A20.1.5. When absorbent cushioning material is required and/or the outer packaging is not liquid-tight, use a means of containing the liquid in the event of leakage. This may take the form of a leak-proof liner, plastic bag, or other equally efficient means of containment. When securely closed polyethylene (4-mil minimum) bags are used to contain the cushioning of hazardous liquid, the bags must be of sufficient size to form a liner for the exterior container, or a bag for the interior container.

A20.1.6. When the outer packaging is not liquid-tight, use a leak-proof liner, plastic bag, or other equally efficient means of containment. When securely closed polyethylene (4-mil minimum) bags are used to contain the cushioning of the hazardous liquid, the bags must be of sufficient size to form a liner for the exterior container , or a bag for the interior container.

A20.1.7. When overpacking individual packagings for consolidation that already meet air-eligibility requirements use enough cushioning material to secure and position the packagings against damage. The cushioning material, absorbent or nonabsorbent, must completely fill any void space in the container.

A20.1.8. Absorbent cushioning material is not required for containers that have met the UN packaging specification test requirements (including the hydrostatic pressure test) as a single packaging.

A20.2. Determining the Amount Required. Use **Table A20.1.** as a guide to determine the amount of vermiculite or diatomaceous earth required for overpacking and cushioning liquid hazardous materials. Other equivalent cushioning materials may be used to meet **A20.1.** requirements.

A20.2.1. The amounts identified in **Table A20.1.** are the minimum requirements. When exact quantities of cushioning materials are not found in **Table A20.1.**, make an approximation based on quantities listed.

A20.2.2. When placing cushioning materials into the container, consider settling of the cushioning materials during transportation. Use enough cushioning material to compensate for any settling that may occur.

A20.2.3. When the applicable test report identifies an amount larger than **Table A20.1.**, use the amount identified in the test report.

Table A20.1. Absorbent Material Requirements in Inches.

A	B	C	D	E
If quantity is	**Then to ship use: Vermiculite, Type 1, Grade 3 (fine), or Type 1, Grade 4 (super fine)**		**Diatomaceous Earth**	
	Centimeters (inches)		**Centimeters (inches)**	
	On sides	**On top and bottom**	**On sides**	**On top and bottom**
.50 L (1 pt)	2.54 cm (1.0)	3.81 cm (1.5)	5.08 cm (2.0)	11.43 cm (4.5)
1.0 L (1 qt)	2.54 cm (1.0)	5.08 cm (2.0)	5.08 cm (2.0)	13.97 cm (5.5)
3.8 L (1 gal)	3.81 cm (1.5)	6.35 cm (2.5)	10.16 cm (4.0)	15.24 cm (6.0)
7.6 L (2 gals)	5.08 cm (2.0)	10.16 cm (4.0)	11.43 cm (4.5)	24.13 cm (9.5)
19.0 L (5 gals)	7.62 cm (3.0)	15.24 cm (6.0)	15.24 cm (6.0)	34.29 cm (13.5)
24.6 L (6.5 gals)	8.89 cm (3.5)	16.51 cm (6.5)	17.78 cm (7.0)	36.83 cm (14.5)
49.3 L (13 gals)	10.16 cm (4.0)	19.05 cm (7.5)	20.32 cm (8.0)	39.37 cm (15.5)
56.8 L (15 gals)	11.43 cm (4.5)	20.32 cm (8.0)	24.13 cm (9.5)	45.74 cm (18.0)

Attachment 21

BRIEFING AGENCY REQUIREMENTS

A21.1. Briefing Agency. This attachment outlines the information that the briefing agency is required to provide to the aircraft commander (or designated representative) according to **1.2.9.**

A21.2. Informational Requirements. The briefing agency must advise the aircraft commander (or designated representative) of:

A21.2.1. The PSN, hazard class, identification number, and PG prescribed in this manual for each hazardous material aboard the aircraft.

A21.2.2. The total quantity in weight or volume.

A21.2.3. The location of the hazardous item in the aircraft.

A21.2.4. Net explosive weight (NEW) of Class 1.1, 1.2, and 1.3 explosives, or of Class 1.4, 1.5, and 1.6 explosives when required.

A21.2.5. The requirement for escorts, couriers, and protective equipment.

A21.2.6. The number of passengers permitted aboard the aircraft.

A21.2.7. The procedures to use in an emergency.

A21.2.8. All cargo being carried under the terms of a DOT exemption, a DoD certification of equivalency (COE), a CAA, or a waiver.

A21.3. Notification Statements. The briefing agency must include the statements identified below on the hazardous cargo manifest when transporting hazardous materials on aircraft. Apply these statements by programmed wording, rubber stamps, or typewriter.

A21.3.1. **Air terminal inspection certification statement:** "ALL HAZARDOUS MATERIALS COVERED BY THIS MANIFEST HAVE BEEN INSPECTED AND FOUND TO BE PACKAGED IN THE PROPER OUTSIDE CONTAINER, FREE OF VISIBLE DAMAGE AND LEAKS, AND IS PROPERLY CERTIFIED." (Air terminal representative signature).

A21.3.2. **Aircrew briefing certification statement:** "I HAVE BEEN BRIEFED ACCORDING TO AFMAN 24-204 (I), PARAGRAPH **1.2.9.**, ON HAZARDOUS CARGO COVERED BY THIS MANIFEST." (Aircraft crewmember signature)

A21.4. Post Briefing Responsibilities. After receiving the briefing, the aircraft commander (or designated representative) will:

A21.4.1. Sign the cargo manifest.

A21.4.2. Return the signed copy, with the attached Shipper's Declaration for Dangerous Goods to the terminal record-keeping activity for retention.

A21.4.3. When crew changes occur, terminal personnel will brief the oncoming aircraft commander or designated representatives required by **A21.2.** The briefing must cover all hazardous materials (onload and throughload).

A21.4.4. For throughload hazardous cargo, the oncoming aircraft commander (or designated representative) signs a copy of the throughload manifest indicating that the briefing has been received.

A21.4.5. Keep the manifest, reflecting the certification for a hazardous cargo briefing, according to current files, maintenance, and disposition instructions.

Attachment 22

PASSENGER MOVEMENT ON AIRCRAFT TRANSPORTING HAZARDOUS MATERIALS

A22.1. Passenger Eligibility. **Table A4.1.**, column 7 provides passenger eligibility codes that identify passenger movement restrictions with hazardous materials.

A22.1.1. Use **Table A4.1.** and **Table A4.2.** to determine passenger movement eligibility with a specific material.

A22.1.2. Do not move passengers with cargo coded as "Cargo Aircraft Only" unless exempted by this manual. Obtain a passenger deviation when required by this attachment.

A22.1.3. Aircraft transporting personnel with hazardous materials must be equipped with serviceable oxygen equipment and oxygen supply for all personnel. Supplemental oxygen is not required when transporting Air, refrigerated liquid; and Engines, internal combustion..

A22.1.4. **Passenger Deviations.** Move passengers with hazardous materials coded as "Cargo Aircraft Only" consistent with operational requirements. Prevent exposure of passengers to the hazardous material. A deviation authorizing the movement of passengers with cargo aircraft only material is granted only for exceptional cases.

A22.1.4.1. Contact the MAJCOM, number Air Force, or Service having operational control of the aircraft for passenger deviations.

A22.1.4.2. When a deviation has been approved, type, print, or stamp on all copies of the passenger manifest the following information: "AUTHORITY TO MOVE PASSENGERS WITH CARGO AIRCRAFT ONLY CODED MATERIAL IS APPROVED. DEVIATION NUMBER:_____."

A22.1.4.3. Separate passengers from the hazardous cargo.

A22.1.4.4. An aircrew member must provide surveillance to ensure passengers are safe and maintain a maximum distance from the hazardous cargo.

A22.1.4.5. Deviations are not required for:

A22.1.4.5.1. Guards.

A22.1.4.5.2. Couriers.

A22.1.4.5.3. Technical escorts responsible for cargo.

A22.1.4.5.4. Crew chiefs and maintenance personnel assigned to support the aircraft transporting the hazardous material.

A22.1.4.5.5. DoD duty passengers transported with material coded P4 in column 7 of **Table A4.1.**

A22.1.5. **Radioactive Material Passenger Restrictions.**

A22.1.5.1. Packages with a radioactive yellow II or radioactive yellow III label may not be transported on passenger aircraft unless:

A22.1.5.1.1. The transport index is not over 1.0 for a package required to be labeled radioactive yellow II.

A22.1.5.1.2. The transport index is not over 3.0 for a package required to be labeled radioactive yellow III.

A22.1.5.2. Radioactive material requiring a label must be separated from personnel and passengers by the greatest distance possible. Radioactive yellow II and yellow III material must be separated by a minimum of 2 pallet positions (176 in) at all times while on the aircraft. If the total transport index of all packages on the aircraft exceeds 50, the separation distance between the surfaces of the radioactive materials packages and the surfaces bounding the space occupied by persons or animals must be at least 9 meters (30 feet).

A22.1.5.3. Do not offer Type B(M) packages for transportation on passenger-carrying aircraft.

A22.1.5.4. Except as provided in **A11.12.**, no person may carry any radioactive material other than a radioactive material intended for use in, or incident to, research, medical diagnosis, or treatment aboard a passenger aircraft.

A22.2. Carriage of Hazardous Materials by Passengers. Passengers must not carry hazardous materials on military aircraft. The exceptions listed below are not subject to any other requirements of this manual (nonregulated) when carried by a crewmember or passenger.

A22.2.1. Material in aerosol containers not exceeding 473.1 ml (16 fluid ounces) or 2.205 kg (1 pound) per container when carried in crewmember or passenger baggage (including carry-on baggage), unless they are classified as poisonous or irritating material. The total quantity of the excepted articles carried by any crewmember or passenger in carry-on or checked baggage must not exceed 2136 g or 2217.8 ml (75 net weight ounces and fluid ounces).

A22.2.2. Oxygen, or any hazardous material used for the generation of oxygen, carried for medical use by a passenger on a military aircraft must be an approved cylinder as listed in **Attachment 6**. Comply with 14 CFR 121.574 or 135.91 for DoD contracted civilian passenger aircraft.

A22.2.3. For human beings or animals with an implanted medical device, such as a heart pacemaker, that contains radioactive material or with radio-pharmaceuticals, that have been injected or ingested.

A22.2.4. Carbon dioxide gas cylinders worn by passengers for the operation of mechanical limbs. Spare cylinders of a similar size for the same purpose, in sufficient quantities to ensure an adequate supply for the duration of the journey are authorized in carry-on and checked baggage.

A22.2.5. Electronic devices acceptable for consumer use that contain lithium batteries. Includes, but not limited to laptop computers, cameras, cell phones, watches, etc. Spare batteries for electronic device must be individually protected to prevent short circuit and limited to a one-for-one replacement for the number of batteries needed to operate the device. Installed lithium batteries and spares will not be placed in checked baggage.

A22.2.6. Catalytic hair curlers containing hydrocarbon gas carried in carry-on or checked baggage. The safety cover must be securely fitted over the heating element. Gas refills are not permitted. Not more than one curler per person is authorized.

A22.2.7. Alcoholic beverages not exceeding 70 percent by volume, when packed in receptacles of less than 5 L may be in carry-on or checked baggage.

A22.2.8. Dry ice, in quantities not exceeding 2 kg (4.4 lbs.) per passenger when used to pack perishables in carry-on or checked baggage, provided the package permits the release of carbon dioxide gas.

A22.2.9. Safety matches or a lighter carried by an individual for use by the individual. However, lighters containing unabsorbed liquid fuel (other than liquefied gas), lighter fuel and lighter refills are not permitted on one's person or in checked or carry-on baggage.

A22.2.10. Securely boxed, cartridges for sporting purposes (in Class 1.4S), in quantities not exceeding 5 kg (11 lbs.) gross weight per passenger may be in checked baggage for personal use, excluding ammunition with explosive or incendiary projectiles. Do not combine allowances for more than one passenger into one or more packages. Comply with DoD 4500.9R, Defense Transportation Regulation, Part I for military issued ammunition.

A22.2.11. Wheelchairs or other battery-powered mobility devices with spillable or nonspillable batteries, provided that the battery is disconnected, battery terminals are insulated to prevent accidental short circuits and the battery is securely attached to the wheelchair or mobility device may be carried in checked baggage. Load and store batteries attached to these devices with there filling holes upright.

A22.2.12. A mercurial barometer carried by a representative of a government weather bureau or other similar official agency may be in carry-on baggage. However, package the barometer in a strong outer packaging, having a sealed inner liner or a bag of strong leak proof and puncture resistant material impervious to mercury, which will prevent the escape of mercury from the package irrespective of its position.

A22.2.13. One small carbon dioxide cylinder fitted into a self-inflating life jacket plus one spare cartridge may be carried in carry-on and checked baggage. However, the life jackets cannot contain any explosives, pyrotechnic, or flammable devices.

A22.2.14. Heat producing articles such as underwater torches (diving lamps) and soldering irons may be in carry-on baggage.

A22.2.15. Scuba diving tanks containing not more than 25 pounds per square inch at 21 degrees C (70 degrees F) may be shipped as checked baggage. A tag or label must be affixed to the tank by a dive shop or licensed individual to indicate service was performed.

Attachment 23

USE OF CONTRACT AIR CARRIERS

A23.1. Contract Air Carriers. Airlift of military hazardous materials utilizing contract air carriers approved by HQ Air Mobility Command (HQ AMC) to transport hazardous materials is authorized according to Department of Transportation Exemptions (DOT-E) 7573 and 9232, DoD 4500.9R, DTR, Part III, 49 CFR, 173.7(b), and this manual.

A23.2. DOT-E 7573. The DoD is authorized to transport hazardous materials via AMC commercial contract cargo aircraft under the authority of DOT-E 7573 according to the following conditions:

A23.2.1. The pilot in charge is notified in writing that the exemption is being used and a copy of DOT-E 7573 must accompany the shipment. See **Attachment 21** for the statement required on the hazardous cargo manifest and briefing requirements.

A23.2.2. Stamp or mark shipping papers (cargo manifest), "DOT-E 7573 Applies."

A23.2.3. Hazardous material shipments are in complete compliance with this manual.

A23.2.4. Segregation compatibility requirements of **Table A18.1.** and **Table A18.2.** apply.

A23.2.5. Comply with **A13.5.1.** or **A13.6.1.** for vehicle and support equipment fuel levels.

A23.2.6. Ensure compliance with all other requirements of the exemption.

A23.3. DOT-E 9232. Comply with DOT-E 9232 and this manual. DOT-E 9232 (when implemented according to DTR Part III) applies only under the following conditions. USTRANSCOM may implement all or only portions of DOT-E 9232 or apply additional restrictions when exemption is used during a declared national emergency; in defense crisis conditions which require the activation of any state of the Civil Reserve Air Fleet (CRAF) program, or the use of foreign-flag aircraft made available to the United States Government (USG) pursuant to formal security agreements between the USG and the involved foreign government; or during rapid deployment of US armed forces.

A23.3.1. **Cargo Aircraft.** The following special provisions apply:

A23.3.1.1. Comply with provisions of DOT-E 7573 and **A23.2.** (with the exception of stamping or marking shipping papers "DOT-E 7573 Applies").

A23.3.1.2. Stamp or mark shipping papers (cargo manifest), DOT-E 9232 Applies."

A23.3.1.3. Based on operational requirements, segregation requirements of **A18.4.** may be used.

A23.3.1.4. Do not remove hazardous materials from required packaging and place in equipment, vehicle racks, or containers.

A23.3.2. **Passenger Aircraft.** The following special provisions apply:

A23.3.2.1. Package and certify hazardous materials shipped as cargo according to this manual.

A23.3.2.2. Stamp or mark shipping papers (cargo manifest), "DOT-E 9232 Applies."

A23.3.2.3. Individual issue hazardous materials may only be removed from outer packaging when needed to meet operational requirements. The troop commander must identify to the aircraft commander (or designated representative) in writing, any hazardous materials removed from

outer packaging, that are in rucksacks or field packs, which are not already included on the cargo manifest according. Identify hazardous materials by PSN, hazard class, UN identification number, PG, and net quantity. Hazardous materials must be packaged to prevent accidental initiation or release.

A23.3.2.4. Load hazardous materials only in the cargo compartment. Hazardous materials (including small arms ammunition) are not authorized in the passenger compartment.

A23.3.2.5. Do not remove hazardous materials from required packaging and place in equipment, vehicle racks, and containers.

A23.4. Use of Passenger Carrying Aircraft. When requirements dictate movement of hazardous materials as cargo on commercial passenger aircraft, contracted to Air Mobility Command, for other than a national emergency, ensure the material is prepared according to 49 CFR 100-199. Type and quantity of material authorized will be according to 49 CFR 172.101 for passenger carrying aircraft. This manual may be used for hazardous materials certification. Do not transport hazardous materials in passenger compartment.

Attachment 24

SPECIAL CARGO REQUIREMENTS

A24.1. Material Requiring SAAM Airlift. This attachment identifies requirements for technical escorts and other extensive protective measures for extremely hazardous materials. The provisions of this attachment apply to the following shipments:

A24.1.1. Material identified in **Table A4.1.** as Special Provision 1 (SP1) which include, but are not limited to, Class 6.1, PG 1, hazard zone A and Class 2.3 hazard zone A toxic material.

A24.1.2. Class 1, compatibility group K.

A24.1.3. Fissle Class III Radioactive Material.

A24.1.4. Infectious substances (etiologic agent) containing a Risk Group 4 (other than Diagnostic Specimens), or a biological product containing a Risk Group 4 material which exceeds 50 mL or 50 grams per package (or total shipment which exceeds 4 L or 4 Kg).

A24.1.5. Any other material determined to need technical escorts for safety concerns.

A24.2. Transportation Requirements.

A24.2.1. Transport the materials identified in **A24.1.** by Special Assignment Airlift Mission (SAAM) only. Process SAAM requests, cargo clearance, and appropriate confirmations according to DoD 4500.9R, Defense Transportation Regulation.

A24.2.2. When Class 6.1, PG I, hazard zone A and Class 2.3, hazard zone A toxic materials, or any material containing a Risk Code 4 infectious material (other than Diagnostic Specimens) are shipped by air, the consignor is required to furnish or ensure availability of:

A24.2.2.1. Complete protective clothing and equipment for all aircrew members.

A24.2.2.2. Qualified technical escort personnel, applicable decontamination and detection equipment or supplies, and suitable first-aid equipment or supplies to cope with leaking containers during airlift.

A24.2.3. Fissile class III shipments must incorporate transportation controls that are performed by the shipper or carrier, as appropriate, to provide nuclear criticality safety, and protect against loading, storing, or transporting that shipment with any other fissile material.

A24.2.4. Transport Fissile class III shipments in an aircraft:

A24.2.4.1. Assigned to the exclusive use of the shipper with a specific restriction for the exclusive use to be provided in the appropriate arrangements between shipper and carrier and with instructions to that effect issued with the shipping papers.

A24.2.4.2. That does not contain other packages of radioactive material requiring one of the labels prescribed in **Attachment 15**.

A24.2.5. Liquids with a mist Inhalation Zone A, PG I hazard, less than 5 L per package, and solids with a toxic Inhalation hazard Zone A, PG I hazard, less than 15 kg per package, may be transported by other than a SAAM with approval of Service focal point according to paragraph **2.3.1.** Passenger prohibition code "P2" applies.

A24.3. Technical Escorts. Furnish technical escorts when service regulations (or cargo clearance arrangements) require it, or when the shipping activity's medical or flight safety personnel dictate. The shipping activity must initiate action to furnish the qualified personnel, when they are required. They must also furnish technical escorts or other personnel to accompany shipments of infectious substances (etiologic agents) or plant quarantine materials per **A10.9.** When the shipping activity is required to furnish qualified personnel, it will also initiate action to furnish all required protective clothing and equipment for crew members, in addition to the appropriate decontamination detection and emergency first-aid equipment. The escort has complete jurisdiction over the cargo as it pertains to normal security, safety, protection of personnel, repair, and disposal of containers. However, in the following situations, escort authorities are primarily technical advisors, and are subordinate to:

A24.3.1. The aircraft commander in matters of flight operations and safety.

A24.3.2. The base installation commander in matters affecting the safety and mission of the command.

A24.4. Shipping Documents for Infectious Substances (Etiologic Agents). An etiologic agent and plant quarantine material shipment record must accompany all shipments of infectious substances (etiologic agents) transported under the provisions of this attachment. The consignor (shipper) must prepare this record.

A24.4.1. If the shipping document is classified, it must be in the custody of the technical escort or other qualified personnel accompanying the shipment. In the absence of accompanying personnel, and if the document is not classified, the shipper will place the original and one copy in the outermost container of the number one package.

A24.4.2. On receipt at the receiving installation, a record of the shipment's condition should be made under "Remarks." Two copies of the completed form should be forwarded directly to the Commanding Officer, US Army, Fort Detrick, Frederick MD 21701-5000, Attn: (1) Transportation Officer, and (2) Liaison Officer (USPHS). This creates a permanent record file that is in compliance with agreements between DoD and the Department of Health and Human Services; and also between DoD and the Department of Agriculture.

A24.4.3. The agency receiving the shipment is responsible for forwarding the report indicated above within 2 hours of receipt.

A24.5. Aircrew Jettison Criteria. For cargo consisting of Class 6.1, PG I, hazard zone A toxic material; Class 2.3, hazard zone A toxic material; infectious substances; biological agents; or radioactive material (other than excepted quantities), the jettison criteria are as follows:

A24.5.1. Must not be jettisoned over land.

A24.5.2. May not be jettisoned over water unless the cargo, in addition to size criteria, weighs at least 1.6 g/cm^3 (100 lbs./ft^3) to ensure sinking. Also, the cargo must be jettisoned at least 19.3 kilometers (12 miles) offshore, and preferably beyond a shelf, in water 100 fathoms (600 ft) or more in depth. The aircraft commander is given a predeparture briefing on acceptable jettisoning locations based on the above criteria. When cargo is jettisoned to decrease weight, jettison all other cargo before hazardous cargo.

A24.5.3. When cargo is leaking and is beyond control of the escort to repair or neutralize, the escort must inform the aircraft commander. The decision of jettisoning will rest with the aircraft commander.

In this instance, the commander may jettison the cargo over water without regard to weight or depth criteria.

A24.5.4. When the cargo weighs less than 1.6 g/cm^3 (100 lb./ft^3) or when size of cargo would not permit inflight jettisoning, model of aircraft selected for overwater missions must be based on two-engine performance from equal time point (ETP) to destination. Aircraft performance is based on aircraft remaining airborne when all cargo except the hazardous cargo is jettisoned.

Attachment 25

HAZARDOUS MATERIALS INITIAL AND REFRESHER TRAINING

A25.1. Training General Requirements. This attachment identifies the hazardous material training required by paragraph **1.3.** Commanders assign hazardous material workers into one of four functional groups. Training requirements are based on functional group. This approach provides basic hazardous materials training applicable to all personnel at the first level. Trainers then provide more detailed training to supplement the basic level of training based on specific job responsibilities.

A25.2. Training for Noncertifying Officials. Train individuals according to the following general areas of responsibility. Unless otherwise required by Service/Agency directives, training may be performed locally. Trainers should develop training specific to the individual's hazardous material duties. The courses listed are suggested DoD courses that may be used to satisfy the applicable level of training. Telephone contact numbers are listed the first time the training location is identified. Commercial or other government sources may also be used for training other than Preparer level to the extent it satisfies the required level of training.

A25.2.1. **Handlers.** Trainers ensure training covers basic hazardous material familiarization, awareness, and communication requirements. This includes hazard classification, marking, labeling, placarding, documentation, compatibility, and safety (including emergency response information). Training will also include handling and job (function) specific requirements.

–HAZMAT Familiarization and Safety in Transportation, 49 CFR Subpart H; Computer Based Training, U.S. Army Defense Ammunition Center, McAlester OK 76544. Telephone DSN 956-8961/8931 or commercial (918) 420-8961/8931.

–Hazardous Materials Handling, SMPT-5, Correspondence, School of Military Packaging Technology, Aberdeen Proving Ground MD 21005-5001. Telephone DSN 298-5185 or commercial (410) 278-5185.

–Transportation of Hazardous Material for Supervisors, A822-0014, Navy Supply Corps School, Athens GA 30606. Telephone DSN 588-7207/7215 or commercial (706) 354- 7207/7215.

–Storage and Handling of Hazardous Materials (R511), DLA Training Center (DTC), Columbus, OH 43213-1430. Telephone DSN 850-5969 or commercial (614) 692-5969/ (800) 458-7903/ E-mail: **mailto:INFO@dtc.dla.mil**.

– Triennial Storage and Handling of Hazardous Material Recurrent (R611), DLA Center for Training, Education, and Development (DCTED), 380 Morrison Road, Columbus, OH 43213-1430. Telephone DSN 850-5986 or commercial (614) 692-5986/(800) 458-7903 / E-mail: **mailto:INFO@dpcso.dla.mil**.

–Hazardous Materials Handlers, CBT ST10, Air Mobility Warfare Center, Air Transportation Division, AMWC/WCOT. Telephone DSN 650-7498.

A25.2.2. **Packers.** Packers, who do not certify, must work closely with the preparer (certifier) and must not close (seal) the container until the preparer (certifier) has validated the packaging. Trainers ensure that packers are knowledgeable in all aspects of handler's requirements with additional emphasis in hazardous materials packaging requirements.

–DoD POP Program (R530 and R630-Refresher), Defense Distribution Center, DDC-J-3/J-4-0, 2001 Mission Drive, New Cumberland, PA 17070-5000. Telephone DSN 771-8238/8353 or commercial (717) 770-8238/8353. Web Available at: **https://www.ddc.dla.mil/pop/**

A25.2.3. **Inspectors.** In addition to handlers' requirements, trainers ensure that inspectors are knowledgeable in the use of commercial and military hazardous materials documents, and shipping papers. Inspectors should be familiar with appropriate packaging specifications.

–Hazardous Materials Airlift Inspector Course (L3AZR2T000-008 - Initial (Resident) or L4AZT2T000-011 – Initial (Mobile)), 345 TRS/TTTD, Lackland AFB TX 78236-5427. Telephone DSN 473-4917 or commercial (210) 671-4917.

–Hazardous Materials Inspector (Exportable) (L6AZS2T000-000), 345 TRS/TTTD, Lackland AFB TX, 78236-5427, Telephone DSN 473-4885 or commercial (210) 671-4885.

–Transportation of Hazardous Material for Supervisors, A822-0014, Navy Supply Corps School, Athens GA 30606.

A25.3. Training for Certifying Officials. Preparers (certifying officials), as defined in **1.2.3.**, are authorized to accomplish the Shipper's Declaration for Dangerous Goods certification according to **1.2.8.** Supervisors must consult DoD Catalog 5010.16-c *Defense Management Education and Training* to select the most appropriate course for the individual based on course prerequisites. Train preparers based on one of the following function specific requirements:

A25.3.1. **Preparers.** Personnel whose primary duty is preparing and certifying all types of hazardous materials shipments on a daily basis. The courses identified below are authorized only if developed and administered according to the most recent Interservice Training Review Organization Task Group on Hazardous Materials Training Memorandum of Understanding (MOU). The MOU is developed jointly with each school and Service/DLA policy focal point to ensure standard and adequate Preparer level training for DoD personnel. Any deviation from the MOU invalidates the course and is not authorized as acceptable training under this manual. These individuals must have satisfactorily completed one of the qualifying courses:

A25.3.1.1. **Initial Training Courses.** Personnel identified in **A25.3.1.** must satisfactorily complete one of the initial training courses identified below as a prerequisite to certifying the Shipper's Declaration for Dangerous Goods for airlift of hazardous cargo.

–Hazardous Material Preparer Course (L3AZR2T000 005, Resident or L4AZT2T000 005, On Site), 345 TRS/TTTD, Lackland AFB TX 78236-5427.

–Technical Transportation of Hazardous Materials (AMMO-62, Resident or AMMO-62OS On Site), U.S. Army Defense Ammunition Center and School, McAlester OK 76544.

–Installation Traffic Management of Hazardous Materials (Initial) (AMMO-41) (Resident), U.S. Army Defense Ammunition Center, McAlester OK 76544. Telephone DSN 956-8961/8931 or commercial (918) 420-8961/8931.

–Defense Packaging of Hazardous Materials for Transportation, 8B-F7(JT), Resident and On Site, School of Military Packaging Technology (SMPT), Aberdeen Proving Ground MD 21005-5001.

–Transportation of Hazardous Material-Basic (A-822-0012), Navy Supply Corps School, Athens, GA 30606-5520. Telephone DSN 588-7215 or commercial (706) 354-7215/7240.

A25.3.1.2. **Refresher Training Courses.** Personnel, who have previously completed one of the courses specified in **A25.3.1.1.**, must satisfy the 24-month refresher training requirement of **A25.4.** by completing one of the following courses:

–Hazardous Material Preparer Refresher (Exportable) (L6AZS2T000 001), 345 TRS/TTTD, Lackland AFB TX 78236-5427. This course approved for Air Force, Army, DLA, DCMA, and Marine Corps activities only.

–General Transportation of Hazardous Materials (AMMO-37, Resident or AMMO-370S, On Site), U.S. Army Defense Ammunition Center, McAlester OK 76544. Telephone DSN 956-8961/8931or commercial (918) 420-8961/8931.

–Defense (Refresher) Packaging of Hazardous Materials for Transportation, 8B-F35 (JT) Resident and On Site, School of Military Packaging Technology (SMPT), Aberdeen Proving Grounds MD 21005-5001.

–Transportation of Hazardous Material-Recertification (A-822-0011), Navy Supply Corps School, Athens GA 30606-5520.

A25.3.2. **Technical Specialist.** Technical specialists may only sign the Shipper's Declaration for Dangerous Goods form as a certifying official on items they are technically qualified to maintain and prepare for shipment. A technical specialist will:

A25.3.2.1. Be designated in writing by the Commander to certify the unit or activity's hazardous materials upon completion of training that includes:

A25.3.2.1.1. Packaging and preparation. Training may be obtained by formal training/job skills or from an individual qualified by formal training/job skills to package/prepare hazardous materials specific to the unit or activity.

A25.3.2.1.2. Certification, marking, labeling, and all other aspects of this manual relevant to the hazardous materials specific to the unit or activity. Training must be conducted by an individual qualified as a Preparer according to **A25.3.1.**

A25.3.2.2. This authorization applies to tactical or contingency operations and channel (non-**Chapter 3**) movement.

A25.3.2.3. Air Force activities use the "Hazardous Material Technical Specialist Instructional Guidance" training material to develop and administer a local technical specialist training program. Contact your MAJCOM transportation office for guidance and the AFMC LSO/LOT HAZMAT web site to obtain a copy of the material.

A25.3.2.4. The following training is available for medical personnel who manage, package, certify or prepare laboratory samples and specimens for transport by any mode.

A25.3.2.4.1. Transport of Biomedical Material Course (Initial or Refresher), U. S. Army Center for Health Promotion and Preventive Medicine (USACHPPM), Aberdeen Proving Ground, MD 21010-5403. Telephone DSN 584-5228/3651 or commercial (410) 436-5228/3651.

A25.4. Training Frequency. All hazardous material personnel must receive initial training and subsequent refresher training at 24-month intervals. This applies to all levels (i.e., Handlers, Packers, Inspectors, and Preparers) of required training. Train individuals based on functional group requirements.

A25.4.1. Each Service focal point or major command (MAJCOM) focal point may grant an extension to this qualification expiration date for a period not to exceed 60 calendar days during which eligible personnel must receive training.

A25.4.2. Each Service focal point or MAJCOM focal point may grant successive 60-day extensions to a person's qualification expiration date for long-term tactical or contingency operations. In this instance, personnel extended past their initial 60-day extension may only certify hazardous materials moved according to the tactical or contingency operation. Once personnel return to normal duty, train each person as specified in this attachment.

A25.4.3. Each Service focal point or MAJCOM focal point is responsible for management of the extension authority and may establish more stringent training frequencies to enhance training requirements.

A25.5. Training Records. Test all hazardous material personnel and maintain a record of the training provided. Maintain and dispose of records according to an approved Records Disposition Schedule. As a minimum, maintain the record for as long as the person works for the DoD as a hazardous material employee and for 90 days after separation from the DoD. This record must indicate the following:

A25.5.1. Name of person who received the training.

A25.5.2. Date training took place.

A25.5.3. A description, copy, or location of training materials used to train the person.

A25.5.4. The name and address of the person who provided the training.

A25.5.5. Certification statement of completion of training and testing.

A25.6. Certification Under Combat Conditions. An aircraft commander (or representative designated by the commander) may accept a hazardous materials shipment under a combat situation without regard to the above training.

A25.7. Non-DoD Personnel Certifying Hazardous Material Shipments. Non-DoD personnel preparing hazardous materials for transportation by military air must do so according to this manual. DoD does not require non-DoD personnel to complete the training courses specified in this attachment. However, these individuals must meet the requirements of Title 49 CFR Part 172 Subpart H *Training* for all employees having responsibility for preparing hazardous materials for shipment. Training must include function specific duties related to military air transportation. Non-DoD personnel who desire the training outlined in this attachment must contact their contract administration office.

Attachment 26

TABLE OF EQUIVALENTS AND NET QUANTITY OF GAS CONVERSION FORMULAE

A26.1. Metrics. Figure A26.1. provides a list of metric prefixes.

Figure A26.1. Metric Prefixes.

Deci	0.1	Deca	10
Centi	0.01	Hecto	100
Milli	0.001	Kilo	1,000
Micro	0.000001	Mega	1,000,000
Nano	0.000000001	Gica	1,000,000,000
Pico	0.000000000001	Tera	1,000,000,000,000

A26.2. Miscellaneous Conversions. Figure A26.2. provides a list of general miscellaneous conversions for use with this manual.

Figure A26.2. Miscellaneous Conversions.

VOLUME:		**WEIGHT:**	
1 liter	0.264 gallon,	1 gram	0.03527 ounces,
	1.057 quarts,		0.0022 pounds avoirdupois
	61.025 cubic inches, 33.815 fluid ounces		
		1 kilogram	2.205 pounds,
1 cubic foot	28.32 liters,		35.274 ounces
	7.481 gallons,		
	1728 cubic inches	1 pound	0.4536 kg
1 cubic meter	1000 liters,	1 ounce	28.35 grams
	35.31 cubic feet,		
	264.2 gallons		
1 milliliter	0.0338 oz	**PRESSURE:**	
1 gallon	3.785l	1 pound per square inch	6.895 kilopascal
1 oz	29.57 ml	1 kilopascal	0.145 psi
LENGTH:		**RADIOACTIVE**	**ACTIVITY:**
1 centimeter	0.3937 inches	1 TBq	27 Ci
1 meter	3.28 feet, 39.37 inches	1 Sv/hr	100 rem/hr
1 inch	2.54 cm, 25.4 mm	1 rem/hr	0.01 Sv/hr
1 foot	0.3048 m		
1 millimeter	0.03937 in		
VOLUME			
1 newton	101.97 gram force		

A26.3. Temperature Conversion. Use **Figure A26.3.** to convert temperatures between Celsius and Fahrenheit.

Figure A26.3. Temperature Conversion Formulae.

C = (F-32) times 5/9
F = (C times 9/5) + 32
K = C + 273
C = degrees Celsius
F = degrees Fahrenheit,
K = degrees Kelvin (absolute)

A26.4. Net Quantity of Gas Conversion Formulae. Use **Figure A26.4.** to determine the net hazard of a compressed gas by converting PSI of a cylinder into pounds. Use **Figure A26.5.** to determine the molecular weight or specific gravity required to complete the formula.

Figure A26.4. Net Quantity of Gas Conversion Formulae.

Formula (1)	P= 0.00512 x A x B x C
	or
Formula (2)	P= .0001744 x A x B x M
where:	P= weight of gas in pounds
	A= pressure in pounds per square inch
	B= volume of cylinder in cubic feet
	C= specific gravity of the gas
	M= molecular weight of the gas molecule

NOTE: Use Formula (1) for calculation using the specific gravity value. Use Formula (2) for calculation using the molecular weight value.

A26.4.1. **Example for Determining Net Quantity of Gas.** The following information is known or determined by examination of the cylinder. Measure the cylinder's height from the external base to the valve seat. Measure the external diameter (width). Assume the cylinder does not cone at the top.

A26.4.1.1. **Example 1.**

Tank measurements:

Height: 50 inches Diameter = 2 x (radius)

Diameter: 9 inches R (inches) = 9/2 = 4.5

Tank contents: CO_2

Internal Pressure: 900 psi

Tank Volume

$V = p\ r^2 h$

$V = p\ (4.5\ \text{inches})^2 \times (50\ \text{inches}) = \{3181\ \text{inches}\}^3 \times \{1/1728\ (\text{Ft}^3/\text{inches}^3)\}$

$V = 1.841\ \text{Ft}^3$

P (pounds of gas) = 0.00512 x A x B x C = $\{0.00512\ \text{in}^2/\text{Ft}^3\} \times \{900\ \text{psi}\} \times \{1.841\ \text{Ft}^3\} \times \{1.516\}$

P = 12.9 pounds

A26.4.1.2. **Example 2.**

Tank measurements:

Height: 40 inches Diameter = 2 x (radius)

Diameter: 12 inches R (inches) = 12/2 = 6

Tank contents: C_2H_2

Internal Pressure: 500 psi

Tank Volume

$V = p\ r^2 h$

$V = p\ (6\ \text{inches})^2 \times (40\ \text{inches})$

$= \{4524\ \text{inches}^3\} \times \{1/1728\ (\text{Ft}^3/\text{inches}^3)\}$

$V = 2.618\ \text{Ft}^3$

P (pounds of gas) = 0.00512 x A x B x C = $\{0.00512\ \text{in}^2/\text{Ft}^3\} \times \{500\ \text{psi}\} \times \{2.618\ \text{Ft}^3\} \times \{0.897\}$

P = 6.01 pounds

A26.4.1.3. **Example 3.**

Tank measurements:

Height: 50 inches Diameter = 2 x (radius)

Diameter: 9 inches R (inches) = 9/2 = 4.5

Tank contents: CO_2

Internal Pressure: 900 psi

Tank Volume

$V = p\ r^2h$

$V = p\ (4.5\ \text{inches})^2 \times (50\ \text{inches}) = \{3181\ \text{inches}\}^3 \times \{1/1728\ (\text{Ft}^3/\text{inches}^3)\}$

$V = 1.841\ \text{Ft}^3$

$P = 0.0001744 \times A \times B \times M = 0.0001744 \times (900\ \text{psi}) \times (1.841\ \text{Ft}^3) \times (44.00)$

P = 12.7 pounds

A26.4.1.4. **Example 4.**

Tank measurements:

Height: 40 inches Diameter = 2 x (radius)

Diameter: 12 inches R (inches) = 12/2 = 6

Tank contents: C_2H_2

Internal Pressure: 500 psi

Tank Volume

$V = p\ r^2h$

$V = p\ (6\ \text{inches})^2 \times (40\ \text{inches}) = \{4524\ \text{inches}^3\} \times \{1/1728\ (\text{Ft}^3/\text{inches}^3)\}$

$V = 2.618\ \text{Ft}^3$

$P = 0.0001744 \times A \times B \times C = 0.0001744 \times (500\ \text{psi}) \times (2.618\ \text{Ft}^3) \times (26.00)$

P = 5.94 pounds

A26.4.2. **Examples for Determining Radioactive Shipments.** A_1/A_2 values represent the maximum activity that can be shipped in a Type A package. A_1 is for Special form material and A_2 values is for Normal or Other form material. In dealing with mixtures of radionuclides if the sum of the ratios is ≤ 1, then use a Type A package. If the sum of the ratios is >1, then use a Type B package.

A26.4.2.1. **Example 1.** Determine the most appropriate packaging when shipping a mixture of 0.46 TBq of Bromine-77 (Br-77) & 0.25 TBq of Cerium-143 (Ce-143).

Activity you have / Activity allowed = sum of the ratio

0.46 TBq/3 TBq = 0.15 (A_2 for Br-77)

0.25 TBq/0.6 TBq = 0.42 (A_2 for Ce-143)

0.15 + 0.42 = 0.57 Total sum of the ratios 0.57 ≤ 1, so a Type A package is required

A26.4.2.2. **Example 2.** Determine if the item can be shipped as a RQ of a hazardous substance.

Shipping a mixture of 2.02 TBq of Silver-112 (Ag-112), 0.16 TBq of Tin-113 (Sn-113) & 0.21 TBq of Tungsten-185 (W-185).

Activity you have / Reportable Quantity = RQ

2.02 TBq/3.7 TBq = 0.546 (RQ for Ag-112)

0.16 TBq/0.37 TBq = 0.432 (RQ for Sn-113)

0.21 TBq/0.37 TBq = 0.568 (RQ for W-185)

Total RQ of 1.576 > 1Therefore, mixture would be regulated as a hazardous substance.

A26.4.2.3. **Example 3.** Determine the most appropriate packaging when shipping the following:

1.45 TBq of Terbium-160 (Tb-160)

A_2 value for Tb-160 is 0.6 TBq.

1.45 TBq > 0.6 TBq Since the amount you are shipping is greater than the A_2 value; a Type B package is required.

A26.4.2.4. **Example 4.** Determine the most appropriate packaging when shipping the following:

0.45 GBq of solid Niobium (Nb-95) internationally

0.45 GBq converted is 0.00045 TBq

A_2 value for Nb-95 = 1 TBq

$10^{-3}A_2$ = 0.001 TBq > 0.00045 TBq

A26.4.2.4.1. Since the maximum activity allowed is greater than amount being shipped, the item can be shipped in an Excepted package.

A26.5. Properties of Common Gases. Figure A26.5. is a list of the molecular weight and specific gravity of common gases.

Figure A26.5. Properties of Common Gases.

GAS	SYMBOL	MOLECULAR WEIGHT	SPECIFIC GRAVITY
Helium	He	4.00	0.138
Argon	A	40.00	1.377
Air	-	29.00	1.000
Oxygen	O_2	32.00	1.103
Nitrogen	N_2	28.00	0.966
Hydrogen	H_2	2.00	0.0695
Nitric Oxide	NO	30.00	1.034
Carbon Monoxide	CO	28.00	0.965
Hydrochloric Acid	HCl	36.50	1.256
Steam	H_2O	18.00	0.623
Carbon Dioxide	CO_2	44.00	1.516
Nitrous Oxide	N_2O	44.00	1.518
Sulfur Dioxide	SO_2	64.00	2.208
Ammonia	NH_3	17.00	0.587
Acetylene	C_2H_2	26.00	0.897
Methyl Chloride	CH_2Cl	50.50	1.738
Methane	Ch_4	16.00	0.553
Ethylene	$C2H_4$	28.00	0.967

Attachment 27

PREPARING EXPLOSIVES PACKAGED PRIOR TO 1 JANUARY 1990

A27.1. General Requirements. Use this attachment to verify existing packaging which is exempt from UN specification packaging requirements according to Paragraph **1.7.2.** The methods of packaging described in this attachment were authorized by 49CFR and in effect on 31 December 1989.

A27.1.1. See **Attachment 17** for certification requirements.

A27.1.2. Use Proper Shipping Names identified in **Table A4.1.** in place of DOT names described in this attachment.

A27.1.3. See **Attachment 5** for special and general handling instructions.

A27.1.4. Comply with **Attachment 24** for ammunition or explosives which are packed in freon for safety during movement or which contain toxic substances previously described as a "Class A Poison."

A27.1.5. Unstable, condemned, or deteriorated explosives will not be shipped by military air. Unserviceable explosives may be shipped if otherwise safe for transportation.

A27.1.6. See **Attachment 14** and **Attachment 15** for marking and labeling requirements.

A27.1.7. Shipping Papers must be annotated, "Government owned goods packaged prior to 1 January 1990."

A27.1.8. Damaged or unserviceable packaging will not be shipped by military air. Repackage explosives according to current guidance in **Attachment 5**.

A27.1.9. See table **A27.1.** for an explosive or ammunition cross reference. In t his table, column 1 contains a list of explosive/ammunition with column 2 giving the paragraph from AFR 71-4 ad column 3 identifying the paragraph for that item in this manual.

A27.1.10. See **Table A27.2.** for DOT/Military specification container cross reference.

Table A27.1. Explosive/Ammunition Cross Reference.

Name of Explosive or Ammunition	AFR 71-4 Paragraph	AFMAN 24-204(I) Paragraph
Actuating Cartridges, Explosive, Fire Extinguisher or Actuating Cartridge, Explosive, Valve	5-32	**A27.16.**
Ammunition for Cannon (with Empty Projectiles; with Inert Loaded Projectiles; with Solid Projectile; without Projectiles; with Tear Gas Projectiles, Class B Explosives; with Explosives Projectiles; with Gas Projectiles; with Illumination Projectiles; with Incendiary Projectiles; with Smoke Projectiles and with Tear Gas Projectiles, Class A Explosives	5-10	**A27.2.**
Ammunition for Small Arms with Incendiary Projectiles and Ammunition for Small Arms with Explosives Projectiles	5-11	**A27.3.**
Black Powder and Low Explosives	5-13	**A27.4.**
Blasting Agent NOS	5-63	**A27.31.**
Cartridge, Practice Ammunition	5-62	**A27.30.**
Common Fireworks, Signal Flares, Hand Signal Devices, Smoke Signals, Smoke Candles, Smoke Grenades, Smoke Pots, and Very Signal Cartridges	5-23	**A27.9.**
Cord, Detonating; Fuse, Mild Detonating, Metal Clad; and Flexible Linear Shaped Charges, Metal Clad	5-25	**A27.10.**
Detonating, Fuzes, Class C Explosives	5-27	**A27.11.**
Detonating Fuzes, Class A Explosives; Booster, Explosive; Burster, Explosive and Supplementary Charges, Explosive	5-17	**A27.6.**
Detonating Primers, Class A Explosives and Detonating Primers, Class C Explosives	5-28	**A27.12.**
Detonators, Class A Explosives and Detonators, Class C Explosives	5-14	**A27.5.**
Explosive Bomb; Explosive Mine; Explosive Projectile; Explosive Torpedo; Grenade, Hand, Explosive; and Grenade, Rifle, Explosive	5-29	**A27.13.**
Explosive Cable Cutters; Explosive Power Device, Class C; Explosive Release Device, or Starter Cartridges, Jet Engine, Class C Explosive	5-30	**A27.14.**
Explosive Power Device, Class B	5-56	**A27.28.**
Explosive Rivets	5-31	**A27.15.**
Fuze, Combination; Fuze, Percussion; Fuze, Time; Fuze, Tracer; or Tracer	5-22	**A27.8.**

Name of Explosive or Ammunition	AFR 71-4 Paragraph	AFMAN 24-204(I) Paragraph
High Explosives	5-34	**A27.18.**
High Explosives, Liquids	5-35	**A27.18.1.**
High Explosives With Liquid Explosive Ingredients	5-36	**A27.18.2.**
High Explosives With No Liquid Explosive Ingredient and Propellant Explosives, Class A	5-37	**A27.18.3.**
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Igniter Cord	5-39	**A27.19.**
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Propellant Explosives, Solid or Liquid (Class A or B Explosives)	5-51	**A27.24.**
Railway Torpedoes	5-33.a.(6)	**A27.23.**
Rocket Ammunition with (Inert Loaded Projectiles, Solid Projectiles, Empty Projectiles, Explosive Projectiles, Gas Projectiles, Smoke Projectiles, Incendiary Projectiles, or Illuminating Projectiles)	5-52	**A27.25.**
Rocket Engine (Liquid), Class B Explosives	5-61	**A27.29.**
Rocket Motors; Jet Thrust Units; Igniters, Rocket Motors, Igniters, Rocket Motors; Igniters, Jet Thrust; Igniters, Ramjet Engine (Class B explosives) or Starter Cartridge, Jet Engine	5-50	**A27.22.**
Rocket Motors; Jet Thrust Units; Igniters, Rocket Motors; or Igniters, Jet Thrust (Class A Explosives)	5-49	**A27.21.**

Name of Explosive or Ammunition	AFR 71-4 Paragraph	AFMAN 24-204(I) Paragraph
Small Arms Ammunition and Small arms Ammunition, Tear Gas Cartridges	5-53	**A27.26.**
Small Arms Primer; Cannon Primer; Combination Primer; Percussion Cap; Grenades Empty, Primed	5-18	**A27.7.**
Special Fireworks	5-33	**A27.17.**
Toy Caps	5-54	**A27.27.**
Delay Electric Igniter; Electric Squib; Empty Cartridge Bag with Black Powder Igniter; Fuse Igniter; Fuse Lighter; Igniter Fuse, Metal Clad; Igniter; Safety Squib	5-19	**A27.33.**

A27.2. Ammunition for Cannon (with Empty Projectiles; with Inert Loaded Projectiles; with Solid Projectile; without Projectiles; with Tear Gas Projectiles, Class B Explosives; with Explosives Projectiles; with Gas Projectiles; with Illumination Projectiles; with Incendiary Projectiles; with Smoke Projectiles and with Tear Gas Projectiles, Class A Explosives. Package in strong wooden or metal containers, or plastic containers approved by military specifications or drawings.

A27.3. Ammunition for Small Arms with Incendiary Projectiles and Ammunition for Small Arms with Explosives Projectiles. Package in strong wooden or metal containers approved by military specifications or drawings not to exceed 175 pounds gross weight.

A27.4. Black Powder and Low Explosives.

A27.4.1. Metal kegs, DOT 1, not less than 7 inches long. Net weight not less than 6 ¼ pounds and no more than 150 pounds.

A27.4.2. Wooden boxes, DOT 14, 15A, 16A, or 19B with inside fiber or metal containers, not over 1 ¾ pound capacity each, or cotton bags at least 4-ounce cotton duck not over 25-pounds capacity each. The maximum gross weight must be 140 pounds for DOT 14 and 200 pounds for DOT 15A, 16A, or 19B wooden boxes.

A27.4.3. Wooden boxes, DOT 14, 15A, 16A, or 19B with inside cylindrical fiber cartridge not over 5 inches in diameter nor over 18 inches long, with fiber at least 0.05 inch thick paraffined on outer surface, with joints securely glued or cemented, or strong paraffined paper cartridges not over 12 inches long authorized only for compressed pellets (cylindrical block) seven-eighths of an inch or more in diameter. Boxes must be completely lined with strong paraffined paper, or other suitable waterproofed material, without joints or other openings at the bottom or sides. Authorized gross weight must not be over 75 pounds.

A27.4.4. Fiberboard boxes, DOT 12H, 23F, or 23H, with inside cylindrical fiber cartridges not over 5 inches in diameter nor over 18 inches long, with fiber at least 0.05 inch thick paraffined on outer surface with joints securely glued or cemented, or strong paraffined paper cartridges not over 12 inches long authorized only for compressed pellets (cylindrical block) seven-eighths of an inch or more in diameter. Authorized gross weight must not be over 65 pounds.

A27.4.5. Black Powder (not low explosive), in addition to containers specified above, may be shipped in the following specification containers:

A27.4.5.1. Wooden boxes, DOT 14, 15A, 16A, or 19B with inside cloth or paper bags not over 25 pounds net weight. The completed shipping package must be capable of withstanding a drop of 4 feet without rupture of inner or outer containers. The completed package must not contain more than 50 pounds net weight of black powder.

A27.4.5.2. Fiberboard boxes, DOT 12H, 23F, or 23H with inside cloth, paper, or securely closed polyethylene bags constructed of material not less than 0.004 inch thick. The maximum net weight must not exceed 25 pounds for cloth or paper bags and 50 pounds for polyethylene bags. Inside fiber or metal containers not over 1 pound net capacity each may be used, provided the completed shipping package is capable of withstanding a drop of 4 feet without rupture of the inner or outer containers. The tubes of the box may be eliminated and a single tube as specified in DOT 23F may be substituted. The completed package must not contain more than 50 pounds net weight of black powder.

A27.4.6. Black pellet powder, primed with the electric squib, secured inside the coaxial hole of the pellet powder (with loose ends of the wire of the squib effectively short-circuited) may be shipped in wooden boxes, DOT 14, 15A, 16A, or 19B with inside strong paraffined paper cartridges not over 12 inches long, and authorized only for compressed pellets (cylindrical block) seven-eighths of an inch or more in diameter. Boxes must be lined as prescribed for cylindrical fiber cartridges. Gross weight must be not be over 65 pounds.

A27.4.7. Low explosives (not black powder), in addition to the containers specified, may be shipped in the following specification containers:

A27.4.7.1. Wooden boxes, DOT 14, 15A, 16A, or 19B with strong paper bags not over 25 pounds capacity. Gross weight of DOT 15A or 16A boxes must not be over 200 pounds. Gross weight of DOT 14 box must not be over 140 pounds.

A27.4.7.2. Fiberboard boxes. DOT 12H, 23F, 23H, with inside strong paper bags not over 25 pounds capacity. Gross weight must not be over 65 pounds.

A27.4.7.3. Wooden boxes, DOT 15A or 19B, lined with paper, DOT 2L. Authorized for rods or cylinders not less than five-eighths of an inch in diameter.

A27.5. Detonators, Class A Explosives and Detonators, Class C Explosives. Detonators must fit snugly in strong inside packaging and must be snugly overpacked in outside containers as specified in **A27.5.7.** and **A27.5.8.** below.

A27.5.1. For devices containing no more than 10 grams of explosives (excluding ignition and delay charges):

A27.5.1.1. No more than 50 devices may be packed in one inside packaging and no more than 500 devices may be packed in one outside packaging.

A27.5.1.2. The gross weight of the completed package must not be over 150 pounds or the gross weight permitted by the specification for the outside packaging used, whichever is less.

A27.5.2. For detonators that are blasting caps (including percussion activated) or delay connectors in metal tubes, the packaging must be as specified below. Also:

A27.5.3. Open ends of any device must be covered with an appropriate cushioning material.

A27.5.3.1. Inside packaging must fit snugly in intermediate packagings consisting of cartons or wrappings made of paper, plastic, or pasteboard.

A27.5.3.2. Intermediate packagings must be separated from the outside packaging by at least 1 inch of cushioning material.

A27.5.4. For devices containing no more than 3 grams of explosives (excluding ignition and delay charges):

A27.5.4.1. No more than 110 devices may be packed in one inside packaging; and,

A27.5.4.2. No more than 5,000 devices may be packed in one outside packaging.

A27.5.5. Detonators that are electric blasting caps, delay connectors in plastic sheaths, or blasting caps with empty plastic tubing containing no more than 3 grams of explosives (excluding ignition and delay charges) must be packed with no more than 100 devices in one inside receptacle and no more than 1,000 devices in one outer container.

A27.5.6. Detonators that are blasting caps with safety fuse, blasting caps with metal clad mild detonating cord, blasting caps with detonating cord, or blasting caps with shock tubes are not required to be attached to the safety fuse, metal clad mild detonating cord, detonating cord, or shock tube, and inside packagings are not required if the packagings configuration restricts freedom of movement of the caps and protects them from impact forces. Quantity limitations do not apply to Detonators, Class C Explosives. Container weight limitations do apply.

A27.5.7. Wooden boxes DOT 14, 15A, 16A, or 19B.

A27.5.8. Fiberboard boxes DOT 12H, 23F, or 23H.

A27.6. Detonating Fuzes, Class A Explosives; Booster, Explosive; Burster, Explosive and Supplementary Charges, Explosive. Package in well secured strong tight wooden or metal boxes approved by military specifications or drawings.

A27.6.1. The gross weight of an outer package containing detonating fuzes, Class A, must not exceed 190 pounds.

A27.6.2. Boosters, bursters, and supplementary charges, without detonators, when shipped separately, must not exceed 300 pounds gross weight.

A27.6.3. A fuze with any radioactive component must also meet requirements of **Attachment 11**.

A27.7. Small Arms Primer; Cannon Primer; Combination Primer; Percussion Cap; Grenades Empty, Primed.

A27.7.1. Package primers (cannon, combination, and small arms), percussion caps, and empty grenades, primed, in strong, tight outside wooden boxes with special provisions for securing the individual packages against movement within the exterior containers.

A27.7.2. Package empty cartridge cases, primed, in strong, tight outside wooden or fiberboard boxes or in DOT21C fiber drums. Each drum must be constructed to the specification requirements for a drum containing at least 250 pounds net weight. Each drum having a metal top or bottom must have a protective corrugated paperboard pad inserted between the contents and the metal.

A27.7.3. Small arms primers containing anvils must be packed in:

A27.7.3.1. Cellular Inside Packages. Packages with partitions separating the layers and columns of the primers so that the explosion of a portion of the primers in the completed shipping packages do not cause the explosion of all primers. They also must be packed in outside containers as stated in **A27.7.1.** or in fiberboard boxes, DOT 12B, equipped with a corrugated fiberboard liner. The bursting test of the liner must be equal to or over that of the box. The exception is that a liner is not required for a full telescopic style box that may be closed with pressure sensitive tape as specified for DOT 12B. Not more than 5,000 primers may be packed in one outside fiberboard box.

A27.7.3.2. Fiberboard boxes, DOT 23H. Each box must be full depth telescopic style, with top section having extended end flaps and bottom section having extended side flaps, set up without glued or stapled joints. The full height inside perimeter liner, top and bottom pads must be made of doublewall corrugated fiberboard. Hand-holes not more than 4 inches by 1 inch, horizontal with top score line are authorized in the ends of boxes. Package primers in cellular inside packages with partitions separating the layers and columns to form a tight fitting pack in the outside container. Do not pack more than 50,000 primers in one outside box.

A27.7.4. Small arms primers and percussion caps may be packed with nonexplosive and nonflammable articles, or with small arms ammunition as provided in **A27.27.** Small arms primers may be included with propellant explosive (solid), class B, in the same outside container as provided in **A27.24.2.** The weight of the small arms primers or percussion caps must not exceed 5 pounds per shipping container. Percussion caps must be packaged in metal or other inside boxes. Do not pack more than 500 caps in inside boxes. The construction of the cap or packaging, and the kind and quantity of explosives in each, is such that the explosion of a part of the caps in the completed package does not cause the explosion of all the caps. Package percussion caps in fiberboard boxes, DOT 12B, also:

A27.7.4.1. Do not pack more than 100 caps each in inside metal cans. Not more than 10 metal cans each must then be overpacked in a chipboard box. Pack no more than five chipboard boxes in the 12B fiberboard box. The completed package must be such that an explosion of a part of the caps will not cause the explosion of all the caps.

A27.7.4.2. Pack no more than 100 caps each in inside plastic cans. The plastic cans must then be packed in a chipboard box with not more than eight such chipboard boxes tightly packed in the DOT 12B fiberboard box. The completed package must be such that an explosion of part of the caps will not cause the explosion of all of the caps. The gross weight of one outside package must not be more than 150 pounds.

A27.8. Fuze, Combination; Fuze, Percussion; Fuze, Time; Fuze, Tracer; or Tracer. Package in strong, tight, outside wooden boxes, triple-wall fiberboard boxes, or DOT 23F fiberboard boxes. Special provisions must be made for securing individual packages of fuzes or tracers against movement in the box. The gross weight of each wooden or fiberboard box must not be more than 150 pounds. The gross weight of each DOT 23F fiberboard box must not be over 65 pounds.

A27.9. Common Fireworks, Signal Flares, Hand Signal Devices, Smoke Signals, Smoke Candles, Smoke Grenades, Smoke Pots, and Very Signal Cartridges must be packaged as follows:

A27.9.1. Wooden boxes, DOT 15A, 16A, 19A, or 19B. The gross weight must not be over 100 pounds, however, a gross weight of 500 pounds is authorized for wooden boxes with very signal cartridges only.

A27.9.2. Fiberboard boxes, DOT 12B. The gross weight of fiberboard boxes must not be over 65 pounds.

A27.9.3. Watertight, aluminum drums, 8 inches in diameter, having a rubber gasket and a positive closure. These are authorized only for smoke pots.

A27.9.4. Smoke signals may be packed two each in a Navy-designated preformed polystyrene container banded with pressure-sensitive tape. Pallet loads must have a 2-foot high, ¼-inch plywood border around the lower portion of the load. Each polystyrene case may be overwrapped in a heat-sealed polystyrene bag. The minimum thickness of the bag must be 0.006 inch. Eighteen such containers may be consolidated in a MIL-B-43096, type II, class 2, wirebound wooden box. Each face of the box must be lined with PPP-F-320, type W6C or equal fiberboard.

A27.9.5. Fireworks, such as sparklers, with match tip or head, or similar igniting point or surface, must have each individual tip, head, or similar ignition point or surface entirely covered and securely protected against accidental contact or friction. Except as otherwise specified above, the gross weight of one outside package containing common fireworks must not be over 100 pounds.

A27.10. Cord, Detonating; Fuse, Mild Detonating, Metal Clad; and Flexible Linear Shaped Charges, Metal Clad. Package in wooden or fiberboard boxes or shipping containers approved by military specification or drawings.

A27.11. Detonating, Fuzes, Class C Explosives. Packaging requirements:

A27.11.1. Package in fiberboard boxes, DOT 12H, with or without liners, with well-secured inside paperboard cartons. Suitable filler or lining materials must be used to prevent movement in the box.

A27.11.2. In well-secured, strong, tight outside wooden or metal boxes approved by military specification or drawing. The gross weight of the outside wooden or metal box must not be over 190 pounds.

A27.12. Detonating Primers, Class A Explosives and Detonating Primers, Class C Explosives. Packaging requirements:

A27.12.1. Wooden boxes, DOT 14, 15A, 16A, or 19B, or fiberboard boxes DOT 12H, 23F, or 23H.

A27.12.2. Shipping containers approved by military specification or drawing.

A27.13. Explosive Bomb; Explosive Mine; Explosive Projectile; Explosive Torpedo; Grenade, Hand, Explosive; and Grenade, Rifle, Explosive. Packaging requirements:

A27.13.1. Pack and secure explosive bombs, mines, projectiles, torpedoes, or grenades in strong wooden or metal boxes, except as provided in (2) below.

A27.13.2. Explosive bombs, mines, projectiles, torpedoes, over 90 pounds in weight, and explosive projectiles of not less than 4 ¾ inches in diameter, may be shipped unboxed if securely fastened to pallets or securely blocked and braced.

A27.13.3. Pack and secure bombs, grenades, or projectiles containing gas, smoke, or incendiary charges and bursting charges in strong wooden or metal boxes.

A27.13.3.1. The gross weight of a box containing more than one grenade or mine must not be over 250 pounds.

A27.13.3.2. The gross weight of a shipping container with more than one explosive bomb, warhead, or projectile must not be over 1,400 pounds.

A27.13.4. Package XM47, XM42, XM42E1, and SX54 mine-dispensing subsystem and XM2,XM12, XM12E1, XM12E2/E3, and XM17 canisters in wooden or metal containers. The following special shipping procedures apply:

A27.13.4.1. Wooden containers must not be stacked more than three high with a minimum of 3 feet of space above the top containers. Containers must be positioned in aircraft to allow a minimum of 2 feet of space in front of the container inspection door. Tiedown of containers must be such that access to inspection door is not denied (nets are not considered an obstruction); and

A27.13.4.2. Gross weight of wooden container must not be over 675 pounds.

A27.13.5. BLU 50/B bomblets are packaged in specially designed fiberboard lined plywood boxes. Inside containers consist of ten each bomblets in snug fitting, preformed polyurethane cushioning in a heat-sealed barrier bag.

A27.13.6. Explosive mines may be packaged in metal drums, PA 16, with 14 inside can assemblies with perforated tops, a preformed packing and two base assemblies. Drums must be filled with liquid freon. Two liquid level sight gauges must be located in the top half of the drum for visual monitoring of the liquid level.

A27.13.7. Explosive mines may be packaged in metal drums, PA 17, with inside preformed packing designed to hold mines below liquid freon level. Drums must be filled with liquid freon. Two liquid level sight gauges must be located in the top half of the drums for visual monitoring of the liquid level.

A27.13.8. Package CDU-4/B (SM41E1), CDE-5/B (XM40ES), CDU-10 (XM40ES/SM44) and CDU-14/B (XM64) in wooden boxes approved by military specification or drawing. CDUs must be filled with liquid freon and level electrically monitored.

A27.13.9. Explosive bomb, further described as 7.2 inch projector charge, may be shipped assembled to a 40-by 48 inch steel pallet having a gross weight of approximately 2,000 pounds.

A27.13.10. Package explosive bombs, CBU-55/B, containing explosive components and fuel (ethylene oxide) in a CNU-120/E container.

A27.13.11. Package explosive bombs, CBU-55/B, without fuel, in a CNU-120/E container.

A27.13.12. Explosive bombs, CBU-33/A, may be packed in plastic containers CNU-104/E conforming to MIL-P-22748A, class A, grade 6. Loaded containers must not be over 1,200 pounds gross weight.

A27.14. Explosive Cable Cutters; Explosive Power Device, Class C; Explosive Release Device, or Starter Cartridges, Jet Engine, Class C Explosive. Packaging Requirements:

A27.14.1. Fiberboard boxes, DOT 12H, 23F, or 23H. The maximum gross weight must not be over 65 pounds.

A27.14.2. Wooden or metal boxes must be approved by military specification or drawings. Starter cartridges, jet engine, must have igniter wires short-circuited when packed for shipment.

A27.15. Explosive Rivets. Package explosive rivets, containing not more than 375 milligrams of explosive composition each, in unit containers or paperboard. Pack the unit containers or paperboard in strong wooden, fiberboard or metal containers approved by military specification or drawings.

A27.16. Actuating Cartridges, Explosive, Fire Extinguisher or Actuating Cartridge, Explosive, Valve. Package in strong wooden or fiberboard boxes.

A27.17. Special Fireworks. Packaging Requirements:

A27.17.1. Wooden boxes, DOT 15A, 15B, 16A, 19A, or 19B. The maximum gross weight must not be over 500 pounds.

A27.17.2. Fiberboard boxes, DOT 12B. The maximum gross weight must not be over 65 pounds. Illuminating projectiles and aeroplane flares are not permitted in DOT 12B boxes.

A27.17.3. Package flash or spreader cartridges with not more than 72 grains of flash powder in inside fiberboard cartons or tin cans containing not over six cartridges. Pack no more than 150 inside containers in outside DOT 15A, 16A, 19A, or 19B wooden boxes or DOT 12B fiberboard boxes.

A27.17.4. Package assembled flash cartridge consisting of a paper cartridge shell, small arms primer, and flash composition in inside cartons. The flash composition in the one-piece assembled and ready for firing flash cartridge must not be over 180 grains. Do not pack more than 12 cartridges each in the inside cartons. A maximum of 12 inside cartons may be packed in DOT 15A, 15B, 16A, 19A, or 19B wooden boxes or DOT 12B fiberboard boxes. Flash cartridges, in quantities not over 5 pounds, packaged in small interior wooden boxes, may be packed with nonexplosive, nonflammable, and noncorrosive items.

A27.17.5. Unit pack no more than six flash sheets in an inside container. Intermediate pack no more than 12 unit packages in a pasteboard box or carton and packed in a DOT 15A, 16A, 19A, or 19B wooden box or DOT 12B fiberboard box. The gross weight of wooden boxes must not be over 150 pounds. The gross weight of fiberboard boxes must not be over 65 pounds.

A27.17.6. Package photographic flash powder in specification containers as specified in **A27.17.3.**, except the inside container must be strong enough to hold up to 2 ounces each of contents. If bottles are used, each bottle must be packed in a securely closed fiber mailing tube with metal ends. Not more than forty eight 2-ounce bottles may be packed in an exterior wooden box. When packed in units not over 1-ounce each without bottles in similar fiber mailing tubes and exterior wooden boxes, the gross weight of each exterior box must not be over 150 pounds. The gross weight of exterior fiberboard boxes must not be over 65 pounds.

A27.17.7. Package toy torpedoes in wooden boxes, DOT 15A, 15B, 16A, 19A, 19B, or fiberboard boxes DOT 12B containers. Not more than 20 one-quarter gross cartons totaling not more than five

gross of toy torpedoes are authorized per fiberboard box. The gross weight of a fiberboard box must not be over 35 pounds. The gross weight of a wooden box must not be over 65 pounds.

A27.17.7.1. Do not pack toy torpedoes of any kind with other fireworks.

A27.17.7.2. Pack toy torpedoes containing a cap in sawdust in inside paper or cardboard cartons. The size of the carton must not be less than 4 cubic inches for each grain of explosive.

A27.17.7.3. Pack toy torpedoes containing a mixture of potassium chlorate, black antimony, and sulfur, in an inner container containing not more than 36 torpedoes. The capacity of this inner container must be at least 105 cubic inches, and it must be divided into 12 equal compartments. All vacant space inside the container must be filled with sawdust or fine shavings.

A27.17.8. Ship distress signals may be packed in outside DOT 12 fiberboard boxes provided:

A27.17.8.1. They are packed in inside metal containers. These containers must be made from at least 24 gauge sheet iron or other metal of equal strength.

A27.17.8.2. The inner container is closed by positive means (not friction).

A27.17.8.3. Inside containers completely fill the outside container.

A27.17.8.4. The gross weight is not over 95 pounds.

A27.17.9. Marine location markers (eight each) and aircraft flares (two each) may be packed two each in a Navy-designed, preformed polystyrene container banded with pressure-sensitive tape. Pallet loads must have 2-feet high, ¼-inch plywood border around the lower portion of the load. Polystyrene case may be overwrapped in heat sealed polyethylene bag .006 inch thickness minimum. Consolidate 18 such containers in a wirebound wood box MIL-B-43096, type II, class 2, lined top, bottom and sides with fiberboard, PPP-F-320, grade W6c or equal.

A27.17.10. Illuminating projectiles, incendiary projectiles, and smoke projectiles over 90 pounds in weight each, or of not less than 4 ¾ inches in diameter, may be palletized. Securely block and brace the palletized load according to methods prescribed by the responsible military department. A shipment container is not required.

A27.17.11. Illuminating projectiles, incendiary projectiles, and smoke projectiles less than 4 ¾ inches in diameter may be shipped without being boxed, when palletized and securely blocked and braced with methods prescribed by the responsible military department.

A27.17.12. MK27 Mod O guided missile flares or MK28-3 target flares may be packed in MK2 Mod O metal boxes.

A27.17.13. Practice or exercise warheads containing polytechnics may be shipped two each in a metal box (MK34, Mod O) with a gross weight over 65 pounds.

A27.17.14. Flares may be packed in flame-retardent polystyrene cases. The polystyrene cases must be shipped palletized, covered with plywood or wirebound sheathing secured with steel strapping.

A27.18. High Explosives.

A27.18.1. High explosives, consisting of a liquid mixed with an absorbent material, must have the absorbent (wood pulp or similar material) in sufficient quantity and be of satisfactory quality, and properly dried at the time of mixing. Nitrate of soda must be dried at the time of mixing to less than 1

percent of moisture; and the ingredients must be uniformly mixed so that the liquid will remain thoroughly absorbed under the most unfavorable atmospheric conditions incident to transportation.

A27.18.2. High explosives containing nitroglycerin or other liquid explosive ingredients must be uniformly mixed with an absorbent material and a satisfactory antacid. The antacid must be in sufficient quantity to have the neutralizing power of an amount of magnesium carbonate equal to 1 percent of the nitroglycerin or other liquid explosive ingredient.

A27.18.3. High explosive cartridges consist of a column of explosives completely enclosed in a shell made of strong paper or polyethylene or a combination of paper and polyethylene, treated so that it will not absorb the liquid ingredient of the explosive.

A27.18.4. High explosive packaged bags made of strong paper of equally efficient material so treated or of such nature that it will not absorb the liquid ingredient of the explosive.

A27.18.5. High explosives packed in boxes which must be lined with strong, paraffined paper or other suitable material. The lining must be without joints or other openings or with cemented joints at the bottom, ends, or sides of the boxes. For explosives with liquid ingredients, the lining must be impervious to such ingredients and also to water. Box covers must be protected from contact with explosives by lining paper or other suitable material.

A27.18.6. Gelatine explosives in cartridges or bags must also have dry fine wood pulp or sawdust at least ¼ of an inch in depth spread over the bottom of the box or the bottom of the box may have a full area pad formed of an absorptive cellulose sheet which has a nitroglycerin absorptive value equivalent to sawdust as specified. Similar materials are required in boxes for packing all non-gelatinous types of explosives containing 30 percent or more of liquid explosive ingredient.

A27.18.7. Except for high explosive (gelatin dynamite) in cartridges, all cartridges of high explosives exceeding 4 inches in length and containing more than 10 percent of a liquid explosive ingredient must be placed horizontally in boxes. Pack bags with their filling holes up.

A27.18.8. Prevent movement of high explosives contained in cartridges and bags within the boxes by sufficiently tight packing.

A27.18.9. High explosive (dynamite), except gelatin dynamite, packed in bags or in cartridges over 2 inches in diameter and containing not more than 30 percent liquid explosive ingredients may be packed in outside containers without sawdust and without lining paper, provided each inside or outside container is siftproof and is treated to prevent penetration by the commodity with which the container is filled for shipping.

A27.18.10. Liquid High Explosives Must Be Packed In DOT 15L wooden boxes and DOT 15M wooden boxes. The inside metal containers in the DOT 15M containers cannot contain more than 10 quarts of liquid explosives each.

A27.18.11. High Explosives with Liquid Explosive Ingredients.

A27.18.11.1. Package high explosives (dynamite) containing no more than 30 percent liquid explosive ingredients in the following specification containers.

A27.18.11.1.1. Fiberboard boxes, DOT 23G, with no more than one cartridge in each box. The gross weight of the boxes must not be over 65 pounds.

A27.18.11.1.2. Wooden boxes, DOT 14, 15A, 16A, 19B or fiberboard boxes, DOT 12H, 23F, or 23H with inside containers, which must be cartridges or bags. Inside cartridges must not be more than 12 inches in diameter by 36 inches in length or 50 pounds gross weight. Inside bags not over 50 pounds must be securely closed to prevent leakage of contents. The gross weight of wooden boxes must not be over 75 pounds and the gross weight of fiberboard boxes must not be more than 65 pounds.

A27.18.11.1.3. Fiberboard boxes, DOT 23F or 23H, having one inside 26-gauge metal container, measuring not over 8 inches in diameter and 31 inches in length, containing high explosives (ammonium dynamite core) surrounded by a blasting agent. Gross weight must not be more than 65 pounds.

A27.18.11.2. High explosives (dynamite) containing 10 percent or less of a liquid ingredient must be prepared for shipment as follows:

A27.18.11.2.1. Packed in DOT 14, 15A, 16A, or 19B wooden boxes or in DOT 12H, 23F, or 23H fiberboard boxes. The gross weight must not be more than 140 pounds.

A27.18.11.2.2. Fiberboard boxes, DOT 23G, with no more than one cartridge in each box. The gross weight of the box must not exceed 65 pounds.

A27.18.11.3. Pack high explosives (dynamite) containing more than 30 percent liquid explosive ingredients in specification containers as follows:

A27.18.11.3.1. Wooden boxes (maximum gross weight 75 pounds), DOT 14, 15A, 16A, or 19B or fiberboard boxes, DOT 12H, 23F, or 23H, with inside containers that consist of:

A27.18.11.3.1.1. Cartridges not over 4 inches in diameter and not over 8 inches in length.

A27.18.11.3.1.2. Cartridges having a diameter of 4 to 5 inches and between 8 and 10 inches in length must be redipped in melted paraffin or equivalent material.

A27.18.11.3.1.3. Two or more cartridges that must be redipped because of their size must be enclosed in another strong paper shell to form a completed cartridge not more than 30 inches in length. The resulting cartridge must be dipped in melted paraffin or equivalent.

A27.18.11.3.1.4. The gross weight of wooden boxes must not be more than 75 pounds and the gross weight of fiberboard boxes must not be more than 65 pounds.

A27.18.11.3.2. In wooden or fiberboard specification boxes as prescribed inside containers may be paper or polyethylene bags meeting the following conditions:

A27.18.11.3.2.1. Paper bags: .

A27.18.11.3.2.1.1. Must be paraffined two-ply paper not over 12 ¾ pounds capacity, securely closed by folding the tops and securingthe fold by tape.

A27.18.11.3.2.1.2. Must insert no more than two such bags into another two-ply paper bag that must be securely closed and dipped in paraffin after closing.

A27.18.11.3.2.2. Polyethylene bags

A27.18.11.3.2.2.1. Must not be less than 0.0004 inches in thickness and no more than 12 ¾ pounds capacity each.

A27.18.11.3.2.2.2. Must not be more than two such securely closed bags packed in an intermediate polyethylene or paper bag. Securely close the polyethylene or paper bag and pack in polyethylene lined outside fiberboard boxes.

A27.18.11.3.2.3. The gross weight of wooden boxes must not be over 75 pounds, and the gross weight of fiberboard boxes must not be over 65 pounds.

A27.18.11.4. High explosives (gelatin dynamite and blasting gelatin) packed in specification containers as follows:

A27.18.11.4.1. Fiberboard boxes, DOT 23G, with no more than one cartridge in each box. Gross weight of boxes must not be over 65 pounds.

A27.18.11.4.2. Wooden boxes, DOT 14, 15A, 16A, or 19B or fiberboard boxes, DOT 12H, 23F, or 23H with inside cartridges or bags. The cartridges must not be more than 12 inches in diameter by 36 inches in length or 50 pounds in weight. Bags not completely sealed against leakage must be packed with filling holes up. The gross weight for wooden boxes must not be over 75 pounds, and the gross weight of fiberboard boxes must not be over 65 pounds.

A27.18.11.4.3. High explosives (straight gelatin dynamite of 80 percent strength and over and blasting gelatin) are packed in cartridges, or in bulk in outside boxes. When packed in bulk, boxes must be double lined throughout with paper and packed in wooden boxes, DOT 14, 15A, 16A, or 19B or 23 H. Pack DOT 23G fiberboard boxes in an outer container consisting of at least seven-ply heavy kraft paper. Two 3-mil polyethylene bags, one within the other, may be used in place of the double-lining paper when a DOT 12H is the outside container. Not more than one such double bag may be packed in DOT 12H fiberboard box. The gross weight of wooden boxes must not be more than 75 pounds and the gross weight of fiberboard boxes must not be over 65 pounds.

A27.18.12. High explosives with no liquid explosive ingredient and propellant explosives, class A. Packaging requirements:

A27.18.12.1. Wooden boxes, DOT 14, 15A, 16A, or 19B. The gross weight must not be more than 140 pounds.

A27.18.12.2. Fiberboard boxes, DOT 12H, 23F, or 23H. The gross weight must not be more than 65 pounds.

A27.18.12.3. Boxes must have an inside polyethylene bag having a minimum thickness of 6 mils, or must be lined with strong paraffined paper or other authorized material, DOT 2L. When such explosives contain over 5 percent moisture, boxes with handholes are not authorized.

A27.18.12.4. Outside boxes. When such explosives are in combination cartridges, consisting of a column of explosive with core of dynamite, they may be shipped when packed in outside boxes. The gross weight must not be over 65 pounds. The column of explosives must be completely enclosed in waterproofed cloth or waterproofed paper, and must not be more than 6 inches in diameter, 2 inches in length, or 25 pounds gross weight.

A27.18.12.5. Fiberboard boxes, DOT 23G. Gross weight of the box must not be over 65 pounds. The high explosives sensitiveness to percussion must not be greater than that measured by the blow delivered by an 8 pound weight dropping from a distance of 7 inches on a compressed pellet of the explosive 0.03 inch thick and 0.2 inch diameter. The compressed pellet is confined rigidly

between hard steel surfaces as in standard Impact Testing Apparatus of the Bureau of Explosives during the test. Pack the high explosives in cartridges when their sensitiveness is greater than the limit prescribed herein. Such explosives, when dry, may be packed in strong siftproof cloth or paper bags of capacity not be over 25 pounds.

A27.18.13. High explosives with no liquid explosive ingredient nor any chlorate. Pack in one of the following outer containers:

A27.18.13.1. When high explosives contain over 5 percent moisture, the box must have an inside securely closed polyethylene bag having a minimum thickness of 6 mil; or the box must have a DOT 2L lining. Polyethylene is authorized only for materials that do not react with or cause decomposition of the plastic.

A27.18.13.2. When high explosives are in combination cartridges, consisting of a column of explosives with a core of dynamite, they may be packed in exterior containers with 65 pounds as the maximum gross weight. Completely enclose the column of explosives in waterproofed cloth or strong waterproofed paper, not more than 6 inches in diameter, 20 inches in length, or a gross weight of 25 pounds.

A27.18.13.3. Sensitiveness to percussion is not greater than that measured by the blow delivered by an 8-pound weight, dropping from a distance of 7 inches, or compressed pellet of the explosive 0.03-inch thick and 0.20-inch diameter, confined rigidly between hard steel surfaces as in the Standard Impact Testing Apparatus of the Bureau of Explosives. The requirement of packaging in cartridges, bags, or metal containers does not apply to plastic-bonded explosives. Pack and cushion to prevent movement of individual pieces within the outside shipping container. Pack in cartridges when their sensitiveness is greater than the limit prescribed in this section. Such explosives, when dry may be packed in strong siftproof bags, securely closed to prevent leakage, or in metal containers of capacity not over 60 pounds.

A27.18.13.4. Wooden boxes, DOT 14, 15A, 16A, or 19B. Gross weight must not be over 140 pounds. Wooden boxes, having inside metal containers that are tightly and securely closed, may be equipped with handholes in each end that must not be more than 1- by 4-inches and centered laterally not nearer than 1 5/8 inches from top edge of box.

A27.18.13.5. Fiberboard boxes, DOT 12H, 23F, 23G, or 23H. Gross weight must not be over 65 pounds.

A27.18.13.6. Metal drums (single-trip) DOT 17H or 37A having a minimum 0.003-inch thick polyethylene liner. Authorized only for Ammonium Perchlorate with particle size of 5 to 15 micrometers. Maximum capacity is 30 gallons.

A27.18.14. Amatol consisting of 80 percent ammonium nitrate and 20 percent Trinitrotoluene, Ammonium Picrate, Nitroguanidine, Nitrourea, Urea Nitrate, Picric Acid, Tetryl, Trinitroresorcinal, Trinitrotoluene, Pentolite, Cyclotrimethylentrinitramine (desensitized), and Soda Amatol, in dry condition, may be shipped in containers with the following specifications:

A27.18.14.1. Those described in **A27.18.13.**

A27.18.14.2. Wooden boxes, DOT 14, 15A, 16A, or 19B, with strong paper or cloth bags of capacity not over 50 pounds, packed with filling holes up.

A27.18.14.3. Fiber drums, DOT 21C. Net weight not over 200 pounds.

A27.18.15. Trinitrotoluene and Pentolite in dry condition.

A27.18.15.1. Packed in containers described in **A27.18.13.**

A27.18.15.2. Packed in containers described in **A27.18.14.**

A27.18.15.3. Wooden boxes, DOT 14, 15A, 16A, 19B, or with strong paper or cloth bags of capacity not over 100 pounds, packed with filling holes up.

A27.18.15.4. Wooden boxes, DOT 14, 15A, 16A, or 19B, with strong siftproof liners, DOT 2L.

A27.18.15.5. Fiber drums, DOT 21C. Net weight must not be over 200 pounds.

A27.18.15.6. The following materials may be shipped dry, in quantity not more than 4 ounces in one outside package for medical purposes or as reagents, as drugs, medicines, or chemicals without other restriction, when in securely closed bottles or jars properly cushioned to prevent breakage:

– Ammonium picrate

– Dipicrylamine

– Dipicrly sulfide

– Dinitrophenylhydrazine

– Nitroguanidine

– Picramide

– Picric acid

– Picryl chloride

– Trinitroansisole

– Trinitrobenzene

– Trintrobenzoic acid

– Trinitro-m-cresol

– Trinitronaphthalene

– Trinitroresorcinol

– Trinitroltoluene

– Urea nitrate

– Triaminotrinitrobenzene

– Trichlortrinitrobenzene and

– Hexanitrostilbene

A27.18.16. Ammonium Picrate, Picric Acid, Urea Nitrate, Trinitrobenzene, Trinitroresorcinol, Trinitrotoluene, Cyclotrimethylenetrinitramine, Cyclotetra-methylenetetranitramine, Pentaerythrite Tetranitrate (desensitized), or Trinitrobenzoic Acid when wet with not less than 10 pounds of water to each 90 pounds of dry material must be shipped in containers to comply with the following specifications:

A27.18.16.1. Metal barrels or drums, DOT 5B, or fiber drums, DOT 2C. Authorized only for Cyclotrimethylenetrinitramine or Cyclotetra-methylenetetrainitramine, wet with not less than 10 pounds of water to each 90 pounds of dry material in inside containers which must be bags made of at least 10-ounce cotton duck rubber or rubberized cloth, and securely closed. The dry weight of Cyclotrimethylenetrinitramine or Cyclotetra-methylenetetranitramine in one metal barrel or drum must not be more than 300 pounds and not more than 225 pounds in fiber drums. These bags containing the Cyclotrimethylenetrinitramine or Cyclotetra-methylenetetranitramine each must then be placed in a rubber bag, rubberized cloth bag, or bag made of suitable watertight material that must be securely closed and then placed in the drum. If shipment of cyclotrimethylenetrinitramine is to take place at a time freezing weather is anticipated, it must be wet with a mixture of denatured ethyl alcohol or other suitable antifreeze and water of such proportions that freezing will not occur in transit.

A27.18.16.2. Fiber drum, DOT 21C, with inside polyethylene bag having 0.004 inch minimum thickness and liquid tight closure. Net weight must not be over 200 pounds. Authorized only for wet desensitized Pentaerythrite Tetranitrate.

A27.18.17. Amatol when cast or compressed in a solid block or column, in addition to containers prescribed in **A27.18.5.** may be shipped in metal drums, DOT 13A, not over 90 pounds gross weight.

A27.18.18. Pack nitrocellulose in wooden boxes complying with DOT 14, 15A, 16A, or 19B, with inside packages that must be:

A27.18.18.1. Wrapped in strong paraffined paper or suitable sparkproof material, when containing not more than 1 pound each of dry, uncompressed nitrocellulose. Completed outside package must not contain more than 10 pounds of dry nitrocellulose.

A27.18.18.2. Wrapped in strong paraffined paper when containing compressed sticks or blocks of dry nitrocellulose. Gross weight must not be over 75 pounds.

A27.18.19. Shaped charges, commercial, having exposed lined conical cavities that are covered will be paired together with the cavities facing each other and with one or more pairs in a fiber tube, or so arranged that the conical cavities of the shaped charges at the ends of the column face toward the center of the tube. The shaped charges in the fiber tubes must fit snugly with no excess space in the outside containers. Shaped charges, commercial, must be packed in specification containers as follows:

A27.18.19.1. Wooden boxes, DOT 14, 15A, 16A, or 19B; gross weight must not be over 140 pounds.

A27.18.19.2. Fiberboard boxes, DOT 12H, 23F, or 23H; gross weight must not be over 65 pounds.

A27.18.19.3. Fiberboard boxes, DOT 12B; at least 275 pounds test double-wall corrugated fiberboard, with double-faced corrugated lining board having minimum test of 200 pounds. Individual charges of explosives must be packed in inside securely closed, waterproof plastic containers, or in securely closed waterproof container having metal ends. Inside individual containers must be separated by means of double-faced corrugated fiberboard partitions of material not less than 175 pounds (Mullen or Cady). Gross weight must not be over 65 pounds.

A27.18.19.4. Specially designed Navy steel cylindrical containers possessing a shock mitigation system. One each charge, to a container: four containers properly strapped or banded to a pallet.

A27.18.20. Cyclotrimethylenetrinitramine (RDX) (desensitized) in pellet form, dry may also be packed in specification containers as follows:

A27.18.20.1. Wooden box, DOT 15A or 19B, for pellets ¼ of an inch or less in diameter. Pellets must be packed in a slide-type fiber container with perforated fillers. All openings of the container must be securely closed with pressure-sensitive tape. Inside containers must be cushioned with at least 2 inches of sawdust between inner and outer containers. No inside container may contain more than ¾ pound net weight of explosive composition, and not more than 10 pounds of net weight explosive composition must be packed in one outside box.

A27.18.20.2. Wooden box, DOT 15A or 19B, for pellets exceeding ¼ inch in diameter. Pellets must be packed in a fiber tube with positive closures at both ends, and must be packed in a fiber container having not more than ¾ pound net weight of explosive composition. Inside containers must be cushioned with at least 2 inches of sawdust between inner and outer containers. Not more than 10 pounds of net weight of explosive composition must be packed in one outside container.

A27.18.21. Conversion kits, containing Comp. A-3 pellets, must be packed eight each to a fiberboard lined, metal ammunition components box, MK2. Kit components and separately packaged pellets must be securely nested within fiberboard separators in inside fiberboard boxes.

A27.19. Igniter Cord. Pack in strong, tight, outside fiberboard boxes or drums, wooden boxes, or metal containers.

A27.20. Initiating Explosive.

A27.20.1. Diazodinitrophenol or Lead Monoitroresorcinate. Packaged wet with not less than 40 percent by weight of water in:

A27.20.1.1. Metal barrels or drums, DOT 5 or 5B, with inside bags made of at least 10-ounce cotton duck, rubber, or rubberized cloth, which must be securely closed. The dry weight of Diazodinitrophenol in one container must not be more than 220 pounds, and the dry weight of lead Mononitroresorcinate in one container must not be over 100 pounds. The bags containing Diazodinitrophenol must be placed in a rubber bag, rubberized cloth bag, or bag made of suitable watertight material, and then placed in the barrel or drum. Any empty space in the outside bag must be filled with water, and this bag securely closed. Sufficient outage in the outside container must be allowed to prevent rupturing of the container in freezing weather, or a mixture of denatured alcohol and water may be used to prevent freezing in transit.

A27.20.1.2. Fiber drums, DOT 21C, not over 30-gallon capacity of at least 9-ply construction having in addition, a sheet of steel having a minimum base box of 75 pounds, not less than .008-inch thick, wound between the fifth and sixth plies. The inside ply of kraft paper must be laminated on each side with polyethylene to form a waterproof lining. The bottom head must be of fiber, metal covered on the outside, and must be attached to the body to form a watertight joint.

A27.20.1.2.1. Lead Mononitroresorcinate must only be packed wet, with not less than 40 percent by weight of water, and must be contained in at least two tightly sealed polyethylene bags of at least 0.004-inch thickness; this unit must then be placed in a tightly closed polyethylene bag of at least 0.004-inch thickness, and this assembly must be placed within a 0.006-inch thickness polyethylene (or other suitable plastic bag) completely filled with water and tightly closed. The 0.006-inch plastic bag must be of such a size as to completely fill the outside ship-

ping container. The dry weight of lead Mononitroresorcinate only in one outside container must not be more than 100 pounds.

A27.20.2. Guanyl Nitrosomino Guanylidene Hydrazine. Packed wet with not less than 30 percent by weight of water in metal barrels or drums, DOT 5 or 5B, with inside containers which must be a bag made of 4-ounce duck. Inside the bag, and over the Guanyl Nitrosamino Guanylidene Hydrazine, there must be placed a cap of the same fabric, of the same diameter as the bag. The gag must be securely tied and placed in a strong grain bag and securely tied. The dry weight of Guanyl Nitrosamino Guanylidene Hydrazine in one container must not be over 75 pounds. The bag and contents must be packed in the center of the wooden barrel or keg, metal barrel or drum, and must be entirely surrounded by not less than 3 inches of well packed sawdust saturated with water. The wooden barrel or keg, or metal barrel or drum, must be lined with a heavy close-fitting jute bag, closed by secure sewing to prevent escape of sawdust. The barrel, keg, or drum must be inspected carefully and all leaks stopped. If freezing temperature is anticipated during shipment, use a mixture of denatured ethyl alcohol and water of such proportions that freezing will not occur during transit.

A27.20.3. Lead Azide (dextrinated type or otherwise prepared to effectively control grain size). Packed wet with not less than 20 percent by weight of water. Containers, packaging, and procedures are the same as prescribed in **A27.20.2.** except that the dry weight of Lead Azide in one container must not be over 150 pounds. The same freezing precautions apply.

A27.20.4. Lead Styphnate (Lead Trinitrosorcinate) or Barium Styphnate, Monohydrate. Packed wet with not less than 20 percent by weight of water in metal barrels or drums, DOT 5, 5B, or 17H with inside containers that must be a bag of rubber or rubberized cloth.

A27.20.4.1. The Lead Styphnate or Barium Styphnate, Monohydrate within this bag should be divided into a number of smaller packages. There must be a cap of the same material and of the same diameter as the bag over the Lead Sytphnate and inside the bag.

A27.20.4.2. The dry weight of Lead Styphnate or Barium Styphnate, Monohydrate in one outer container must not be over 150 pounds. The bag and contents must be packed in the center of the metal barrel or drum, and must be entirely surrounded by not less than 3 inches of well packed sawdust saturated with water.

A27.20.4.3. The metal barrel or drum must be lined with a heavy, close-fitting, jute bag closed by secure sewing to prevent escape of sawdust. The barrel or drum must be inspected carefully and all leaks stopped.

A27.20.4.4. If freezing temperature is anticipated during shipment, use a mixture of denatured ethyl alcohol and water of such proportions that freezing will not occur during transit.

A27.20.5. Nitro Mannite. Packed wet, with not less than 40 percent by weight or water container and packaging procedures are the same as **A27.20.1.** except that the dry weight of Nitro mannite in one container must not be over 100 pounds. The same freezing precautions apply.

A27.20.6. Nitrosoguanadine. Packed wet with not less than 10 percent by weight of water in metal barrels or drums, DOT 5, 5B, or 17H with inside strong cloth bag. The dry weight of Nitrosoguanidine in one container must not be over 75 pounds.

A27.20.7. Pentaerythrite Tetranitrate. Packed wet with not less than 40 percent by weight of water. Container and packaging procedures are outlined in **A27.20.1.** Except that the dry weight of Pentaer-

tythrite Tetranitrate in one container must not be over 300 pounds. The same freezing precautions apply.

A27.20.8. Tetrazene. Packed wet with not less than 30 percent by weight of water. Container and packaging are the same as **A27.20.2.** The dry weight in one container must not be more than 75 pounds. The same freezing precautions apply.

A27.20.9. Fulminate of Mercury. Packed wet with not less than 25 percent by weight of water in DOT 5, 5B, or 17H metal drums or barrels with inside bag made of 4-ounce duck.

A27.20.9.1. Inside the bag and over the Fulminate, there must be placed a cap of the same fabric and of the same diameter as the bag. The bag must be securely tied and placed in a strong grain bag. This grain bag must also be securely tied.

A27.20.9.2. The dry weight of Fulminate in one container must not be over 150 pounds. Pack the bag and contents in the center of the wooden barrel, keg, or drum, entirely surrounded by not less than 3 inches of well-packed sawdust saturated with water.

A27.20.9.3. The barrel or drum must be lined with a heavy, close fitting jute bag closed by secure sewing to prevent escape of sawdust. Inspect the barrel or drum carefully, to stop all leaks.

A27.20.9.4. If shipment of Fulminate of Mercury is to take place at a time that freezing weather is to be anticipated, use a mixture of denatured ethyl alcohol and water of such proportions that freezing will not occur in transit.

A27.21. Rocket motors; Jet Thrust Units; Igniters, Rocket Motors; or Igniters, Jet Thrust (Class A Explosives). Package in:

A27.21.1. Wooden boxes or wooden boxes fiberboard lined, DOT 14, 15A, 15E, 16A, or 19B.

A27.21.2. Metal Containers, MIL-D-6054 or other metal containers approved by the DOT.

A27.21.2.1. Igniters or igniter components may be shipped in the same outside container with the rocket motor or jet thrust unit if separately packed in unit package (metal can, fiberboard box, etc).

A27.21.2.2. Rocket motors must be shipped in nonpropulsive state. When military air shipment of a rocket motor in a propulsive state is required, the shipper must obtain written approval from hazard classification authority listed in TB 700-2/NAVSEAINST 8020.8B/T.O. 11A-1-47/DLAR 8220.1, DoD Explosive Hazard Classification Procedures.

A27.22. Rocket Motors; Jet Thrust Units; Igniters, Rocket Motors, Igniters, Rocket Motors; Igniters, Jet Thrust; Igniters, Ramjet Engine (Class B explosives) or Starter Cartridge, Jet Engine. Package requirements:

A27.22.1. Wooden boxes or wooden boxes fiberboard lined, DOT 14, 15A, 15E, 16A, or 19B. Packages containing igniters, ramjet engines must not be over 500 pounds gross weight.

A27.22.2. Wooden boxes, DOT 15B, authorized only for igniters, jet thrust (jato) class B or igniters, rocket motor igniters, ramjet engine, class B explosive. Packages containing igniters, ramjet engine must not be over 500 pounds gross weight.

A27.22.3. Service-designated and NAVAIR/NAVSEA-approved wood or metal containers identified by Ordinance Requirement (OR), MIL-STD, or other appropriate container document, and a letter container designated, such as MK and MOD or CNU numbers.

A27.22.4. MIL-D-6054 drums (MS 63052) with specially designated interior blocking and bracing. Authorized for jet thrust units, class B explosives only.

A27.22.5. LAU-10/A Launcher, using unit load adapterMK58, MOD 1 and palletized with WR-54/115C, which consists of 16 units per shipment of rocket motors, class B explosives.

A27.22.6. MK4 metal container with properly designed interior mounting or blocking supports. Authorized for packed one each M77A1 rocket.

A27.22.7. Fiberboard box, DOT 23F, authorized for Igniters, Jet Thrust (jato), Class B, Igniters, Rocket Motor, Class B, or Starter Cartridges, Jet Engine, Class B only which must be packed in tightly closed inside fiberboard boxes, at least 200 pound test (Mullen or Cady), or metal containers. Starter Cartridges, Jet Engine, must have igniter wires short-circuited when packed for shipment.

A27.22.8. Wooden boxes, specification MIL-B-2427, Grade A, Style 4, Type II, containing eight igniters packed one each in inside hermetically sealed metal containers.

A27.22.8.1. Igniters or igniter components may be shipped in the same container with jet thrust units. When approved by military specifications or drawings.

A27.22.8.2. Rocket motors must be nonpropulsive in shipment. When military air shipment of a rocket motor in a propulsive state is required, the shipper must obtain written approval from hazard classification authority listed in TB 70-2/NAVSEAINST 8020.3/T.O. 11A-1-47/DLAR 8220.1, DoD Explosive Hazard Classification Procedures.

A27.23. Railway Torpedoes. Packaging Requirements:

A27.23.1. Wooden boxes, DOT 15A, 15B, 16A, 19A, or 19B are authorized; however, the net weight in wooden boxes must not be over 125 pounds.

A27.23.2. Fiberboard boxes, DOT 12H, 23F, or 23H are authorized; however, the gross weight must not be over 65 pounds.

A27.23.3. Fiberboard boxes, DOT 12B, with inside cartons are authorized. The inside cartons must not contain over 72 track torpedoes each. The gross weight of the exterior fiberboard box must not be over 65 pounds.

A27.23.4. Fiberboard boxes, DOT 12B, without inside containers may be used for not more than 50 track torpedoes provided the smallest dimension of the box is at least 6 inches.

A27.24. Propellant Explosives, Solid or Liquid (Class A or B Explosives). Package Requirements:

A27.24.1. Tight metal cases in tight wooden boxes free from loose knots and cracks, or tight metal containers. Gross weight must not be over 200 pounds.

A27.24.2. Wooden boxes, DOT 14, 15A, or 19B metal lined DOT 2F. Gross weight must not be over 200 pounds.

A27.24.3. Wooden boxes, DOT 14, 15A, 19B, or fiberboard boxes, DOT specifications 23F, or 23H, with inside cloth or paper bags of capacity must not be over 25 pounds net weight. Each bag must be

capable of withstanding, when filled, at least 2 drops on end from a height of 4 feet without breaking or sifting of contents. Net weight of contents in outside container must not be over 50 pounds.

A27.24.4. Wooden boxes, DOT 14, 15A, 15B, 15C, 19B, or fiberboard boxes, DOT 12B, or 23H, with inside containers that must be DOT 13 metal kegs. Fiberboard boxes must contain not more than six metal kegs not over 5 pounds net weight each in one outside containers. Gross weight of wooden boxes must not be over 200 pounds, and fiberboard boxes must not be more than 65 pounds.

A27.24.5. Wooden boxes, DOT 14, 15A, 15B, 15C, or 19B fiberboard boxes, DOT 23F or 23H, with inside strong metal containers. A maximum of four inside containers must not be more than 25 pounds each. Gross weight of fiberboard boxes must not be more than 65 pounds.

A27.24.6. Fiber drums, DOT 21C. Drums having wooden heads must contain a strong sift-proof liner. Authorized net weight not over 265 pounds.

A27.24.7. Wooden boxes, DOT 14, 15A, 16A, or 19B not lined, authorized only for grains not less than 1 inch in diameter or 3 inches in length, provided such grains are tightly packed and are coated with a protective material. Gross weight must not be over 200 pounds.

A27.24.8. Other wooden boxes and fiberboard boxes approved by the military services may be used instead of DOT specification containers.

A27.24.9. Wooden boxes, DOT 14, 15A, 15B, 19B, or fiberboard boxes, DOT 12H, 23F, or 23H with inside fiber or metal containers of not more than a 1 ¾ pound capacity each. Gross weight of wooden boxes must not be over 200 pounds, and fiberboard boxes must not weigh over 65 pounds.

A27.24.10. Conversion kits, containing Propellant Explosives, Class A, are packed eight each to a fiberboard lined, metal ammunition components box, MK2. Kit components and separately packaged pellets must be securely nested within fiberboard separators.

A27.24.11. Fiberboard boxes, DOT 12H, 23G, or 23H with inside securely closed polyethylene bags having a minimum wall thickness of 6 mils.

A27.24.11.1. Propellant Explosives (Smokeless Powder for Cannon or Small Arms) in water, must be packed in containers to comply with the following specifications:

A27.24.11.2. Metal barrels or drums, DOT 5, 5A, 5B, 6B, or 6C.

A27.24.11.3. Wooden boxes, DOT 15A or 19B, metal lined DOT 2F.

A27.24.12. Pack Propellant Explosives (liquid) in specific containers as follows:

A27.24.12.1. Wooden boxes or wooden boxes fiberboard lined, DOT 15A, 15B, or 15E, with inside polyethylene bottles having taped screw cap closures, not over 1-gallon capacity each. Each bottle must be entirely contained within a polyethylene or other suitable plastic bag formed of material not less than 0.004-inch thickness, with ends securely closed. Each bottle in the plastic bag must be enclosed in a tight metal container, and be surrounded on all sides with at least 2 inches of incombustible cushioning material. Cans in the outside box must also be cushioned from each other and the sides, top, and bottom of the container.

A27.24.12.2. Metal barrels or drums, DOT 5B, 6B, 6C, 6D, or 17C, with inside polyethylene, DOT 2S, container packed inside a strong, tight metal drum and securely closed, or inside glass-lined aluminum carboy not over a 12-gallon capacity. Inside steel or glass-lined carboy must be surrounded on all sides with at least 2 inches of incombustible absorbent cushioning material

uniformly distributed. Polyethylene containers are authorized only for liquids that do not react dangerously with plastic or result in container failure. Containers must not be entirely filled; sufficient interior space must be left vacant to prevent leakage or distortion of containers due to expansion of the contents from increased temperatures during transit.

A27.24.13. Propellant Explosives (solid) with small arms primers, must be packed as follows:

A27.24.13.1. Inside containers must be tightly closed metal cans or fiber containers, not over 1-pound each or not containing more than one-grain of propellant (not exceeding 5 pounds each). The inside container must be packed to prevent movement within the outside container.

A27.24.13.2. Not more than 1,000 small arms packed as prescribed in **A27.7.3.** may be included in one outside shipping container with solid propellant explosives. The inside container must be packed to prevent movement within outside container.

A27.24.13.3. Wooden boxes, DOT 15A, 15B, 15C, or 19B.

A27.24.13.4. Fiberboard boxes, DOT 12B, 23F, or 23H. Not more than 10 pounds of propellant explosives may be shipped in one outside container.

A27.24.14. Document destroyer with starter must be packaged as follows:

A27.24.14.1. Metal or fiber drums with inside containers and items consisting of five 20-pound packages of sodium nitrate in kraft bags lined with polyethylene; 2 pounds of sodium nitrate, 0.2-0.4 percent Anticaking Tricalcium Phosphate, and 2 pounds of sugar mixed with ¼ pound of charcoal in kraft bags lined with polyethylene; Two Igniter Incendiary M-25 consisting of the M-201A1 fuse adapted to the M-1 fire starter approximately 1 inch in diameter by 2 ¾ inches high cellulose acetate body filled with petroleum jell; one 24-inch two mesh wire screen; safety matches. Net weight of contents must not be more than 120 pounds.

A27.24.14.2. Metal drums (Army drawing D-4 11-34) with inside fiber drums and items consisting of sodium nitrate, a 2-inch tube filled with charcoal, sodium nitrate, and sugar. The inside drum is positioned to form a 2-inch annulus which is filled with sodium nitrate.

A27.25. Rocket Ammunition with (Inert Loaded Projectiles, Solid Projectiles, Empty Projectiles, Explosive Projectiles, Gas Projectiles, Smoke Projectiles, Incendiary Projectiles, or Illuminating Projectiles). Pack in strong wooden or metal containers or aluminum containers approved by military specification or drawings.

A27.26. Small Arms Ammunition and Small arms Ammunition, Tear Gas Cartridges. Pack in pasteboard or other inside boxes, or in partitions designed to fit snugly in the outside container, or pack in metal clips. The partitions and metal clips must be designed to protect the primers from accidental damage. The inside boxes, partitions, and metal clips must be packed in securely closed strong outside wooden or fiberboard boxes or metal containers. Blank industrial power load cartridges may be packed in bulk in securely closed fiberboard boxes.

A27.27. Toy Caps. Toy caps must not contain more than an average of ¼ grain of explosive composition per cap, and must be packed in inside packages constructed of paperboard not less than 0.013-inch thick, or metal not less than 0.008-inch thick, or noncombustible plastic not less than 0.015-inch thick. The material must provide a complete enclosure, and the minimum dimensions of each side or end of such package must be not less than 1/8 of an inch in height. The number of caps in an inside package must be

limited so that not more than 10 grains of explosive composition is packed into 1 cubic inch of space, and not more than 17.5 grains of explosive composition of toy caps is packed in any inside container.

A27.27.1. Pack Toy Caps In:

A27.27.1.1. Wooden boxes, DOT 15A, 15B, 16A, 19A, or 19B. Gross weight must not be over 150 pounds.

A27.27.1.2. Fiberboard boxes, DOT 12B. Gross weight must not be over 65 pounds.

A27.27.1.3. Wooden boxes in good condition, and weighing not more than 100 pounds gross.

A27.28. Explosive Power Device, Class B. Packing requirements:

A27.28.1. Wooden boxes or wooden boxes, fiberboard lined, DOT 14, 15A, 15E, 16A, or 19B.

A27.28.2. Containers authorized by military specification or drawings.

A27.29. Rocket Engine (Liquid), Class B Explosives. Pack in strong, airtight metal containers approved by military specification or drawings. Follow handling instructions and special requirements in A5.74.

A27.30. Cartridge, Practice Ammunition. Pack in inside boxes, partitions, or metal clips to protect primers from accidental firing, then place in:

A27.30.1. A strong wooden box closed by strapping.

A27.30.2. A fiberboard box closed by strapping or taping.

A27.30.3. A metal container.

A27.31. Blasting Agent NOS. Packaging Requirements:

A27.31.1. Rigid packages (for example, boxes and drums), prepared as for shipment, must be capable of withstanding a 4-foot drop onto solid concrete so as to strike the most vulnerable point on the package without rupture of any loss of contents.

A27.31.2. Nonrigid packages (for example, tubes and bags), prepared as for shipment, must be capable of withstanding three 4-foot drops onto solid concrete without rupture of any loss of content.

A27.32. Oil Well Cartridges. Pack so that explosive composition is not over 20 grains per cubic inch of space in the following shipping containers:

A27.32.1. Wooden boxes, DOT 15A, 15B, 16A, 19A, or 19B. Gross weight must not exceed 150 pounds.

A27.32.2. Fiberboard box, DOT 15B. Gross weight must not exceed 65 pounds.

A27.33. Moderate Ammunition Explosive Hazards. Pack in strong fiberboard or wooden boxes. The ammunition may also be packed in wooden or metal barrels or drums.

Table A27.2. DOT/Military Specification Cross Reference.

DOT Specification	Military/Federal Specification	Description
1A	None	Boxed carboys
2C	PPP-B-636, Type CF-DW, 275	Inside containers, corrugated fiberboard carton
2F	PPP-C-96	Inside metal container and liner
2L	None	Lining for boxes
2S	MIL-D-40030, Styles A and B	Polyethylene containers
5	PPP-P-704, Type I, Class 7 and 10	Steel barrels or drums
5B	PPP-P-704, Type I, Class 4; Type III, Class 7 and 8; PPP-D-729, Type 1, Class A and B	Steel barrels or drums
6B	PPP-D-736, Type III and IV	Steel barrels or drums
6C	None	Steel barrels or drums
6D	PPP-C-1337, Type I, Class 3 and 4, Type II	Cylindrical steel overpack, straight sided for inside plastic container
12B	PPP-B-636, Type CF or SF, V3c	Fiberboard boxes
12H	PPP-B-636, Type CF, V3c, Style FTC	Fiberboard boxes
13	None	Metal kegs
13A	None	Metal drums
14	None	Wooden boxes, nailed
15A	PPP-B-621, Styles 1, 2, 2 ¾, 6, and 7, MIL-B-2427, Types I, II, III. MIL-B-48024, Type I and II.	Wooden boxes, nailed.
15B	PPP-B-621, Style 1, 2, 2 ¾, 6, and 7. MIL-B-2427, Type I, II, III. MIL-B-48024, Type I and II	Wooden boxes, nailed
15C	PPP-B-621, Style 1, 2, 2 ¾, 6, and 7. MIL-B-2427, Type I, II, III. MIL-B-48024, Type I and II.	Wooden boxes, nailed
15E	None	Wooden boxes, fiberboard lined

DOT Specification	Military/Federal Specification	Description
15L	None	Wooden boxes with inside containers for desensitized liquid explosives
15M	None	Wooden boxes, metal lined, with inside containers for desensitized liquid explosives
16A	PPP-B-585; MIL-B-46506	Plywood or wooden boxes, wirebound
17C	PPP-P-704, Type I, Class 4 and 9; Type II, Class 10 and 11. PPP-D-736, Type V and VI	Steel drums
17H	PPP-D-729, Type IV; PPP-D-705, Type V; PPP-P-704, Type II, Class 7	Steel barrels or drums
19A	PPP-B-601; MIL-B-48024	Wooden boxes, glued plywood, cleated
19B	None	Wooden boxes, glued plywood, nailed
21C	None	Fiber drum
23F	PPP-B-636, Type CF and SF	Fiberboard boxes
23G	None	Special cylindrical fiberboard box for high explosives.
23H	PPP-B-636, Type SF	Fiberboard boxes
37A	PPP-P-704, Type II, Class 1,3,5,8, and 9; Type III, Class 1,3, and 6; MIL-D-13901	Steel drums

Attachment 28

INSPECTION PROCEDURES

A28.1. Inspection General Requirements. Inspect hazardous materials before entering into the military airlift system. The inspection will ensure hazardous materials are properly prepared and documented. Follow the guidelines in this attachment when inspecting hazardous materials, including opening an external container to inspect the internal packagings.

A28.1.1. **Originating Shipping Activities.** This activity must prevent entry of improper shipments into the transportation system. Establish a quality control program that ensures packing, marking, labeling, and certifying of hazardous materials comply with this manual and safety of airlift criteria.

A28.1.1.1. Inspect each package to ensure the packaging is correct and in good condition.

A28.1.1.2. Open exterior containers if there is physical evidence to support suspected damage of the inner receptacles or if the external markings do not correspond to the type of container. Reseal opened containers according to the applicable test report or special packaging instruction (SPI).

A28.1.1.3. Provide calibrated dip-stick with any vehicle or wheel engine-powered support equipment without an operational fuel gauge containing fuel-in-tank. Not required if the item is drained and purged or drained to 500 ml (17 oz) or less of residual fuel.

A28.1.1.4. Check shipper's certification for overall accuracy including correct packaging paragraph.

A28.1.1.5. Immediately remove damaged or improperly prepared packages from the transportation system.

A28.1.1.6. Periodically inspect cylinders or spheres to ensure they have been retested and marked as required by 49 CFR 173.34(e) and DLAR 4145.25/AR 700-68/NAVSUPINST 4440.128/MCO 10330.2B/ AFR 67-12, *Storage and Handling of Compressed Gases and Cylinders*. Do not offer for transportation any cylinder or sphere not meeting this requirement.

A28.1.2. **Inspectors Other Than Originating Shipping Activity.** Establish an inspection program at each Aerial Port of Embarkation to prevent improperly prepared hazardous material from entering the transportation system.

A28.1.2.1. As a minimum, visually inspect all exterior containers and equipment for damage or leakage. Reject packages showing evidence of leakage (moisture or staining) or other suspected damage until corrective action is taken to make sure the item is safe for air shipment (see paragraph **1.9.**).

A28.1.2.2. Remove improperly prepared or damaged containers from the transportation system and advise the shipper to immediately coordinate corrective action. Properly store suspect packages containing explosive material pending repair or disposition.

A28.1.2.3. Use accurate fuel gauges, calibrated dip-sticks or other positive means to determine the amount of fuel-in-tank for vehicles and equipment. If positive means is not available, drain and refill fuel tank to appropriate level in the presence of an inspector.

A28.1.2.4. Review all Shipper's Declarations for Dangerous Goods for accuracy. Make sure special instructions and warning labels are complete and being followed.

A28.1.2.5. Enter "Inspected by (followed by name of inspector, location, and date)" in key 6 of the Shipper's Declaration form.

A28.1.2.6. Do not violate compatibility requirements (**Attachment 18**) in the consolidation or makeup of cargo loads (see **3.6.1.** for tactical, contingency or emergency airlift).

A28.1.2.7. Prepare **SF 361, Transportation Discrepancy Report,** according to DoD 4500.9-R, DTR, Part II, or **SF 364, Supply Discrepancy Report**, according to DLAI 4140.55/AR 735-11-2/ SECNAVINST 4355.18A/AFJMAN 23-215 (or equivalent reporting means as designated by the Service Focal Points and coordinated with HQ AMC) for any deficiencies discovered.

A28.1.2.8. The Tanker Airlift Control Element (TALCE), Departure Airfield Control Group (DACG), or Mission Support Element/Team (MSE/MST) or Cargo Deployment Function (CDF) provides qualified inspectors for the mobility movement inspection function during tactical or contingency deployments, redeployments, and exercises (see **1.2.6.**).

A28.1.2.9. **Figure A28.1.** is an example of inspection record format.

A28.2. Inspection Packaging Procedures. Design inspection procedures to validate safety of the shipment. Do not physically damage the package or perform any function that adversely affects the integrity or original performance capability of the packaging.

A28.2.1. **Packaging Areas of Emphasis.** As a minimum, inspection will address the following areas:

A28.2.1.1. Single Packaging**.**

A28.2.1.1.1. Drum ullage.

A28.2.1.1.2. External visual condition and serviceability. Dents or corrosion at chime or seam, or dents causing paint chipping is considered damaged and must be removed from the transportation system.

A28.2.1.1.3. External package marking and labeling. Verify UN specification code (including package type and gross weight), air-eligible, hazard and handling markings/labels.

A28.2.1.2. Combination Packaging.

A28.2.1.2.1. Inner receptacle orientation.

A28.2.1.2.2. Inner receptacle ullage.

A28.2.1.2.3. Inner receptacle secondary closure.

A28.2.1.2.4. Absorbent cushioning material.

A28.2.1.2.5. Leak-proof liner (covering item or lining outer container).

A28.2.1.2.6. Air-eligible.

A28.2.1.2.7. External package markings including UN specification code, air-eligible, hazard and handling marking/labels, orientation markings for combination packagings and drums used as overpacks.

A28.2.1.3. Vehicles and Equipment.

A28.2.1.3.1. Fuel gauges operative or dip-stick available.

A28.2.1.3.2. Fuel in tank quantity, including verifying presence of additional fuel tanks.

A28.2.1.3.3. Fuel leaks.

A28.2.1.3.4. Battery terminal posts protected against short circuit.

A28.2.1.3.5. Fire extinguishers secured in properly configured and approved holders.

A28.2.1.3.6. Spare fuel and secondary loads properly identified, packaged, stowed, and restrained.

A28.2.2. **Packaging Opening and Closing.** The following instructions provide acceptable procedures for opening external containers to inspect the internal packaging configuration. Comply with these procedures to maintain the performance capability of the package and the original shipper's certification. Noncompliance with any of these procedures constitutes repacking and requires a new certification.

A28.2.2.1. Fiberboard box opening.

A28.2.2.1.1. Cut originial tape along seam using a shallow blade knife. Do not tear tape.

A28.2.2.1.2. If adhesive sealed on inside box flaps or the flaps are stitched/stapled (not closed by tape) opening will damage packaging components.

A28.2.2.2. Fiberboard box closure.

A28.2.2.2.1. Apply new tape over the existing tape using same method as original.

A28.2.2.2.2. Use only ASTM D 5486, Type I, Class 2 (film backed, pressure-sensitive adhesive, weather resistant) tape to reclose package.

A28.2.2.2.3. Ends of sealing tape must extend over the original tape a minimum of one-inch adhering to the fiberboard on the ends of the package.

A28.2.2.2.4. Use three-inch wide tape or two strips of two-inch wide tape.

A28.2.2.2.5. Ensure surface is clean and dry before applying tape and box flaps meet squarely.

A28.2.2.2.6. Do not cover markings or labels with tape.

A28.2.2.2.7. When reclosed using these procedures a new shipper's certification is not required. Based on DoD testing the packaging is considered returned to original condition and is not considered repacking.

A28.2.2.2.8. If adhesive sealed on inside box flaps or flaps are stitched/stapled (not closed by tape) then reclosure is considered repacking and requires a new shipper's certification.

A28.2.2.3. Wood box opening.

A28.2.2.3.1. Opening causes damage to packaging material.

A28.2.2.3.2. To reduce damage to wood material, use a nail puller to remove nails.

A28.2.2.3.3. Do not pry open wood box panels using crowbars, etc.

A28.2.2.4. Wood box closure.

A28.2.2.4.1. Do not close by nailing through existing holes.

A28.2.2.4.2. Must replace damaged components. Use prescribed materials and specifications required by the applicable testreport, special packaging inst ruction, or drawing.

A28.2.2.4.3. Replacing packaging material components is considered repacking and requires a new shipper's certification.

A28.2.2.5. Drum opening.

A28.2.2.5.1. Only open drums used as a combination package or overpack. Do not open drums used as a single package for liquid hazardous material.

A28.2.2.6. Drum closure.

A28.2.2.6.1. Replace old gaskets with new gaskets and seals. Old gaskets will "set"ew gaskets and seals. Old gaskets will "set"and will not reseal properly.

A28.2.2.6.2. Use the torque and closing instructions required by the applicable test report.

A28.2.2.6.3. Reclosure of drum is considered repackingand requires new shipper's certification.

A28.2.2.7. Overpacks.

A28.2.2.7.1. Outside packaging used as an "Overpack" (for ease of handling) may be opened for inspection of contents. Follow inspection guidance for specific opening and closing of inside shipping containers according to **A28.2.2.**

A28.2.2.7.2. Close overpacks in a similar manner as received. A new shipper’s declaration is not required.

A28.2.2.8. Non-Specification (strong outside) Packaging.

A28.2.2.8.1. Non-specification packaging may be opened for inspection.

A28.2.2.8.2. Close non-specification packaging in a similar manner as received. A new shipper’s declaration is not required.

A28.2.2.9. UN Specification Jerricans.

A28.2.2.9.1. Caps may be removed for inspection.

A28.2.2.9.2. Re-secure cap (hand-tight) ensuring there is no "cross-threading." A new shippers declaration is not required.

A28.2.3. **Inner package inspection.**

A28.2.3.1. Perform visual inspection. Do not rearrange inner packaging contents or configuration.

A28.2.3.2. Do not cut wraps or barrier material.

A28.2.3.3. Any change to the inner configuration is considered repacking and requires a new shipper's certification.

A28.2.4. **Exceptions to inspection.** Some item packaging requires specialized training for opening, interior inspection, and closure. Only individuals trained and qualified in these specialized areas are authorized to open the following packagings:

– Radioactive material

– Class 1 (ammunition and explosives)

– Etiological Agents or Infectious Substances

– Pressurized metal shipping containers or drums

– Material identified as "inhalation hazard"

A28.3. Inspection Checklist. Inspection activities will establish a program that standardizes the local inspection process and ensures continuous level of quality. **Figure A28.1.** provides a suggested checklist to use during the inspection process.

Figure A28.1. Hazmat Inspection Checklist.

HAZMAT INSPECTION AND ACCEPTANCE CHECKLIST					TCN
INSPECTION VALIDATION					
THE SHIPMENT HAS BEEN INSPECTED AND			COMPLIES WITH ALL REGULATORY REQUIREMENTS		DOES NOT COMPLY WITH ALL REGULATORY REQUIREMENTS AS INDICATED
DATE *(YYYYMMDD)*	INSPECTED BY *(NAME)*		DATE *(YYYYMMDD)*		CORRECTED BY *(NAME)*
DATE *(YYYYMMDD)*	RE-INSPECTED BY *(NAME)*		CORRECTIVE ACTIONS CHECKED. SHIPMENT COMPLIES WITH ALL REGULATORY REQUIREMENTS.		

ENTER "X" TO IDENTIFY NONCOMPLIANCE. USE COMMENTS BLOCK TO PROVIDE ADDITIONAL DETAILS. CIRCLE "X" WHEN CORRECTIVE ACTION IS COMPLETED. SIGN INSPECTION VALIDATION BLOCK AND ATTACH TO SHIPPER'S DECLARATION FIELD WITH STATION MANIFEST. THOSE ITEMS THAT APPLY ONLY TO RADIOACTIVE MATERIAL ARE IDENTIFIED BY AN "'." ADDITIONAL CHECKPOINTS ON THE REVERSE.

SHIPPER"S DECLARATION		**PACKAGING - OUTER**	
	1. THREE ORIGINAL DOCUMENTS FOR EACH PROPER SHIPPING NAME (PSN) UNDER A SINGLE TCN		39. CONTAINER SERVICEABLE; DAMAGE, LEAKAGE, OR LOSS OF CONTENTS
	2. SHIPPERS ADDRESS AND PHONE NUMBER		40. APPROVED OUTER CONTAINER *(IF REQUIRED)*
	3. CONSIGNEE DODAAC OR ADDRESS *(OR WORLDWIDE MOBILITY)*		41. PACKAGING PERMITTED BY PACKAGING REFERENCE
	4. TRANSPORTATION CONTROL NUMBER (TCN)		42. OTHER
	5. AIRPORT OF DEPARTURE AND DESTINATION *(OR WORLDWIDE MOBILITY)*	**IF APPLICABLE**	
	6. NAME AND TITLE OF PREPARER WITH SIGNATURE		43. ULLAGE
	7. PLACE AND DATE MATERIAL CERTIFIED		44. UN SPECIFICATION CONTAINER MATCHES CORRESPONDING PACKING GROUP
	8. PEN AND INK CHANGES SIGNED		45. GROSS WEIGHT OF PACKAGE IS EQUAL TO OR LESS THAN TESTED WEIGHT INDICATED AS PART OF UN SPECIFICATION MARKING
	9. EMERGENCY RESPONSE NUMBER		46. SINGLE PACKAGE (CONTAINING A LIQUID) TESTED PRESSURE (KPA) AGREES WITH CONTAINER REQUIREMENTS
	10. OTHER		47. OTHER
CARGO IDENTIFICATION *(NATURE & QUANTITY OF HAZMAT)*		**PACKAGING –INNER *(IF INSPECTED AND APPLICABLE)***	
	11. IDENTIFIES WHETHER PACKED WITHIN PASSENGER OR CARGO AIRCRAFT ONLY LIMITATIONS		48. ABSORBENT MATERIAL
	12. IDENTIFIES RADIOACTIVE OR NONRADIOACTIVE SHIPMENT		49. LEAK OR ACID PROOF LINER
	13. PSN *(WITH TECHNICAL NAME IF IDENTIFIED BY "*")*		50. INNER RECEPTACLE ORIENTATION
	14. PRIMARY HAZARD CLASS OR DIVISION *(COMPATIBILITY GROUP FOR EXPLOSIVES)*		51. SECONDARY CLOSURE
	15. IDENTIFICATION NUMBER *(UN, ID, OR NA)*		52. OTHER
	16. PACKAGING GROUP (PG) IF APPLICABLE	**MARKING**	
	17. SUBSIDIERY RISK CLASS OR DIVISION, IF ASSIGNED		53. PSN AND UN, ID, OR NA NUMBER *(FOR MULTIPLE ITEMS IN OVERPACK, EACH HAZARD IS IDENTIFIED)*
	18. NUMBER AND TYPE OF PACKAGES	**IF APPLICABLE**	
	19. NET QUANTITY PER PACKAGE *(METRIC UNLESS EXCEPTED)*		54. UN SPECIFICATION MARKING
	20. R-ACTIVITY PER PACKAGE GIVEN IN BECQUEREL SYSTEM		55. "RQ"
	21. R-NAME AND SYMBOL OF MATERIAL		56. "WASTE"
	22. R-MATERIAL PHYSICAL AND CHEMICAL FORM		57. "INHALATION HAZARD" *(NOT REQUIRED IF PART OF LABEL)*
	23. PACKAGING PARAGRAPH (FROM ***Attachment 5-Attachment 13***)		58. AIR ELIGIBLE MARKING FOR LIQUIDS
	24. **A3.2.3.** USED WHEN UN SPECIFICATION TESTED PACKAGE IS OVERPACKED TO MEET AIR REQUIREMENTS		59. "INNER (INSIDE) PACKAGE (CONTAINER) COMPLIES WITH PRESCRIBED SPECIFICATIONS" USED WHEN SHIPPER'S DECLARATION STATES "OVERPACK USED" OR WHEN OTHERWISE REQUIRED
	25. DOT-E, COE, CAA, OR OTHER APPROVED DOCUMENT USED AS CERTIFICATION REFERENCE *(COPY ACCOMPANIES SHIPMENT)*		60. "ORIENTATION" ARROWS ON COMBINATION PACKAGES CONTAINING LIQUIDS OR PACKAGES CONTAINING WET CELL BATTERIES
	26. 49 CFR, IATA, OR ICAO REFERENCE USED AS CERTIFICATION REFERENCE *(IF MEETING PASSENGER RESTRICTIONS)*		61. "LIMITED QUANTITY" OR "LTD QTY"
			62. FLASHPOINT *(FOR FLAMMABLE LIQUIDS)*
	27. R-CATEGORY OF RADIOACTIVE PACKAGE		63. "ORM-D" OR "ORM-D AIR" FOR DOMESTIC ONLY SHIPMENT OF PSN "CONSUMER COMMODITY" *(NOT IDENTIFIED AS A CLASS 9)*
	28. R-TRANSPORT INDEX		64. DOT-E NUMBER *(WHEN USED AS CERTIFICATION REFERENCE)*
IF APPLICABLE			65. COE NUMBER *(WHEN USED AS CERTIFICATION REFERENCE)*
	29. "RQ" IDENTIFIES A PSN AS A HAZARDOUS SUBSTANCE		66. CAA NUMBER *(IF REQUIRED BY CAA)*
	30. "WASTE" IS MARKED OR LABELED ON PACKAGE		67. OTHER
	31. "TOXIC" IF NOT INCLUDED AS PART OF DIVISION 6.1 (PG I OR PG II) PSN	**LABELING**	
	32. "INHALATION HAZARD (ZONE)" IF MATERIAL MEETS THIS DEFINITION		68. PRIMARY RISK LABEL
	33. "OVERPACK USED" IF OVERPACKED		69. R-RADIOACTIVE MATERIAL LABELS ON OPPOSITE SIDES OF
	34. "LIMITED QUANTITY" OR "LTD QTY"	**IF APPLICABLE**	
			70. SUBSIDIARY RISK LABELS
	35. CRYOGENICS VENTING REQUIREMENTS		71. "CARGO AIRCRAFT ONLY" *(IF SO IDENTIFIED ON THE SHIPPER'S DECLARATION, NOT MANDATORY FOR **Chapter 3**)*
	36. SECONDARY HAZARD PSN, CLASS, CLASS OR DIVISION AND NET QUANTITY		72. "MAGNETIZED MATERIAL" *(IF ITEM MEETS DEFINITION)*
	37. HANDLING INSTRUCTIONS		73. "EMPTY" *(IF ITEM MEETS DEFINITION)*
	38. OTHER		74. OTHER

VEHICLES AND EQUIPMENT **USE DD FORM 2133 AS CHECKLIST FOR Chapter 3 OPERATIONS**	
	75. FUEL GUAGE OPERATIVE OR DIP STICK AVAILABLE
	76. VEHICLES AND SELF-PROPELLED EQUIPMENT WITH FUEL QTY NOT EXCEEDING ¾ TANK CAPACITY *(DRAINED IF PALLETIZED UNLESS MEETING SUBFLOOR REQUIREMENTS)*
	77. SUPPORT EQUIPMENT DRAINED
	78. NO EXISTING FUEL LEAKS
	79. ALL ADDITIONAL HAZARDS IDENTIFIED *(SEE BLOCK 37)*
	80. SECONDARY LOADS CERTIFIED, PACKAGED, AND MARKED
	81. BULK FLAMMABLE LIQUID FUEL TANKS DRAINED OR PURGED AS REQUIRED
	82. SPARE FUEL IN AUTHORIZED CONTAINERS
	83. DISCONNECTED BATTERY POSTS PROTECTED
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