BY ORDER OF THE
SECRETARIES OF THE AIR FORCE,
THE ARMY, THE NAVY, AND THE
DEFENSE LOGISTICS AGENCY

AIR FORCE JOINT MANUAL 24-204
TM 38-250
NAVSUP PUB 505
MCO P4030.19F
DLAM 4145.3
25 NOVEMBER 1994

Transportation

PREPARING HAZARDOUS MATERIALS FOR MILITARY AIR SHIPMENTS

This manual implements AFPD 24-2, *Preparation and Movement of Air Force Material*. It provides guidance and procedures for preparing hazardous materials for shipment aboard 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 the hazardous materials that are on the aircraft. It implements Department of Defense (DoD) Regulation 4500.32-R, *Military Standard Transportation and Movement Procedures (MILSTAMP)* 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.** DoD personnel who knowingly violate this manual are subject to disciplinary action based on the seriousness of the offense according to the Uniform Code of Military Justice, the Federal Personnel Manual (FPM) supplement 751, and Agency Code of Penalties (AFI 36-704, AR CPR S1, NAV CMMI 751.1, MC NCPI 750, and DLAR FPM chapter 751.) Penalties may be civil or criminal and may include fines or imprisonment. See attachments 1 and 2 for terms, abbreviations, and acronyms used in this manual.

SUMMARY OF REVISIONS

This is a complete revision incorporating 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 converts DOT and Federal or Military specification packaging to Performance Oriented Packaging (POP). Other major changes include amending table A4.1 to reflect the international hazard classification and communication system and replacing the DD Form 1387-2, **Special Handling Data/Certification**, for certifying with a commercial form, **Shipper's Declaration for Dangerous Goods**. Holders of AFR 71-4 should retain a copy in order to use specification (non-POP) packaging for domestic only and Grandfathered shipments (see paragraph 1.6). 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.

Paragraph

Chapter 1--General Guidance and Training Requirements
Section A--General Guidance
Applicability 1.1
Responsibilities Assigned 1.2

Supersedes AFR 71-4/TM 38-250/NAVSUP PUB 505/
MCO P4030.19E/DLAM 4145.3, 15 January 1988.
OPR: AFMC-LSO/LGTP (Mr Mike Werneke)

Certified by: HQ USAF/LGT (Maj Gen James F. Hinkel)
Pages:414/Distribution: (see page 13)

Please Recycle Printed on Recycled Paper

Paragraph

Steps for Preparing Hazardous Materials 1.3
Transportability Design Criteria 1.4
General Packaging Requirements 1.5
Performance Oriented Packaging (POP) 1.6
Damaged or Improper Shipments 1.7
Empty Containers, Cylinders, and Radioactive Packages 1.8
Stowing Hazardous Materials 1.9
Protective Equipment 1.10
Unitized, Palletized, Containerized, or Consolidated Loads 1.11
Notifying the Aircraft Commander 1.12
Procedures for Airdropping Hazardous Materials 1.13
Nuclear Weapons Material 1.14
Air Standardization Coordinating Committee (ASCC) Air Standards 1.15
NATO STANAG 3854, Policies and Procedures Governing the Air Transportation of Dangerous Cargo 1.16

Section B--Training Requirements

Functional Groups 1.17
Reserved 1.18
Training Frequency 1.19
Training Records 1.20
Certification Under Combat Conditions 1.21
Extension to Qualification Expiration Date 1.22
Contractor Personnel Certifying Hazardous Materials Shipments 1.23

Chapter 2--Deviations, Waivers, and Special Requirements

Deviations 2.1
Passenger Prohibition Codes and Serviceable Oxygen 2.2
Prohibiting Passengers From Carrying Hazardous Materials 2.3
Packaging and Compatibility Waivers 2.4
DOT Exemptions 2.5
DoD Certification of Equivalency (COE) 2.6
Limited and Excepted Quantities 2.7
Emergency Response Information 2.8
Complying With Special Cargo Requirements 2.9

Chapter 3--Tactical, Contingency, or Emergency Airlift

Purpose 3.1
Applicability 3.2
Use of Commercial Airlift 3.3
Packaging Requirements 3.4
Applying Dagger and Theta Deviations 3.5
Load Configurations 3.6
Fuel for Vehicles and Equipment 3.7
Lithium Batteries 3.8
Chemically Contaminated Cargo 3.9
Preparing the Shipper's Declaration for Dangerous Goods 3.10
Labeling Hazardous Materials 3.11
Diverting Hazardous Materials to Nontactical Airlift 3.12

Page

Attachments

1. Terms Explained 15

Page

2. Abbreviations and Acronyms 25
3. General and Hazard Class Specific Packaging Requirements 27
4. Items Listing 37
5. Class 1--Explosives and Ammunition 252
6. Class 2--Compressed Gases 268
7. Class 3--Flammable Liquids 292
8. Class 4--Flammable Solids, Spontaneously Combustible Material, and Dangerous When Wet Material 295
9. Class 5--Oxidizing Materials and Organic Peroxides 300
10. Class 6--Poisonous (Toxic) Materials and Infectious Substances 334
11. Class 7--Radioactive Materials 340
12. Class 8--Corrosive Materials 354
13. Class 9--Miscellaneous Hazardous Material 361
14. Marking Hazardous Materials 369
15. Labeling Hazardous Materials 373
16. Area Placarding 376
17. Certifying Hazardous Materials 378
18. Compatibility 391
19. Excepted and Limited Quantities 396
20. Absorbent Cushioning Requirements 400
21. Inaccessible Containerized Loads 402
22. Briefing Agency Requirements 403
23. Deviation Authority 404
24. Packaging Exceptions for Tactical, Contingency, or Emergency Operations 405
25. Use of Commercial Airlift 406
26. Special Cargo Requirements 407
27. Carriage of Hazardous Materials by Passengers 409
28. Hazardous Materials Initial and Refresher Training 410
29. Table of Equivalents 411

Chapter 1

GENERAL GUIDANCE AND TRAINING REQUIREMENTS

Section A--General Guidance

1.1. Applicability. Handlers, packers, inspectors, and preparers (certifiers) of hazardous materials for military airlift comply with rules designed to maximize safety and security of 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. 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.

1.2. Responsibilities Assigned:

1.2.1. **The 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 Updates and page change 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:

- **Air Force.** HQ AFMC/LGTP, 5215 Thurlow Street, Wright-Patterson AFB, OH 45433-5540, (513) 257-4503 DSN: 787-4503.
- **Army.** U.S. Army Safety Center/CSSC-PP, Fort Rucker, AL 36362-5363, (205) 255-3553 DSN: 558-3553.
- **Navy.** Commander, Naval Supply Systems Command, Code 4122D, 1931 Jefferson Davis

Highway, Arlington, VA 22241-5360 (703) 607-1088 DSN: 327-1088. Navy activities get waivers from Navy Ships Parts Control Center, Code 0541, P.O. Box 2020, Mechanicsburg, PA 17055-0788, (717) 790-2784 DSN 430-2784.

- **Marine Corps.** Commandant of Marine Corps (LPP-2), Headquarters, U.S. Marine Corps, 2 Navy Annex, Washington, DC 20380-1775, (703) 696-1061 DSN 226-1061.
- **Defense Logistics Agency.** HQ Defense Logistics Agency/MMDO, Cameron Station, Alexandria, VA 22304-6100 (703) 274-6266 DSN: 284-6266.

1.2.3. **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 day to day duties.

1.2.4. **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.

1.2.5. **Originating Shipping Activities** establish quality control programs that ensure packing, marking, labeling, and certifying of hazardous materials comply with this manual and safety of airlift criteria.

- The shipping activity will conduct a visual examination of the exterior shipping container and review of the shipping documents.
- Open exterior containers only when 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). Changes to the inner configuration of a POP tested package must meet the authorized variations in 49 CFR 178.601. Any changes other than an authorized variation, voids the POP certification and will result in retesting, repacking, and remarking the container.

1.2.5.1. **Originating Activity Inspectors:**

- Inspect each package to ensure the container is correct and is in good condition.
- Check shipper's certification for overall accuracy including correct packaging paragraph.
- Immediately remove damaged or improperly prepared packages from the transportation system.
- Ensure overseas shipments are in POP containers.
- Periodically inspect cylinders or spheres to ensure they have been retested and marked as required by 49 CFR 173.34(e) and DoD DSAR 4145.25/AR 700-68/NAVSUPINST 4440.128B/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.

1.2.6. **Inspectors Other Than Originating Shipping Activity:**

- 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 1.7).
- 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.
- Ensure overseas shipments are in POP containers.
- Review all Shipper's Declarations for Dangerous Goods for accuracy. Make sure special instructions and warning labels are complete and being followed.
- Do not violate compatibility requirements (attachment 18) in the consolidation or makeup of cargo loads.
- Prepare SF 361, **Transportation Discrepancy Report,** according to AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15, or SF 364, **Report of Discrepancy**, according to DLAR 4140.55/AR 735-11-2/NAVMATINST 4355.73B/AFR 400-54/MCO 4430.3H.

1.2.7. **Air Cargo Terminal Inspection Function.** The Tanker Airlift Control Element (TALCE), Departure Airfield Control Group (DACG), or Transportation Control Unit (TCU) provides qualified inspectors for mobility operations, deployments, redeployments, and exercises.

1.2.7.1. **Inspectors:**

- Ensure proper preparation and documentation of hazardous materials before entering them into the airlift system.
- Use DD Form 2133, **Joint Airlift Inspection Record**, for joint inspections (or sign the reverse side of the Shipper's Declaration for Dangerous Goods).

1.2.8. **Installation or Activity Commanders (or their designated representatives).** Appoint preparers in writing to include their scope of authority.
1.2.9. **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.

1.3. Steps for Preparing Hazardous Materials. To ensure compliance with all safety, security, and legal requirements, preparers follow a logical sequence:

- **Step 1.** Determine whether the airlift mission is channel or mobility. Chapters 1 and 2 cover general rules applicable to all hazardous material shipments by military aircraft. Chapter 3 covers policy and procedural exceptions specific to tactical, contingency, or emergency operations.
- **Step 2.** Determine the proper shipping name (PSN), hazard classification, identification number and packing group from attachment 4. Identify if a reportable quantity (RQ) designation applies.
- **Step 3.** Determine the basic packaging paragraph from table A4.1. Identify the packaging configuration from attachments 5 through 13. Check general requirements identified in attachment 3. Comply with any special handling instructions.
- **Step 4.** Mark and label the package according to attachments 14 and 15.
- **Step 5.** Complete the hazardous material certification according to attachment 17.
- **Step 6.** Before loading, determine compatibility and placarding according to attachments 16 and 18.

1.4. 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.*

1.5. 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.

1.6. Performance Oriented Packaging (POP). Prepare hazardous materials in a POP certified container unless exempted by a specific packaging paragraph in this manual. Use the ICAO Technical Instructions, UN Recommendations on the Transport of Dangerous Goods (orange book), and 49 CFR to identify performance test requirements. POP requirements are mandatory for tactical and contingency (chapter 3) operations involving overseas locations. If the managing activity has specified a container Special Packaging Instruction (SPI), use that POP certified container. Shipper must frustrate hazardous cargo not correctly packaged and marked to the POP requirements. Service focal points are unable to waive POP requirements.
1.6.1. **Domestic Shipments.** Shippers can use POP containers to ship hazardous materials domestically. Until 49 CFR mandates use of POP containers for domestic shipments, shippers can use the packaging paragraphs in AFR 71-4, *Preparing Hazardous Materials for Military Air Shipments*, 15 January 1988. Only use packaging paragraphs in AFR 71-4 for domestic shipments. AFR 71-4 specifies the old DOT specification packagings and provides authorized transitional and Grandfathered specification packaging references. Shippers must ensure containers transported overseas are appropriate POP containers. Certify domestic shipments using the Shipper's Declaration for Dangerous Goods rather than DD Form 1387-2, **Special Handling Data/Certification.** Cite this paragraph and the packaging paragraph in AFR 71-4 as shown in this example: 1.6.1/*-*, replace *-* with the appropriate packaging paragraph from AFR 71-4.
1.6.2. **Exempt Items.** Compressed gas cylinders, radioactive material, dry ice, magnetized material, life-saving appliances, mercury contained in manufactured articles, and packages whose net mass exceeds 400 kg (882 pounds) or with a capacity exceeding 450 liters (118.9 gallons) are exempt from POP testing (see paragraph 1.6.4).
1.6.3. **Grandfathered Items.** Government-owned goods packaged before 1 January 1990 are exempt from POP requirements. Annotate the shipping papers "Government-owned goods packaged before 1 January 1990." See paragraph 1.6.1 for certification information.
1.6.4. **Competent Authority Approvals (CAA).** Certain hazardous materials are exempt from POP testing but require a CAA. Use CAA as authority for military air shipments. The activity managing the item must submit the CAA request to the Service focal point. Service focal points ensure widest possible dissemination of CAAs once Military Traffic Management Command (MTMC) receives approved copies from the DOT. Types issued are:

- Explosive hazard classification CAA for some explosives and munitions' group items. A copy of this CAA doesn't have to accompany military air shipments.
- Packaging CAA for items as specified by the US Competent Authority. These items include certain Class 1 packing methods identified in 49 CFR and some nonexplosive items that fall outside the POP testing criteria. A copy of this CAA must accompany the military air shipment.

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

- Return shipments destined to overseas locations not in POP containers at originator's expense. The originating activity may provide the shipper with the appropriate POP marking to correct the shipment. Consider urgency of need when determining the best method for correcting a deficient shipment.
- Report deficiencies on SF 361, **Transportation Discrepancy Report,** or SF 364, **Report of Discrepancy.** Report leaks from packages, equipment, and self-propelled vehicles during loading or unloading, or in flight as a packaging deficiency.
- 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.
- Do not move dropped or damaged explosive items. The Transportation or Packaging Office will immediately contact safety or munitions personnel to determine disposition.

1.8. Empty Containers, Cylinders, and Radioactive Packages (see attachment 3.1.12).

1.9. Stowing Hazardous Materials:

- Ensure hazardous materials are compatible (attachment 18) when stored in transit.
- Ensure hazardous materials are accessible in flight (see attachment 21).
- Ensure hazard warning labels are visible to aircrew and unloading personnel.
- Do not stow hazardous materials (except dry ice) on the same aircraft pallet with foodstuff, feed, or any other edible material intended for consumption by humans or animals (see paragraph 3.6.4).

1.10. Protective Equipment. Provide protective equipment for aircrew and passengers when materials, whose vapors are toxic, irritating or corrosive are part of the cargo.

- Aircraft must have a closed oxygen system or gas mask for each person aboard.
- Shipper must provide any required special equipment.
- While the exact equipment required depends on the materials being transported, following are the minimum:
  - Two pairs of rubber gloves.
  - One pair of asbestos or leather (with wool inserts) gloves.
  - One plastic or rubber apron.
  - A five-pound (2.3 kg) package of incombustible absorbent waste.
  - Three large plastic bags.
  - One oxygen or gas mask.
- 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.

1.11. Unitized, Palletized, Containerized, or Consolidated Loads. Shippers must ensure aerial ports can handle loads. These loads must:

- Be configured so they are as stable as a single container.
- Provide easy access to individual hazardous packages.
- Be compatible as required by attachment 18.
- Not use fiberboard or plywood sideboards unless specifically required by this manual.
- Be packaged, marked, labeled, and certified to the requirements of this manual and MIL-STD-129.

1.11.1. Prepare containerized loads to:

- Ensure air transportation personnel have access to the contents for inspection and the hazardous materials are accessible to the flight crew during flight. Provide a key to unescorted, locked containers to the aircraft commander or designated representative. See attachment 21 for items that can be nonaccessible.
- Ensure installed equipment meets the restraint criteria of MIL-A-8421.
- Apply hazard warning labels for all installed or stowed items on the outside container.

1.11.2. Consolidated loads must also have the PSN, identification number, and hazard label on the overpack container for each hazardous material inside.

1.12. Notifying the Aircraft Commander. 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 must provide this notification in the absence of an established air terminal or base operation. The briefing agency must meet the requirements of attachment 22.

1.13. Procedures for Airdropping Hazardous Materials. Prepare airdrop loads according to the TO 13C7/FM 10-500 series. Documenting, marking, labeling, preparing, and accepting procedures remain the same as for air landed cargo. The shipper must complete a Shipper's Declaration for Dangerous Goods certification.

1.14. 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.

1.15. Air Standardization Coordinating Committee (ASCC) Air Standards. Member nations (Australia, Canada, New Zealand, United Kingdom, and United States) have agreed in Air Standards 44/9 to accept the categorization and authorization by participating nations of explosives, radioactive materials, and dangerous cargo for onward carriage in their own military aircraft. Label shipments according to the ICAO Technical Instructions, IATA Dangerous Goods Regulation or by nationally approved labels. Certify the shipment meets all requirements for air transport.

1.16. 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 1.15 and 1.16 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.

Section B--Training Requirements

1.17. Functional Groups. Commanders assign hazardous material workers into one of four functional groups and determine the level of training required. This method forms a building block approach. 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 (additional levels added) based on specific job responsibilities.

1.17.1. **Handlers.** Trainers ensure training covers basic hazardous material familiarization, awareness, and communication requirements. This includes hazard classification, marking, labeling, placarding, forms, compatibility, and safety (including emergency response information). Training should also include handling and job (function) specific requirements.

1.17.2. **Packers.** Packers must work closely with the certifier (preparer) and must not close (seal) the container until the certifier (preparer) has validated the packaging. Trainers ensure that packers are knowledgeable in all aspects of 1.17.1 with additional emphasis in hazardous materials packaging requirements.

1.17.3. **Inspectors.** In addition to 1.17.1 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.

1.17.4. **Preparers.** The installation or activity commander (or designated representative) authorizes preparers (certifying official) in writing to complete the Shipper's Declaration for Dangerous Goods Certification. This authorization must include the scope of the individual's authority according to 1.17.4.1 and 1.17.4.2. The following personnel accomplish the Shipper's Declaration for Dangerous Goods Certification:

1.17.4.1. Personnel whose primary duty is preparing and certifying all types of hazardous materials shipments on a daily basis. These individuals must have satisfactorily completed one of the qualifying courses in attachment 28 within the preceding 24 calendar months.

1.17.4.2. Technical specialists are personnel trained and qualified to maintain only those hazardous materials within their specialty (such as, vehicle maintenance personnel are technical specialists for vehicles). Technical specialist can only sign the Shipper's Declaration for Dangerous Goods as a certifying official on items they are technically qualified to maintain, and prepare for shipment as directed by a technical manual.

Technical specialists must satisfactorily complete training within the preceding 24-months in order to remain proficient in preparing the Shipper's Declaration for Dangerous Goods. This authorization applies to tactical or contingency operations and channel movement.

1.17.4.3. **Initial Training.** Personnel identified in 1.17.4.1 must satisfactorily complete one of the initial training courses identified in attachment 28 as a prerequisite to certifying the Shipper's Declaration for Dangerous Goods for airlift of hazardous cargo. Each course contains essentially the same core information, plus special data peculiar to an individual's Air Force specialty code (AFSC), Military Occupational Specialty (MOS), or job specialty. Any course in attachment 28 satisfies the minimum training requirements. However, supervisors should consult DoD Catalog 5010.16-C, *Defense Management Education and Training (DMET)*, to select the most appropriate course for the individual concerned. Submit training requirements through formal training channels using the DMET.

1.17.4.4. **Recertification Training.** Personnel, who have previously completed one of the courses specified in 1.17.4.3 can satisfy the 24-month refresher training requirement by completing one of the formal courses identified in attachment 28.

1.18. Reserved.

1.19. Training Frequency. Personnel must receive initial training and subsequent refresher training at 24-month intervals.

1.20. Training Records. Test personnel and maintain a record of the training provided. Maintain the record for as long as the person works for the DoD and for 90 days after separation from the DoD. This record must indicate the following:

- Name of person who received the training.
- Date training took place.
- A description, copy, or location of training materials used to train the person.
- The name and address of the person who provided the training.
- Certification statement of completion of training and testing.

1.21. 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.

1.22. Getting an Extension to Qualification Expiration Date. Each Service or major command (MAJCOM) may grant an extension to the qualification expiration date specified in paragraph 1.19 for a period not to exceed 60 calendar days during which eligible personnel must receive training. Each Service or MAJCOM 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 1.17.4.3 or 1.17.4.4. Each organization must maintain a list of their personnel authorized to certify hazardous materials for transportation by military aircraft.

1.23. Contractor Personnel Certifying Hazardous Materials Shipments. Contractors preparing hazardous materials offered for transportation by military air must do so according to this manual. Contractors do not have to complete the training specified in attachment 28. However, the contractor must appoint knowledgeable personnel to complete the Shipper's Declaration for Dangerous Goods. Title 49 CFR 172.704 requires contractors to so instruct each of their officers, agents, and employees having any responsibility for preparing hazardous materials for shipment. Contractors desiring training in this subject must contact their contract administration office.

Chapter 2

DEVIATIONS, WAIVERS, AND SPECIAL REQUIREMENTS

2.1. Deviations. Deviations are a departure from established procedures in this manual. See attachment 23 to obtain deviations only for a specific mission or operation.

2.2. Passenger Prohibition Codes and Serviceable Oxygen. Table A4.1 identifies some hazardous materials with a Dagger (†) or Theta (❑) code that restricts passenger movement with that material. Do not transport passengers with dagger (†) or theta (❑) coded items unless issued a passenger deviation. Theta items may be transported with DoD duty passengers without a deviation. Contact the MAJCOM, numbered Air Force, or Service having operational control of the aircraft for

passenger deviations. See attachment 23 for deviations and passenger oxygen requirements.

2.3. Prohibiting Passengers from Carrying Hazardous Materials. Except for items listed in attachment 27, ensure crewmembers or passengers do not carry hazardous materials on military aircraft. Items listed in attachment 27 are not subject to any other requirements of this manual.

2.4. Packaging and Compatibility Waivers. Waivers are exceptions to the packaging or compatibility requirements of this manual.

2.4.1. **Getting Packaging Waivers.** The shipper must obtain a waiver for any hazardous item or packaging not authorized in attachments 5 through 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 POP requirements. Do not jeopardize safety for convenience or ease of operation. To obtain a waiver, the shipper must:

- Provide a detailed description of the package.
- Provide the PSN, hazard class, identification number, and packing group of the material.
- Provide an explanation why the established requirements can not be met.

2.4.2. **Compatibility Waivers for Military Aircraft.** Shippers submit waiver requests to their Service focal point (see paragraph 1.2.2) for approval. For Air Force aircraft, the Service focal point forwards the waiver request, with their coordination, to HQ AMC/SEW/DOJC Scott AFB IL 62225-5363. Waiver requests must contain the following information:

- Reason incompatible materials require shipment together.
- Reason for air movement and why other modes won't work.
- 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.
- Provide intended date of movement, routing, and type of airlift required.
- Provide national stock numbers; PSNs; model numbers of explosive items; hazard classes; quantity or net explosive weight (individual and total as applicable); identification numbers, and packaging paragraphs.
- Provide points of contact at origin and destination bases.

2.4.3. **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 2.4.2 to HQ AMC/XONC/SEW who will request an exemption from the DOT if warranted.

2.5. 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. A copy of the exemption must accompany each shipment. Maintain a copy of the exemption at each facility where it is used in connection with the transportation of the hazardous material. Do not use DOT exemptions for international shipments unless the item is exempted from POP requirements.

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. Do not use COEs for international shipments unless the item is exempted from POP requirements. A copy of the COE must accompany the shipment.

2.7. Limited and Excepted Quantities. Use good quality nonperformance packaging to ship small quantities of hazardous materials aboard military aircraft. Personnel may use POP packaging even though it's not required. These items are exempt (see attachment 19) from certain requirements of this manual.

2.8. Emergency Response Information. Personnel can 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 monitored at all times by a person who is knowledgeable of the hazards and characteristics of the materials being shipped, for use 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:

- For Class 1 material, contact The Army Operations Center, DSN 227-0218 or Commercial (703) 528-8230.
- For radioactive material and material poisonous by inhalation, contact The National Response Center, 1-800-424-8802.
- For all other hazardous materials, contact The DoD Emergency Response Hotline, 1-800-851-8061.

2.9. Complying With Special Cargo Requirements. Ensure Class 6.1, PG I, hazard zone A; Class 2.3, hazard zone A and B; Class 1, compatibility group K; Fissile Class III Radioactive Materials; infectious substances; and biological research materials comply with the extensive protective measures outlined in attachment 26.

Chapter 3

TACTICAL, CONTINGENCY, OR EMERGENCY AIRLIFT

3.1. Purpose. Shippers must identify procedural exceptions for movement of hazardous materials under tactical, contingency, or emergency conditions. 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 ensure operational necessity.

- The MAJCOM having operational control of the deploying unit justifies the applicability of this chapter by indicating the nature of the movement in the airlift request.
- Ensure that this chapter is used for operations that support DoD agencies and allies in providing sustained, immediate, and responsive air movement, and delivery of combat 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.
- 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/XRW.
- Observe all practical ground and flight rules and brief each aircraft commander (or representative designated by the commander) according to attachment 22. It is not necessary to include a summary of the hazardous cargo on the cargo manifest (military aircraft only).
- 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.
- Theater commanders evaluate acceptable risk relative to the urgency of need to determine if the procedures of this chapter will continue to apply to sustained logistical resupply airlift.

3.3. Use of Commercial Airlift. Use DOT exemptions 7573 and 9232 (DOT-E 7573 and DOT-E 9232), as outlined in attachment 25, as required for commercial airlift.

3.4. Packaging Requirements. Comply with POP (except when otherwise specified) and the packaging configurations specified in attachments 5 through 13. See paragraph 1.6.1 for domestic only authorizations. Do not remove hazardous materials from their required packaging except as authorized in attachment 24.

3.5. Applying Dagger and Theta Deviations. Dagger (†) and theta (❑) deviation requirements do not apply to this chapter. Deviation approval does not apply since personnel moving under this authority are participants in the tactical, contingency, or emergency operation (not considered passengers). Indicate "Cargo Aircraft Only" in Key 7 on the Shipper's Declaration for Dangerous Goods form. This authority does not apply to medical evacuees or passengers.

3.6. Load Configurations:

3.6.1. **Compatibility for Chapter 3 Movements.** 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 A18.5 for incompatible hazardous materials transported on the same aircraft.

3.6.2. **War Readiness Spares Kits (WRSK).** Ensure hazardous materials transported in WRSK are:

- Individually packaged, marked, labeled, and certified. Mark the outer container with the PSN and identification number, and apply a hazard label for each hazardous material inside (see paragraph 1.11).
- Compatible and accessible from the aisle side of the pallet.
- In outer containers that must be in good condition and marked "INSIDE PACKAGES COMPLY WITH PRESCRIBED SPECIFICATIONS."

3.6.3. **Complete Round Rigging (CRR).** CRR (unassembled on lapes/airdrop platform) allows deploying units to airlift normally incompatible explosive 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.

- Use CRR for airdrop missions only.
- Use only CRR load configurations shown in TO 13C7-18-41/FM 10-553 for low and high velocity parachute airdrop.
- Ensure CRR by low altitude parachute extraction (LAPE) method is according to approved TO/FM rigging procedures.
- Do not use CRR for mobility exercises due to the increased risk to the air crew and aircraft.

3.6.4. **Meals Ready to Eat (MRE).** If required, load MRE's on the same 463L pallet with hazardous materials (other than Class 2.3 poisons). Separate hazardous materials (except Class 1) from the MREs by the greatest distance possible, but not less than 44 inches. Do not load hazardous materials above the MRE's. Do not 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 on the same aircraft in air eligible POP containers listed in attachment 7, paragraph 7.3. If required, stow these containers in the vehicle or equipment according to chapter 1, paragraph 1.9. Prevent metal-to-metal contact between containers not secured in racks by using cushioning material or fiberboard. Certify stowed containers using a separate certification form other than that used for the vehicle or equipment. Containers secured in racks designed to accommodate them do not require a separate certification form. Secure DOT 5L jerricans to vehicles or equipment in permanently configured and approved holders. The DOT 5L is not an air eligible container. However, it may be used provided jerricans are secured to vehicles or equipment in permanently configured and approved holders. 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). If required, completely drain DOT 5L jerricans of flammable fuel and ship palletized, floor loaded, or as secondary loads. Purging is not required. Certify drained but not purged jerricans to the flammable residue remaining in the container.

3.7.1. **Fuel-in-Tank Limitations:**

3.7.1.1. Transport fueled vehicles, self-propelled units, and wheeled engine-powered support equipment to ensure against spillage during loading, unloading, and transportation. Vehicles and self-propelled units will not exceed three-fourths tank of fuel when loaded on the aircraft cargo floor and one-half tank of fuel when loaded on the aircraft cargo ramp. Wheeled engine-powered support equipment will not exceed one-half tank regardless of position on the aircraft. Position units loaded on the aircraft cargo ramp with fuel tank openings located on the high side of the ramp. Do not exceed one-half tank of fuel for units loaded aboard aircraft with a steep angle of ascent (i.e., KC-10, KC-135). Drain fuel tanks of palletized units. Units palletized due to the aircraft's subfloor requirements may contain fuel-in-tank. Equipment mounted on a single axle that is disconnected from its prime mover and loaded with its tongue resting on the aircraft floor must be drained, but need not be purged. Except for the exceptions identified in this chapter, all other requirements of attachment 13, paragraph 13.5. apply.

3.7.1.2. Use accurate fuel gauges, calibrated dip sticks, or other positive means to determine the amount of fuel-in-tank. If required, locally manufacture dip sticks. Additionally, draining the tank and refilling it with the appropriate amount of fuel (in the presence of air terminal or joint inspection personnel) is an acceptable means to accurately determine the fuel level. Drain and cap vehicles or equipment when personnel are unable to accurately determine the amount of fuel, or if the shipment is susceptible to fuel spills or leakage. Purging is not necessary.

3.7.1.3. Drain and cap engine-powered ground equipment and support equipment (SE), except as specified in paragraph 3.7.1.1. Purging is not necessary. Any unit transported as a secondary load or palletized (except units palletized due to the aircraft's subfloor requirements) requires a Shipper's Declaration for Dangerous Goods.

3.7.1.4. Vehicles, self-propelled units, and wheeled engine-powered SE require Shipper's Declaration for Dangerous Goods certification of fuel, installed batteries, or other installed components (i.e., fire extinguishers, air conditioners, accumulators, etc.). Do not use the DD

Form 2133, **Joint Airlift Inspection Record**, for certification. Use a separate Shipper's Declaration for Dangerous Goods form for any hazardous material transported as a secondary load on the vehicle or equipment. Joint inspectors are responsible for inspecting cargo for proper shipping configuration to be accepted into the military airlift system. The transported force representative (shipper) provides the hazardous material certification. As a minimum, joint inspectors receive local training according to 1.17.3.

3.7.2. **Bulk Fuel.** Do not transport servicing trucks, trailers, and semitrailers containing bulk fuel, or any bulk hazardous material by air. Purge the bulk tank of hazardous material according to service technical manuals. Drain (but need not purge unless directed by technical directives) bulk fuel tanks used to transport nonflammable liquids or flammable liquids with a flash point exceeding 38 degrees C (100 degrees F). Provide air circulation in the cargo compartment of pressurized aircraft.

3.7.3. **Additional Fuel.** Transport flammable liquid fuel in MIL-D-23119 collapsible fabric drums, 500 gallon capacity.

3.8. Lithium Batteries. Do not transport damaged lithium batteries or those suspected of damage. Prepare lithium batteries according to attachment 13, paragraph A13.8 or as follows:

3.8.1. **New Lithium Batteries.** New lithium batteries in electronic equipment installed in a battery box or compartment require no additional packaging. Reference this paragraph on the Shipper's Declaration for Dangerous Goods when transporting equipment with installed batteries as cargo (not handcarried) to be air landed. For airdrop missions, pack electronic equipment handcarried in a rucksack, in a shipping (airdrop) container, or as a door bundle depending on mission requirements. Individuals may handcarry (pockets, rucksack, backpacks, etc.) 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. Lithium batteries shipped under these conditions do not require certification on a Shipper's Declaration for Dangerous Goods. The troop commander briefs the aircraft commander or designated representative on the location of the lithium batteries and the total quantity, including lithium batteries being handcarried by individuals. Package, mark, and certify all other new lithium batteries according to attachment 13, paragraph A13.8.

3.8.2. **Used Lithium Batteries.** Handle used lithium batteries in electronic equipment installed in a battery box or compartment as specified in paragraphs 3.7.1.4 and 3.8.1. Wrap batteries, not installed in equipment and airlifted from a forward area (i.e., close proximity to combat or simulated area), in nonconductive material to prevent short circuit. Properly package (i.e., individually wrap in nonconductive material) and place batteries in an outer container with one inch of inert material surrounding each battery according to attachment 13, paragraph A13.8. Do not transport used lithium batteries by military airlift if surface transportation is available. Reference this paragraph when completing the Shipper's Declaration for Dangerous Goods.

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, wearing 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. Label contaminated cargo with a "Poison Gas" label and mark "Contaminated - Do Not Open." Apply the "Contaminated - Do Not Open" marking by any means that is highly visible and legible.

3.10. Preparing the Shipper's Declaration for Dangerous Goods. Prepare the Shipper's Declaration according to attachment 17.

3.11. Labeling Hazardous Materials. Label hazardous materials for tactical or contingency movement according to attachment 15. For dagger and theta coded items, it is not necessary to attach a "Cargo Aircraft Only" label to the cargo. Delete the "passenger and cargo aircraft" block on the Shipper's Declaration for Dangerous Goods.

3.12. Diverting Hazardous Materials to Nontactical Airlift. Prepare and forward redeployed hazardous materials prepared according to this chapter if off-loaded intransit as follows:

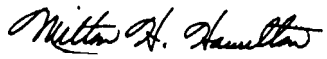
- The operating command forwards cargo on subsequent SAAM aircraft to support same movement directive (when possible).
- When a SAAM is not available, forward cargo to the Traffic Management Office/Installation Transportation Officer (TMO/ITO) who establishes mode of transportation by most expeditious means. Payment of commercial transportation is the responsibility of the operating command.
- Move cargo diverted to channel airlift on first available aircraft. Do not repackage unless transporting the cargo on a commercial aircraft not operating under DOT-E 7573 or DOT-E 9232. Certify according to attachment 17. Use attachment 18 for compatibility requirements for channel airlift.

Official

JOHN M. NOWAK, Lt General, USAF
DCS/Logistics

Official

GORDON R. SULLIVAN
General, United States Army
Chief of Staff



MILTON H. HAMILTON
Administrative Assistant to the
Secretary of the Army
07678

Official

R. A. ARCHER
Captain, SC, USN
Deputy Commander,
Naval Supply Systems Command

Official

R. A. TIEBOUT
Lieutenant General, U.S. Marine Corps
Deputy Chief of Staff for
Installations and Logistics

Official

GARY C. TUCKER
Colonel, USA
DASC Commander

DISTRIBUTION:

AIR FORCE: F

ARMY: To be distributed in accordance with DA Form 12-34-E, block 0836 requirements for TM 38-250.

NAVY: Naval Aviation Supply Office Automated Distribution List, M125050000

MARINE CORPS: MARCORPS PCN 10204000000

TERMS EXPLAINED

A_1--The maximum activity of special form radioactive material permitted in a type A package.

A_2--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.

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

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

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).

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 which 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 (Organice 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 confined.
  - 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)*:**

- An infectious substance is a viable microorganism, or its toxin, which causes or may cause disease in humans or animals, and includes those agents listed in 42 CFR 72.3 of the Department of Health and Human Services regulations, or any other agent that has the potential to cause severe disabling or fatal disease. The terms "infectious substance" and "etiologic agent" are synonymous.
- A diagnostic specimen is any human or animal material including, but not limited to, excreta, secreta, blood, and its components, tissue, and tissue fluids, being shipped for purposes of diagnosis.
- A biological product is a material prepared and manufactured according to 9 CFR, part 102 (Licenses for Biological Products), 9 CFR, part 103 (Biological Products for Experimental Treatment of Animals), 9 CFR, part 104 (Permits for Biological Products), 21 CFR, part 312 (Investigational New Drug Application), or 21 CFR, parts 600 to 800 (Biologics), and may be shipped according to this manual.

Class 7 (Radioactive Material)--Any material having a specific activity greater than 0.002 micro curies per gram (uCi/g) (see definition of "specific activity").

Class 8 (Corrosive Material)--A liquid or solid that causes visible destruction or irreversible alterations in human skin tissue on contact. In case 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 that meets the definition of a hazardous waste or a hazardous substances.

Closed Transport Vehicle--A transport vehicle equipped with a securely attached exterior enclosure that restricts the access of unauthorized persons to the cargo space containing the radioactive materials during normal transport. The enclosure may be either temporary or permanent. In the case of packaged materials, the enclosure may be of the "see-through" type and must limit access from top, sides, and ends.

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.

Containment System--The components of the packaging intended to retain the radioactive contents during transportation.

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.

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).

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.

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 radio nuclides. Fissile radio nuclides are plutonium^{238}, 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 A4.5.6. Certain exclusions are provided in A3.2.6.14.

Flammable Range--This term refers to the difference between the minimum and maximum volume percentages of the material in air that forms a flammable compressed gas.

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."

Fusee--A device designed to burn at a controlled rate and to produce visual effects for signaling purposes. The composition of the fusee must be such that the fusee will not ignite spontaneously or undergo a marked decomposition when subjected to a temperature of 75 degrees C (167 degrees F) for 48 consecutive hours.

Gross Weight:

- 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 Cargo 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 Cargo 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 are capable of posing an unreasonable risk to health, safety, and property when transported. A hazardous substance, including its mixtures and solutions, must meet ALL of the following conditions:

- Listed in the appendix to 49 CFR 172.101.
- In a quantity (in one package) which equals or exceeds the reportable quantity (RQ) listed in the appendix to 49 CFR 172.101.
- When in a mixture or solution:
    - For radio nuclides, 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.

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	0.45	0.002	20

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

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 30,000 curies (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) for 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.

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.

Multilateral Approval--Approval by both the competent authority of the country of origin and of each country which the shipment is to be transported. This definition does not imply approval from countries over which radioactive materials are carried in aircraft if there is no scheduled stop in that country.

Natural Thorium--Thorium with the naturally occurring distribution of thorium isotopes (essentially 100 weight percent $thorium^{232}$).

Natural Uranium--Uranium with the naturally occurring distribution of uranium isotopes (approximately 0.711 weight percent $uranium^{232}$, and the remainder essentially $uranium^{238}$).

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

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 A3.2.6.16.1.

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) for 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, such as a consumer commodity, 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 of 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.

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

Package or Outside Package--A package plus its contents.

Packaging--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.

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 millirem per hour (mrem/h). Neutron flux densities may be converted into radiation levels according to 49 CFR 173.403 (v).

Radioactive Article--Any manufactured instrument or article such as clock, electronic tube or apparatus, or a similar instrument or article having radioactive material as a component part.

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

Radioactive Material--Any material having a specific activity greater than 0.002 microcuries per gram (uCi/g)(see definition of "specific activity").

Readily Combustible Solids--Readily combustible solids are solids which may cause or contribute to a fire through friction.

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).

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.

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

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).

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

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.

Subsidiary Hazard (Risk)--An additional hazardous property of a material other than the primary hazard.

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.

Transport Index--The dimensionless number (rounded up to the first decimal place) 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:

- The number expressing the maximum radiation level in mrem/h at one meter (3.3 feet) from the external surface of the package.
- For fissile class II packages or packages in a fissile class III shipment, the number expressing the maximum radiation level at one meter (3.3 feet) from the external surface of the package, or the number obtained by dividing 50 by the allowable number of packages that may be transported together, whichever is larger.

Transport Vehicle--For the purpose of this manual, transport vehicle is an aircraft.

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.

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.

Unilateral Approval--Approval by the competent authority of the country of origin only.

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

Unirradiated Uranium--Uranium containing not more than 10^{-6} grams plutonium per gram of uranium^{235} and a fission product activity of not more than 0.25 mCi of fission products per gram of uranium^{235}.

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.

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
ECS	Environmental Control System
EOD	Explosive Ordinance Disposal
EPA	Environmental Protection Agency
ERG	Emergency Response Guidebook
ETP	Equal Time Point
FAR	Federal Acquisition Regulation
FPM	Federal Personnel Manual
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
LAPE	Low Altitude Parachute Extraction
MAJCOM	Major Command
MILVAN	Military Van
MOS	Military Occupational Specialty
MRE	Meals Ready to Eat
MTMC	Military Traffic Management Command
NA	North American
NBC	Nuclear, Biological, and Chemical
NEW	Net Explosive Weight
NOS	Not Otherwise Specified

PCB	Polycholorinated Biphenyls
PG	Packing Group
POD	Port of Debarkation
POE	Port of Embarkation
POP	Performance Oriented Packaging
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
WRSK	War Readiness Spares Kit

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 attachments 5 through 13. Hazardous material packaging must be authorized by this manual, 49 CFR Part 173, the ICAO Technical Instructions, or the IATA Dangerous Goods Regulation and meet the requirements outlined in this attachment.

A3.1.1. **Transportability.** Securely close and construct containers to prevent leakage due to changes in temperature, humidity, and altitude during transportation and in-transit handling.

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

- Temperature changes (-40 to 65.5 degrees C [-40 to +150 degrees F]).
- Pressure changes due to altitude changes (sea level to 3.7 km (12,000 feet)).
- 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 entirely fill containers designed to hold liquids. 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.

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

A3.1.2. **Inner Receptacle Pressure Requirements.** 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; or a pressure related to the vapor pressure of the liquid contained in the receptacle, whichever is greater. The outermost container of the combination packaging must be marked "Air Eligible", and the tested pressure may be displayed beneath the air eligible marking. Repack or overpack liquid hazardous materials in containers that do not meet the internal hydraulic pressure requirements, into Performance Oriented Packaging (POP) certified containers that meet this requirement. Determine the pressure related to the vapor pressure of the liquid by one of the following methods:

- 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).
- times the vapor pressure at 50 degrees C (122 degrees F) less 100 kPa (15 psi).
- times the vapor pressure at 55 degrees C (131 degrees F) less 100 kPa (15 psi).

A3.1.3. **Single 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. Repack or overpack liquid hazardous materials in containers that do not meet the internal hydraulic pressure requirement into POP certified containers that meet this requirement.

A3.1.4. **Metal Drums.** Unless otherwise specified, the maximum capacity of metal drums is 208 L (55 gallons).

A3.1.5. **Metal Containers.** Do not accept for shipment metal containers having corrosion or dents at the chime or seam, soldered, or welded area.

A3.1.6. **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.*

A3.1.7. **Closures.** Stoppers, corks, or other such friction-type closures must be held in place securely, tightly, and effectively. Secure screw-type closures on any inside plastic container to prevent the closures from loosening due to vibrations or substantial changes in temperature. The closure may be secured with pressure-sensitive tape, self-shrinking plastic, wire, a device designed to prevent the cap from loosening, or other positive means (that is, secondary seal).

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. **Inner Packaging.** Pack, secure, and cushion inner packagings of combination packagings to prevent breakage or leakage and to control movement within the outer container. 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.

A3.1.10. **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 Figure A17.1 for certification instructions.

A3.1.11. **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.

A3.1.12. **Empty Packages.** Inspect containers, drums, tanks, or dewars, that formerly contained a hazardous material covered by this manual, to determine the presence or absence of residue.

A3.1.12.1. **Empty Containers.** If the package or item is void of hazardous materials or has been purged, then each package or item must be labeled "EMPTY". Unless otherwise specified, close the package or item for shipment. Shipper's certification citing this paragraph is required. Complete Keys 1 through 8, 16, and 18 through 21 of the Shipper's Declaration for Dangerous Goods. Annotate "EMPTY Package" in Key 18. Key 16 will show "A3.1.12.1." See attachment 17 for detailed information on key references.

- If the hazardous article has been removed from its container and there is no possibility of remaining residue (i.e., empty torpedo or missile containers), label the container "EMPTY". Close the container for shipment. A Shipper's Declaration for Dangerous Goods is not required.
- If there is presence of hazardous material, the hazardous material must be removed (purged) or the package is regulated in the same manner as prescribed for the item if full (including packaging in POP container for international movement).

A3.1.12.2. **Empty Cylinders.** Compressed gas cylinders are empty if the pressure in the cylinder is less than 40 pounds per square inch absolute (psia). Psia equals the service pressure plus atmospheric pressure (14.7 psi). However, if the cylinder contains the residue of a material that is flammable or poisonous, regardless of psia, ship it regulated as a full container.

- Before shipment, inspect empty cylinders for dents, bulges, oxidation pits, or other damage. Handle faulty cylinders as required by the latest DOT regulations or 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.*
- Tightly close valves of cylinders previously used for shipping hazardous articles before offering for transportation. The requirements of A3.2.2.2 apply to the protection of the valves.
- Cylinders shipped as "EMPTY" must have the old labels removed, obliterated, destroyed, or completely covered by the "EMPTY" label.
- Certification on Shipper's Declaration for Dangerous Goods is the same as A3.1.12.1, except show "A3.1.12.2" in Key 16.

A3.1.12.3. **Empty Radioactive Materials Packaging.** Any packaging that previously contained radioactive materials and has been emptied of contents as far as practical is excepted from shipping paper, certification, marking, and labeling requirements provided that:

- The requirements of A11.11 are met.
- The packaging is in unimpaired condition and is securely closed so that there will be no leakage of radioactive material under normal transportation conditions.
- Internal contamination is not over 100 times the limits specified in A3.2.6.16.
- Any labels previously applied are removed, obliterated, or covered and the "EMPTY" label is affixed to the packaging.
- The packaging is prepared for shipment according to the requirements of A11.12.

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

A3.2.1. **Class 1.**

A3.2.1.1. **Forbidden Explosives.** Do not offer for airlift shipments of explosives listed below:

- An explosive that has not been approved according to A3.2.1.2.
- Bulk fulminates or other detonating compounds in dry condition.
- Explosive compounds that ignite spontaneously or undergo marked decomposition when subjected to a temperature of 75 degrees C (167 degrees F) for 48 hours.
- An explosive mixture or device containing a chlorate and also containing:

  - An ammonium salt including a substituted ammonium or quaternary ammonium salt.
  - An acidic substance including a salt of a weak base and a strong acid.
- Leaking, dropped, or otherwise damaged explosives and ammunition.
  - Air terminal personnel must not repack leaking or otherwise damaged shipments of explosives and ammunition unless an ammunition inspector is present.
  - Onward shipment of suspected or damaged explosives may be made provided the shipment is certified that it has been inspected and repacked and in proper condition for safe transportation. Qualified personnel must sign the certification.
- Propellants that are unstable, condemned, or deteriorated.
- Nitroglycerin, diethylene glycol dinitrate, or any other liquid explosives not specifically authorized by attachment 5.
- A loaded firearm except as authorized by chapter 3.
- Fireworks that combine an explosive and a detonator.
- Fireworks containing yellow or white phosphorus.
- 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).
- Explosives specifically forbidden in table A4.1.

A3.2.1.2. **New Explosives.** New explosives and explosive devices must be tested, approved, and assigned a DoD classification according to TB 700-2, NAVORDINST 8020.3, TO 11A-1-47, DSAR 8220.1, *DoD Explosive Hazard Classification Procedures*. Explosives assigned an Interim Hazard Classification (IHC) must have a copy of the approved IHC accompany the shipment.

A3.2.1.3. **Explosive Safety.** Safety precautions, standards, and rules for operating in an environment with explosives are prescribed in AFI 91-201 (Air Force), TM 9-1300-206 (Army), and NAVSEA OP 5 (Navy).

A3.2.2. **Class 2.**

A3.2.2.1. **Cylinder Requirements.** Cylinders used for shipment of compressed gases, including safety relief devices, must comply with Title 49 CFR and this manual. Requirements covering cylinders also apply to spherical pressure vessels. Additional data on compressed gas cylinders can be found in DSAR 4145.25/AR 700-68/ NAVSUPINST 4440.128B/MCO 10330.2B/AFR 67-12.

- Cylinders or spherical pressure vessels must not contain gases or materials capable of combining chemically so as to endanger its serviceability. Make sure all cylinders, including closing devices and cushioning materials, are in good condition so that their contents are well protected during transit.
- For poisonous materials required to be packaged in cylinders, each cylinder must be closed with a plug or valve meeting the following requirements:
  - 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.
  - 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 or the cylinder to prevent loss of material through or past the packing.
  - Each valve outlet must be sealed by a threaded cap or threaded solid plug.
  - Cylinders, valves, plugs, outlet caps, luting, and gaskets must be compatible with each other and with the material.

A3.2.2.2. **Valve Protection.** Protect all valves of containers charged with compressed gas by one of the following methods:

- By a securely attached metal cap of sufficient strength to protect the valve from injury during transit.
- By boxing or crating the cylinder or sphere to give proper protection to the valve.
- 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.
- 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).

A3.2.2.3. **Cylinders.** Cylinders that contain a poisonous material, which have a wall thickness at any point of less than 2.03 mm (0.080 inch) and does not have fitted value protection, must be overpacked in a 4C1, 4D, 4F, 4G, 4H1, or 4H2 box. The box must meet the requirements of A3.1. Box and valve protection must be 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.

A3.2.2.4. **Requirement for Outside Container.** Ship cylinders, DOT 2P, 2Q, 3E, 3HT, 4BA spherical type, 4D, 4DA, 4DS, 9, 39, 40, and 41 in strong outside containers. The package must be 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.

A3.2.2.5. **Pressure and Filling Requirements:**

A3.2.2.5.1. The pressure in the container at 21 degrees C (70 degrees F) must not be more than the service pressure for which the container is marked or designated, except as provided in A3.2.2.5.7.

A3.2.2.5.2. 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.

A3.2.2.5.3. 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.

A3.2.2.5.4. The pressure for a poisonous material required to be packaged in a cylinder must not exceed the service pressure of the cylinder at 55 degrees C (131 degrees F). Sufficient outage shall be provided to ensure the cylinder will not be liquid full at 55 degrees C (131 degrees F).

A3.2.2.5.5. For containers made before the effective date of specifications, the service pressure is designated for the same type of container made according to current specification.

A3.2.2.5.6. For authorized cylinders not marked with a service pressure, the service pressure is designated as shown in figure A3.1.

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 A3.1. Cylinder Specification and Service Pressures.

A3.2.2.5.7. 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:

- That such cylinders are equipped with frangible disc safety devices (without fusible metal backing) having a bursting pressure not over the minimum prescribed test pressure.
- That the elastic expansion is determined at the time of the last test or retest by the water-jacket method.
- That either the average wall stress or the maximum wall stress must not exceed the limitations in figure A3.2.

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 A3.2. Wall-Stress Limitations.

A3.2.2.5.8. Except for carbon dioxide, nitrous oxide, and vinyl fluoride, inhibited, 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, inhibited, may completely fill the cylinder provided the pressure is not over 1 1/4 times the service pressure (see definition for filling density).

A3.2.2.6. **Mandatory Color-Code Identification.** Exact color-code identification of any material contained in a compressed gas cylinder is mandatory and must be color-coded according to MIL-STD-101.

A3.2.2.7. **Foreign Containers.** Foreign containers must meet the requirements of this manual and 49 CFR 173.301(i).

A3.2.3. **Class 3.**

A3.2.3.1. **Inner Container Quantity Requirements.** Where inner containers are required and authorized, the maximum quantity per container must not exceed 19 L (5 gallons). Suitably separate all inner containers. For PG I material, the maximum quantity per outer container must not exceed 38 L (10 gallons). For PG II material, the quantity per outer container must not exceed 76 L (20 gallons). For PG III material, the quantity per outer container must not exceed 208 L (55 gallons).

A3.2.3.2. **Combustible Liquids.** The requirements in this manual do not apply to materials classed as combustible liquid, except for marking the type of fuel and flash point on the shipping container.

A3.2.3.3. **Pads and Swabs.** Pads and swabs soaked with a flammable liquid and sealed in a bag are not regulated for military air shipments.

A3.2.3.4. **Alcoholic Beverages.** Alcoholic beverages in packagings of four liters or less are not subject to the requirements of this manual.

A3.2.4. **Class 4 Material.** 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.

A3.2.5. **Class 5.**

A3.2.5.1. 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.

A3.2.5.2. 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.

A3.2.6. **Class 7.**

A3.2.6.1. **General Design Requirements.** Except for limited quantities or excepted instruments or articles, each package used for shipment of radioactive materials must be designed so that:

- The package can be easily handled and properly secured during transport.
- A package with a gross weight over 10 kg (22 pounds) up to 50 kg (110 pounds), must have a means for manual handling.
- A package with a gross weight of 50 kg (110 pounds) or more can be safely handled by mechanical means.
- 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, the lifting attachment must be designed 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. Each attachment or other feature on the outer surface of the packaging that could be used to lift the package must be removable or otherwise capable of being made inoperable for transport, or must be designed with strength equivalent to that required for lifting attachments.
- The external surface, as far as practical, may be easily decontaminated.

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

A3.2.6.2. **Additional Design Requirements for Type A and B Packages:**

A3.2.6.2.1. 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.

A3.2.6.2.2. Each type B(U) or type B(M) package must meet the design and test requirements of 10 CFR, part 71.

A3.2.6.3. **Radiation Level Limitations.** Each package of radioactive materials must be designed so that:

- The radiation level is not more than 200 mrem/h at any point on the external surface of the package.
- The transport index is not over 10.

A3.2.6.4. **Thermal Limitations.** Each package of radioactive material must be designed, constructed, and loaded so that:

A3.2.6.4.1. 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.

A3.2.6.4.2. 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.
- A temperature of 82 degrees C (180 degrees F) in an exclusive use shipment.

A3.2.6.5. **General Transportation Requirements:**

A3.2.6.5.1. Secure each shipment of radioactive materials to prevent shifting during normal transportation conditions.

A3.2.6.5.2. Except as specifically required by a CAA, a package of radioactive materials may be carried among packaged general cargo without special stowage provisions, if:

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

A3.2.6.5.3. Packages bearing labels prescribed in A15.2.3 may not be carried in compartments occupied by passengers, except in those compartments exclusively reserved for couriers accompanying those packages.

A3.2.6.5.4. Packages with a radioactive yellow II or radioactive yellow III label may not be carried aboard a passenger aircraft unless:

- The transport index is not over 1.0 for a package required to be labeled radioactive yellow II.
- The transport index is not over 3.0 for a package required to be labeled radioactive yellow III.
- The package is carried on the floor of the cargo compartment, or freight container and is not accessible to the passengers.

A3.2.6.5.5. 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 0.5 mrem/h and there is no significant removable radioactive surface contamination as determined in A3.2.6.16.1. 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 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.

A3.2.6.5.6. 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.

A3.2.6.5.7. Do not offer Type B(M) packages for transportation on passenger-carrying aircraft.

A3.2.6.5.8. If an overpack is used to consolidate individual packages of radioactive materials, the packages must comply with the packaging in attachment 11, marking in attachment 14, and labeling in attachment 15.

A3.2.6.5.9. Shipments of fissile class III radioactive materials are authorized (see A3.2.6.12 through A3.2.6.14):

- In a cargo aircraft only that has been assigned for the sole use of the shipper for the specific shipment of fissile radioactive material according to 2.9. The shipper and carrier must develop the instructions for the sole use and issue the instructions with the shipping papers.
- In an aircraft in which there are no other packages required to bear a radioactive label. The shipper and carrier must make specific arrangements and issue instructions to that effect with the shipping papers.

A3.2.6.5.10. No person may offer for military airlift:

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

- Any continuously vented type B(M) packages, which require external cooling by an auxiliary cooling system or packages subject to operational controls during transport.
- Any liquid pyrophoric radioactive materials.

A3.2.6.5.11. Do not transport exclusive use shipments of packages having a surface radiation level in excess of 200 mrem/h except by special arrangement.

A3.2.6.6. **Storage Incident to Transportation.** Limit the number of packages bearing radioactive yellow II or radioactive yellow III labels stored in any one storage area, such as a transit area, terminal building, storeroom, or assembly yard, so that the sum of the transport indexes in any individual group of packages does not exceed 50. 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.

A3.2.6.7. **Separation Distances:**

A3.2.6.7.1. Except as provided in A3.2.6.7.3, determine the minimum separation distances prescribed in A3.2.6.7.2 by measuring the shortest distance between the surfaces of the radioactive materials package and the surfaces bounding the space occupied by passengers or animals. If more than one package of radioactive materials is placed in a passenger-carrying aircraft, determine the minimum separation distance for these packages according to A3.2.6.7.2 on the basis of the sum of the transport index numbers of the individual packages or overpacks.

A3.2.6.7.2. Table A3.1 prescribes minimum separation distances for the carriage of packages containing radioactive materials labeled with radioactive yellow II or radioactive yellow III in passenger-carrying aircraft.

Table A3.1. Separation Distances.

Transport Index or Sum of Transport Indexes of all Packages in the Aircraft or Predesignated Area	Minimum Separation Distances	
	Centimeters	Inches
0.1 to 1.0	30	12
1.1 to 2.0	50	20
2.1 to 3.0	70	28
3.1 to 4.0	85	34
4.1 to 5.0	100	40
5.1 to 6.0	115	46
6.1 to 7.0	130	52
7.1 to 8.0	145	57
8.1 to 9.0	155	61
9.1 to 10.0	165	65
1.1 to 12.0	185	73
12.1 to 13.0	195	77
13.1 to 14.0	205	81
14.1 to 15.0	215	85
15.1 to 16.0	225	89
16.1 to 17.0	235	93
17.1 to 18.0	245	97
18.1 to 20.0	260	102
20.1 to 25.0	290	114
25.1 to 30.0	320	126
30.1 to 35.0	350	138
35.1 to 40.0	375	148
40.1 to 45.0	400	157
45.1 to 50.0	425	167

A3.2.6.7.3. **Predesignated Areas.** A package labeled with radioactive yellow II or radioactive yellow III may be carried in a passenger-carrying aircraft according to a system of predesignated areas established by the aircraft operator, provided that it is designed to ensure that:

- The packages can be placed in each predesignated area according to the required minimum separation distances.

- The predesignated areas are separated from each other by minimum distance equal to at least four times the distances outlined in A3.2.6.7.1 for the predesignated area containing packages with the largest sum of transport indexes.

A3.2.6.8. **Requirements for Carrying Packages Containing Radioactive Materials in a Cargo Aircraft Only.** Separate groups of packages from each other in an aircraft by a distance of 6 meters (20 feet) or less. Do not carry any package labeled with radioactive yellow II or radioactive yellow III on a cargo aircraft only unless:

- The total transport index for all of the packages is not over 50.0 and the packages are carried according to A3.2.6.7.
- The total transport index for all of the packages exceeds 50.0 and:
- The separation distance between the surfaces of the radioactive materials packages and the surfaces bounding the space occupied by persons or animals is at least 9 meters (30 feet).
  - The transport index for any group of packages does not exceed 50.0.
  - Each group of packages is separated from every other group in the aircraft by not less than 6 meters (20 feet), measured from the outer surface of each group.
  - The total transport index for all packages containing fissile radioactive materials is not over 50.0.

A3.2.6.9. **Special Requirements for Transporting Radioactive Material With Undeveloped Film.** Do not carry packages labeled with radioactive yellow II or radioactive yellow III on an aircraft closer than the distances shown in table A3.2 to any package marked as containing undeveloped film.

Table A3.2. Temporary Storage.

Minimum separation distance to nearest undeveloped film of various times of transit (m=meters and ft= feet)

Transport Index	Up to 2 Hours		2 to 4 Hours		4 to 8 Hours		8 to 12 Hours		Over 12 Hours	
	m	ft	m	ft	m	ft	m	ft	m	ft
0.1 to 1.0	0.3	1	0.6	2	0.9	3	1.2	4	1.5	5
1.1 to 5.0	0.9	3	1.2	4	1.8	6	2.4	8	3.3	11
5.1 to 10.0	1.2	4	1.8	6	2.7	9	3.3	11	4.5	15
10.1 to 20.0	1.5	5	2.4	8	3.6	12	4.8	16	6.6	22
20.1 to 30.0	2.1	7	3.0	10	4.5	15	6.0	20	8.7	29
30.1 to 40.0	2.4	8	3.3	11	5.1	17	6.6	22	9.9	33
40.1 to 50.0	2.7	9	3.6	12	5.7	19	7.2	24	10.8	36

A3.2.6.10. **Approval of Special Form Radioactive Material:**

A3.2.6.10.1. Each shipper of special form radioactive materials must maintain on file for at least 1 year after the latest shipment, and provide to HQ AFMC/LGT on request, 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.

A3.2.6.10.2. 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:

- 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.
- 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.
- A statement of the tests that have been made 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.

A3.2.6.10.3. Criteria in A3.2.6.10.1 and A3.2.6.10.2 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."

A3.2.6.11. **Uranium Hexaflouride (Fissile and Low Specific Activity):**

A3.2.6.11.1. 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:

- Before initial filling and during periodic inspection and test, clean packages according to American National Standard N14.1.
- Design, fabricate, inspect, test, and mark packagings according to American National Standard N14.1 in effect at the time the packaging was manufactured.
- Uranium hexafluoride must be in solid form when offered for transportation.
- 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.
- The pressure in the package at 20 degrees C (68 degrees F) must be less than 101.3kPa (14.8 psia).

A3.2.6.11.2. Periodically inspect, test, and mark packages of uranium hexafluoride according to American National Standard N14.1-1987.

A3.2.6.11.3. Perform each repair to a package for uranium hexafluoride according to American National Standard N14.1-1987.

A3.2.6.12. **Specific Requirements for Fissile Class III Shipments:**

A3.2.6.12.1. Fissile class III shipments must incorporate transportation controls that are performed by the shipper or carrier, as appropriate, and:

- Provide nuclear criticality safety.
- Protect against loading, storing, or transporting that shipment with any other fissile material.

A3.2.6.12.2. Transport Fissile class III shipments in an aircraft:

- 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.
- That does not contain other packages of radioactive material requiring one of the labels prescribed in attachment 15.
- Specific arrangements must be made between the shipper and the carrier.

A3.2.6.12.3. Fissile material packaging must meet the test requirements of 10 CFR, part 71.

A3.2.6.13. **Mixing Fissile Material Packages.** Mixing fissile material packages with other types of radioactive materials, including fissile class I with fissile class II packages is authorized if the total transport index is not over 50.

A3.2.6.14. **Fissile Materials--Exceptions.** The requirements of A3.2.6.12 and A3.2.6.13 do not apply to:

- A package not containing more than 15 grams of fissile radionuclides.
- A package containing irradiated natural or depleted uranium including the products of irradiation if the irradiation has taken place only in the thermal reactor.
- A package containing homogeneous solutions or mixtures where:
  - The minimum ratio of the number of hydrogen atoms to the number of atoms of fissile radionuclides (H/X) is 5200.
  - The maximum concentration of fissile radionuclides is 5 grams per liter (g/l).
  - The maximum mass of fissile radionuclides in the package is 500 grams, except that for a mixture where the total mass of plutonium and uranium^{233} is not over 1 percent of the mass of uranium^{235}, the limit is 800 grams.
- A package containing 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}, if the fissile radionuclides are distributed homogeneously throughout the package contents, and do not form a lattice arrangement within the package.
  - A package containing any fissile material if it does not contain more than 5 grams of fissile radionuclides in any 10 liter volume, and if the material is packaged to maintain this limit of fissile radionuclide concentration during normal transport.
  - A package containing not more than one kg of plutonium of which not more than 20 percent by mass may consist of plutonium^{239}, plutonium^{241}, or any combination of those radionuclides.
  - A package containing liquid solutions of uranyl nitrate enriched in uranium^{235} to a maximum of 2 percent by weight, with total plutonium and uranium^{233} not more than 0.1 percent of the mass of uranium^{235}.
- A package containing thorium or uranium with not more than 0.72 percent by weight of fissile material used for shipment solely within the United States.

A3.2.6.15. **Requirements for Foreign-Made Packages.** In addition to the requirements of attachment 11, each shipper of a foreign-made type B, type B(U), type B(M) or fissile material package for which a competent authority certificate is required

by the IAEA *"Regulations for the Safe Transport of Radioactive Materials, Safety Series No. 6"* must meet the requirements of 49 CFR 173.473.

A3.2.6.16. **Radioactive Contamination:**

A3.2.6.16.1. **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, when averaged over the surface wiped, must not be over the limits given in table A3.3 at any time during transport. Other methods of assessment of equal or greater efficiency may be used. When other methods are used, take the detection efficiency of the method used into account and in no case must the nonfixed contamination on the external surfaces of the package be over 10 times the limits listed in table A3.3.

Table A3.3. Removable External Radioactive Contamination--Wipe Limits.

Contaminant	Maximum permissible limits	
	uCi/cm^2	depletion per minute (dpm)/cm^2
Beta-gamma emitting radio nuclides; all radionuclide with half-lives less than 10 days; natural uranium; natural thorium; uranium^{-235}; uranium^{-238}; thorium^{-232}; thorium^{-228}; and thorium^{-230} when contained in ores or physical concentrates.	10^{-5}	22
All other alpha emitting radionuclides	10^{-6}	2.2

A3.2.6.16.2. **Inspecting Aircraft for Contamination.** Aircraft used routinely for carrying radioactive materials must be periodically checked for radioactive contamination. The frequency of checks must be related to 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 0.5 mrem/h or if there is significant removable radioactive surface contamination as outlined in A3.2.6.16.1.

A3.2.7. **Class 8.**

A3.2.7.1. Where inner containers are required and authorized for liquid Class 8 material, unless otherwise specified by the packaging paragraph, the maximum quantity per container must not exceed 3.8 L (1 gallon). Suitably separate all inner containers. Do not pack bottles containing corrosive liquids in the same outside container with other hazardous materials.

A3.2.7.2. 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.

A3.2.8. **Class 9.** 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.

ITEMS LISTING

A4.1. General Requirements. This attachment contains an alphabetical listing of the items covered in attachments 5 through 13. It also lists items prohibited for air transportation. Do not ship items listed as "FORBIDDEN" or "NOT ACCEPTED" by military air. Some items may not be classified as hazardous materials under this manual. An item listed in table A4.1 may not be regulated because it does not meet the definition of the hazard class. When an item is determined to be nonhazardous, the shipper must alert the carrier by annotating, "NONHAZARDOUS" in the address block of the DD Form 1387, **Military Shipment Label.** Ship the item as general cargo and the hazardous materials certification (Shipper's Declaration) is not required.

A4.2. Using Table A4.1. Table A4.1 identifies "hazardous"materials for the purpose of transportation. Table A4.1 identifies the eligibility of the material for air shipment, the proper shipping name (PSN), the hazard class, the identification number, the packing group (PG), the labels required, special provisions applicable to the material, and the basic packaging paragraph. To use table A4.1, locate the PSN of the hazardous material and follow the information identified on the same line with the PSN. Information that can be found in each column of table A4.1 is as follows:

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

- The † (dagger) identifies the PSN as an extremely dangerous material. Transport on cargo aircraft only. Passengers are not permitted.
- The ❑ (theta) identifies a material that is less hazardous than a dagger item, but still requires transportation on cargo aircraft only. DoD duty passengers may be transported with these items without a deviation (see 2.2).
- 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". These items are identified by a "UN" or "ID" number in column 4.
- The "*" (asterisk) identifies that a technical name is not required in association with the PSN.

A4.2.2. **Column 2: Proper Shipping Names (PSN).** PSNs are listed alphabetically in all capital letters in table A4.1. They may be used in the singular or plural. New and revised PSNs in 49 CFR, part 172 are authorized PSNs under this manual, provided the packaging requirements do not change. Words which appear in lower case letters are descriptive words that do not constitute part of the PSN. A technical or chemical group name may be required in association with the PSN. When a technical name is required, enter it in parenthesis immediately following the PSN when marking and certifying the shipment.

A4.2.2.1. **Technical or Chemical Group Names.** The following exceptions constitute instances where entry of the technical or chemical group name is mandatory:

- **Not Otherwise Specified (N.O.S.) Items.** The term "N.O.S." in a PSN stands for not otherwise specified. Select a N.O.S. PSN based on the general hazard of the material when a more specific PSN is not listed in table A4.1. A technical name is required unless the proper shipping name is identified with an * in column 1 (see A4.2.1). See A4.4 for more information on generic N.O.S. items.
- **Organic Peroxides.** The technical name is required for Organic Peroxides. Technical names are listed below the appropriate generic PSN (in lower case letters) in table A4.1. Generic PSNs begin with the words "Organic Peroxide."
- **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 of the PSNs in the series is appropriate. Do not list all of the PSNs in the series when certifying 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, either name may be used as the PSN. The dagger (†), theta (❑), not accepted, and forbidden designations applicable to the referenced entry also apply to the "see" entry.

A4.2.2.4. **Concentration Ranges.** When a shipping name includes a concentration range as part of the shipping description, the actual concentration being 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)."

A4.2.2.5. **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). All packaging and certification requirements outlined in this manual must be met for hazardous waste. Label hazardous waste shipments with the appropriate hazard class label and a properly completed hazardous waste label. Mark shipments according to 49 CFR 172, 40 CFR 262.32, and MIL-STD-129.
A4.2.2.6. **Paint or Paint Related Material.** Except when otherwise specified, use the PSN "PAINT" for paint, lacquer, enamel, stain, shellac, varnish, liquid aluminum, liquid bronze, liquid gold, liquid wood filler, and liquid lacquer base. Use the PSN "PAINT-RELATED MATERIAL" for paint thinning, reducing, or removing compound. However, if a substance is specifically listed by name in table A4.1, use that PSN and corresponding packaging paragraph.
A4.2.3. **Column 3: Hazard Class and Division.** Column 3 contains class and division information. "FORBIDDEN" and "NOT ACCEPTED" items are also identified in this column. Do not transport "FORBIDDEN" and "NOT ACCEPTED" items by military aircraft. 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. When this manual references hazard class, that includes any division number if appropriate. For Class 1 (explosives), the compatibility group is also given. See A4.5 for further information on class/divisions.
A4.2.4. **Column 4: Identification Number.** Column 4 lists the identification number assigned to each PSN. Items with "UN" (United Nations) or "ID" (identification) numbers can be shipped domestically or internationally. Items with "NA" (North American) numbers can only be shipped domestically, or to and from Canada. New or revised UN or NA numbers in 49 CFR, part 172 are recognized in 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. Packing groups I, II, and III indicate the degree of hazard associated with the materials and are used to identify the severity of Performance Oriented Packaging (POP) tests associated with the item.
A4.2.6. **Column 6: Labels.** Column 6 lists hazard warning label requirements. Label requirements may vary, depending on the applicable PG. Apply all of the labels listed for the PG, unless otherwise excepted by attachment 15. The first label shown indicates the primary hazard, additional labels indicate subsidiary hazards. See attachment 15 for more labeling information.
A4.2.7. **Column 7: Special Provisions.** Column 7 specifies codes for special provisions that are applicable for each PSN and hazard class. Special provision codes may vary, depending on the PG. The codes may reflect packaging provisions, restrictions, and exceptions from requirements for particular quantities or forms of materials. The codes are divided into three categories: numeric codes, codes beginning with "N", and codes beginning with "A". Requirements of the special provision codes are identified in table A4.2. When a special provision dictates an additional packaging requirement, the requirement is mandatory. Certify to the appropriate packaging paragraph, even if the packaging paragraph does not include the special provision.
A4.2.8. **Column 8: Packaging Paragraph.** This column lists the applicable packaging paragraph. "FORBIDDEN" or "NOT ACCEPTED" items are also identified in this column. Except when otherwise specified, prepare hazardous material shipments according to the appropriate packaging paragraph for military air transportation.

A4.3. Hazardous Substances. Materials 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. Hazardous substances are found in the appendix to 49 CFR 172.101. The reportable quantity (RQ) is used to determine if material is considered to be a hazardous substance. The RQ is the quantity found in column 3 of the appendix to 49 CFR 172.101. This number 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. A substance in a mixture or solution is considered to be a "hazardous substance" when the concentration by weight equals or exceeds the concentration listed in figure A1.1. If the material meets these requirements, it must be regulated as a hazardous material and a hazardous substance. 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. Show the letters "RQ" after the PSN in Key 11 of the Shipper's Declaration for Dangerous Goods when the quantity of material in one package equals or exceeds the RQ.

A4.4. Items Not Specifically Listed:
A4.4.1. **Not Otherwise Specified (N.O.S.).** Some items are not listed in table A4.1 by their specific name. To include all such items would make the list too lengthy; therefore, general class listings have been established for the hazard. These general classes cover items "Not Otherwise Specified" (N.O.S.). Examples of such are: "FLAMMABLE LIQUID, N.O.S.;

POISONOUS SOLID, N.O.S." To determine the PSN for N.O.S. material, compare the characteristics of the items with the definitions of the various classes in this manual. Hazardous material definitions can be found in attachment 1. Even though a specific name may not be listed in table A4.1, a technical name must be determined by looking at the item or material safety data sheet.

A4.4.2. **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:

- The defining criteria of the hazard class.
- The hazard precedence prescribed in A4.5.
- The shipper's knowledge of the material.
- A3.2.1.2 for new explosives.
- Under the requirements of A4.4.1. If a N.O.S. PSN is assigned, a technical name is not required.

A4.5. Classifying Hazardous Materials:

A4.5.1. **Hazard Class Names.** The hazard class of a hazardous material is indicated either by class and division number, class name, or ORM-D (domestic shipments only). Figure A4.1 lists class and division numbers and the corresponding class and division names.

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

Figure A4.1. Hazard Classes.

A4.5.2 **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. 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:

- Class 7 (Radioactive material, other than limited quantities). When limited quantities are involved the other hazardous properties take precedence.
- Class 1 (Explosives).
- Class 2.3 (poisonous gas).
- Class 2.1 (flammable gas). See note.
- Class 2.2 (nonflammable gas). See note.
- Class 5.2 (organic peroxide).
- Class 6.2 (infectious substances or etiologic agents).

- Class 4.1 (flammable solid). Only self-reactive substances and wetted explosives. For other Class 4.1 materials, see figure A4.2.
- Class 4.2 (substances liable to spontaneous combustion). Only pyrophoric substances. For other Class 4.2 materials, see figure A4.2.
- Class 6.1 (poisonous substances), PG I, poisonous by inhalation only. For other Class 6.1 materials, see figure A4.2.

A4.5.2.1. Classify the following hazard classes according to figure A4.2, *Precedence of Hazard*:

- Class 3 (flammable liquids).
- Class 4.1 (flammable solids), other than Class 4.1 in A4.5.2.
- Class 4.2 (substances liable to spontaneous combustion), other than Class 4.2 in A4.5.2.
- Class 4.3 (substances which, in contact with water, emit flammable gases).
- Class 8 (corrosive material).
- Class 5.1 (oxidizers).
- Class 6.1 (poisonous substances), other than Class 6.1 in A4.5.2.
- Combustible liquid (combustible liquid does not have a class number).
- Class 9 (miscellaneous hazardous material).

NOTE: 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).

A4.5.3. **How To Use Figure A4.2.** Find one of the hazard classes (including the appropriate PG) of your material in the horizontal or vertical column. For example, Class 4.2, PG II in the vertical column. Then find the other hazard class (including the appropriate PG) in the other column. For example, Class 8, solid, PG II in the horizontal column. Where these two columns intersect identifies the primary hazard class that must be used when shipping this material. The PG of the primary hazard class is also identified at the intersection of the two columns. In the example, the primary hazard class is 4.2 and the PG is II. Include the other class as the subsidiary hazard. In our example, the subsidiary hazard would be Class 8. The PG for the subsidiary hazard is not applicable to the shipment.

Precedence of Hazards and Packing Groups for Classes 3, 4 and 8 and for Class 5.1 and 6.1

Class or		4.2	4.2	4.3	4.3	4.3	5.1	5.1	5.1	6.1	6.1	6.1	6.1	8	8	8	8	8	8
Class						(s)	(s)	(s)	(d)	(o)		***	(l)	(s)	(l)	(s)	(l)	(s)	
	Packing Group	II	III	I	II	III	I	II	III	I	I	II	III	I	I	II	II	III	III
3	I						**X**	**X**	**X**	3, I	3, I	3, I	3, I	3, I	**X**	3, I	**X**	3, I	**X**
3	II						**X**	**X**	**X**	3, I	3, I	3, II	3, II	8, I	**X**	3, II	**X**	3, II	**X**
3	III						**X**	**X**	**X**	6.1, I	6.1, I	6.1, II	3, III*	8, I	**X**	8, II	**X**	3, III	**X**
4.1	II	4.2, II	4.2, II	4.3, I	4.3, II	4.3, II	5.1, I	4.1, II	4.1, II	6.1, I	6.1, I	4.1, II		**X**	8, I	**X**	4.1, II	**X**	4.1, II
4.1	III	4.2, II	4.2, III	4.3, I	4.3, II	4.3, III	5.1, I	4.1, II	4.1, III	6.1, I	6.1, I	6.1, II		**X**	8, I	**X**	8, II	**X**	4.1, III
4.2	II			4.3, I	4.3, II	4.3, II	5.1, I	4.2, II	4.2, II	6.1, I	6.1, I	4.2, II		**X**	8, I	**X**	4.2, II	**X**	4.2, II
4.2	III			4.3, I	4.3, II	4.3, III	5.1, I	5.1, II	4.2, III	6.1, I	6.1, I	6.1, II		**X**	8, I	**X**	8, II	**X**	4.2, III
4.3	I						5.1, I	4.3, I	4.3, I	6.1, I	4.3, I	4.3, I		4.3, I	4.3, I	4.3,I	4.3, I	4.3, I	4.3, I
4.3	II						5.1, I	4.3, II	4.3, II	6.1, I	4.3, I	4.3, II		8, I	8, I	4.3, II	4.3, II	4.3, II	4.3, II
4.3	III						5.1, I	5.1, II	4.3, III	6.1, I	6.1, I	6.1, II		8, I	8, I	8,II	8, II	4.3, III	4.3, III
5.1**	I**									5.1, I	5.1, I	5.1, I		5.1, I	5.1, I	5.1, I	5.1, I	5.1, I	5.1, I
5.1**	II**									6.1, I	5.1, I	5.1, II		8, I	8, I	5.1, II	5.1, II	5.1, II	5.1, II
5.1**	III									6.1, I	6.1, I	6.1, II		8, I	8, I	8, II	8, II	5.1, III	5.1,III
6.1(d)	I													8, I	6.1, I	6.1, I	6.1, I	6.1, I	6.1, I
6.1(o)	I													8, I	6.1, I	6.1, I	6.1, I	6.1, I	6.1, I
6.1(i)	II													8, I	6.1, I	6.1, II	6.1, II	6.1, II	6.1, II
6.1(d)	II													8, I	6.1, I	8, II	6.1, II	6.1, II	6.1, II
6.1(o)	II													8, I	8, I	8, II	6.1, II	6.1, II	6.1, II

Figure A4.2. Precedence of Hazard.

(**l**) = liquid
(**s**) = solid
(**i**) = inhalation
(**o**) = oral
(**d**) = dermal

X = an impossible combination
***** = For pesticides only, the primary hazard must be Class/division 6.1, PG III.

****** = Hazard Class 5.1 liquids are to be assessed by analogy with listed substances in table A4.1 and assigning the substance to PG I, II, or III as appropriate.
******* = For classification see A4.5.4.

A4.5.4. **Material With More Than One Hazard.** For a material with more than one hazard, and one of the hazards is Class 6.1, PG III, do not consider the Class 6.1 in determining the classification of the material. However, where a pesticide has the hazards of Class 3, PG III and Class 6.1, PG III, the primary hazard must be Class 6.1, PG III.

A4.5.5. **Assignment of Generic Proper Shipping Names and "Types" to 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.

A4.5.5.1. **Determining the Generic PSN.** 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, 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). Turn to the "ORGANIC PEROXIDE" listed in table A4.1. These entries constitute the "generic" organic peroxide proper shipping names. Match the UN identification number for the technical name with a UN identification number associated with the generic PSN.

A4.5.5.2. **Organic Peroxide Generic "Types".** 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.

A4.5.6. **Classification of Fissile Materials.** Except as provided in A3.2.6.14, 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.

- **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.
- **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.
- **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 A3.2.6.12 by appropriate arrangements between the shipper and the carrier.

A4.6. Determining Degree of Hazard (PG). For most material, the degree of hazard is determined by the PG (see A4.2.5) assigned in table A4.1. 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 1, 2, and 7 do not have packing groups.

A4.6.1. **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 A4.3. There are no hazard zones for Class 2.1 and 2.2.

Hazard Zone	Inhalation Toxicity (parts per million)
A	LC50 less than or equal to 200 ppm
B	LC50 greater than 200 ppm and less than or equal to 1000 ppm
C	LC50 greater than 1000 ppm and less than or equal to 3000 ppm
D	LC50 greater than 3000 ppm or less than or equal to 5000 ppm

Figure A4.3. Determination of Hazard Zone for Class 2.3.

A4.6.2. **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 A4.4, match the initial boiling point of the material to the flash point, and assign the corresponding PG. Flash points may be determined from the material safety data sheet, DoD 6050.5 (Hazardous Material Information System), 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.

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)

Figure A4.4. Criteria for Class 3 PG.

A4.6.3 **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, appendix E to part 173.
A4.6.4. **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, appendix F. 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.
A4.6.5. **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:
A4.6.5.1. Determine the PG assignment for other than inhalation of vapors by using figure A4.5.

PG	Oral Toxicity LD50(mg/kg)	Dermal Toxicity LD50(mg/kg) LC50 (mg/L)	Inhalation Toxicity by dusts and mists
I	< 5	<40	<0.5
II	> 5, < 50	>40, <200	<0.5, <2
III	solids: > 50, <200, liquids > 50, <500	>200, <1000	> 2, <10

Figure A4.5. PG Assignment For Other Than Inhalation of Vapors.

A4.6.5.2. Determine the PG and hazard zone assignments for inhalation of vapors by using figure A4.6.

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} $\leq$ 5000 mL/m^3, and the criteria for packing groups I and II, hazard zones A, B, and C are not met

Figure A4.6. Inhalation Toxicity.

NOTE: "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.

A4.6.5.3. 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.
A4.6.5.4. 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).
A4.6.6. **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.

A4.7. Table A4.1 Alphabetical Listing of Items:

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	Accellerene; see p-NITROSODIMETHYLANILINE						
	Accumulators, electric; see BATTERIES, etc.						
D	ACCUMULATORS, PRESSURIZED, PNEUMATIC or HYDRAULIC (containing nonflammable gas)	2.2	NA1956		NONFLAM-MABLE GAS		A6.10
	ACETAL	3	UN1088	II	FLAMMABLE LIQUID		A7.3
❑	ACETALDEHYDE	3	UN1089	I	FLAMMABLE LIQUID	A3	A7.3
	ACETALDEHYDE AMMONIA	9	UN1841	III	CLASS 9		A13.3
	ACETALDEHYDE OXIME	3	UN2332	II	FLAMMABLE LIQUID		A7.3
	ACETIC ACID, GLACIAL or ACETIC ACID SOLUTION, more than 80% acid, by mass	8	UN2789	II	CORROSIVE	A3,A6, A7,A10	A12.3
	ACETIC ACID SOLUTION, more than 10%, but not more than 80% acid, by mass	8	UN2790	II	CORROSIVE	A3,A6, A7,A10	A12.3
	ACETIC ANHYDRIDE	8	UN1715	II	CORROSIVE	A3,A6, A7,A10	A12.3
	Acetic oxide; see ACETIC ANHYDRIDE						
	Acetoin; see ACETYL METHYL CARBINOL						
	ACETONE	3	UN1090	II	FLAMMABLE LIQUID		A7.3
†	ACETONE CYANOHYDRIN, STABILIZED	6.1	UN1541	I	POISON	2,A3,N34	A10.7
	ACETONE OILS	3	UN1091	II	FLAMMABLE LIQUID		A7.3
	Acetonitrile; see METHYL CYANIDE						
	Acetyl acetone peroxide with more than 9% by mass active oxygen	FORBIDDEN					FORBIDDEN
	Acetyl benzoyl peroxide, solid, or more than 40% in solution	FORBIDDEN					FORBIDDEN
	ACETYL BROMIDE	8	UN1716	II	CORROSIVE		A12.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	ACETYL CHLORIDE	3	UN1717	II	FLAMMABLE LIQUID CORROSIVE	A3,A6, A7,N34	A7.3
	Acetyl cyclohexanesulphonyl peroxide, more than 82%, wetted with less than 12% water	FORBIDDEN					FORBIDDEN
	Acetylene dichloride; see DICHLOROETHYLENE						
†	ACETYLENE, DISSOLVED	2.1	UN1001		FLAMMABLE GAS		A6.4
	Acetylene (liquefied)	FORBIDDEN					FORBIDDEN
	Acetylene silver nitrate	FORBIDDEN					FORBIDDEN
	Acetylene tetrabromide; see TETRABROMOETHANE						
	Acetylene tetrachloride; see TETRACHLOROETHANE						
	ACETYL IODIDE	8	UN1898	II	CORROSIVE		A12.3
	ACETYL METHYL CARBINOL	3	UN2621	III	FLAMMABLE LIQUID		A7.3
	Acetyl oxide; see ACETIC ANHYDRIDE						
	Acetyl peroxide, solid or more than 25% in solution Acid butyl phosphate; see BUTYL ACID PHOSPHATE	FORBIDDEN					FORBIDDEN
	Acid mixtures, hydrofluoric and sulphuric; see HYDROFLUORIC ACID AND SULPHURIC ACID MIXTURES						
	Acid mixtures, nitrating acid; see NITRATING ACID MIXTURES						
	Acid mixtures, spent, nitrating acid; see NITRATING ACID MIXTURES, SPENT						
	Acid, picric; see TRINITROPHENOL, etc.						
	Acid potassium sulphate; see POTASSIUM HYDROGEN SULPHATE						

Acid, sludge; see SLUDGE ACID

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	Acids, liquid, N.O.S.; see CORROSIVE LIQUIDS, N.O.S.						
	Acraldehyde, inhibited; see ACROLEIN, INHIBITED						
	ACRIDINE	6.1	UN2713	III	KEEP AWAY FROM FOOD		A10.6
	ACROLEIN DIMER, STABILIZED	3	UN2607	III	FLAMMABLE LIQUID		A7.3
†	ACROLEIN, INHIBITED	6.1	UN1092	I	POISON, FLAMMABLE LIQUID	1	A10.7
	ACRYLAMIDE	6.1	UN2074	III	KEEP AWAY FROM FOOD		A10.6
	ACRYLIC ACID, INHIBITED	8	UN2218	II	CORROSIVE		A12.3
❑	ACRYLONITRILE, INHIBITED	3	UN1093	I	FLAMMABLE LIQUID, POISON		A7.3
	Actinolite; see WHITE ASBESTOS, etc.						
	Activated carbon; see CARBON, ACTIVATED						
	Activated charcoal; see CARBON, ACTIVATED						
	Actuating cartridge, explosive; see CARTRIDGES, POWER DEVICE						
	ADHESIVES, containing flammable liquid	3	UN1133	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
	ADIPONITRILE	6.1	UN2205	III	KEEP AWAY FROM FOOD		A10.5
	Aeroplane flares; see FLARES, AERIAL						
*	AEROSOLS, FLAMMABLE, N.O.S., each not exceeding 1L capacity	2.1	UN1950		FLAMMABLE GAS		A6.3
*	AEROSOLS, FLAMMABLE, N.O.S. containing	FORBIDDEN					FORBIDDEN

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	poisonous gases of substances in Division 6.l Packing Group I or ll (including tear gas devices)						
*	AEROSOLS, FLAMMABLE, N.O.S. (each not exceeding 1L capacity) CONTAINING SUBSTANCES IN DIVISION 6.1 PACKING GROUP III	2.1	UN1950		FLAMMABLE GAS		A6.3
*	AEROSOLS, FLAMMABLE, N.O.S. CONTAINING SUBSTANCES IN CLASS 8 PACKING GROUP I or II	FORBIDDEN					FORBIDDEN
*	AEROSOLS, FLAMMABLE, N.O.S. (each not exceeding lL capacity) CONTAINING SUBSTANCES IN CLASS 8 PACKING GROUP III	2.1	UN1950		FLAMMABLE GAS, CORROSIVE		A6.3
*	AEROSOLS, FLAMMABLE, N.O.S. (each not exceeding lL capacity) CONTAINING SUBSTANCES IN DIVISION 6.1 PACKING GROUP III AND SUBSTANCES IN CLASS 8 Packing Group III	2.1	UN1950		FLAMMABLE GAS, CORROSIVE		A6.3
*	AEROSOLS, NONFLAMMABLE, N.O.S., (each not exceeding lL capacity)	2.2	UN1950		NONFLAM-MABLE GAS		A6.3
*	AEROSOLS, NONFLAMMABLE, N.O.S. CONTAINING SUBSTANCES IN DIVISION 6.1 PACKING GROUP I OR II (other than tear gas devices)	FORBIDDEN					FORBIDDEN
*	AEROSOLS, NONFLAMMABLE, N.O.S. (each not exceeding lL capacity) CONTAINING SUBSTANCES IN DIVISION 6.1 PACKING GROUP III	2.2	UN1950		NONFLAM-MABLE GAS		A6.3
*	AEROSOLS, NONFLAMMABLE, N.O.S. CONTAINING SUBSTANCES IN CLASS 8 PACKING GROUP I OR II	FORBIDDEN					FORBIDDEN
*	AEROSOLS, NONFLAMMABLE, N.O.S.	2.2	UN1950		NONFLAM-	A34	A6.3

	(each not exceeding 1L capacity) CONTAINING SUBSTANCES IN CLASS 8 PACKING GROUP III				MABLE GAS, CORROSIVE		
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
*	AEROSOLS, NONFLAMMABLE, N.O.S. (each not exceeding lL capacity) CONTAINING SUBSTANCES IN DIVISION 6.1 PACKING GROUP III AND SUBSTANCES IN CLASS 8, PACKING GROUP III	2.2	UN1950		NONFLAM-MABLE GAS, CORRISIVE		A6.3
	AIR, COMPRESSED	2.2	UN1002		NONFLAM-MABLE GAS		A6.3,A6.7
	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	FLAMMABLE LIQUID, POISON, CORROSIVE		A7.5
	Aircraft Survival Kits; see LIFE-SAVING APPLIANCES						
❑	AIR, REFRIGERATED LIQUID (cryogenic liquid) low pressure or pressurized	2.2	UN1003		NONFLAM-MABLE GAS, OXIDIZER		A6.12
†	AIR, REFRIGERATED LIQUID (cryogenic liquid) nonpressurized	2.2	UN1003		NONFLAM-MABLE GAS, OXIDIZER		A6.12
	Alcohol, denatured; see ALCOHOLS, N.O.S. or ALCOHOLS, TOXIC, N.O.S.						
	ALCOHOLIC BEVERAGES containing more than 24% but not more than 70% alcohol by volume	3	UN3065	III	FLAMMABLE LIQUID		A7.3
	ALCOHOLIC BEVERAGES containing more than 70% alcohol by volume	3	UN3065	II	FLAMMABLE LIQUID		A7.3
	Alcohol, industrial; see ALCOHOLS, N.O.S. or ALCOHOLS, TOXIC, N.O.S.						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	ALCOHOLS, N.O.S.	3	UN1987	I	FLAMMABLE LIQUID		A7.3
				II	FLAMMABLE LIQUID		
				III	FLAMMABLE LIQUID		
❑	ALCOHOLS, TOXIC, N.O.S.	3	UN1986	I	FLAMMABLE LIQUID, POISON		A7.3
				II	FLAMMABLE LIQUID, POISON		
	Aldehyde ammonia; see ACETALDEHYDE AMMONIA						
	Aldehyde; see ACETALDEHYDE						
	ALDEHYDES, N.O.S.	3	UN1989	I	FLAMMABLE LIQUID		A7.3
				II	FLAMMABLE LIQUID		
				III	FLAMMABLE LIQUID		
❑	ALDEHYDES, TOXIC, N.O.S.	3	UN1988	I	FLAMMABLE LIQUID, POISON		A7.3
				II	FLAMMABLE LIQUID, POISON		
	ALDOL	6.1	UN2839	II	POISON		A10.5
D	ALDRIN, liquid	6.1	NA2762	II	POISON		A10.5
D	ALDRIN, solid	6.1	NA2761	II	POISON		A10.6

❑*	ALKALI METAL ALLOYS, LIQUID, N.O.S.	4.3	UN1421	I	DANGEROUS WHEN WET	A2,A3,N34	A8.3
❑	ALKALI METAL AMALGAMS, LIQUID	4.3	UN1389	I	DANGEROUS WHEN WET	A2,A3,N34	A8.3
❑	ALKALI METAL AMALGAMS, SOLID	4.3	UN1389	I	DANGEROUS WHEN WET	A2,A3,N34	A8.4
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	ALKALI METAL AMIDES	4.3	UN1390	II	DANGEROUS WHEN WET	A6,A7,A8, A19,A20	A8.4
❑	ALKALI METAL DISPERSIONS or ALKALINE EARTH METAL DISPERSIONS	4.3	UN1391	I	DANGEROUS WHEN WET	A2,A3,	A8.3
	Alkaline corrosive battery fluid; see BATTERY FLUID, ALKALI						
	Alkaline corrosive liquids, N.O.S.; see CAUSTIC ALKALI LIQUIDS, N.O.S.						
	Alkaline corrosive solids, N.O.S.; see CORROSIVE SOLIDS, N.O.S.						
*	ALKALINE EARTH METAL ALLOYS, N.O.S.	4.3	UN1393	II	DANGEROUS WHEN WET	A19	A8.4
❑	ALKALINE EARTH METAL AMALGAMS	4.3	UN1392	I	DANGEROUS WHEN WET	A19,N34, N40	A8.4
	ALKALOIDS, LIQUID, poisonous, N.O.S. or ALKALOID SALTS, LIQUID, poisonous, N.O.S.	6.1	UN3140	I II III	POISON POISON KEEP AWAY FROM FOOD	A4	A10.5
	ALKALOIDS, SOLID, N.O.S. or ALKALOID SALTS, SOLID, N.O.S., poisonous	6.1	UN1544	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.6
	Alkyl aluminium halides; see ALUMINIUM ALKYL HALIDES						
	ALKYLAMINES, N.O.S. or POLYALKYAMINES, N.O.S. flammable, corrosive	3	UN2733	I II	FLAMMABLE LIQUID, CORROSIVE FLAMMABLE		A7.3

				III	LIQUID, CORROSIVE FLAMMABLE LIQUID, CORROSIVE		
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	ALKYLAMINES, N.O.S. or POLYALKYLAMINES, N.O.S. corrosive	8	UN2735	I II III	CORROSIVE CORROSIVE CORROSIVE	A3,A6, N34	A12.3
	ALKYLAMINES, N.O.S. or POLYALKYLAMINES, N.O.S. corrosive, flammable	8	UN2734	I II	CORROSIVE, FLAMMABLE LIQUID CORROSIVE, FLAMMABLE LIQUID	A3,A6, N34	A12.3
	ALKYL, ARYL or TOLUENE SULPHONIC ACID LIQUID with more than 5% free sulphuric acid	8	UN2584	II	CORROSIVE		A12.3
	ALKYL, ARYL or TOLUENE SULPHONIC ACID, LIQUID with not more than 5% free sulfuric acid	8	UN2586	III	CORROSIVE		A12.3
	ALKYL, ARYL, or TOLUENE SULPHONIC ACID, SOLID, with more than 5% free sulfuric acid	8	UN2583	II	CORROSIVE		A12.4
	ALKYL, ARYL, or TOLUENE SULPHONIC ACID, SOLID with not more than 5% free sulphuric acid	8	UN2585	III	CORROSIVE		A12.4
*	ALKYL PHENOLS, LIQUID, N.O.S. (including C2-C8 homologues)	6.1	UN3145	III	KEEP AWAY FROM FOOD		A10.5
*	ALKYL PHENOLS, SOLID, N.O.S. (including C2-C8 homologues)	6.1	UN2430	III	KEEP AWAY FROM FOOD		A10.6
	Allene; see PROPADIENE, INHIBITED						
	Allethrin; see PESTICIDES, LIQUID, TOXIC, N.O.S.						
	ALLYL ACETATE	3	UN2333	II	FLAMMABLE LIQUID, POISON		A7.3
†	ALLYL ALCOHOL	6.1	UN1098	I	POISON,	2	A10.7

†	ALLYLAMINE	6.1	UN2334	I	FLAMMABLE LIQUID POISON, FLAMMABLE LIQUID	2	A10.7
❑	ALLYL BROMIDE	3	UN1099	I	FLAMMABLE LIQUID, POISON		A7.3
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
❑	ALLYL CHLORIDE	3	UN1100	I	FLAMMABLE LIQUID, POISON		A7.3
	Allyl chlorocarbonate; see ALLYL CHLOROFORMATE						
†	ALLYL CHLOROFORMATE	8	UN1722	I	CORROSIVE, POISON	1,A3,N41	A12.12
	ALLYL ETHYL ETHER	3	UN2335	II	FLAMMABLE LIQUID, POISON		A7.3
❑	ALLYL FORMATE	3	UN2336	I	FLAMMABLE LIQUID, POISON		A7.3
	ALLYL GLYCIDYL ETHER	3	UN2219	III	FLAMMABLE LIQUID, POISON		A7.3
	ALLYL IODIDE	3	UN1723	I	FLAMMABLE LIQUID, CORROSIVE	A3,A6,N34	A7.3
†	ALLYL ISOTHIOCYANATE, INHIBITED	6.1	UN1545	II	POISON	2,A3,A7	A10.7
❑	ALLYLTRICHLOROSILANE, STABILIZED	8	UN1724	II	CORROSIVE, FLAMMABLE LIQUID	A7,N34	A12.3
†	ALUMINIUM ALKYL HALIDES	4.2	UN3052	I	SPONTANE-OUSLY COM-BUSTIBLE		A8.6

†	ALUMINIUM ALKYL HYDRIDES	4.2	UN3076	I	SPONTANE-OUSLY COM-BUSTIBLE		A8.6
†	ALUMINIUM ALKYLS	4.2	UN3051	I	SPONTANE-OUSLY COM-BUSTIBLE		A8.6

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
†	ALUMINIUM BOROHYDRIDE or ALUMINIUM BOROHYDRIDE IN DEVICES	4.2	UN2870	I	SPONTANE-OUSLY COM-BUSTIBLE, DANGEROUS WHEN WET		A8.6
	ALUMINIUM BROMIDE, ANHYDROUS	8	UN1725	II	CORROSIVE		A12.4
	ALUMINIUM BROMIDE, SOLUTION	8	UN2580	III	CORROSIVE		A12.3
	ALUMINIUM CARBIDE	4.3	UN1394	II	DANGEROUS WHEN WET	A20,N41	A8.4
	ALUMINIUM CHLORIDE, ANHYDROUS	8	UN1726	II	CORROSIVE		A12.4
	ALUMINIUM CHLORIDE, SOLUTION	8	UN2581	III	CORROSIVE		A12.3
	Aluminium dross, wet or hot	FORBIDDEN					FORBIDDEN
	ALUMINIUM FERROSILICON POWDER	4.3	UN1395	II	DANGEROUS WHEN WET, POISON	A19	A8.4
❑	ALUMINIUM HYDRIDE	4.3	UN2463	I	DANGEROUS WHEN WET	A19,N40	A8.4
	ALUMINIUM NITRATE	5.1	UN1438	III	OXIDIZER	A1,A29	A9.8
	Aluminium phosphate solution; see CORROSIVE LIQUIDS, N.O.S.						
❑	ALUMINIUM PHOSPHIDE	4.3	UN1397	I	DANGEROUS WHEN WET, POISON	A8,A19, N40	A8.4
❑	ALUMINIUM PHOSPHIDE PESTICIDES	6.1	UN3048	I	POISON	A8	A10.6
	ALUMINIUM POWDER, COATED	4.1	UN1309	II	FLAMMABLE		A8.4

					SOLID		
				III	FLAMMABLE SOLID		
	ALUMINIUM POWDER, UNCOATED	4.3	UN1396	II	DANGEROUS WHEN WET	A19,A20	A8.4
				III	DANGEROUS WHEN WET		
	ALUMINIUM RESINATE	4.1	UN2715	III	FLAMMABLE SOLID		A8.4

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	ALUMINIUM SILICON POWDER, UNCOATED	4.3	UN1398	III	DANGEROUS WHEN WET	A1,A19	A8.4
	Amatols; see EXPLOSIVE, BLASTING, TYPE B						
	Aminobenzene; see ANILINE						
	2-Amino benzotrifluoride; see 2-TRIFLUOROMETHYLANILINE						
	3-Amino benzotrifluoride; see 3-TRIFLUOROMETHYLANILINE						
	Aminobutane; see N-BUTYLAMINE						
	2-AMINO-4-CHLOROPHENOL	6.1	UN2673	II	POISON		A10.6
	2-AMINO-5-DIETHYLAMINOPENTANE	6.1	UN2946	III	KEEP AWAY FROM FOOD		A10.5
	2-(2-AMINOETHOXY) ETHANOL	8	UN3055	III	CORROSIVE		A12.3
	N-AMINOETHYLPIPERAZINE	8	UN2815	III	CORROSIVE		A12.3
	1-Amino-2-nitrobenzene; see NITROANILINES						
	1-Amino-3-nitrobenzene; see NITROANILINES						
	1-Amino-4-nitrobenzene; see NITROANILINES						
	AMINOPHENOLS (o-m-p-)	6.1	UN2512	III	KEEP AWAY FROM FOOD		A10.6
	Aminopropyldiethanolamine; see ALKYLAMINES, N.O.S.						
	n-Aminopropylmorpholine; see ALKYLAMINES, N.O.S.						
	AMINOPYRIDINES (o-m-p-)	6.1	UN2671	II	POISON		A10.6

❑	AMMONIA, ANHYDROUS, LIQUEFIED or AMMONIA SOLUTIONS relative density less than 0.880 at 15 degrees C in water, with more than 50% ammonia	2.3	UN1005		POISON GAS, CORROSIVE	4	A6.3,A6.5
D	AMMONIA, ANHYDROUS LIQUEFIED or AMMONIA SOLUTIONS relative density less than 0.880 at 15 degrees C in water, with more than 50% ammonia	2.2	UN1005		NONFLAM-MABLE GAS	13	A6.3,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	CORROSIVE		A12.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (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		NONFLAM-MABLE GAS		A6.3,A6.5
	AMMONIUM ARSENATE	6.1	UN1546	II	POISON		A10.6
	Ammonium azide	FORBIDDEN					FORBIDDEN
	Ammonium bichromate; see AMMONIUM DICHROMATE						
	Ammonium bifluoride; see AMMONIUM HYDROGEN FLUORIDE SOLID						
	Ammonium bifluoride solution; see AMMONIUM HYDROGEN FLUORIDE, SOLUTION						
	Ammonium bisulphate; see AMMONIUM HYDROGEN SULPHATE						
	Ammonium bisulphite solution; see BISULPHITES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.						
	Ammonium bromate	FORBIDDEN					FORBIDDEN
	Ammonium chlorate	FORBIDDEN					FORBIDDEN
	AMMONIUM DICHROMATE	5.1	UN1439	II	OXIDIZER		A9.8
	AMMONIUM DINITRO-O-CRESOLATE	6.1	UN1843	II	POISON		A10.6
	AMMONIUM FLUORIDE	6.1	UN2505	III	KEEP AWAY FROM FOOD		A10.6
	AMMONIUM FLUOROSILICATE	6.l	UN2854	III	KEEP AWAY		A10.6

					FROM FOOD		
	Ammonium fulminate	FORBIDDEN					FORBIDDEN
	Ammonium hydrate; see AMMONIA SOLUTIONS, etc.						
	AMMONIUM HYDROGEN FLUORIDE, SOLID	8	UN1727	II	CORROSIVE	N34	A12.4
	AMMONIUM HYDROGEN FLUORIDE, SOLUTION	8	UN2817	II	CORROSIVE, POISON	N34	A12.3
				III	CORROSIVE		
	AMMONIUM HYDROGEN SULPHATE	8	UN2506	II	CORROSIVE		A12.4
	Ammonium hydrosulphide, solution; see AMMONIUM SULPHIDE SOLUTION						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
D	AMMONIUM HYDROXIDE; see AMMONIA SOLUTIONS, etc.						
	AMMONIUM METAVANADATE	6.1	UN2859	II	POISON		A10.6
	Ammonium nitrate explosives; see EXPLOSIVE, BLASTING, TYPE B						
*	AMMONIUM NITRATE FERTILIZERS; N.O.S.	5.1	UN2072	I	OXIDIZER		A9.8
				II	OXIDIZER		
				III	OXIDIZER		
	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					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	OXIDIZER	A1,A29	A9.8
	AMMONIUM NITRATE FERTILIZER; uniform nonsegregating mixtures of nitrogen/phosphate or nitrogen/potash types or complete fertilizers	9	UN2071	III	CLASS 9		A13.4

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	of nitrogen/phosphate/potash type, with not more than 0.4% total added combustible material or with not more than 45% ammonium nitrate with unrestricted combustible material.						
	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	OXIDIZER	A1,A29	A9.8
	AMMONIUM NITRATE FERTILIZERS; uniform nonsegregating mixtures of ammonium nitrate with calcium carbonate and/or dolomite, with more than 80%, but less than 90% ammonium nitrate and not more than 0.4% total combustible material	5.1	UN2068	III	OXIDIZER	A1,A29	A9.8
	AMMONIUM NITRATE FERTILIZERS; uniform nonsegregating mixtures of nitrogen/phosphate or nitrogen/potash types or complete fertilizers of nitrogen/phosphate/potash type, with more 70%, but less than 90% ammonium nitrate and	5.1	UN2070	III	OXIDIZER	A1,A29	A9.8

	not more than 0.4% total combustible material						
D	AMMONIUM NITRATE-FUEL OIL MIXTURE (CONTAINING ONLY PRILLED AMMONIUM NITRATE AND FUEL OIL)	1.5D	NA0331	II	EXPLOSIVE		A5.6
	AMMONIUM NITRATE, LIQUID (HOT CONCENTRATED SOLUTION)	NOT ACCEPTED					NOT ACCEPTED
†	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	II	EXPLOSIVE		A5.7

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	AMMONIUM NITRATE, with not more than 0.2% of combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance	5.1	UN1942	III	OXIDIZER	A1,A29	A9.8
	Ammonium nitrite	FORBIDDEN					FORBIDDEN
	AMMONIUM PERCHLORATE	5.1	UN1442	II	OXIDIZER	A9	A9.8
†	AMMONIUM PERCHLORATE	1.1D	UN0402	II	EXPLOSIVE	107	A5.8
	Ammonium permanganate; see PERMANGANATES, INORGANIC, N.O.S.						
	AMMONIUM PERSULPHATE	5.1	UN1444	III	OXIDIZER	A1,A29	A9.8
†	AMMONIUM PICRATE, dry or wetted with less than l0% water, by mass	1.1D	UN0004	II	EXPLOSIVE		A5.8
	AMMONIUM PICRATE, WETTED with not less than 10% water, by mass	4.1	UN1310	I	FLAMMABLE SOLID	A2,N41	A8.4
	AMMONIUM POLYSULPHIDE, SOLUTION	8	UN2818	II	CORROSIVE, POISON		A12.3
				III	CORROSIVE		
	AMMONIUM POLYVANADATE	6.1	UN2861	II	POISON		A10.6
	Ammonium silicofluoride; see AMMONIUM FLUOROSILICATE						

	AMMONIUM SULPHIDE SOLUTION	8	UN2683	II	CORROSIVE, POISON, FLAMMABLE LIQUID		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	II	EXPLOSIVE		A5.9
❑	AMMUNITION, ILLUMINATING, with or without burster, expelling charge or propelling charge	1.3G	UN0254	II	EXPLOSIVE		A5.9

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	AMMUNITION, ILLUMINATING, with or without burster, expelling charge or propelling charge	1.4G	UN0297	II	EXPLOSIVE		A5.9
❑	AMMUNITION, INCENDIARY liquid or gel, with burster, expelling charge or propelling charge	1.3J	UN0247	II	EXPLOSIVE		A5.9
	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	II	EXPLOSIVE		A5.9
❑	AMMUNITION, INCENDIARY, WHITE PHOSPHOROUS,with burster, expelling charge or propelling charge	1.3H	UN0244	II	EXPLOSIVE		A5.9
❑	AMMUNITION, INCENDIARY, with or without burster, expelling charge, or propelling charge	1.2G	UN0009	II	EXPLOSIVE		A5.9
❑	AMMUNITION, INCENDIARY, with or without burster, expelling charge, or propelling charge	1.3G	UN0010	II	EXPLOSIVE		A5.9

	AMMUNITION, INCENDIARY, with or without burster, expelling charge or propelling charge	1.4G	UN0300	II	EXPLOSIVE		A5.9
	Ammunition, incendiary (water-activated contrivances); see CONTRIVANCES, WATER-ACTIVATED, etc.						
	Ammunition, industrial; see CARTRIDGES, OIL WELL or CARTRIDGES, POWER DEVICE						
	Ammunition, lachrymatory; see AMMUNITION, TEAR-PRODUCING, etc.						
	AMMUNITION, PRACTICE	1.4G	UN0362	II	EXPLOSIVE		A5.9
❑	AMMUNITION, PRACTICE	1.3G	UN0488	II	EXPLOSIVE		A5.9
	AMMUNITION, PROOF	1.4G	UN0363	II	EXPLOSIVE		A5.9
	Ammunition, rocket; see WARHEADS, ROCKET, etc.						
	Ammunition, SA (small arms); see CARTRIDGES FOR WEAPONS, etc.						
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	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	II	EXPLOSIVE		A5.9
❑	AMMUNITION, SMOKE, WHITE PHOSPHORUS, with burster, expelling charge, or propelling charge	1.2H	UN0245	II	EXPLOSIVE		A5.9
❑	AMMUNITION, SMOKE, with or without burster, expelling charge or propelling charge	1.3G	UN0016	II	EXPLOSIVE, CORROSIVE		A5.9
	AMMUNITION, SMOKE, with or without burster, expelling charge or propelling charge	1.4G	UN0303	II	EXPLOSIVE, CORROSIVE		A5.9

❑	AMMUNITION, SMOKE, with or without burster, expelling charge or propelling charge	1.2G	UN0015	II	EXPLOSIVE, CORROSIVE		A5.9
	Ammunition, sporting; see CARTRIDGES FOR WEAPONS, etc. (UN0012, 0328, 0339)						
❑	AMMUNITION, TEAR-PRODUCING, NONEXPLOSIVE, without burster or expelling charge, nonfuzed	6.1	UN2017	II	POISON, CORROSIVE		A10.6
❑	AMMUNITION, TEAR-PRODUCING, with burster, expelling charge or propelling charge	1.2G	UN0018	II	EXPLOSIVE, CORROSIVE, POISON		A5.9
❑	AMMUNITION, TEAR-PRODUCING, with burster, expelling charge or propelling charge	1.3G	UN0019	II	EXPLOSIVE, CORROSIVE, POISON		A5.9
	AMMUNITION, TEAR-PRODUCING, with burster, expelling charge or propelling charge	1.4G	UN0301	II	EXPLOSIVE, CORROSIVE, POISON		A5.9
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
❑	AMMUNITION, TOXIC, NON-EXPLOSIVE, without burster or expelling charge, nonfuzed	6.1	UN2016	II	POISON		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	II	EXPLOSIVE, POISON		A5.9
❑	AMMUNITION, TOXIC, with burster, expelling charge, or propelling charge	1.3K	UN0021	II	EXPLOSIVE, POISON		A5.9
	Amorces; see FIREWORKS						
	AMYL ACETATES	3	UN1104	III	FLAMMABLE LIQUID		A7.3
	AMYL ACID PHOSPHATE	8	UN2819	III	CORROSIVE		A12.3
	AMYL ALCOHOLS	3	UN1105	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE		

					LIQUID		
	Amyl aldehyde; see VALERALDEHYDE						
	AMYLAMINE	3	UN1106	II	FLAMMABLE LIQUID		A7.3
	AMYL BUTYRATES	3	UN2620	III	FLAMMABLE LIQUID		A7.3
	AMYL CHLORIDES	3	UN1107	II	FLAMMABLE LIQUID		A7.3
	n-AMYLENE	3	UN1108	I	FLAMMABLE LIQUID		A7.3
	AMYL FORMATES	3	UN1109	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
	AMYL MERCAPTANS	3	UN1111	II	FLAMMABLE LIQUID	A3	A7.3
	AMYL METHYL KETONE	3	UN1110	III	FLAMMABLE LIQUID		A7.3
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	AMYL NITRATE	3	UN1112	II	FLAMMABLE LIQUID		A7.3
	AMYL NITRITE	3	UN1113	II	FLAMMABLE LIQUID		A7.3
❑	AMYLTRICHLOROSILANE	8	UN1728	II	CORROSIVE	A7,N34	A12.3
	Anaesthetic ether; see DIETHYL ETHER						
	Anhydrous ammonia; see AMMONIA, ANHYDROUS, LIQUEFIED						
	Anhydrous hydrazine; see HYDRAZINE, ANHYDROUS						
	Anhydrous hydriodic acid; see HYDROGEN IODIDE, ANHYDROUS						
	Anhydrous hydrofluoric acid; see HYDROGEN FLUORIDE, ANHYDROUS						
	ANILINE	6.1	UN1547	II	POISON		A10.5
	Aniline chloride; see ANILINE HYDROCHLORIDE						

ANILINE HYDROCHLORIDE	6.1	UN1548	III	KEEP AWAY FROM FOOD		A10.6
Aniline oil; see ANILINE						
Aniline salt; see ANILINE HYDROCHLORIDE						
ANISIDINES, LIQUID	6.1	UN2431	III	KEEP AWAY FROM FOOD		A10.5
ANISIDINES, SOLID	6.1	UN2431	III	KEEP AWAY FROM FOOD		A10.6
ANISOLE	3	UN2222	III	FLAMMABLE LIQUID		A7.3
ANISOYL CHLORIDE	8	UN1729	II	CORROSIVE		A12.3
Anthophyllite; see WHITE ASBESTOS, etc.						
Anti-freeze liquid; see FLAMMABLE LIQUIDS, N.O.S.						
Anti-knock compound, mixture; See MOTOR FUEL ANTI-KNOCK MIXTURES						
Antimonious chloride; see ANTIMONY TRICHLORIDE						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	ANTIMONY COMPOUNDS, INORGANIC, LIQUID, N.O.S.	6.1	UN3141	I II III	POISON POISON KEEP AWAY FROM FOOD	A4	A10.5
	ANTIMONY COMPOUNDS, INORGANIC, SOLID, N.O.S.	6.1	UN1549	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.6
	Antimony hydride; see STIBINE						
	ANTIMONY LACTATE	6.1	UN1550	III	KEEP AWAY FROM FOOD		A10.6
	Antimony oxide; see ANTIMONY COMPOUNDS, INORGANIC, SOLID, N.O.S.						
	ANTIMONY PENTACHLORIDE, LIQUID	8	UN1730	II	CORROSIVE		A12.3
	ANTIMONY PENTACHLORIDE, SOLUTION	8	UN1731	II	CORROSIVE		A12.3

				III	CORROSIVE		
❑	ANTIMONY PENTAFLUORIDE	8	UN1732	II	CORROSIVE, POISON	A3,A6,A7 A10,N3	A12.3
	Antimony perchloride, liquid; see ANTIMONY PENTACHLORIDE, LIQUID						
	ANTIMONY POTASSIUM TARTRATE	6.1	UN1551	III	KEEP AWAY FROM FOOD	A10,N3	A10.6
	ANTIMONY POWDER	6.1	UN2871	III	KEEP AWAY FROM FOOD		A10.6
	Antimony sulphide and a chlorate, mixtures of Antimony sulfide, solid; see ANTIMONY COMPOUNDS, INORGANIC, SOLID, N.O.S.	FORBIDDEN					FORBIDDEN
D	ANTIMONY TRIBROMIDE, SOLID	8	NA1549	II	CORROSIVE		A12.4
D	ANTIMONY TRIBROMIDE, SOLUTION	8	NA1549	II	CORROSIVE		A12.3
	ANTIMONY TRICHLORIDE, LIQUID	8	UN1733	II	CORROSIVE		A12.3
	ANTIMONY TRICHLORIDE, SOLID	8	UN1733	II	CORROSIVE		A12.4
D	ANTIMONY TRIFLUORIDE, SOLID	8	NA1549	II	CORROSIVE		A12.4
D	ANTIMONY TRIFLUORIDE SOLUTION	8	NA1549	II	CORROSIVE		A12.3
	Antu; see NAPHTHYLTHIOUREA						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	Aqua ammonia; see AMMONIA SOLUTIONS, etc.						
	ARGON, COMPRESSED	2.2	UN1006		NONFLAM-MABLE GAS		A6.3,A6.7
	ARGON, REFRIGERATED LIQUID (cryogenic liquid)	2.2	UN1951		NONFLAM-MABLE GAS		A6.12
	Arsenate of lead; see LEAD ARSENATES						
	Arsenates, N.O.S., liquid; see ARSENIC COMPOUNDS, LIQUIDS, N.O.S.						
	Arsenates, N.O.S., solid; see ARSENIC COMPOUNDS, SOLID, N.O.S.						
	ARSENIC	6.1	UN1558	III	POISON		A10.6
	ARSENIC ACID, LIQUID	6.1	UN1553	I	POISON		A10.5
	ARSENIC ACID, SOLID	6.1	UN1554	II	POISON		A10.6
	ARSENICAL DUST	6.1	UN1562	II	POISON		A10.6

	Arsenical flue dust; see ARSENICAL DUST						
❑*	ARSENICAL PESTICIDES, LIQUID, FLAMMABLE, TOXIC, N.O.S., flashpoint less than 23 degrees C	3	UN2760	I II	FLAMMABLE LIQUID, POISON FLAMMABLE LIQUID, POISON		A7.3
*	ARSENICAL PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S., flashpoint not less than 23 degrees C	6.1	UN2993	I II III	POISON, FLAMMABLE LIQUID POISON, FLAMMABLE LIQUID KEEP AWAY FROM FOOD, FLAMMABLE LIQUID		A10.5
*	ARSENICAL PESTICIDES, LIQUID, TOXIC, N.O.S.	6.1	UN2994	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.5
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
*	ARSENICAL PESTICIDES, SOLID, TOXIC, N.O.S.	6.1	UN2759	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.6
	ARSENIC BROMIDE	6.1	UN1555	II	POISON		A10.6
	Arsenic chloride; see ARSENIC TRICHLORIDE						
*	ARSENIC COMPOUNDS, LIQUID, 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	UN1556	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.5
*	ARSENIC COMPOUNDS, SOLID, N.O.S., including Arsenates, N.O.S., Arsenites, N.O.S., Arsenic sulphides, N.O.S., and Organic	6.1	UN1557	I II III	POISON POISON KEEP AWAY		A10.6

	compounds of arsenic, N.O.S.				FROM FOOD		
	Arsenic, fuming liquid; see ARSENIC TRICHLORIDE						
	Arsenic hydride; see ARSINE						
	ARSENIC PENTOXIDE	6.1	UN1559	II	POISON		A10.6
D	ARSENIC SULFIDE	6.1	NA1557	II	POISON		A10.6
	Arsenic sulphide and a chlorate, mixtures of	FORBIDDEN					FORBIDDEN
†	ARSENIC TRICHLORIDE	6.1	UN1560	I	POISON	2	A10.7
	ARSENIC TRIOXIDE	6.1	UN1561	II	POISON		A10.6
D	ARSENIC TRISULFIDE	6.1	NA1557	II	POISON		A10.6
	Arsenic, white, solid; see ARSENIC TRIOXIDE						
	Arsenious acid, solid; see ARSENIC TRIOXIDE						
	Arsenious chloride; see ARSENIC TRICHLORIDE						
	Arsenious and mercuric iodide solution; see ARSENIC COMPOUNDS, LIQUID, N.O.S.						
	Arsenites, N.O.S.; see ARSENIC COMPOUNDS, etc.						
†	ARSINE	2.3	UN2188		POISON GAS, FLAMMABLE GAS	1	A6.16
	ARTICLES, EXPLOSIVE, EXTREMELY INSENSITIVE; (ARTICLES, EEI)	1.6N	UN0486	II	EXPLOSIVE	101	A5.10

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	ARTICLES, EXPLOSIVE, N.O.S.	1.4S	UN0349	II	EXPLOSIVE	101	A5.11
	ARTICLES, EXPLOSIVE, N.O.S.	1.4B	UN0350	II	EXPLOSIVE	101	A5.11
	ARTICLES, EXPLOSIVE, N.O.S.	1.4C	UN0351	II	EXPLOSIVE	101	A5.11
	ARTICLES, EXPLOSIVE, N.O.S.	1.4D	UN0352	II	EXPLOSIVE	101	A5.11
	ARTICLES, EXPLOSIVE, N.O.S.	1.4G	UN0353	II	EXPLOSIVE	101	A5.11
†	ARTICLES, EXPLOSIVE, N.O.S.	1.1L	UN0354	II	EXPLOSIVE	101	A5.11
❑	ARTICLES, EXPLOSIVE, N.O.S.	1.2L	UN0355	II	EXPLOSIVE	101	A5.11
❑	ARTICLES, EXPLOSIVE, N.O.S.	1.3L	UN0356	II	EXPLOSIVE	101	A5.11
†	ARTICLES, EXPLOSIVE, N.O.S.	1.1C	UN0462	II	EXPLOSIVE	101	A5.11
†	ARTICLES, EXPLOSIVE, N.O.S.	1.1D	UN0463	II	EXPLOSIVE	101	A5.11
†	ARTICLES, EXPLOSIVE, N.O.S.	1.1E	UN0464	II	EXPLOSIVE	101	A5.11
†	ARTICLES, EXPLOSIVE, N.O.S.	1.1F	UN0465	II	EXPLOSIVE	101	A5.11

❑	ARTICLES, EXPLOSIVE, N.O.S.	1.2C	UN0466	II	EXPLOSIVE	101	A5.11
❑	ARTICLES, EXPLOSIVE, N.O.S.	1.2D	UN0467	II	EXPLOSIVE	101	A5.11
❑	ARTICLES, EXPLOSIVE, N.O.S.	1.2E	UN0468	II	EXPLOSIVE	101	A5.11
❑	ARTICLES, EXPLOSIVE, N.O.S.	1.2F	UN0469	II	EXPLOSIVE	101	A5.11
❑	ARTICLES, EXPLOSIVE, N.O.S.	1.3C	UN0470	II	EXPLOSIVE	101	A5.11
	ARTICLES, EXPLOSIVE, N.O.S.	1.4E	UN0471	II	EXPLOSIVE	101	A5.11
	ARTICLES, EXPLOSIVE, N.O.S.	1.4F	UN0472	II	EXPLOSIVE	101	A5.11
	ARTICLES, PRESSURED HYDRAULIC containing nonflammable gas	2.2	UN3164		NONFLAM-MABLE GAS		A6.10
	ARTICLES, PRESSURIZED, PNEUMATIC containing nonflammable gas	2.2	UN3164		NONFLAM-MABLE GAS		A6.10
❑	ARTICLES, PYROPHORIC	1.2L	UN0380	II	EXPLOSIVE		A5.11
†	ARTICLES, PYROTECHNIC for technical purposes	1.1G	UN0428	II	EXPLOSIVE		A5.12
❑	ARTICLES, PYROTECHNIC for technical purposes	1.2G	UN0429	II	EXPLOSIVE		A5.12
❑	ARTICLES, PYROTECHNIC for technical purposes	1.3G	UN0430	II	EXPLOSIVE		A5.12
	ARTICLES, PYROTECHNIC for technical purposes	1.4G	UN0431	II	EXPLOSIVE		A5.12
	ARTICLES, PYROTECHNIC for technical purposes	1.4S	UN0432	II	EXPLOSIVE		A5.12
	Asbestos; see BLUE ASBESTOS, WHITE ASBESTOS, or BROWN ASBESTOS, etc.						
	Ascaridole (organic peroxide)	FORBIDDEN					FORBIDDEN
	Asphalt, cut back; see TARS, LIQUID, etc.						
D	ASPHALT, at or above its flashpoint	NOT ACCEPTED					NOT ACCEPTED

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	Automobile, motorcycle, tractor, or other self-propelled vehicle, engine, or other mechanical apparatus; see ENGINES, INTERNAL COMBUSTION or BATTERY-POWERED VEHICLE						
	Azaurolic acid (salt of) (dry)	FORBIDDEN					FORBIDDEN
	Azidodithiocarbonic acid	FORBIDDEN					FORBIDDEN
	Azidoethyl nitrate	FORBIDDEN					FORBIDDEN
	Azido guanidine picrate (dry)	FORBIDDEN					FORBIDDEN
	5-Azido-1-hydroxy tetrazole	FORBIDDEN					FORBIDDEN
	Azido hydroxy tetrazole (mercury	FORBIDDEN					FORBIDDEN

	and silver salts)						
	3-Azido-1, 2-propylene glycol dinitrate	FORBIDDEN					FORBIDDEN
	1-Aziridinyl phosphine oxide-(tris); see TRI-(1-AZIRIDINYL) PHOSPHINE OXIDE, SOLUTION 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					FORBIDDEN
	BARIUM	4.3	UN1400	II	DANGEROUS WHEN WET	A19	A8.4

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	BARIUM ALLOYS, PYROPHORIC	4.2	UN1854	I	SPONTANE-OUSLY COM-BUSTIBLE		A8.6
	BARIUM AZIDE, dry or wetted with less than 50% water, by mass	1.1A	UN0224	II	EXPLOSIVE, POISON	111,117	A5.13
	BARIUM AZIDE, wetted with not less than 50% water, by mass	4.1	UN1571	I	FLAMMABLE SOLID, POISON	A2	A8.11
	BARIUM BROMATE	5.1	UN2719	II	OXIDIZER, POISON		A9.8

	BARIUM CHLORATE	5.1	UN1445	II	OXIDIZER, POISON	A9,N34	A9.8
*	BARIUM COMPOUNDS, N.O.S.	6.1	UN1564	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.6
†	BARIUM CYANIDE	6.1	UN1565	I	POISON	N74,N75	A10.6
	BARIUM HYPOCHLORITE with more than 22% available chlorine	5.1	UN2741	II	OXIDIZER, POISON	A7,A9, N34	A9.8
	BARIUM NITRATE	5.1	UN1446	II	OXIDIZER, POISON		A9.8
	BARIUM OXIDE	6.1	UN1884	III	KEEP AWAY FROM FOOD		A10.6
	BARIUM PERCHLORATE	5.1	UN1447	II	OXIDIZER, POISON		A9.8
†	BARIUM PERMANGANATE	5.1	UN1448	II	OXIDIZER, POISON		A9.8
	BARIUM PEROXIDE	5.1	UN1449	II	OXIDIZER, POISON		A9.8
	Barium selenate; see SELENATES						
	Barium selenite; see SELENITES						
D	BARIUM STYPHNATE	1.1A	NA0473	II	EXPLOSIVE	111,117	A5.13
	BATTERIES, DRY, CONTAINING POTASSIUM HYDROXIDE SOLID, electric storage	8	UN3028	III	CORROSIVE		A12.4

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	BATTERIES, WET, FILLED WITH ACID, electric storage	8	UN2794	III	CORROSIVE		A12.5
	BATTERIES, WET, FILLED WITH ALKALI, electric storage	8	UN2795	III	CORROSIVE		A12.5
	BATTERIES, WET, NONSPILLABLE, electric storage	8	UN2800	III	CORROSIVE		A12.5
	BATTERY FLUID, ALKALI	8	UN2797	II	CORROSIVE	N6	A12.3,A12.5
	BATTERY FLUID, ACID	8	UN2796	II	CORROSIVE	A3,A7, N6,N34	A12.3, 12.5

	Battery lithium type; see LITHIUM BATTERIES						
	BATTERY-POWERED EQUIPMENT (wet battery)	9	ID8040		CLASS 9		A13.6
	BATTERY-POWERED VEHICLE (wet battery)	9	ID8039		CLASS 9		A13.6
	Battery, wet, with wheelchair; see WHEELCHAIR, ELECTRIC						
❑	BENZENE	3	UN1114	II	FLAMMABLE LIQUID		A7.3
	benzene diazonium chloride (dry)	FORBIDDEN					FORBIDDEN
	benzene diazonium nitrate (dry)	FORBIDDEN					FORBIDDEN
	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						
	BENZENESULPHONYL CHLORIDE	8	UN2225	III	CORROSIVE		A12.3
	benzenethiol; see PHENYL MERCAPTAN						
	benzene triozonide	FORBIDDEN					FORBIDDEN
	BENZIDINE	6.1	UN1885	II	POISON		A10.6

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
*	BENZOIC DERIVATIVE PESTICIDES, LIQUID, FLAMMABLE, TOXIC, N.O.S., flashpoint less than 23 degrees C	3	UN2770	I	FLAMMABLE LIQUID, POISON		A7.3
				II	FLAMMABLE LIQUID, POISON		
*	BENZOIC DERIVATIVE PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S., flashpoint	6.1	UN3003	I	POISON, FLAMMABLE		A10.5

	not less than 23 degrees C				LIQUID		
				II	POISON FLAMMABLE LIQUID		
				III	KEEP AWAY FROM FOOD, FLAMMABLE LIQUID		
*	BENZOIC DERIVATIVE PESTICIDES, LIQUID, TOXIC, N.O.S.	6.1	UN3004	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.5
*	BENZOIC DERIVATIVE PESTICIDES, SOLID, TOXIC, N.O.S.	6.1	UN2769	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.6
	benzol; see BENZENE						
	BENZONITRILE	6.1	UN2224	II	POISON		A10.5
	BENZOQUINONE	6.1	UN2587	II	POISON		A10.6
	BENZOTRICHLORIDE	8	UN2226	II	CORROSIVE		A12.3
	BENZOTRIFLUORIDE	3	UN2338	II	FLAMMABLE LIQUID		A7.3
	benzoxidiazoles (dry)	FORBIDDEN					FORBIDDEN
	benzoyl azide	FORBIDDEN					FORBIDDEN
❑	BENZOYL CHLORIDE	8	UN1736	II	CORROSIVE		A12.3
†	BENZYL BROMIDE	6.1	UN1737	II	POISON, CORROSIVE	A3,A7, N34,N33	A10.5
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
†	BENZYL CHLORIDE	6.1	UN1738	II	POISON, CORROSIVE	A3,A7, N43,N33	A10.5
†	BENZYL CHLOROFORMATE	8	UN1739	I	CORROSIVE	A3,A6,N41	A12.3
	BENZYLDIMETHYLAMINE	8	UN2619	II	CORROSIVE		A12.3
	4-(benzyl(ethyl)amino)-3-ethoxybenzenediazonium zinc chloride see SELF-REACTIVE SOLID						

	TYPE D						
	BENZYLIDENE CHLORIDE	6.1	UN1886	II	POISON		A10.5
	BENZYL IODIDE	6.1	UN2653	II	POISON		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	POISON		A10.6
				III	KEEP AWAY FROM FOOD		
	BERYLLIUM NITRATE	5.1	UN2464	II	OXIDIZER		A9.8
	BERYLLIUM, POWDER	6.1	UN1567	II	POISON, FLAMMABLE SOLID		A10.6
*	BIFLUORIDES, N.O.S., solid	8	UN1740	II	CORROSIVE	N3,N34	A12.4
				III	CORROSIVE		
*	BIFLUORIDES, N.O.S., solutions	8	UN1740	II	CORROSIVE	N3,N34	A12.3
				III	CORROSIVE		
	biphenyl triozonide	FORBIDDEN					FORBIDDEN
*	BIPYRIDILIUM PESTICIDES, LIQUID, FLAMMABLE,TOXIC, N.O.S., flashpoint less than 23 degrees C	3	UN2782	I	FLAMMABLE LIQUID, POISON		A7.3
				II	FLAMMABLE LIQUID, POISON		

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
*	BIPYRIDILIUM PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S., flashpoint not less than 23 degrees C	6.1	UN3015	I	POISON, FLAMMABLE LIQUID		A10.5
				II	POISON, FLAMMABLE LIQUID		

				III	KEEP AWAY FROM FOOD, FLAMMABLE LIQUID		
*	BIPYRIDILIUM PESTICIDES, LIQUID, TOXIC, N.O.S.	6.1	UN3016	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.5
*	BIPYRIDILIUM PESTICIDES, SOLID, TOXIC, N.O.S.	6.1	UN2781	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.6
	bis (aminopropyl) piperazine; see CORROSIVE LIQUID, N.O.S.						
	BISULPHITES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.	8	UN2693	III	CORROSIVE		A12.3
†	BLACK POWDER or GUNPOWDER, COMPRESSED; or BLACK POWDER or GUNPOWDER IN PELLETS	1.1D	UN0028	II	EXPLOSIVE		A5.14
†	BLACK POWDER or GUNPOWDER, granular or as a meal	1.1D	UN0027	II	EXPLOSIVE		A5.14
†	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.						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	BLUE ASBESTOS (crocidolite) or BROWN ASBESTOS (amosite, mysorite)	9	UN2212	II	CLASS 9		A13.12
	BOMBS, PHOTO-FLASH	1.1F	UN0037	II	EXPLOSIVE		A5.15
	BOMBS, PHOTO-FLASH	1.1D	UN0038	II	EXPLOSIVE		A5.15
	BOMBS, PHOTO-FLASH	1.2G	UN0039	II	EXPLOSIVE		A5.15

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	BOMBS, PHOTO-FLASH	1.3G	UN0299	II	EXPLOSIVE		A5.15
	BOMBS, SMOKE, NONEXPLOSIVE, with corrosive liquid, without initiating device	8	UN2028	II	CORROSIVE		A12.6
†	BOMBS, with bursting charge	1.1F	UN0033	II	EXPLOSIVE		A5.15
†	BOMBS, with bursting charge	1.1D	UN0034	II	EXPLOSIVE		A5.15
†	BOMBS, with bursting charge	1.2D	UN0035	II	EXPLOSIVE		A5.15
†	BOMBS, with bursting charge	1.2F	UN0291	II	EXPLOSIVE		A5.15
	BOMBS WITH FLAMMABLE LIQUID, with bursting charge	1.1J	UN0399	II	EXPLOSIVE		A5.16
	BOMBS WITH FLAMMABLE LIQUID, with bursting charge	1.2J	UN0400	II	EXPLOSIVE		A5.16
❑	BOOSTERS WITH DETONATOR	1.1B	UN0225	II	EXPLOSIVE		A5.17
D	BOOSTERS WITH DETONATOR	1.2B	UN0268	II	EXPLOSIVE		A5.17
D	BOOSTERS WITH DETONATOR	1.4B	NA0350	II	EXPLOSIVE	115	A5.17
	BOOSTERS, without detonator	1.1D	UN0042	II	EXPLOSIVE		A5.18
	BOOSTERS, without detonator	1.2D	UN0283	II	EXPLOSIVE		A5.18
	Borate and chlorate mixtures; see CHLORATE AND BORATE MIXTURES						
	BORNEOL	4.1	UN1312	III	FLAMMABLE SOLID	A1	A8.4
†	BORON TRIBROMIDE	8	UN2692	I	CORROSIVE, POISON	2,A3,A7, N34	A12.12
†	BORON TRICHLORIDE	2.3	UN1741		POISON GAS, CORROSIVE	1	A6.5
†	BORON TRIFLUORIDE	2.3	UN1008		POISON GAS	2	A6.7
†	BORON TRIFLUORIDE ACETIC ACID COMPLEX	8	UN1742	II	CORROSIVE		A12.3
	BORON TRIFLUORIDE DIETHYL ETHERATE	8	UN2604	I	CORROSIVE, FLAMMABLE LIQUID	A19	A12.3
	BORON TRIFLUORIDE DIHYDRATE	8	UN2851	II	CORROSIVE		A12.4
	BORON TRIFLUORIDE DIMETHYL ETHERATE	4.3	UN2965	I	DANGEROUS WHEN WET, CORROSIVE,	A19	A8.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
					FLAMMABLE LIQUID		
	BORON TRIFLUORIDE PROPIONIC ACID COMPLEX	8	UN1743	II	CORROSIVE		A12.3
	Box toe gum; see NITROCELLULOSE						
	BRAKE FLUID, hydraulic	3	UN1118	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
*	BROMATES, INORGANIC, N.O.S.	5.1	UN1450	II	OXIDIZER		A9.8
†	BROMINE CHLORIDE	2.3	UN2901		POISON GAS, CORROSIVE, OXIDIZER	2	A6.5
†	BROMINE	8	UN1744	I	CORROSIVE, POISON	1,A3,A6, N34,N43	A12.12
	Bromine azide	FORBIDDEN					FORBIDDEN
†	BROMINE PENTAFLUORIDE	5.1	UN1745	I	OXIDIZER, POISON, CORROSIVE	1	A9.11
†	BROMINE SOLUTIONS	8	UN1744	I	CORROSIVE, POISON	1,N34	A12.12
†	BROMINE TRIFLUORIDE	5.1	UN1746	I	OXIDIZER, POISON, CORROSIVE	2	A9.11
	BROMOACETIC ACID, solid	8	UN1938	II	CORROSIVE	A7,N34	A12.4
	BROMOACETIC ACID, solution	8	UN1938	II	CORROSIVE		A12.3
†	BROMOACETONE	6.1	UN1569	II	POISON, CORROSIVE	2	A10.4
	BROMOACETYL BROMIDE	8	UN2513	II	CORROSIVE		A12.3
	BROMOBENZENE	3	UN2514	III	FLAMMABLE LIQUID		A7.3
	BROMOBENZYL CYANIDES, liquid	6.1	UN1694	I	POISON		A10.5
	BROMOBENZYL CYANIDES, solid	6.1	UN1694	I	POISON		A10.6
	2-BROMOBUTANE	3	UN2339	II	FLAMMABLE LIQUID		A7.3

	BROMOCHLOROMETHANE	6.1	UN1887	III	KEEP AWAY FROM FOOD		A10.5
	4-Bromo-1,2-dinitrobenzene	FORBIDDEN					FORBIDDEN
	4-Bromo-1,2-dinitrobenzene (unstable at 59 degrees C)	FORBIDDEN					FORBIDDEN
	2-BROMOETHYL ETHYL ETHER	3	UN2340	II	FLAMMABLE		A7.3
	BROMOFORM	6.1	UN2515	III	KEEP AWAY FROM FOOD		A10.5
	1-BROMO-3-CHLOROPROPANE	6.1	UN2688	III	KEEP AWAY FROM FOOD		A10.5
	1-BROMO-3-METHYLBUTANE	3	UN2341	III	FLAMMABLE LIQUID		A7.3
	BROMOMETHYLPROPANES	3	UN2342	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
	1-bromo-3-nitrobenzene (unstable at 56 degrees C)	FORBIDDEN					FORBIDDEN
	2-BROMOPENTANE	3	UN2343	II	FLAMMABLE LIQUID		A7.3
	2-BROMOPROPANE	3	UN2344	II	FLAMMABLE LIQUID		A7.3
	3-BROMOPROPYNE	3	UN2345	II	FLAMMABLE LIQUID		A7.3
	Bromosilane	FORBIDDEN					FORBIDDEN
	Bromotoluene-alpha; see BENZYL BROMIDE						
	BROMOTRIFLUOROETHYLENE	2.1	UN2419		FLAMMABLE GAS		A6.3,A6.5
	BROMOTRIFLUOROMETHANE (R13B1)	2.2	UN1009		NONFLAM-MABLE GAS		A6.3,A6.5
†	BRUCINE	6.1	UN157O	I	POISON		A10.6
†	BURSTERS, explosive	1.1D	UN0043	II	EXPLOSIVE		A5.19
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	BUTADIENE, INHIBITED	2.1	UN1010		FLAMMABLE GAS		A6.3,A6.5

	BUTANE or BUTANE MIXTURES; see also PETROLEUM GASES, LIQUEFIED	2.1	UN1011		FLAMMABLE GAS		A6.3,A6.8
	Butane, butane mixtures and mixtures having similar properties in cartridges each not exceeding 5OO grams; see RECEPTACLES, SMALL, CONTAINING GAS, etc.						
	BUTANEDIONE	3	UN2346	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
	1,2,4-butanetriol trinitrate	FORBIDDEN					FORBIDDEN
	BUTANOLS	3	UN1120	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
	tert-butoxycarbonyl azide	FORBIDDEN					FORBIDDEN
	BUTOXYL	3	UN2708	III	FLAMMABLE LIQUID		A7.3
	BUTYL ACETATES	3	UN1123	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
	BUTYL ACID PHOSPHATE	8	UN1718	III	CORROSIVE		A12.3
	BUTYL ACRYLATE	3	UN2348	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
	Butyl alcohols; see BUTANOLS						
	N-BUTYLAMINE	3	UN1125	II	FLAMMABLE LIQUID		A7.3
	N-BUTYLANILINE	6.1	UN2738	II	POISON		A10.5
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	BUTYL BENZENES	3	UN2709	III	FLAMMABLE		A7.3

					LIQUID		
	N-BUTYL BROMIDE	3	UN1126	II	FLAMMABLE LIQUID		A7.3
	n-Butyl chloride; see CHLOROBUTANES						
❑	N-BUTYL CHLOROFORMATE	6.1	UN2743	II	POISON, CORROSIVE	2	A10.7
D❑	SEC-BUTYL CHLOROFORMATE	6.1	NA2742	I	POISON, FLAMMABLE LIQUID, CORROSIVE	2	A10.7
	TERT-BUTYLCYCLOHEXYL CHLOROFORMATE	6.1	UN2747	III	KEEP AWAY FROM FOOD		A10.7
	BUTYLENE; see also PETROLEUM GASES, LIQUEFIED	2.1	UN1012		FLAMMABLE GAS		A6.3,A6.8
	1,2-BUTYLENE OXIDE, STABILIZED	3	UN3022	II	FLAMMABLE LIQUID		A7.3
	butyl ethers; see DIBUTYL ETHERS						
	butyl ethyl ether; see ETHYL BUTYL ETHER						
	N-BUTYL FORMATE	3	UN1128	II	FLAMMABLE LIQUID		A7.3
	tert-butyl hydroperoxide, more than 90% with water	FORBIDDEN					FORBIDDEN
	N-n-BUTYL IMIDAZOLE	6.1	UN2690	II	POISON		A10.5
†	TERT-BUTYL ISOCYANATE	3	UN2484	I	FLAMMABLE LIQUID, POISON	1,A7	A7.6
†	N-BUTYL ISOCYANATE	3	UN2485	II	FLAMMABLE LIQUID, POISON	1,A7	A7.6
	BUTYL MERCAPTANS	3	UN2347	II	FLAMMABLE LIQUID	A3	A7.3
	N-BUTYL METHACRYLATE	3	UN2227	III	FLAMMABLE LIQUID		A7.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)

	BUTYL METHYL ETHER	3	UN2350	II	FLAMMABLE LIQUID		A7.3
	BUTYL NITRITES	3	UN2351	I	FLAMMABLE LIQUID		A7.3
				II	FLAMMABLE LIQUID		
				III	FLAMMABLE LIQUID		
	tert-butyl peroxyacetate, more than 76% in solution	FORBIDDEN					FORBIDDEN
	n-butyl peroxydicarbonate, more than 52% in solution	FORBIDDEN					FORBIDDEN
	tert-butyl peroxyisobutyrate, more than 77% in solution	FORBIDDEN					FORBIDDEN
	BUTYLPHENOLS, LIQUID	6.1	UN2228	III	KEEP AWAY FROM FOOD		A10.5
	BUTYLPHENOLS, SOLID	6.1	UN2229	III	KEEP AWAY FROM FOOD		A10.6
	Butyl phosphoric acid; see BUTYL ACID PHOSPHATE						
	BUTYLPROPIONATE	3	UN1914	III	FLAMMABLE LIQUID		A7.3
	BUTYLTOLUENES	6.1	UN2667	III	KEEP AWAY FROM FOOD		A10.5
†	BUTYLTRICHLOROSILANE	8	UN1747	II	CORROSIVE	A7,N34	A12.3
	5-TERT-BUTYL-2,4,6-TRINITRO-M-XYLENE or MUSK XYLENE	4.1	UN2956	III	FLAMMABLE SOLID		A8.5
	BUTYL VINYL ETHER, INHIBITED	3	UN2352	II	FLAMMABLE LIQUID		A7.3
	1,4-BUTYLNEDIOL	6.1	UN2716	III	KEEP AWAY FROM FOOD	A1	A10.6
	BUTYRALDEHYDE	3	UN1129	II	FLAMMABLE LIQUID		A7.3
	BUTYRALDOXIME	3	UN2840	III	FLAMMABLE LIQUID		A7.3
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**

SYM-BOL	PROPER SHIPPING NAME/DESCRIPTION	HAZARD CLASS/DIV	UN/ID NUMBER	PG	LABELS	SPECIAL PROVISION	PACKAGING PARAGRAPH
	BUTYRIC ACID	8	UN2820	III	CORROSIVE		A12.3
	BUTYRIC ANHYDRIDE	8	UN2739	III	CORROSIVE		A12.3
	BUTYRONITRILE	3	UN2411	II	FLAMMABLE LIQUID, POISON		A7.3
	BUTYRYL CHLORIDE	3	UN2353	II	FLAMMABLE LIQUID, CORROSIVE		A7.3
	Cabazide	FORBIDDEN					FORBIDDEN
	Cable cutters, explosive; see CUTTERS, CABLE, EXPLOSIVE						
	CACODYLIC ACID	6.1	UN1572	II	POISON		A10.6
	CADMIUM COMPOUNDS	6.1	UN2570	I	POISON		A10.6
				II	POISON		
				III	KEEP AWAY FROM FOOD		
❑	CAESIUM or CESIUM	4.3	UN1407	I	DANGEROUS WHEN WET	A19,N34, N40	A8.4
	CAESIUM HYDROXIDE	8	UN2682	II	CORROSIVE		A12.4
	CAESIUM HYDROXIDE SOLUTION	8	UN2681	II	CORROSIVE		A12.3
	CAESIUM NITRATE	5.1	UN1451	III	OXIDIZER		
	Caffeine; see ALKALOIDS, etc.						
	Cajeputene; see DIPENTENE						
	CALCIUM	4.3	UN1401	II	DANGEROUS WHEN WET		A8.4
	Calcium alloys; see ALKALINE EARTH METAL ALLOYS, N.O.S.						
	CALCIUM ARSENATE	6.1	UN1573	II	POISON		A10.6
	CALCIUM ARSENATE AND CALCIUM ARSENITE MIXTURES, SOLID	6.1	UN1574	II	POISON		A10.6
D	CALCIUM ARSENITE, SOLID	6.1	NA1574	II	POISON		A10.6
	Calcium bisulphite solutions; see BISULPHITES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.						

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	CALCIUM CARBIDE	4.3	UN1402	II	DANGEROUS WHEN WET	A1,A8, N34	A8.4
	CALCIUM CHLORATE	5.1	UN1452	II	OXIDIZER	N34	A9.8
	CALCIUM CHLORATE, AQUEOUS SOLUTION	5.1	UN2429	II	OXIDIZER	A2,N41	A9.7
	CALCIUM CHLORITE	5.1	UN1453	II	OXIDIZER	A9,N34	A9.8
	CALCIUM CYANAMIDE with more than 0.1% of calcium carbide	4.3	UN1403	III	DANGEROUS WHEN WET	A1,A19	A8.4
	CALCIUM CYANIDE	6.1	UN1575	I	POISON	N79,N80	A10.6
	CALCIUM DITHIONITE or CALCIUM HYDROSULPHITE	4.2	UN1923	II	SPONTANE-OUSLY COM-BUSTIBLE	A19,A20	A8.4
❑	CALCIUM HYDRIDE	4.3	UN1404	I	DANGEROUS WHEN WET	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	OXIDIZER	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	OXIDIZER		A9.8
	CALCIUM HYPOCHLORITE MIXTURES, DRY with more than 10%, but not more than 39% available chlorine	5.1	UN2208	III	OXIDIZER	A1,A29, N34	A9.8
	CALCIUM MANGANESE SILICON	4.3	UN2844	III	DANGEROUS WHEN WET	A1,A19	A8.4
	CALCIUM NITRATE	5.1	UN1454	III	OXIDIZER		A9.8
	CALCIUM OXIDE	8	UN1910	III	CORROSIVE		A12.4
	CALCIUM PERCHLORATE	5.1	UN1455	II	OXIDIZER		A9.8
	CALCIUM PERMANGANATE	5.1	UN1456	II	OXIDIZER		A9.8
	CALCIUM PEROXIDE	5.1	UN1457	II	OXIDIZER		A9.8

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
❑	CALCIUM PHOSPHIDE	4.3	UN1360	I	DANGEROUS WHEN WET, POISON	A8,A19, N40	A8.4
†	CALCIUM, PYROPHORIC or CALCIUM ALLOYS, PYROPHORIC	4.2	UN1855	I	SPONTANE-OUSLY COM-BUSTIBLE		A8.12
	CALCIUM RESINATE	4.1	UN1313	III	FLAMMABLE SOLID	A1,A19	A8.4
	CALCIUM RESINATE, FUSED	4.1	UN1314	III	FLAMMABLE SOLID	A1,A19	A8.3
	calcium selenate; see SELENATES						
	calcium selenite; see SELENITES						
	CALCIUM SILICIDE	4.3	UN1405	II	DANGEROUS WHEN WET	A19	A8.4
				III	DANGEROUS WHEN WET	A1,A19	
	Calcium superoxide; see CALCIUM PEROXIDE						
	Calor gas; see HYDROCARBON GASES, etc.						
	Camphanone; see CAMPHOR, synthetic						
	CAMPHOR OIL	3	UN1130	III	FLAMMABLE LIQUID		A7.3
	CAMPHOR, synthetic	4.1	UN2717	III	FLAMMABLE SOLID	A1	A8.4
	Camping gas; see RECEPTACLES, SMALL, CONTAINING GAS						
	Candles, gas; see LIGHTERS						
	Cannon primers; see PRIMERS, TUBULAR						
	CAPROIC ACID	8	UN2829	III	CORROSIVE		A12.3
	Caps, blasting; see DETONATORS, etc.						
	Caps, prime; see PRIMERS, CAP TYPE						
†*	CARBAMATE PESTICIDES, LIQUID, FLAMMABLE, TOXIC, N.O.S., flashpoint less than 23 degrees C	3	UN2758	I	FLAMMABLE LIQUID, POISON		A7.3
				II	FLAMMABLE		

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
					LIQUID, POISON		
*	CARBAMATE PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S., flashpoint not less than 23 degrees C	6.1	UN2991	I II III	POISON, FLAMMABLE LIQUID POISON FLAMMABLE LIQUID KEEP AWAY FROM FOOD, FLAMMABLE LIQUID		A10.5
*	CARBAMATE PESTICIDES, LIQUID, TOXIC, N.O.S.	6.1	UN2992	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.5
*	CARBAMATE PESTICIDES, SOLID, TOXIC, N.O.S.	6.1	UN2757	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.6
	Carbolic acid; see PHENOL, SOLID, or PHENOL, MOLTEN						
	Carbolic acid solutions; see PHENOL SOLUTIONS						
	CARBON, ACTIVATED	4.2	UN1362	III	SPONTANE-OUSLY COM-BUSTIBLE		A8.4
†	CARBON, animal or vegetable origin	4.2	UN1361	III	SPONTANE-OUSLY COM-BUSTIBLE		A8.4
	Carbon bisulphide; see CARBON DISULPHIDE						
	Carbon black (animal or vegetable origin); see CARBON						
	CARBON DIOXIDE	2.2	UN1013		NONFLAM-MABLE GAS		A6.3,A6.5,A6.7

❑	CARBON DIOXIDE AND ETHYLENE OXIDE MIXTURES with more than 6% ethylene oxide	2.3	UN1041		POISON GAS, FLAMMABLE GAS	6	A6.5
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	CARBON DIOXIDE AND ETHYLENE OXIDE MIXTURES with not more than 6% ethylene oxide	2.2	UN1952		NONFLAM-MABLE GAS		A6.5
	CARBON DIOXIDE AND NITROUS OXIDE MIXTURES	2.2	UN1015		NONFLAM-MABLE GAS		A6.3,A6.5
	CARBON DIOXIDE AND OXYGEN MIXTURES	2.2	UN1014		NONFLAM-MABLE GAS		A6.3,A6.5
	CARBON DIOXIDE, REFRIGERATED LIQUID (cryogenic liquid)	2.2	UN2187		NONFLAM-MABLE GAS		A6.3,A6.12
	CARBON DIOXIDE, SOLID or DRY ICE	9	UN1845	III	CLASS 9		A13.9
	CARBON DISULPHIDE	NOT ACCEPTED					NOT ACCEPTED
❑	CARBON MONOXIDE	2.3	UN1016		POISON GAS, FLAMMABLE LIQUID	4	A6.7
†	CARBON MONOXIDE AND HYDROGEN MIXTURE	2.3	UN2600		POISON GAS, FLAMMABLE GAS	5	A6.7
D†	CARBON MONOXIDE, REFRIGERATED LIQUID (cryogenic liquid)	2.3	NA9202		POISON GAS, FLAMMABLE GAS	4	A6.12
	Carbon oxysulphide; see CARBONYL SULPHIDE						
	CARBON TETRABROMIDE	6.1	UN2516	III	KEEP AWAY FROM FOOD		A10.6
	CARBON TETRACHLORIDE	6.1	UN1846	II	POISON	N36	A10.5
	Carbonyl chloride; see PHOSGENE						
†	CARBONYL FLUORIDE	2.3	UN2417		POISON GAS	2	A6.7
❑	CARBONYL SULPHIDE	2.3	UN2204		POISON GAS, FLAMMABLE GAS	2	A6.5
	Cartridge cases, empty primed; see CASES, CARTRIDGE,						

EMPTY WITH PRIMER

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	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	II	EXPLOSIVE		A5.20
❑	CARTRIDGES, FLASH	1.3G	UN0050	II	EXPLOSIVE		A5.20
†	CARTRIDGES FOR WEAPONS, BLANK	1.1C	UN0326	II	EXPLOSIVE		A5.21
❑	CARTRIDGES FOR WEAPONS, BLANK	1.2C	UN0413	II	EXPLOSIVE		A5.21
❑	CARTRIDGES FOR WEAPONS, BLANK; or CARTRIDGES, SMALL ARMS, BLANK	1.3C	UN0327	II	EXPLOSIVE		A5.21
	CARTRIDGES FOR WEAPONS, BLANK; or CARTRIDGES, SMALL ARMS, BLANK	1.4C	UN0338	II	EXPLOSIVE		A5.21
	CARTRIDGES FOR WEAPONS, BLANK; or CARTRIDGES, SMALL ARMS, BLANK	1.4S	UN0014	II	EXPLOSIVE	112	A5.21
❑	CARTRIDGES FOR WEAPONS, INERT PROJECTILE or CARTRIDGES, SMALL ARMS	1.2C	UN0328	II	EXPLOSIVE		A5.21
	CARTRIDGES FOR WEAPONS, INERT PROJECTILE or CARTRIDGES, SMALL ARMS,	1.4S	UN0012	II	EXPLOSIVE	112	A5.21
	CARTRIDGES FOR WEAPONS, INERT PROJECTILE or CARTRIDGES, SMALL ARMS	1.4C	UN0339	II	EXPLOSIVE		A5.21
❑	CARTRIDGES FOR WEAPONS, INERT PROJECTILE or CARTRIDGES, SMALL ARMS	1.3C	UN0417	II	EXPLOSIVE		A5.21
†	CARTRIDGES FOR WEAPONS, with bursting charge	1.1F	UN0005	II	EXPLOSIVE		A5.21
❑	CARTRIDGES FOR WEAPONS, with bursting charge	1.2F	UN0007	II	EXPLOSIVE		A5.21
	CARTRIDGES FOR WEAPONS, with bursting charge	1.4F	UN0348	II	EXPLOSIVE		A5.21
	CARTRIDGES FOR WEAPONS, with bursting charge	1.4E	UN0412	II	EXPLOSIVE		A5.21
†	CARTRIDGES FOR WEAPONS, with bursting charge	1.1E	UN0006	II	EXPLOSIVE		A5.21
❑	CARTRIDGES FOR WEAPONS, with bursting charge	1.2E	UN0321	II	EXPLOSIVE		A5.21
	Cartridges, illuminating; see AMMUNITION,						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	ILLUMINATING, etc.						
❑	CARTRIDGES, OIL WELL	1.3C	UN0277	II	EXPLOSIVE		A5.22
	CARTRIDGES, OIL WELL	1.4C	UN0278	II	EXPLOSIVE		A5.22
❑	CARTRIDGES, POWER DEVICE	1.3C	UN0275	II	EXPLOSIVE		A5.23
	CARTRIDGES, POWER DEVICE	1.4C	UN0276	II	EXPLOSIVE	110	A5.23
❑	CARTRIDGES, POWER DEVICE	1.2C	UN0381	II	EXPLOSIVE		A5.23
	CARTRIDGES, POWER DEVICE	1.4S	UN0323	II	EXPLOSIVE	110,112	A5.23
	Cartridges, safety; see CARTRIDGES, FOR WEAPONS, INERT PROJECTILES						
	Cartridges, safety, blank; see CARTRIDGES FOR WEAPONS, BLANK						
❑	CARTRIDGES, SIGNAL	1.3G	UN0054	II	EXPLOSIVE		A5.20
	CARTRIDGES, SIGNAL	1.4G	UN0312	II	EXPLOSIVE		A5.20
	CARTRIDGES, SIGNAL	1.4S	UN0405	II	EXPLOSIVE		A5.20
	CARTRIDGES, SMALL ARMS; see CARTRIDGES FOR WEAPONS, INERT PROJECTILE						
	CARTRIDGES, SMALL ARMS, BLANK; see CARTRIDGES FOR WEAPONS, BLANK						
	Cartridges, sporting; see CARTRIDGES FOR WEAPONS, INERT PROJECTILE						
	Cartridges, starter, jet engine; see CARTRIDGES, POWER DEVICE						
	CASES, CARTRIDGE, EMPTY WITH PRIMER	1.4S	UN0055	II	EXPLOSIVE		A5.24
	CASES, CARTRIDGE, EMPTY WITH PRIMER	1.4C	UN0379	II	EXPLOSIVE		A5.24
❑	CASES, COMBUSTIBLE, EMPTY, WITHOUT PRIMER	1.3C	UN0447	II	EXPLOSIVE		A5.24
	CASES, COMBUSTIBLE, EMPTY, WITHOUT PRIMER	1.4C	UN0446	II	EXPLOSIVE		A5.24
	Casinghead gasoline; see NATURAL GASOLINE						
	CASTOR BEANS or CASTOR MEAL or CASTER POMACE or CASTOR FLAKE	9	UN2969	II	CLASS 9		A13.3
	CAUSTIC ALKALI LIQUIDS, N.O.S.	8	UN1719	I	CORROSIVE	A7	A12.3
				II	CORROSIVE		
				III	CORROSIVE		
	Caustic antimony; see ANTIMONY TRICHLORIDE						
	Caustic arsenic chloride; see						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	ARSENIC TRICHLORIDE						
	Caustic oil of arsenic; see ARSENIC TRICHLORIDE						
	Caustic potash; see POTASSIUM HYDROXIDE SOLUTION						
	Caustic soda liquor; see SODIUM HYDROXIDE SOLUTION						
	Cellosolve; see ETHYLENE GLYCOL MONOETHYL ETHER						
	Cellosolve acetate; see ETHYLENE GLYCOL MONOETHYL ETHER ACETATE						
	CELLULOID, in blocks, rods, rolls, sheets, tubes, etc. (except scrap)	4.1	UN2000	III	FLAMMABLE SOLID		A8.4
†	CELLULOID, SCRAP	4.2	UN2002	III	SPONTANE-OUSLY COM-BUSTIBLE		A8.4
	Cement, flammable; see ADHESIVES containing flammable liquid						
	CERIUM, slabs, ingots, or rods	4.1	UN1333	II	FLAMMABLE SOLID	N34	A8.4
	CERIUM, turnings or gritty powder	4.3	UN3078	II	DANGEROUS WHEN WET	A1	A8.4
	Cer mischmetall; see FERROCERIUM						
	CESIUM; see CAESIUM						
	CESIUM NITRATE or CAESIUM NITRATE	5.1	UN1451	III	OXIDIZER	A1,A29	A9.8
	Charcoal, activated; see CARBON, ACTIVATED						
D	CHARCOAL briquettes, shell, screenings, wood, etc.	4.2	NA1361	III	SPONTANE-OUSLY COM-BUSTIBLE		A8.4
	Charcoal, nonactivated; see CARBON						
	Charcoal screenings, wet	FORBIDDEN					FORBIDDEN
	Charcoal, wet	FORBIDDEN					FORBIDDEN
†	CHARGES, BURSTING, PLASTICS BONDED	1.1D	UN0457	II	EXPLOSIVE		A5.25

❑	CHARGES, BURSTING, PLASTICS BONDED	1.2D	UN0458	II	EXPLOSIVE		A5.25
	CHARGES, BURSTING, PLASTICS BONDED	1.4D	UN0459	II	EXPLOSIVE		A5.25
	CHARGES, BURSTING, PLASTICS BONDED	1.4S	UN0460	II	EXPLOSIVE		A5.25
†	CHARGES, DEMOLITION	1.1D	UN0048	II	EXPLOSIVE		A5.26
†	CHARGES, DEPTH	1.1D	UN0056	II	EXPLOSIVE		A5.27

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	Charges, expelling, explosive, for fire extinguishers; see CARTRIDGES, POWER DEVICE						
†	CHARGES, EXPLOSIVE, COMMERCIAL without detonator	1.1D	UN0442	II	EXPLOSIVE		A5.28
❑	CHARGES, EXPLOSIVE, COMMERCIAL without detonator	1.2D	UN0443	II	EXPLOSIVE		A5.28
	CHARGES, EXPLOSIVE, COMMERCIAL without detonator	1.4D	UN0444	II	EXPLOSIVE		A5.28
	CHARGES, EXPLOSIVE, COMMERCIAL without detonator	1.4S	UN0445	II	EXPLOSIVE		A5.28
❑	CHARGES, PROPELLING, FOR CANNON	1.2C	UN0414	II	EXPLOSIVE		A5.29
❑	CHARGES, PROPELLING, FOR CANNON	1.3C	UN0242	II	EXPLOSIVE		A5.29
†	CHARGES, PROPELLING, FOR CANNON	1.1C	UN0279	II	EXPLOSIVE		A5.29
†	CHARGES, PROPELLING, FOR ROCKET MOTORS	1.1C	UN0271	II	EXPLOSIVE		A5.30
❑	CHARGES, PROPELLING FOR ROCKET MOTORS	1.3C	UN0272	II	EXPLOSIVE		A5.30
❑	CHARGES, PROPELLING FOR ROCKET MOTORS	1.2C	UN0415	II	EXPLOSIVE		A5.30
†	CHARGES, PROPELLING, FOR ROCKET MOTORS, composite mixture	1.1C	UN0273	II	EXPLOSIVE		A5.30
❑	CHARGES, PROPELLING, FOR ROCKET MOTORS, composite mixture	1.3C	UN0274	II	EXPLOSIVE		A5.30
❑	CHARGES, PROPELLING, FOR ROCKET MOTORS, composite mixture	1.2C	UN0416	II	EXPLOSIVE		A5.30
❑	CHARGES, SHAPED, COMMERCIAL without detonator	1.2D	UN0439	II	EXPLOSIVE		A5.31
	CHARGES, SHAPED, COMMERCIAL without detonator	1.4D	UN0440	II	EXPLOSIVE		A5.31
	CHARGES, SHAPED, COMMERCIAL	1.4S	UN0441	II	EXPLOSIVE		A5.31

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	without detonator						
†	CHARGES, SHAPED, COMMERCIAL without detonator	1.1D	UN0059	II	EXPLOSIVE		A5.31
	CHARGES, SHAPED, FLEXIBLE, LINEAR	1.4D	UN0237	II	EXPLOSIVE		A5.32
†	CHARGES, SHAPED, FLEXIBLE, LINEAR	1.1D	UN0288	II	EXPLOSIVE	101	A5.32
†	CHARGES, SUPPLEMENTARY, EXPLOSIVE	1.1D	UN0060	II	EXPLOSIVE		A5.33
D	CHEMICAL KITS	8	NA1760	II	CORROSIVE		A12.7
	CHEMICAL KITS (must be classified and labeled according to the hazard class of the individual constituent(s)		ID8004				A12.7
	Chile saltpetre; see SODIUM NITRATE						
	CHLORAL, ANHYDROUS, INHIBITED	6.1	UN2075	II	POISON		A10.6
	CHLORATE AND BORATE MIXTURES	5.1	UN1458	II	OXIDIZER	A9,N34	A9.8
	CHLORATE AND MAGNESIUM CHLORIDE MIXTURES	5.1	UN1459	II	OXIDIZER	A9,N34	A9.8
	Chlorate of potash; see POTASSIUM CHLORATE						
	Chlorate of soda; see SODIUM CHLORATE						
*	CHLORATES, INORGANIC, N.O.S.	5.1	UN1461	II	OXIDIZER	A9,N34	A9.8
	CHLORIC ACID SOLUTION, with not more than 10% chloric acid	NOT ACCEPTED					NOT ACCEPTED
	Chloride of phosphorus; see PHOSPHORUS TRICHLORIDE						
	Chloride of sulphur; see SULPHUR CHLORIDES						
	Chlorinated lime; see CALCIUM HYPOCHLORITE MIXTURES, etc.						
†	CHLORINE	2.3	UN1017		POISON GAS	2	A6.5
	Chlorine azide	FORBIDDEN					FORBIDDEN
D	CHLORINE DIOXIDE, HYDRATE, FROZEN	NOT ACCEPTED					NOT ACCEPTED
	Chlorine dioxide (not hydrate)	FORBIDDEN					FORBIDDEN
†	CHLORINE PENTAFLUORIDE	2.3	UN2548		POISON GAS, OXIDIZER, CORROSIVE	1	A6.5
†	CHLORINE TRIFLUORIDE	2.3	UN1749		POISON GAS, OXIDIZER, CORROSIVE	1	A6.5

*	CHLORITES, INORGANIC, N.O.S.	5.1	UN1462	II	OXIDIZER	A7,N34	A9.8
†	CHLOROACETALDEHYDE	6.1	UN2232	II	POISON	2	A10.7
	CHLOROACETIC ACID, LIQUID	6.1	UN1750	II	POISON, CORROSIVE	A7,N34	A10.5
	CHLOROACETIC ACID, SOLID	6.1	UN1751	II	POISON, CORROSIVE	A3,A7, N34	A10.6
†	CHLOROACETONE, STABILIZED	6.1	UN1695	II	POISON	2,N12, N32,N34	A10.7

SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	Chloroacetone (unstabilized)	FORBIDDEN					FORBIDDEN
†	CHLOROACETONITRILE	6.1	UN2668	II	POISON	2	A10.7
❑	CHLOROACETOPHENONE, LIQUID	6.1	UN1697	II	POISON	A3,N12, N32,N33	A10.5
❑	CHLOROACETOPHENONE, SOLID	6.1	UN1697	II	POISON	A3,N12, N32,N33, N34	A10.6
†	CHLOROACETYL CHLORIDE	8	UN1752	II	CORROSIVE, POISON	2,A3,A6, A7,N34, N43	A12.12
	CHLOROANILINES, LIQUID	6.1	UN2019	II	POISON		A10.5
	CHLOROANILINES, SOLID	6.1	UN2018	II	POISON		A10.6
	CHLOROANISIDINES	6.1	UN2233	III	KEEP AWAY FROM FOOD		A10.6
	CHLOROBENZENE	3	UN1134	III	FLAMMABLE LIQUID		A7.3
	Chlorobenzol; see CHLOROBENZENE						
	CHLOROBENZOTRIFLUORIDES	3	UN2234	III	FLAMMABLE LIQUID		A7.3
	CHLOROBENZYLCHLORIDES	6.1	UN2235	III	KEEP AWAY FROM FOOD		A10.5
	Chlorobromomethane; see BROMOCHLOROMETHANE						
	CHLOROBUTANES	3	UN1127	II	FLAMMABLE LIQUID		A7.3
	1-Chlorobutane; see CHLOROBUTANES						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	2-Chlorobutane; see CHLOROBUTANES						
	CHLOROCRESOLS, liquid	6.1	UN2669	II	POISON		A10.5
	CHLOROCRESOLS, solid	6.1	UN2669	II	POISON		A10.6
	3-Chloro-4-diethyl-aminobenzenediazonium zink chloride; see SELF-REACTIVE SOLID TYPE D						
	CHLORODIFLUOROBROMOMETHANE	2.2	UN1974		NONFLAM-MABLE GAS		A6.3,A6.5
	1-Chloro-1,1- difluoroethane; see CHLORODIFLUOROETHANES						
❑	CHLORODIFLUOROETHANES or DIFLUOROCHLOROETHANES	2.1	UN2517		FLAMMABLE GAS		A6.3,A6.5
	CHLORODIFLUOROMETHANE	2.2	UN1018		NONFLAM-MABLE GAS		A6.3,A6.5
	CHLORODIFLUOROMETHANE AND CHLOROPENTAFLUOROETHANE MIXTURE with fixed boiling point, with approximately 49% chlorodifluoromethane	2.2	UN1973		NONFLAM-MABLE GAS		A6.3,A6.5
	3-Chloro-1,2-dihydroxypropane; see GLYCEROL ALPHA-MONOCHLOROHYDRIN						
	Chlorodimethyl ether; see METHYL CHLOROMETHYL ETHER						
	CHLORODINITROBENZENES	6.1	UN1577	II	POISON		A10.6
	Chlorodinitrobenzol, see; CHLORODINITROBENZENES						
	Chloroethane; see ETHYL CHLORIDE						
	Chloroethane nitrile; see CHLOROACETONITRILE						
	2-Chloroethanol; see ETHYLENE CHLOROHYDRIN						
	CHLOROFORM	6.1	UN1888	II	POISON	N36	A10.5
†	CHLOROFORMATES, N.O.S., flashpoint not less than 23 degrees C	6.1	UN2742	II	POISON, CORROSIVE	5	A10.5
	Chloromethane; see METHYL CHLORIDE						
	1-Chloro-3-methylbutane; see AMYL CHLORIDE						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	2-Chloro-2-methylbutane; see AMYL CHLORIDE						
	CHLOROMETHYL CHLOROFORMATE	6.1	UN2745	II	POISON, CORROSIVE		A10.5
	Chloromethyl cyanide; see CHLOROACETONITRILE						
	CHLOROMETHYL ETHYL ETHER	3	UN2354	II	FLAMMABLE LIQUID, POISON		A7.3
	Chloromethyl methyl ether; see METHYL CHLOROMETHYL ETHER						
	3-CHLORO-4-METHYLPHENYL ISOCYANATE	6.1	UN2236	II	POISON		A10.5
	1-Chloro-2-methylpropane; see CHLOROBUTANES						
	2-Chloro-2-methylpropane; see CHLOROBUTANES						
	3-Chloro-2-methylprop-1-ene; see METHYL ALLYL CHLORIDE						
	CHLORONITROANILINES	6.1	UN2237	III	KEEP AWAY FROM FOOD		A10.6
†	CHLORONITROBENZENES, LIQUID	6.1	UN1578	II	POISON		A10.5
†	CHLORONITROBENZENES, SOLID	6.1	UN1578	II	POISON		A10.6
	CHLORONITROTOLUENES, LIQUID	6.1	UN2433	III	KEEP AWAY FROM FOOD		A10.5
	CHLORONITROTOLUENES, SOLID	6.1	UN2433	III	KEEP AWAY FROM FOOD		A10.6
	CHLOROPENTAFLUOROETHANE (R-115)	2.2	UN1020		NONFLAM-MABLE GAS		A6.3,A6.5
	CHLOROPHENATES, LIQUID	8	UN2904	III	CORROSIVE		A12.3
	CHLOROPHENATES, SOLID	8	UN2905	III	CORROSIVE		A12.4
	CHLOROPHENOLS, LIQUID	6.1	UN2021	III	KEEP AWAY FROM FOOD		A10.5
	CHLOROPHENOLS, SOLID	6.1	UN2020	III	KEEP AWAY FROM FOOD		A10.6
❑	CHLOROPHENYLTRICHLOROSILANE	8	UN1753	II	CORROSIVE	A7,N34	A12.3
†	CHLOROPICRIN	6.1	UN1580	I	POISON	2	A10.7
†	CHLOROPICRIN AND METHYL BROMIDE MIXTURES	2.3	UN1581		POISON GAS	2	A6.17

†	CHLOROPICRIN AND METHYL CHLORIDE MIXTURES Chloropicrin mixture, flammable (pressure not exceeding 14.7 psia at 115 degrees F flashpoint below 100 degrees F); see POISONOUS LIQUIDS, FLAMMABLE, N.O.S.	2.3	UN1582		POISON GAS	2	A6.17
†	CHLOROPICRIN MIXTURES, N.O.S.	6.1	UN1583	I II III	POISON POISON KEEP AWAY FROM FOOD	5	A10.5

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
D†	CHLOROPIVALOYL CHLORIDE	6.1	NA9263	I	POISON, CORROSIVE	2	A10.7
	CHLOROPLATINIC ACID, SOLID	8	UN2507	III	CORROSIVE		A12.4
†	CHLOROPRENE, INHIBITED	3	UN1991	I	FLAMMABLE LIQUID, CORROSIVE		A7.3
	Chloroprene, uninhibited	FORBIDDEN					FORBIDDEN
	2-CHLOROPROPANE	3	UN2356	I	FLAMMABLE LIQUID	N36	A7.3
	3-Chloro-propanediol-1,2; see GLYCEROL ALPHA-MONOCHLOROHYDRIN						
	Chloropropanol; see PROPYLENE CHLOROHYDRIN						
	2-Chloro-1-propanol; see PROPYLENE CHLOROHYDRIN						
	3-CHLOROPROPANOL-1	6.1	UN2849	III	KEEP AWAY FROM FOOD		A10.5
	2-CHLOROPROPENE	3	UN2456	I	FLAMMABLE LIQUID	A3,N36	A7.3
	3-Chloropropene; see ALLYL CHLORIDE						
	3-Chloroprop-1-ene; see ALLYL CHLORIDE						
	ALPHA-CHLOROPROPIONIC ACID	8	UN2511	III	CORROSIVE		A12.3
	2-CHLOROPYRIDINE	6.1	UN2822	II	POISON		A10.5
	CHLOROSILANES, N.O.S.	8	UN2987	II	CORROSIVE		A12.3

	CHLOROSILANES, N.O.S., flashpoint less than 23 degrees C	3	UN2985	II	FLAMMABLE LIQUID, CORROSIVE		A7.3
	CHLOROSILANES, N.O.S., flashpoint not less than 23 degrees C	8	UN2986	II	CORROSIVE, FLAMMABLE LIQUID		A12.3
❑*	CHLOROSILANES, N.O.S., which in contact with water emit flammable gases	4.3	UN2988	I	DANGEROUS WHEN WET, FLAMMABLE LIQUID, CORROSIVE	A2	A8.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
†	CHLOROSULPHONIC ACID (with or without sulphur trioxide)	8	UN1754	I	CORROSIVE, POISON	2,A3, A10,A6	A12.12
	1-CHLORO-2,2,2-TRIFLUOROETHANE (R-124)	2.2	UN1021		NONFLAM-MABLE GAS		A6.3,A6.5
	CHLOROTOLUENES	3	UN2238	III	FLAMMABLE LIQUID		A7.3
	4-CHLORO-O-TOLUIDINE HYDROCHLORIDE	6.1	UN1579	III	KEEP AWAY FROM FOOD		A10.6
	CHLOROTOLUIDINES, liquid	6.1	UN2239	III	KEEP AWAY FROM FOOD		A10.5
	CHLOROTOLUIDINES, solid	6.1	UN2239	III	KEEP AWAY FROM FOOD		A10.6
	1-CHLORO-2,2,2-TRIFLUOROETHANE (R133a)	2.2	UN1983		NONFLAM-MABLE GAS		A6.3,A6.5
	Chlorotrifluoroethylene; see TRIFLUOROCHLOROETHYLENE, INHIBITED						
	CHLOROTRIFLUOROMETHANE (R-13)	2.2	UN1022		NONFLAM-MABLE GAS		A6.3,A6.5
	CHLOROTRIFLUOROMETHANE AND TRIFLUOROMETHANE AZEOTROPIC MIXTURE (R503) with approximately 60% chlorotrifluoromethane	2.2	UN2599		NONFLAM-MABLE GAS		A6.3,A6.5

	CHROMIC ACID, SOLID; also see CHROMIUM TRIOXIDE, ANHYDROUS	5.1	NA1463	II	OXIDIZER, CORROSIVE		A9.8
	CHROMIC ACID, SOLUTION	8	UN1755	II	CORROSIVE		A12.3
	Chromic anhydride; see CHROMIUM TRIOXIDE, ANHYDROUS						
	CHROMIC FLUORIDE, SOLID	8	UN1756	II	CORROSIVE		A12.4
	CHROMIC FLUORIDE, SOLUTION	8	UN1757	II	CORROSIVE		A12.3
	Chromic trioxide; see CHROMIUM TRIOXIDE, ANHYDROUS						
	CHROMIUM NITRATE	5.1	UN2720	III	OXIDIZER	A1,A29	A9.8
	CHROMIUM OXYCHLORIDE	8	UN1758	I	CORROSIVE	A3,A6, A7,N34	A12.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	CHROMIUM TRIOXIDE, ANHYDROUS	5.1	UN1463	II	OXIDIZER, CORROSIVE		A9.8
	CHROMOSULFURIC ACID	8	UN2240	I	CORROSIVE	A3,A6, A7,N34	A12.3
	Chromyl chloride; see CHROMIUM OXYCHLORIDE						
	Chrysotile; see WHITE ASBESTOS						
	Cigar and cigarette lighter fluid; see FLAMMABLE LIQUIDS, N.O.S.						
	Cigar and cigarette lighters, charged with fuel; see LIGHTERS FOR CIGARS, CIGARETTES, etc.						
	Cinene; see DIPENTENE						
	Cinnamene; see STYRENE MONOMER, INHIBITED						
	Cinnamol; see STYRENE MONOMER, INHIBITED						
	Cleaning fluid or liquid; see FLAMMABLE LIQUIDS, etc.						
	Coal briquettes, hot	FORBIDDEN					FORBIDDEN
❑	COAL GAS	2.3	UN1023		POISON GAS, FLAMMABLE GAS	3	A6.7
	Coal tar, crude and solvent; see NAPHTHA						

	COAL TAR DISTILLATES, FLAMMABLE	3	UN1136	I	FLAMMABLE LIQUID		A7.3
				II	FLAMMABLE LIQUID		
				III	FLAMMABLE LIQUID		
	Coal tar dye, corrosive liquid, N.O.S.; see DYES, LIQUID N.O.S. or DYE INTERMEDIATES, LIQUID N.O.S. corrosive						
	Coal tar, oil; see COAL TAR DISTILLATES, etc.						
	COATING SOLUTION	3	UN1139	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	Cobalt catalyst; see METAL CATALYST, etc.						
	COBALT NAPHTHENATES, POWDER	4.1	UN2001	III	FLAMMABLE SOLID	A19	A8.4
	COBALT RESINATE, PRECIPITATED	4.1	UN1318	III	FLAMMABLE SOLID	A1,A19	A8.4
	Coke, hot	FORBIDDEN					FORBIDDEN
	Collodion cottons; see NITROCELLULOSE						
	Cologne spirits; see PERFUMERY PRODUCTS with flammable solvents						
	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	1.1B	UN0461	II	EXPLOSIVE	101	A5.34
❑	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	1.2B	UN0382	II	EXPLOSIVE	101	A5.34
	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	1.4B	UN0383	II	EXPLOSIVE	101	A5.34
	COMPONENTS, EXPLOSIVE TRAIN, N.O.S.	1.4S	UN0384	II	EXPLOSIVE	101	A5.34
	Composition B; see HEXOLITE, etc.						
	Compound, anti-freeze liquid; see FLAMMABLE LIQUIDS, N.O.S.						
	Compounds, cleaning liquid, corrosive; see CORROSIVE LIQUIDS, N.O.S.						
	Compounds, cleaning liquid, flammable;see FLAMMABLE LIQUIDS, N.O.S.						

D	COMPOUNDS, CLEANING LIQUID	8	NA1760	I II III	CORROSIVE CORROSIVE CORROSIVE	A7 N37 N37	A12.3
D	COMPOUNDS, CLEANING LIQUID	3	NA1993	I II III	FLAMMABLE LIQUID FLAMMABLE LIQUID FLAMMABLE LIQUID		A7.3
	Compounds, enamel; see PAINT, etc.						
D	COMPOUNDS, TREE or WEED KILLING, LIQUID	8	NA1760	I II III	CORROSIVE CORROSIVE CORROSIVE	A7 N37 N37	A12.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
D	COMPOUNDS, TREE or WEED KILLING, LIQUID	3	NA1993	I II III	FLAMMABLE LIQUID FLAMMABLE LIQUID FLAMMABLE LIQUID		A7.3
D	COMPOUNDS, TREE or WEED KILLING, LIQUID	6.1	NA2810	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.5
	Compressed gas and hexaethyl tetraphosfate mixtures; see HEXAETHYL TETRAPHOSFATE AND COMPRESSED GAS MIXTURES						
	Compressed gas and tetraethyl dithiopyrophosfate mixtures; see TETRAETHYL DITHIOPYROPHOSFATE AND GASES, etc.						
	Compressed gas and tetraethyl pyrophosfate mixtures; see TETRAETHYL PYROPHOSFATE						

	AND COMPRESSED GAS MIXTURES						
	COMPRESSED GAS, N.O.S.	2.2	UN1956		NONFLAM-MABLE GAS		A6.3,A6.5,A6.7
❑	COMPRESSED GAS, FLAMMABLE, N.O.S.	2.1	UN1954		FLAMMABLE GAS		A6.3,A6.5,A6.7
†	COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S., inhalation hazard Zone A	2.3	UN1953		POISON GAS, FLAMMABLE GAS	1	A6.16
†	COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S., inhalation hazard Zone B	2.3	UN1953		POISON GAS, FLAMMABLE GAS	2	A6.5,A6.7
❑	COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S., inhalation hazard Zone C	2.3	UN1953		POISON GAS, FLAMMABLE GAS	3	A6.5,A6.7
❑	COMPRESSED GAS, TOXIC, FLAMMABLE N.O.S., inhalation hazard Zone D	2.3	UN1953		POISON GAS, FLAMMABLE GAS	4	A6.5,A6.7
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
†	COMPRESSED GAS, TOXIC, N.O.S., inhalation hazard Zone A	2.3	UN1955		POISON GAS	1	A6.16
†	COMPRESSED GAS, TOXIC, N.O.S., inhalation hazard Zone B	2.3	UN1955		POISON GAS	2	A6.5,A6.7
❑	COMPRESSED GAS, TOXIC, N.O.S., inhalation hazard Zone C	2.3	UN1955		POISON GAS	3	A6.5,A6.7
❑	COMPRESSED or LIQUEFIED GASES, TOXIC, N.O.S., inhalation hazard Zone D	2.3	UN1955		POISON GAS	4	A6.5,A6.7
D	CONSUMER COMMODITY	ORM-D	NONE		NONE		A13.3
❑	CONTRIVANCES, WATER-ACTIVATED, with burster, expelling charge or propelling charge	1.2L	UN0248	II	EXPLOSIVE	101	A5.35
❑	CONTRIVANCES, WATER-ACTIVATED, with burster, expelling charge or propelling charge	1.3L	UN0249	II	EXPLOSIVE	101	A5.35
	COPPER ACETOARSENITE	6.1	UN1585	II	POISON		A10.6
	Copper acetylide	FORBIDDEN					FORBIDDEN
	Copper amine azide	FORBIDDEN					FORBIDDEN

	COPPER ARSENITE	6.1	UN1586	II	POISON		A10.6
❑*	COPPER BASED PESTICIDES, LIQUID, FLAMMABLE, TOXIC, N.O.S., flashpoint less than 23 degrees C	3	UN2776	I	FLAMMABLE LIQUID, POISON		A7.3
				II	FLAMMABLE LIQUID, POISON		
*	COPPER BASED PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S., flashpoint not less than 23 degrees C	6.1	UN3009	I	POISON, FLAMMABLE LIQUID		A10.5
				II	POISON, FLAMMABLE LIQUID		
				III	KEEP AWAY FROM FOOD, FLAMMABLE LIQUID		
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
*	COPPER BASED PESTICIDES, LIQUID, TOXIC, N.O.S.	6.1	UN3010	I	POISON		A10.5
				II	POISON		
				III	KEEP AWAY FROM FOOD		
*	COPPER BASED PESTICIDES, SOLID, TOXIC, N.O.S.	6.1	UN2775	I	POISON		A10.6
				II	POISON		
				III	KEEP AWAY FROM FOOD		
	COPPER CHLORATE	5.1	UN2721	II	OXIDIZER	A1	A9.8
	COPPER CHLORIDE	8	UN2802	III	CORROSIVE		A12.4
	COPPER CYANIDE	6.1	UN1587	II	POISON		A10.6
	Copper orthoarsenite; see COPPER ARSENITE						
	Copper selenate; see SELENATES						
	Copper selenite; see SELENITES						
	Copper tetramine nitrate	FORBIDDEN					FORBIDDEN
	Copra	FORBIDDEN					FORBIDDEN
†	CORD, DETONATING, flexible	1.1D	UN0065	II	EXPLOSIVE	102	A5.36

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	CORD, DETONATING, flexible	1.4D	UN0289	II	EXPLOSIVE		A5.36
❑	CORD, or FUSE, DETONATING, metal clad	1.2D	UN0102	II	EXPLOSIVE		A5.37
†	CORD, or FUSE, DETONATING, metal clad	1.1D	UN0290	II	EXPLOSIVE		A5.37
❑	CORD, or FUSE, DETONATING, MILD EFFECT, metal clad	1.4D	UN0104	II	EXPLOSIVE		A5.37
	CORD, IGNITER	1.4G	UN0066	II	EXPLOSIVE		A5.38
	Cordite, see POWDER, SMOKELESS						
	Corrosive battery fluid; see BATTERY FLUID, ACID or BATTERY FLUID, ALKALI						
	CORROSIVE LIQUID, FLAMMABLE, N.O.S.	8	UN2920	I	CORROSIVE, FLAMMABLE LIQUID		A12.3
				II	CORROSIVE, FLAMMABLE LIQUID		
	CORROSIVE LIQUID, N.O.S.	8	UN1760	I	CORROSIVE	A7	A12.3
				II	CORROSIVE		
				III	CORROSIVE		
❑	CORROSIVE LIQUID, OXIDIZING, N.O.S.	8	UN3093	I	CORROSIVE, OXIDIZER		A12.3
				II	CORROSIVE, OXIDIZER		
	CORROSIVE LIQUID, POISONOUS, N.O.S.	8	UN2922	I	CORROSIVE, POISON	A7	A12.3
				II	CORROSIVE, POISON		
❑	CORROSIVE LIQUID, WATER-REACTIVE, N.O.S.	8	UN3094	I	CORROSIVE, DANGEROUS WHEN WET		A12.3
				II	CORROSIVE, DANGEROUS WHEN WET		
	CORROSIVE SOLID, FLAMMABLE, N.O.S.	8	UN2921	I	CORROSIVE, FLAMMABLE		A12.4

				II	SOLID CORROSIVE, FLAMMABLE		
	CORROSIVE SOLID, N.O.S.	8	UN1759	I	SOLID CORROSIVE		A12.4
				II	CORROSIVE		
				III	CORROSIVE		
	CORROSIVE SOLID, OXIDIZING, N.O.S.	8	UN3084	I	CORROSIVE, OXIDIZER		A12.4
				II	CORROSIVE, OXIDIZER		
	CORROSIVE SOLID, POISONOUS, N.O.S.	8	UN2923	I	CORROSIVE, POISON		A12.4
				II	CORROSIVE, POISON		

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	CORROSIVE SOLID, SELF-HEATING, N.O.S.	8	UN3095	I	CORROSIVE, SPONTANE-OUSLY COM-BUSTIBLE		A12.4
				II	CORROSIVE, SPONTANE-OUSLY COM-BUSTIBLE		
	CORROSIVE SOLIDS, WATER-REACTIVE, N.O.S.	8	UN3096	I	CORROSIVE, DANGEROUS WHEN WET		A12.4
				II	CORROSIVE, DANGEROUS WHEN WET		
	Cosmetics, corrosive, liquid, N.O.S.; see						

	CORROSIVE LIQUIDS, N.O.S.						
	Cosmetics, corrosive, solid, N.O.S.; see CORROSIVE SOLIDS, N.O.S.						
	Cosmetics, flammable, liquid, N.O.S.; see FLAMMABLE LIQUIDS, N.O.S. or PERFUMERY PRODUCTS						
	Cosmetics, flammable, solid, N.O.S.; see FLAMMABLE SOLIDS, INORGANIC or ORGANIC, N.O.S.						
	Cosmetics, oxidizing material, N.O.S.; see OXIDIZING LIQUID OR SOLID N.O.S.						
	Cotton seed, cut linters, hull fibers, pulp, waste, and shavings, with animal or vegetable oil; see FIBRES						
	COTTON WASTE, OILY	4.2	UN1364	III	SPONTANE-OUSLY COM-BUSTIBLE		A8.4
	COTTON, WET	FORBIDDEN					FORBIDDEN

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
❑*	COUMARIN DERIVATIVE PESTICIDES, LIQUID, FLAMMABLE, TOXIC, N.O.S., flashpoint less than 23 degrees C	3	UN3024	I	FLAMMABLE LIQUID, POISON		A7.3
				II	FLAMMABLE LIQUID, POISON		
*	COUMARIN DERIVATIVE PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S., flashpoint not less than 23 degrees C	6.1	UN3025	I	POISON, FLAMMABLE LIQUID		A10.5
				II	POISON, FLAMMABLE LIQUID		
				III	KEEP AWAY FROM FOOD,		

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
					FLAMMABLE LIQUID		
*	COUMARIN DERIVATIVE PESTICIDES, LIQUID, TOXIC, N.O.S.	6.1	UN3026	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.5
*	COUMARIN DERIVATIVE PESTICIDES, SOLID, TOXIC, N.O.S.	6.1	UN3027	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.6
	Creosote; see POISONOUS LIQUID, N.O.S.						
	Creosote salts; see NAPHTHALENE, CRUDE or REFINED						
	CRESOLS (o-m-p-)	6.1	UN2076	II	POISON		A10.5
	CRESYLIC ACID	6.1	UN2022	II	POISON		A10.5
	Crocidolite; see BLUE ASBESTOS						
†	CROTONALDEHYDE, STABILIZED	3	UN1143	II	FLAMMABLE LIQUID, POISON	2	A7.6
	CROTONIC ACID, LIQUID	8	UN2823	III	CORROSIVE		A12.3
	CROTONIC ACID, SOLID	8	UN2823	III	CORROSIVE		A12.4
	Crotonic aldehyde; see CROTONALDEHYDE, STABILIZED						
	CROTONYLENE	3	UN1144	I	FLAMMABLE LIQUID		A7.3
	Crude naphtha; see NAPHTHA						
	Cumene; see ISOPROPYLBENZENE						
	Cupric cyanide; see COPPER CYANIDE						
❑	CUPRIETHYLENEDIAMINE SOLUTION	8	UN1761	II III	CORROSIVE, POISON CORROSIVE, POISON		A12.3
	CUTTERS, CABLE, EXPLOSIVE	1.4S	UN0070	II	EXPLOSIVE		A5.39
	Cyanide of calcium; see						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	CALCIUM CYANIDE						
	Cyanide of potassium; see POTASSIUM CYANIDE						
	Cyanide of sodium; see SODIUM CYANIDE						
	Cyanide or cyanide mixtures, dry; see CYANIDES, INORGANIC, N.O.S.						
❑*	CYANIDES, INORGANIC, N.O.S.	6.1	UN1588	I II III	POISON POISON KEEP AWAY FROM FOOD	N74,N75 N74,N75 N74,N75	A10.6
†	CYANIDE SOLUTIONS	6.1	UN1935	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.5
	Cyanoacetonitrile; see MALONONITRILE						
†	CYANOGEN BROMIDE	6.1	UN1889	I	POISON, CORROSIVE	1,A6,A8	A10.7
†	CYANOGEN CHLORIDE, INHIBITED	2.3	UN1589		POISON GAS, FLAMMABLE GAS	1	A6.16
	Cyanogen Chloride, uninhibited	FORBIDDEN					FORBIDDEN
†	CYANOGEN, LIQUEFIED	2.3	UN1026		POISON GAS, FLAMMABLE GAS	2	A6.16
	CYANURIC CHLORIDE	8	UN2670	III	CORROSIVE		A12.4
	Cyanuric triazide	FORBIDDEN					FORBIDDEN
❑	CYCLOBUTANE	2.1	UN2601		FLAMMABLE GAS		A6.3,A6.5
	CYCLOBUTYL CHLOROFORMATE	6.1	UN2744	II	POISON, CORROSIVE		A10.5
	1,5,9-CYCLODODECATRIENE	6.1	UN2518	III	KEEP AWAY FROM FOOD		A10.5
	CYCLOHEPTANE	3	UN2241	II	FLAMMABLE		A7.3

					LIQUID		
	CYCLOHEPTATRIENE	3	UN2603	II	FLAMMABLE LIQUID, POISON		A7.3
	1,3,5-Cycloheptatriene; see CYCLOHEPTATRIENE						
	CYCLOHEPTENE	3	UN2242	II	FLAMMABLE LIQUID		A7.3
	1,4-Cyclohexadienedione see BENZOQUINONE						
	CYCLOHEXANE	3	UN1145	II	FLAMMABLE LIQUID		A7.3
	Cyclohexanethiol; see CYCLOHEXYL MERCAPTAN						
	CYCLOHEXANONE	3	UN1915	III	FLAMMABLE LIQUID		A7.3
	CYCLOHEXENE	3	UN2256	II	FLAMMABLE LIQUID		A7.3
❑	CYCLOHEXENYLTRICHLOROSILANE	8	UN1762	II	CORROSIVE	A7,N34	A12.3
	CYCLOHEXYL ACETATE	3	UN2243	III	FLAMMABLE LIQUID		A7.3
	CYCLOHEXYLAMINE	8	UN2357	II	CORROSIVE, FLAMMABLE LIQUID		A12.3
†	CYCLOHEXYL ISOCYANATE	6.1	UN2488	II	POISON	2	A10.7

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	CYCLOHEXYL MERCAPTAN	3	UN3054	III	FLAMMABLE LIQUID		A7.3
❑	CYCLOHEXYLTRICHLOROSILANE	8	UN1763	II	CORROSIVE	A7,N34	A12.3
	CYCLONITE, see CYCLOTRIMETHYLENE-TRINITRAMINE, etc.						
	CYCLOOCTADIENE PHOSPHINES; see 9-PHOSPHABICYCLONONANES						
	CYCLOOCTADIENES	3	UN2520	III	FLAMMABLE LIQUID		A7.3
	CYCLOOCTATETRAENE	3	UN2358	II	FLAMMABLE LIQUID		A7.3

	CYCLOPENTANE	3	UN1146	II	FLAMMABLE LIQUID		A7.3
	Cyclopentane, methyl; see METHYLCYCLOPENTANE						
	CYCLOPENTANOL	3	UN2244	III	FLAMMABLE LIQUID		A7.3
	CYCLOPENTANONE	3	UN2245	III	FLAMMABLE LIQUID		A7.3
	CYCLOPENTENE	3	UN2246	II	FLAMMABLE LIQUID		A7.3
❑	CYCLOPROPANE,LIQUEFIED	2.1	UN1027		FLAMMABLE GAS		A6.3,A6.5
†	CYCLOTETRAMETHYLENETETRANITRAMINE, HMX, or OCTOGEN, DESENSITIZED	1.1D	UN0484	II	EXPLOSIVE		A5.40
	Cyclotetramethylenetetranitramine (dry or unphlegmatized)(HMX)	FORBIDDEN					FORBIDDEN
†	CYCLOTETRAMETHYLENETETRANITRAMINE, HMX, or OCTOGEN, WETTED with not less than 15% water, by mass	1.1D	UN0226	II	EXPLOSIVE		A5.40
	CYCLOTETRAMETHYLENE-TETRANITRAMINE, HMX, or OCTOGEN, WETTED with less than 15% water, by mass	FORBIDDEN					FORBIDDEN
†	CYCLOTRIMETHYLENETRINITRAMINE,	1.1D	UN0391	II	EXPLOSIVE		A5.40
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	CYCLONITE, HEXOGEN, or RDX, AND CYCLOTETRAMETHYLENETETRANITRAMINE, NMX, or OCTOGEN MIXTURES, WETTED with not less than 15% water by mass, or CYCLOTRIMETHYLENETRINITRAMINE, CYCLONITE, HEXOGEN, or RDX, AND CYCLOTETRAMETHYLENETETRANITRAMINE, NMX, or OCTOGEN MIXTURES, DESENSITIZED with not less than 10% phlegmatizer by mass						
†	CYCLOTRIMETHYLENETRINITRAMINE,	1.1D	UN0483	II	EXPLOSIVE		A5.40

	CYCLONITE, HEXOGEN, or RDX, DESENSITIZED CYCLOTRIMETHYLENETRINITRAMINE, CYCLONITE, HEXOGEN, RDX, WETTED with not less than 15% water by mass	1.1D	UN0072	II	EXPLOSIVE		A5.40
	CYMENES	3	UN2046	II	FLAMMABLE LIQUID		A7.3
	Cymol, see CYMENES						
	Dead oil; see TARS, LIQUID, etc.						
	Deanol; see DIMETHYLETHANOLAMINE						
❑	DECABORANE	4.1	UN1868	II	FLAMMABLE SOLID, POISON	A19,A20	A8.4
	DECAHYDRONAPHTHALENE	3	UN1147	III	FLAMMABLE LIQUID		A7.3
	Decalin; see DECAHYDRONAPHTHALENE						
	N-DECANE	3	UN2247	III	FLAMMABLE LIQUID		A7.3
❑	DEFLAGRATING METAL SALTS OF AROMATIC NITRODERIVATIVES, N.O.S.	1.3C	UN0132	II	EXPLOSIVE		A5.41
	De-icing fluid; see FLAMMABLE LIQUIDS, N.O.S.						
	Delay electric igniter; see IGNITERS						
D	DENATURED ALCOHOL	3	NA1987	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
D	DENATURED ALCOHOL	3	NA1986	I	FLAMMABLE LIQUID		A7.3
				II	FLAMMABLE LIQUID		
	Depth charges; see CHARGES, DEPTH						
	Detonating relays; see DETONATORS, NON-ELECTRIC or DETONATOR ASSEMBLIES, NON-ELECTRIC						
†	DETONATOR ASSEMBLIES, NON-ELECTRIC	1.1B	UN0360	II	EXPLOSIVE		A5.42

	for blasting						
	DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting	1.4B	UN0361	II	EXPLOSIVE	103	A5.42
†	DETONATORS, ELECTRIC, for blasting	1.1B	UN0030	II	EXPLOSIVE		A5.43
	DETONATORS, ELECTRIC, for blasting	1.4B	UN0255	II	EXPLOSIVE	103	A5.43
	DETONATORS, ELECTRIC, for blasting	1.4S	UN0456	II	EXPLOSIVE	104	A5.43
†	DETONATORS FOR AMMUNITION	1.1B	UN0073	II	EXPLOSIVE		A5.44
❑	DETONATORS FOR AMMUNTION	1.2B	UN0364	II	EXPLOSIVE		A5.44
	DETONATORS FOR AMMUNITION	1.4B	UN0365	II	EXPLOSIVE	103	A5.44
	DETONATORS FOR AMMUNITION	1.4S	UN0366	II	EXPLOSIVE	104	A5.44
†	DETONATORS, NON-ELECTRIC, for blasting	1.1B	UN0029	II	EXPLOSIVE		A5.45
	DETONATORS, NON-ELECTRIC, for blasting	1.4B	UN0267	II	EXPLOSIVE	103	A5.45
	DETONATORS, NON-ELECTRIC, for blasting	1.4S	UN0455	II	EXPLOSIVE	104	A5.45
❑	DEUTERIUM	2.1	UN1957		FLAM-MABLE GAS		A6.3,A6.7
	DEVICES, SMALL, HYDROCARBON GAS POWERED or HYDROCARBON GAS REFILLS FOR SMALL DEVICES with release device	2.1	UN3150		FLAMMABLE GAS		A6.3,A6.5
	DIACETONE ALCOHOL	3	UN1148	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	Diacetone alcohol peroxides, more than 57% in solution with more than 9% hydrogen peroxide, less than 26% diacetone alcohol and less than 9% water, total active oxygen content more than 10%, by mass	FORBIDDEN					FORBIDDEN
	Diacetyl, see BUTANEDIONE						
	Diacetyl peroxide, solid or more than 25% in solution	FORBIDDEN					FORBIDDEN

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	DIALLYLAMINE	3	UN2359	II	FLAMMABLE LIQUID		A7.3
	DIALLYLETHER	3	UN2360	II	FLAMMABLE LIQUID, POISON	N12	A7.3
	m-Diaminobenzene; see PHENYLENEDIAMINES						
	4,4'-DIAMINODIPHENYLMETHANE	6.1	UN2651	III	KEEP AWAY FROM FOOD		A10.6
	1,2-Diaminoethane; see ETHYLENEDIAMINE						
	Diaminopropylamine; see 3,3'-IMINODIPROPYLAMINE						
	Di-(aminopropyl)-piperazine; see ALKYLAMINES, N.O.S.						
	DI-N-AMYLAMINE	6.1	UN2841	III	KEEP AWAY FROM FOOD		A10.5
	p-Diazidobenzene	FORBIDDEN					FORBIDDEN
	1,2-Diazidoethane	FORBIDDEN					FORBIDDEN
	1,1'-Diazoaminonaphthalene	FORBIDDEN					FORBIDDEN
	Diazoaminotetrazole (dry)	FORBIDDEN					FORBIDDEN
	Diazodinitrophenol (dry)	FORBIDDEN					FORBIDDEN
†	DIAZODINITROPHENOL, WETTED with not less than 40% water, or mixture of alcohol and water, by mass	1.1A	UN0074	II	EXPLOSIVE	111,117	A5.46
	Diazodiphenylmethane	FORBIDDEN					FORBIDDEN
	2-diazo-1-naphthol-4-sulphochloride; see SELF-REACTIVE SOLID TYPE B						
	2-diazo-1-naphthol-5-sulphochloride; see SELF-REACTIVE SOLID TYPE B						
	Diazonium nitrates (dry)	FORBIDDEN					FORBIDDEN
	Diazonium perchlorates (dry)	FORBIDDEN					FORBIDDEN
	1,3-Diazopropane	FORBIDDEN					FORBIDDEN
	Dibenzopyridine; see ACRIDINE						
	DIBENZYLDICHLOROSILANE	8	UN2434	II	CORROSIVE		A12.3

	Dibenzyl peroxydicarbonate, more than 87% with water	FORBIDDEN					FORBIDDEN
	DIBORANE	NOT ACCEPTED					NOT ACCEPTED
D	DIBORANE MIXTURES	NOT ACCEPTED					NOT ACCEPTED
	Dibromoacetylene	FORBIDDEN					FORBIDDEN
	meta-DIBROMOBENZENE	3	UN2711	III	FLAMMABLE LIQUID		A7.3
	1,3-Dibromobenzene; see meta-DIBROMOBENZENE						
	m-Dibromobenzene; see meta-DIBROMOBENZENE						
	1,2-DIBROMOBUTAN-3-ONE	6.1	UN2648	II	POISON		A10.5
	DIBROMOCHLOROPROPANES	6.1	UN2872	II III	POISON KEEP AWAY FROM FOOD		A10.5
	1,2-Dibromo-3-chloropropane; see DIBROMOCHLOROPROPANES						
	DIBROMODIFLUOROMETHANE	9	UN1941	III	CLASS 9		A13.4
	1,2-Dibromoethane; see ETHYLENE DIBROMIDE						
	DIBROMOMETHANE	6.1	UN2664	III	KEEP AWAY FROM FOOD		A10.5
	DI-N-BUTYLAMINE	8	UN2248	II	CORROSIVE, FLAMMABLE LIQUID		A12.3
	DIBUTYLAMINOETHANOL	6.1	UN2873	III	KEEP AWAY FROM FOOD		A10.5
	N,N-Di-n-butylaminoethanol; see						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	DIBUTYLAMINOETHANOL						
	DIBUTYL ETHERS	3	UN1149	III	FLAMMABLE LIQUID		A7.3
	2,2-Di-(tert-butylperoxy) butane, more than 55% in solution	FORBIDDEN					FORBIDDEN
	Di-n-butyl peroxydicarbonate, more	FORBIDDEN					FORBIDDEN

	than 52% solution						
	Di-(tert-butylperoxy) phthalate, more than 55% in solution	FORBIDDEN					FORBIDDEN
	DICHLOROACETIC ACID	8	UN1764	II	CORROSIVE	A3,A6, A7,N34	A12.3
	1,3-DICHLOROACETONE	6.1	UN2649	II	POISON		A10.6
	DICHLOROACETYL CHLORIDE	8	UN1765	II	CORROSIVE	A3,A6, A7,N34	A12.3
	Dichloroacetylene	FORBIDDEN					FORBIDDEN
	DICHLOROANILINES, SOLID or LIQUID	6.1	UN1590	II	POISON		A10.5
	N.N'-Dichlorazodicarbonamidine (salts of) (dry)	FORBIDDEN					FORBIDDEN
	O-DICHLOROBENZENE	6.1	UN1591	III	KEEP AWAY FROM FOOD		A10.5
D	DICHLOROBUTENE	8	NA2920	I	CORROSIVE, FLAMMABLE LIQUID		A12.3
	2,2'-DICHLORODIETHYL ETHER	6.1	UN1916	II	POISON, FLAMMABLE	N33,N34	A10.5
	DICHLORODIFLUOROMETHANE	2.2	UN1028		NONFLAM-MABLE GAS		A6.3,A6.5
	DICHLORODIFLUOROMETHANE AND DIFLUOROETHANE AZEOTROPIC MIXTURE with approximately 74% dichlorodifluoromethane	2.2	UN2602		NONFLAM-MABLE GAS		A6.3,A6.5
❑	DICHLORODIFLUOROMETHANE AND ETHYLENE OXIDE MIXTURES with not more than 12% ethylene oxide	2.3	UN3070		POISON GAS	4	A6.5
†	DICHLORODIMETHYL ETHER, SYMMETRICAL	6.l	UN2249	I	POISON		A10.5
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	1,1-DICHLOROETHANE	3	UN2362	II	FLAMMABLE LIQUID		A7.3
	1,2-Dichloroethane; see ETHYLENE DICHLORIDE						
	DICHLOROETHYLENE	3	UN1150	II	FLAMMABLE LIQUID		A7.3

	Dichloroethyl sulphide	FORBIDDEN					FORBIDDEN
	alpha-Dichlorohydrin; see 1,3-DICHLOROPROPANOL-2						
	DICHLOROISOCYANURIC ACID, DRY or DICHLOROISOCYANURIC ACID SALTS	5.1	UN2465	II	OXIDIZER	28	A9.8
	DICHLOROISOPROPYL ETHER	6.1	UN2490	II	POISON		A10.5
	DICHLOROMETHANE	6.1	UN1593	III	KEEP AWAY FROM FOOD	N36	A10.5
	DICHLOROFLUOROMETHANE	2.2	UN1029		NONFLAM-MABLE GAS		A6.3,A6.5
	1,1-DICHLORO-1-NITROETHANE	6.1	UN2650	II	POISON		A10.5
	DICHLOROPENTANES	3	UN1152	III	FLAMMABLE LIQUID		A7.3
	Dichlorophenols; see CHLOROPHENOLS, etc.						
	DICHLOROPHENYL ISOCYANATES	6.1	UN2250	II	POISON		A10.6
❑	DICHLOROPHENYLTRICHLOROSILANE	8	UN1766	II	CORROSIVE	A7,N34	A12.3
	1,2-Dichloropropane; see PROPYLENE DICHLORIDE						
	1,3-Dichloro-2-propanone; see 1,3-DICHLOROACETONE						
	1,3-DICHLOROPROPANOL-2	6.1	UN2750	II	POISON		A10.5
	DICHLOROPROPENE	3	UN2047	II	FLAMMABLE LIQUID		A7.3
	Dichloropropene and propylene dichloride mixture; see PROPYLENE DICHLORIDE						
†	DICHLOROSILANE	2.3	UN2189		POISON GAS, FLAMMABLE GAS	2	A6.5
	DICHLOROTETRAFLUOROETHANE	2.2	UN1958		NONFLAM-MABLE GAS		A6.3,A6.5
D†	3,5 DICHLORO-2,4,6 TRIFLUOROPYRIDINE	6.1	NA9264	I	POISON	2	A10.7
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	Dichlorovinylchloroarsine	FORBIDDEN					FORBIDDEN
	1,4-Dicyanobutane; see ADIPONITRILE						
	DICYCLOHEPTADIENE; see 2,5-NORBORNADIENE						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	DICYCLOHEXYLAMINE	8	UN2565	III	CORROSIVE		A12.3
	Dicyclohexylamine nitrite; see DICYCLOHEXYLAMMONIUM NITRITE						
	DICYCLOHEXYLAMMONIUM NITRITE	4.1	UN2687	III	FLAMMABLE SOLID		A8.4
	DICYCLOPENTADIENE	3	UN2048	III	FLAMMABLE LIQUID		A7.3
	2,2-Di-(4,4-di-tert-butylperoxycyclohexyl) propane more than 42% with inert solid	FORBIDDEN					FORBIDDEN
	Di-2,4-dichlorobenzoyl peroxide, more than 75% with water	FORBIDDEN					FORBIDDEN
	1,2-DI-(DIMETHYLAMINO) ETHANE	3	UN2372	II	FLAMMABLE LIQUID		A7.3
	DIDYMIUM NITRATE	5.1	UN1465	III	OXIDIZER	A1	A9.8
D	DIELDRIN	6.1	NA2761	II	POISON		A10.6
D	DIESEL FUEL; also see GAS OIL	3	NA1993	III	NONE		A7.3
	Diethanol nitrosamine dinitrate (dry)	FORBIDDEN					FORBIDDEN
	1,2-Diethoxyethane; see ETHYLENE GLYCOL DIETHYL ETHER						
	DIETHOXYMETHANE	3	UN2373	II	FLAMMABLE LIQUID		A7.3
	2,5-diethoxy-4-morpholinobenzene-diazonium zinc chloride; see SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED						
	3,3-DIETHOXYPROPENE	3	UN2374	II	FLAMMABLE LIQUID		A7.3
	Diethyl acetal; see ACETAL						
	DIETHYLAMINE	3	UN1154	II	FLAMMABLE LIQUID	N34	A7.3
	DIETHYLAMINOETHANOL	3	UN2686	III	FLAMMABLE LIQUID		A7.3
	DIETHYLAMINOPROPYLAMINE	8	UN2684	III	CORROSIVE, FLAMMABLE LIQUID		A12.3

	N,N-DIETHYLANILINE	6.1	UN2432	III	KEEP AWAY FROM FOOD		A10.5
	DIETHYLBENZENE	3	UN2049	III	FLAMMABLE LIQUID		A7.3
	Diethylcarbinol; see AMYL ALCOHOLS						
	DIETHYL CARBONATE	3	UN2366	III	FLAMMABLE LIQUID		A7.3
	Diethyl cellosolve; see ETHYLENE GLYCOL DIETHYL ETHER						
❑	DIETHYLDICHLOROSILANE	8	UN1767	II	CORROSIVE, FLAMMABLE LIQUID	A7,N34	A12.3
	Diethyldimethyl lead mixture; see MOTOR FUEL ANTI-KNOCK MIXTURES						
	Diethylenediamine; see PIPERAZINE						
	DIETHYLENEGLYCOL DINITRATE, DESENSITIZED with not less than 25% nonvolatile water-insoluble phlegmatizer, by mass	NOT ACCEPTED					NOT ACCEPTED
	Diethyleneglycol dinitrate (dry)	FORBIDDEN					FORBIDDEN
	DIETHYLENETRIAMINE	8	UN2079	II	CORROSIVE		A12.3
	N,N-Diethylethanolamine; see DIETHYLAMINOETHANOL						
	DIETHYL ETHER or ETHYL ETHER	3	UN1155	I	FLAMMABLE LIQUID		A7.3
	N,N-DIETHYLETHYLENEDIAMINE	8	UN2685	II	CORROSIVE, FLAMMABLE LIQUID		A12.3
	Diethylgold bromide	FORBIDDEN					FORBIDDEN
	Di-(2-ethylhexyl) phosphoric acid; see DIISOOCTYL ACID PHOSPHATE						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	DIETHYL KETONE	3	UN1156	II	FLAMMABLE LIQUID		A7.3

	Diethyl peroxydicarbonate, more than 27% in solution	FORBIDDEN					FORBIDDEN
	DIETHYL SULPHATE	6.1	UN1594	II	POISON		A10.5
	DIETHYL SULPHIDE	3	UN2375	II	FLAMMABLE LIQUID		A7.3
	DIETHYLTHIOPHOSPHORYL CHLORIDE	8	UN2751	II	CORROSIVE		A12.3
†	DIETHYLZINC	4.2	UN1366	I	SPONTANE-OUSLY COM-BUSTIBLE		A8.6
	2,4-Difluoroaniline; see FLUOROANILINES						
	DIFLUOROCHLOROETHANES;see CHLORODIFLUOROETHANES						
❑	DIFLUOROETHANE (R152a)	2.1	UN1030		FLAMMABLE GAS		A6.3,A6.5
❑	1,1-DIFLUOROETHYLENE (R1132a)	2.1	UN1959		FLAMMABLE GAS		A6.3,A6.5
	DIFLUOROPHOSPHORIC ACID, ANHYDROUS	8	UN1768	II	CORROSIVE	A6,A7, N5,N34	A12.3
	2,3-DIHYDROPYRAN	3	UN2376	II	FLAMMABLE LIQUID		A7.3
	p-Dihydroxybenzene; see HYDROQUINONE						
	1,8-Dihydroxy-2,4,5,7 tetranitroanthraquinone (chrysamminic acid)	FORBIDDEN					FORBIDDEN
	Di-(1-hydroxytetrazole) (dry)	FORBIDDEN					FORBIDDEN
	Diiodoacetylene	FORBIDDEN					FORBIDDEN
	DIISOBUTYLAMINE	3	UN2361	III	FLAMMABLE LIQUID		A7.3
	DIISOBUTYLENE, ISOMETRIC COMPOUNDS	3	UN2050	II	FLAMMABLE LIQUID		A7.3
	alpha-Diisobutylene; see DIISOBUTYLENE, ISOMETRIC COMPOUNDS						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	beta-Diisobutylene; see DIISOBUTYLENE,						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	ISOMERIC COMPOUNDS						
	DIISOBUTYL KETONE	3	UN1157	III	FLAMMABLE LIQUID		A7.3
	DIISOOCTYL ACID PHOSPHATE	8	UN1902	III	CORROSIVE		A12.3
	DIISOPROPYLAMINE	3	UN1158	II	FLAMMABLE LIQUID		A7.3
	Diisopropylbenzene hydroperoxide, more than 72% in solution	FORBIDDEN					FORBIDDEN
	DIISOPROPYL ETHER	3	UN1159	II	FLAMMABLE LIQUID		A7.3
	Diisopropyl oxide; see DIISOPROPYL ETHER						
†	DIKETENE, INHIBITED	3	UN2521	III	FLAMMABLE LIQUID, POISON	2	A7.6
	1,1-DIMETHOXYETHANE	3	UN2377	II	FLAMMABLE LIQUID		A7.3
	1,2-DIMETHOXYETHANE	3	UN2252	II	FLAMMABLE LIQUID		A7.3
	Dimethoxymethane; see METHYLAL						
	Dimethoxystrychnine; see BRUCINE						
❑	DIMETHYLAMINE, ANHYDROUS	2.1	UN1032		FLAMMABLE GAS		A6.5
	DIMETHYLAMINE SOLUTION	3	UN1160	II	FLAMMABLE LIQUID		A7.3
	2-DIMETHYLAMINOACETONITRILE	3	UN2378	II	FLAMMABLE LIQUID, POISON		A7.3
	4-dimethylamino-6-(2-dimethylaminoethoxy) toluene-2-diazonium zinc chloride; see SELF-RELATIVE SOLID TYPE D, TEMPERATURE CONTROLLED						
	2-Dimethylaminoethanol; see DIMETHYLETHANOLAMINE						
	DIMETHYLAMINOETHYL METHACRYLATE	6.1	UN2522	II	POISON		A10.5

	N,N-DIMETHYLANILINE	6.1	UN2253	II	POISON		A10.5
	Dimethylarsenic acid; see CACODYLIC ACID						
	Dimethyl benzene; see XYLENES						
	N,N-Dimethylbenzylamine; see BENZYLDIMETHYLAMINE						
	2,3-DIMETHYLBUTANE	3	UN2457	II	FLAMMABLE LIQUID		A7.3
	1,3-DIMETHYLBUTYLAMINE	3	UN2379	II	FLAMMABLE LIQUID		A7.3
	DIMETHYLCARBAMOYL CHLORIDE	8	UN2262	II	CORROSIVE		A12.3
	DIMETHYL CARBONATE	3	UN1161	II	FLAMMABLE LIQUID		A7.3
	DIMETHYLCYCLOHEXANES	3	UN2263	II	FLAMMABLE LIQUID		A7.3
	DIMETHYLCYCLOHEXYLAMINE	8	UN2264	II	CORROSIVE		A12.3
❑	DIMETHYLDICHLOROSILANE	3	UN1162	I	FLAMMABLE LIQUID, CORROSIVE		A7.3
	DIMETHYLDIETHOXYSILANE	3	UN2380	II	FLAMMABLE LIQUID		A7.3
	2,5-Dimethyl-2,5 dihydroperoxy hexane, more than 82% with water	FORBIDDEN					FORBIDDEN
	2,5-Dimethyl-1,4-dioxane; see DIMETHYLDIOXANES						
	4,4-Dimethyldioxane-1,3; see DIMETHYLDIOXANES						
	DIMETHYLDIOXANES	3	UN2707	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
	DIMETHYL DISULPHIDE	3	UN2381	II	FLAMMABLE LIQUID		A7.3
	DIMETHYLETHANOLAMINE	3	UN2051	III	FLAMMABLE LIQUID		A7.3
❑	DIMETHYL ETHER	2.1	UN1033		FLAMMABLE GAS		A6.3,A6.5
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**

SYM-BOL	PROPER SHIPPING NAME/DESCRIPTION	HAZARD CLASS/DIV	UN/ID NUMBER	PG	LABELS	SPECIAL PROVISION	PACKAGING PARAGRAPH
	N,N-DIMETHYLFORMAMIDE	3	UN2265	III	FLAMMABLE LIQUID		A7.3
	Dimethylhexane dihydroperoxide (dry)	FORBIDDEN					FORBIDDEN
†	DIMETHYLHYDRAZINE, SYMMETRICAL	3	UN2382	I	FLAMMABLE LIQUID, POISON	2,A7	A7.6
†	DIMETHYLHYDRAZINE, UNSYMMETRICAL	6.1	UN1163	I	POISON, FLAMMABLE LIQUID, CORROSIVE	2,A7	A10.7
❑	2,2-DIMETHYLPROPANE other than pentane and isopentane	2.1	UN2044		FLAMMABLE GAS		A6.3,A6.5
	DIMETHYL-N-PROPYLAMINE	3	UN2266	II	FLAMMABLE LIQUID, CORROSIVE		A7.3
†	DIMETHYL SULPHATE	6.1	UN1595	I	POISON, CORROSIVE	2	A10.7
	DIMETHYL SULPHIDE	3	UN1164	I	FLAMMABLE LIQUID		A7.3
	DIMETHYL THIOPHOSPHORYL CHLORIDE	8	UN2267	III	CORROSIVE		A12.3
†	DIMETHYLZINC	4.2	UN1370	I	SPONTANE-OUSLY COM-BUSTIBLE		A8.6
	Di-(1-naphthoyl) peroxide	FORBIDDEN					FORBIDDEN
	DINGU; see DINITROGLYCOLURIL						
	DINITROANILINES	6.1	UN1596	II	POISON		A10.6
	DINITROBENZENES, liquid	6.1	UN1597	II	POISON		A10.5
	DINITROBENZENES, solid	6.1	UN1597	II	POISON		A10.6
	Dinitrochlorobenzenes; see CHLORODINITROBENZENES						
	Dinitrocresol; see DINITRO-O-CRESOL						
	DINITRO-O-CRESOL, solid	6.1	UN1598	II	POISON		A10.6
	DINITRO-O-CRESOL, solution	6.1	UN1598	II	POISON		A10.5
	Dinitro-7,8-dimethylglycoluril (dry)	FORBIDDEN					FORBIDDEN
	1,3-Dinitro-5,5-dimethyl hydantoin	FORBIDDEN					FORBIDDEN

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	1,3-Dinitro-4,5-dinitrosobenzene	FORBIDDEN					FORBIDDEN
	1,2-Dinitroethane	FORBIDDEN					FORBIDDEN
	1,1-Dinitroethane (dry)	FORBIDDEN					FORBIDDEN
	DINITROGEN TETROXIDE, liquefied	FORBIDDEN					FORBIDDEN
†	DINITROGLYCOLURIL	1.1D	UN0489	II	EXPLOSIVE		A5.47
	Dinitromethane	FORBIDDEN					FORBIDDEN
❑	DINITROPHENOLATES, alkali metals, dry or wetted with less than 15% water, by mass	1.3C	UN0077	II	EXPLOSIVE		A5.47
	DINITROPHENOLATES, WETTED with not less than 15% water, by mass	4.1	UN1321	I	FLAMMABLE SOLID, POISON	A8,A19, A20,N41	A8.4
	Dinitropropylene glycol	FORBIDDEN					FORBIDDEN
†	DINITROPHENOL, dry or wetted with less than 15% water, by mass	1.1D	UN0076	II	EXPLOSIVE		A5.47
	DINITROPHENOL SOLUTIONS	6.1	UN1599	II	POISON		A10.5
	DINITROPHENOL, WETTED with not less than 15% water, by mass	4.1	UN1320	I	FLAMMABLE SOLID, POISON	A8,A19, A20,N41	A8.4
	Dinitropropylene glycol	FORBIDDEN					FORBIDDEN
†	DINITRORESORCINOL, dry or wetted with less than 15% water, by mass	1.1D	UN0078	II	EXPLOSIVE		A5.47
	4,6-Dinitroresorcinol (heavy metal salts of) (dry)	FORBIDDEN					FORBIDDEN
	2,4-Dinitroresorcinol (heavy metal salts of) (dry)	FORBIDDEN					FORBIDDEN
	DINITRORESORCINOL, WETTED with not less than 15% water, by mass	4.1	UN1322	I	FLAMMABLE SOLID	A8,A19, A20,N41	A8.4
	3,5-Dinitrosalicylic acid (lead salt) (dry)	FORBIDDEN					FORBIDDEN
❑	DINITROSOBENZENE	1.3C	UN0406	II	EXPLOSIVE		A5.48
	Dinitrosobenzylamidine and salts of (dry)	FORBIDDEN					FORBIDDEN
	n,n'-dinitroso-n,n'-dimethyl terephthalamide, not more than 72% as a paste; see SELF-REACTIVE SOLID TYPE C						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	n,n'-dinitrosopentamethylenetetramine, not more than 82% with phlegmatizer; see SELF-REACTIVE SOLID TYPE C						
	2,2-Dinitrostilbene	FORBIDDEN					FORBIDDEN
	1,4-Dinitro-1,1,4,4-tetramethylolbutane tetranitrate (dry)	FORBIDDEN					FORBIDDEN
	DINITROTOLUENES, LIQUID	6.1	UN2038	II	POISON		A10.5
	Dinitrotoluene mixed with sodium chlorate; see EXPLOSIVE, BLASTING, TYPE C						
†	DINITROTOLUENES, MOLTEN	6.1	UN1600	II	POISON		A10.5
	DINITROTOLUENES, SOLID	6.1	UN2038	II	POISON		A10.6
	2,4-Dinitro-1,3,5-trimethylbenzene	FORBIDDEN					FORBIDDEN
	Di-(beta-nitroxyethyl) ammonium nitrate	FORBIDDEN					FORBIDDEN
	a,a'-Di-(nitroxy) methylether	FORBIDDEN					FORBIDDEN
	1,9-Dinitroxy pentamethylene- 2,4,6,8 tetramine (dry)	FORBIDDEN					FORBIDDEN
	DIOXANE	3	UN1165	II	FLAMMABLE LIQUID		A7.3
	DIOXOLANE	3	UN1166	II	FLAMMABLE LIQUID		A7.3
	DIPENTENE	3	UN2052	III	FLAMMABLE LIQUID		A7.3
†	DIPHENYLAMINE CHLOROARSINE	6.1	UN1698	I	POISON		A10.5
❑	DIPHENYLCHLOROARSINE,	6.1	UN1699	I	POISON	A8,N33, N34	A10.6
†	DIPHENYLDICHLOROSILANE	8	UN1769	II	CORROSIVE	A7,N34	A12.3
	DIPHENYLMETHANE-4,4'-DIISOCYANATE liquid or solid	6.1	UN2489	III	KEEP AWAY FROM FOOD		A10.5,A10.6
	DIPHENYLMETHYL BROMIDE	8	UN1770	II	CORROSIVE		A12.4
	diphenyloxide-4,4' DISULPHOHYDRAZIDE; see SELF-REACTIVE SOLID TYPE D						
	DIPICRYLAMINE; see HEXANITRODIPHENYLAMINE						
†	DIPICRYL SULPHIDE, dry or wetted with less	1.1D	UN0401	II	EXPLOSIVE		A5.47

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	than 10% water, by mass						
❑	DIPICRYL SULPHIDE, WETTED with not less than 10% water, by mass	4.1	UN2852	I	FLAMMABLE SOLID	A2,N41	A8.4
	Dipropionyl peroxide, more than 28% in solution	FORBIDDEN					FORBIDDEN
	DIPROPYLAMINE	3	UN2383	II	FLAMMABLE LIQUID		A7.3
	Dipropylene triamine; see 3,3'-IMINODIPROPYLAMINE						
	4-dipropylaminobenzene-diazonium zinc chloride; see SELF-REACTIVE SOLID TYPE D						
	DIPROPYL ETHER	3	UN2384	II	FLAMMABLE LIQUID		A7.3
	DIPROPYL KETONE	3	UN2710	III	FLAMMABLE LIQUID		A7.3
	DISINFECTANTS, CORROSIVE, LIQUID, N.O.S.	8	UN1903	II III	CORROSIVE CORROSIVE		A12.3
	DISINFECTANTS, LIQUID, N.O.S., poisonous	6.1	UN3142	I II III	POISON POISON KEEP AWAY FROM FOOD	A4	A10.5
	DISINFECTANTS, SOLID, N.O.S., poisonous	6.1	UN1601	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.6
	Dispersant gas; see COMPRESSED orLIQUEFIED GASES, etc.						
*	DITHIOCARBAMATE PESTICIDES, LIQUID, FLAMMABLE, TOXIC, N.O.S., flashpoint less than 23 degrees C	3	UN2772	I II	FLAMMABLE LIQUID, POISON FLAMMABLE LIQUID, POISON		A7.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
*	DITHIOCARBAMATE PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S., flashpoint not less than 23 degrees C	6.1	UN3005	I	POISON, FLAMMABLE LIQUID		A10.5
				II	POSION, FLAMMABLE LIQUID		
				III	KEEP AWAY FROM FOOD, FLAMMABLE LIQUID		
*	DITHIOCARBAMATE PESTICIDES, LIQUID, TOXIC, N.O.S.	6.1	UN3006	I	POISON		A10.5
				II	POISON		
				III	KEEP AWAY FROM FOOD		
*	DITHIOCARBAMATE PESTICIDES, SOLID, TOXIC, N.O.S.	6.1	UN2771	I	POISON		A10.6
				II	POISON		
				III	KEEP AWAY FROM FOOD		
	DIVINYL ETHER, INHIBITED	3	UN1167	II	FLAMMABLE LIQUID		A7.3
D	DODECYLBENZENESULPHONIC ACID	8	NA2584	II	CORROSIVE		A12.3
❑	DODECYLTRICHLOROSILANE	8	UN1771	II	CORROSIVE	A7,N34	A12.3
	Dressing, leather, see; FLAMMABLE LIQUIDS, N.O.S.						
	Drugs, corrosive, liquid, N.O.S.; see CORROSIVE LIQUIDS, N.O.S.						
	Drugs, corrosive, solid, N.O.S.; see CORROSIVE SOLIDS, N.O.S.						
	Drugs, flammable, liquid, N.O.S.; see FLAMMABLE LIQUIDS, N.O.S.						
	Drugs, flammable, solid, N.O.S.; see FLAMMABLE SOLIDS, INORGANIC						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	OR ORGANIC, N.O.S.						
	Drugs, oxidizing, liquid or solid N.O.S.; see OXIDIZING LIQUID OR SOLID, N.O.S.						
	DRUGS, N.O.S., IN SMALL INNER PACKAGINGS, containing flammable aerosol and/or nonflammable aerosol and/or flammable liquid and/or toxic substance	9	ID8008		CLASS 9		A13.3
	Drugs, toxic, liquid, N.O.S.; see POISONOUS LIQUIDS, NOS Drugs, toxic, solid, N.O.S.; see POISONOUS SOLIDS, N.O.S.						
	DRY ICE; see CARBON DIOXIDE, SOLID						
	Dyes and dye intermediates, N.O.S. flammable liquid; see FLAMMABLE LIQUIDS, N.O.S.						
	DYES, LIQUID, N.O.S., or DYE INTERMEDIATES, LIQUID, N.O.S. corrosive	8	UN2801	II III	CORROSIVE CORROSIVE		A12.3
	DYES, LIQUID, N.O.S., or DYE INTERMEDIATES, LIQUID, N.O.S, poisonous	6.1	UN1602	II III	POISON KEEP AWAY FROM FOOD		A10.5
	DYES, SOLID,N.O.S., or DYE INTERMEDIATES, SOLID, N.O.S, corrosive	8	UN3147	II III	CORROSIVE CORROSIVE		A12.4
	DYES, SOLID, N.O.S., or DYE INTERMEDIATES, SOLID, N.O.S., poisonous	6.1	UN3143	I II III	POISON POISON KEEP AWAY FROM FOOD	A5	A10.6
	Dynamite; see EXPLOSIVE, BLASTING, TYPE A						
	Electric squibs; see IGNITERS						
	Electric storage batteries; see BATTERIES, etc.						
	Electrolyte (acid or alkali) for batteries; see BATTERY FLUID, ACID or BATTERY FLUID, ALKALI						
	Electron tubes containing mercury; see						

	MERCURY CONTAINED IN MANUFACTURED ARTICLES empty package						A3.1.12
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	ENGINES, INTERNAL COMBUSTION	9	UN3166		CLASS 9		A13.5 A13.6 A13.7
	Engines, rocket; see ROCKET MOTORS, etc.						
❑	ENGINE STARTING FLUID, with flammable gas	2.1	UN1960		FLAMMABLE GAS		A6.5
	ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S.	9	UN3082	III	CLASS 9	8	A13.4
	ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S.	9	UN3077	III	CLASS 9	8	A13.4
†	EPIBROMOHYDRIN	6.1	UN2558	I	POISON		A10.5
	EPICHLOROHYDRIN	6.1	UN2023	II	POISON		A10.5
	1,2-Epoxybutane; see 1,2-BUTYLENE OXIDE, STABLIZED						
	Epoxyethane; see ETHYLENE OXIDE, etc.						
	1,2-EPOXY-3-ETHOXYPROPANE	3	UN2752	III	FLAMMABLE LIQUID		A7.3
	2,3-Epoxy-1-propanal; see GLYCIDALDEHYDE						
	2,3-Epoxypropyl ethyl ether; see 1,2-EPOXY-3-ETHOXYPROPANE						
	Etching acid, liquid, N.O.S.; see HYDROFLUROIC ACID SOLUTION						
❑	ETHANE, COMPRESSED	2.1	UN1035		FLAMMABLE GAS		A6.3,A6.5
D	ETHANE-PROPANE MIXTURES, REFRIGERATED LIQUID (cryogenic liquid)	NOT ACCEPTED					NOT ACCEPTED
	ETHANE, REFRIGERATED LIQUID	NOT ACCEPTED					NOT ACCEPTED
	Ethanethiol; see ETHYL MERCAPTAN						
	Ethanol amine dinitrate	FORBIDDEN					FORBIDDEN

	ETHANOLAMINE or ETHANOLAMINE SOLUTIONS	8	UN2491	III	CORROSIVE		A12.3
	ETHANOL or ETHANOL SOLUTIONS	3	UN1170	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	Ether; see DIETHYL ETHER						
	Ether acetate; see ETHYLENE GLYCOL MONOETHYL ETHER ACETATE						
	Ether ethyl; see DIETHYL ETHER						
	2-Ethoxyethanol; see ETHYLENE GLYCOL MONOETHYL ETHER						
	2-Ethoxyethyl acetate; see ETHYLENE GLYCOL MONOETHYL ETHER ACETATE						
	Ethoxypropane-1; see ETHYL PROPYL ETHER						
	ETHYL ACETATE	3	UN1173	II	FLAMMABLE LIQUID		A7.3
❑	ETHYL ACETYLENE, INHIBITED	2.1	UN2452		FLAMMABLE GAS		A6.5
	ETHYL ACRYLATE, INHIBITED	3	UN1917	II	FLAMMABLE LIQUID		A7.3
	ETHYL ALCOHOL or ETHYL ALCOHOL SOLUTIONS; see ETHANOL						
	Ethyl aldehyde; see ACETALDEHYDE						
❑	ETHYLAMINE	2.1	UN1036		FLAMMABLE GAS		A6.15
	ETHYLAMINE, AQUEOUS SOLUTIONS with not less than 50%, but not more than 70% ethylamine	3	UN2270	II	FLAMMABLE LIQUID		A7.3
	ETHYL AMYL KETONE	3	UN2271	III	FLAMMABLE LIQUID		A7.3
	N-ETHYLANILINE	6.1	UN2272	III	KEEP AWAY FROM FOOD		A10.5
	2-ETHYLANILINE	6.1	UN2273	III	KEEP AWAY FROM FOOD		A10.5

	ETHYLBENZENE	3	UN1175	II	FLAMMABLE LIQUID		A7.3
	N-ETHYL-N-BENZYLANILINE	6.1	UN2274	III	KEEP AWAY FROM FOOD		A10.5
	N-ETHYLBENZYLTOLUIDINES SOLID, or LIQUID	6.1	UN2753	III	KEEP AWAY FROM FOOD		A10.5
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	ETHYL BORATE	3	UN1176	II	FLAMMABLE LIQUID		A7.3
	ETHYL BROMIDE	6.1	UN1891	II	POISON		A10.5
†	ETHYL BROMOACETATE	6.1	UN1603	II	POISON		A10.5
	2-ETHYLBUTANOL	3	UN2275	III	FLAMMABLE LIQUID		A7.3
	ETHYLBUTYL ACETATE	3	UN1177	III	FLAMMABLE LIQUID		A7.3
	ETHYL BUTYL ETHER	3	UN1179	II	FLAMMABLE LIQUID		A7.3
	2-ETHYLBUTYRALDEHYDE	3	UN1178	II	FLAMMABLE LIQUID		A7.3
	ETHYL BUTYRATE	3	UN118O	II	FLAMMABLE LIQUID		A7.3
❑	ETHYL CHLORIDE	2.1	UN1037		FLAMMABLE GAS		A6.13
	ETHYL CHLOROACETATE	6.1	UN1181	II	POISON		A10.5
†	ETHYL CHLOROFORMATE	6.1	UN1182	I	POISON, FLAMMABLE LIQUID, CORROSIVE	2,A3, A6,A7, N34	A10.7
	ETHYL 2-CHLOROPROPIONATE	3	UN2935	III	FLAMMABLE LIQUID		A7.3
	Ethyl-alpha-chloropropionate; see ETHYL-2-CHLOROPROPIONATE						
†	ETHYL CHLOROTHIOFORMATE	8	UN2826	II	CORROSIVE, POISON	2	A12.12
	ETHYL CROTONATE	3	UN1862	II	FLAMMABLE		A7.3

					LIQUID		
	ETHYL CYANOACETATE	6.1	UN2666	III	KEEP AWAY FROM FOOD		A10.5
†	ETHYLDICHLOROARSINE	6.1	UN1892	I	POISON	2	A10.7

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
❑	ETHYLDICHLOROSILANE	4.3	UN1183	I	DANGEROUS WHEN WET, CORROSIVE, FLAMMABLE LIQUID	A2,A3, A7,N34	A8.3
	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	NOT ACCEPTED					NOT ACCEPTED
†	ETHYLENE CHLOROHYDRIN	6.1	UN1135	II	POISON	2	A10.7
❑	ETHYLENE, COMPRESSED	2.1	UN1962		FLAMMABLE GAS		A6.3,A6.5
	ETHYLENEDIAMINE	8	UN1604	II	CORROSIVE, FLAMMABLE LIQUID		A12.3
	Ethylene diamine diperchlorate	FORBIDDEN					FORBIDDEN
†	ETHYLENE DIBROMIDE	6.1	UN1605	II	POISON	2	A10.7
	Ethylene dibromide and methyl bromide liquid mixtures; see METHYL BROMIDE AND ETHYLENE DIBROMIDE, MIXTURES LIQUID						
†	ETHYLENE DICHLORIDE	3	UN1184	II	FLAMMABLE LIQUID, POISON		A7.3

	ETHYLENE GLYCOL DIETHYL ETHER	3	UN1153	III	FLAMMABLE LIQUID		A7.3
	Ethylene glycol dinitrate	FORBIDDEN					FORBIDDEN
	ETHYLENE GLYCOL MONOBUTYL ETHER	6.1	UN2369	III	KEEP AWAY FROM FOOD		A10.5
	ETHYLENE GLYCOL MONOETHYL ETHER	3	UN1171	III	FLAMMABLE LIQUID		A7.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	ETHYLENE GLYCOL MONOETHYL ETHER ACETATE	3	UN1172	III	FLAMMABLE LIQUID		A7.3
	ETHYLENE GLYCOL MONOMETHYL ETHER	3	UN1188	III	FLAMMABLE LIQUID		A7.3
	ETHYLENE GLYCOL MONOMETHYL ETHER ACETATE	3	UN1189	III	FLAMMABLE LIQUID		A7.3
†	ETHYLENEIMINE, INHIBITED	6.1	UN1185	I	POISON, FLAMABLE LIQUID	1,N25,N32	A10.7
❑	ETHYLENE OXIDE AND PROPYLENE OXIDE MIXTURES, not more than 30% ethylene oxide	3	UN2983	I	FLAMMABLE LIQUID, POISON	5,A11,N4, N34	A7.3
†	ETHYLENE OXIDE, pure or with nitrogen	2.3	UN1040		POISON GAS, FLAMMABLE GAS	3	A6.14
	Ethylene oxide and carbon dioxide mixtures; see CARBON DIOXIDE AND ETHYLENE OXIDE MIXTURES, etc.						
†	ETHYLENE, REFRIGERATED LIQUID (cryogenic liquid)	2.1	UN1038		FLAMMABLE GAS		A6.12
	ETHYL ETHER; see DIETHYL ETHER						
❑	ETHYL FLUORIDE	2.1	UN2453		FLAMMABLE GAS		A6.3,A6.5
	Ethyl fluid; see MOTOR FUEL ANTI-KNOCK MIXTURES						
	ETHYL FORMATE	3	UN1190	II	FLAMMABLE		A7.3

					LIQUID		
	Ethylhexaldehyde; see OCTYL ALDEHYDES, etc.						
	2-ETHYLHEXYLAMINE	8	UN2276	III	CORROSIVE		A12.3
	2-ETHYLHEXYL CHLOROFORMATE	6.1	UN2748	II	POISON, CORROSIVE		A10.5
	Ethyl hydroperoxide	FORBIDDEN					FORBIDDEN
	Ethylidene chloride; see 1,1-DICHLOROETHANE						
	ETHYL ISOBUTYRATE	3	UN2385	II	FLAMMABLE LIQUID		A7.3
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
†	ETHYL ISOCYANATE	3	UN2481	II	FLAMMABLE LIQUID, POISON	1,A7	A7.6
	ETHYL LACTATE	3	UN1192	III	FLAMMABLE LIQUID		A7.3
❑	ETHYL MERCAPTAN	3	UN2363	I	FLAMMABLE LIQUID		A7.3
	ETHYL METHACRYLATE	3	UN2277	II	FLAMMABLE LIQUID		A7.3
❑	ETHYL METHYL ETHER	2.1	UN1039		FLAMMABLE GAS		A6.22
	ETHYL METHYL KETONE or METHYL ETHYL KETONE	3	UN1193	II	FLAMMABLE LIQUID		A7.3
	Ethyl nitrate	FORBIDDEN					FORBIDDEN
	Ethyl nitrite	FORBIDDEN					FORBIDDEN
	ETHYL NITRITE, SOLUTIONS	NOT ACCEPTED					NOT ACCEPTED
	ETHYL ORTHOFORMATE	3	UN2524	III	FLAMMABLE LIQUID		A7.3
	ETHYL OXALATE	6.1	UN2525	III	KEEP AWAY FROM FOOD		A10.5
	Ethyl perchlorate	FORBIDDEN					FORBIDDEN
D	ETHYLPHENYLDICHLOROSILANE	8	UN2435	II	CORROSIVE	A7,N34	A12.3
D†	ETHYL PHOSPHONOTHIOIC DICHLORIDE, ANHYDROUS	6.1	NA2927	I	POISON, CORROSIVE	2	A10.7
D†	ETHYL PHOSPHONOUS	6.1	NA2845	I	POISON	2	A10.7

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	DICHLORIDE, ANHYDROUS						
D†	ETHYL PHOSPHORODICHLORIDATE	6.1	NA2927	I	POISON, CORROSIVE	2	A10.7
	1-ETHYLPIPERIDINE	3	UN2386	II	FLAMMABLE LIQUID		A7.3
	ETHYL PROPIONATE	3	UN1195	II	FLAMMABLE LIQUID		A7.3
	ETHYL PROPYL ETHER	3	UN2615	II	FLAMMABLE LIQUID		A7.3
	Ethyl silicate; see TETRAETHYL SILICATE						
	Ethyl sulphate; see DIETHYL SULPHATE						
	ETHYLSULPHURIC ACID	8	UN2571	II	CORROSIVE		A12.3
	N-ETHYLTOLUIDINES	6.1	UN2754	II	POISON		A10.5
†	ETHYLTRICHLOROSILANE	3	UN1196	I	FLAMMABLE LIQUID, CORROSIVE	A7,N34	A7.3
	Ethyl trimethyl lead mixture; see MOTOR FUEL ANTI-KNOCK MIXTURES						
	Ethylzinc; see DIETHYLZINC						
	Etiologic agent; see INFECTIOUS SUBSTANCES, etc.						
	Explosive articles; see ARTICLES, EXPLOSIVE, N.O.S.						
†	EXPLOSIVE, BLASTING, TYPE A	1.1D	UN0081	II	EXPLOSIVE		A5.49
†	EXPLOSIVE, BLASTING, TYPE B	1.1D	UN0082	II	EXPLOSIVE		A5.49
	EXPLOSIVE, BLASTING, TYPE B	1.5D	UN0331	II	EXPLOSIVE	105,106	A5.50
†	EXPLOSIVE, BLASTING, TYPE C	1.1D	UN0083	II	EXPLOSIVE		A5.51
†	EXPLOSIVE, BLASTING, TYPE D	1.1D	UN0084	II	EXPLOSIVE		A5.52
†	EXPLOSIVE, BLASTING, TYPE E	1.1D	UN0241	II	EXPLOSIVE		A5.49
	EXPLOSIVE, BLASTING, TYPE E	1.5D	UN0332	II	EXPLOSIVE	105,106	A5.53
D†	EXPLOSIVE PEST CONTROL DEVICES	1.1E	NA0006	II	EXPLOSIVE		A5.54
D	EXPLOSIVE PEST CONTROL DEVICES	1.4E	NA0412	II	EXPLOSIVE		A5.54
	Explosives, slurry; see EXPLOSIVE, BLASTING, TYPE E						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	Explosives substances; see SUBSTANCES, EXPLOSIVE, N.O.S.						
	Explosives, emulsion; see EXPLOSIVES, BLASTING, TYPE E						
	Explosives, water gels; see EXPLOSIVE, BLASTING, TYPE E						
	EXTRACTS, AROMATIC, LIQUID	3	UN1169	I	FLAMMABLE LIQUID		A7.3
				II	FLAMMABLE LIQUID		
				III	FLAMMABLE LIQUID		
†	EXTRACTS, FLAVORING, LIQUID	3	UN1197	I	FLAMMABLE LIQUID		A7.3
				II	FLAMMABLE LIQUID		
				III	FLAMMABLE LIQUID		
	Fabric with animal or vegetable oil; see FIBERS or FABRIC, etc.						
	FERRIC ARSENATE	6.1	UN1606	II	POISON		A10.6
	FERRIC ARSENITE	6.1	UN1607	II	POISON		A10.6
	FERRIC CHLORIDE	8	UN1773	III	CORROSIVE		A12.4
	FERRIC CHLORIDE, SOLUTION	8	UN2582	III	CORROSIVE		A12.3
	FERRIC NITRATE	5.1	UN1466	III	OXIDIZER	A1,A29	A9.8
	FERROCERIUM	4.1	UN1323	II	FLAMMABLE SOLID	A19	A8.4
	FERROSILICON, with 30% or more, but less than 90% silicon	4.3	UN14O8	III	DANGEROUS WHEN WET, KEEP AWAY FROM FOOD	A1,A19	A8.4
	FERROUS ARSENATE	6.1	UN16O8	II	POISON		A10.6
D	FERROUS CHLORIDE, SOLID	8	NA1759	II	CORROSIVE		A12.4
D	FERROUS CHLORIDE, SOLUTION	8	NA1760	II	CORROSIVE		A12.3

	FERROUS METAL BORINGS, SHAVINGS, TURNINGS, or CUTTINGS in a form liable to self-heating	4.2	UN2793	III	SPONTANE-OUSLY COM-BUSTIBLE	A1,A19	A8.4
❑	FERTILIZER AMMONIATING SOLUTION with free ammonia	2.2	UN1043		NONFLAM-MABLE GAS		A6.3,A6.5
	Fertilizers containing ammonium nitrate, NOS; see AMMONIUM NITRATE						
	FERTILIZERS, N.O.S.						
	Fiberglass repair kits; see POLYESTER RESIN KITS						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
†	FIBRES or FABRICS, ANIMAL or VEGETABLE, N.O.S. with oil	4.2	UN1373	III	SPONTANE-OUSLY COM-BUSTIBLE		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	FLAMMABLE SOLID		A8.13
	FIRE EXTINGUISHER CHARGES, corrosive liquid	8	UN1774	II	CORROSIVE	N41	A12.3
	Fire extinguisher charges, expelling, explosive; see CARTRIDGES, POWER DEVICE						
	FIRE EXTINGUISHERS containing compressed or liquified gas	2.2	UN1044		NONFLAM-MABLE GAS		A6.3, A6.9
	FIRELIGHTERS, SOLID with flammable liquid	4.1	UN2623	II	FLAMMABLE SOLID	A19	A8.4
				III	FLAMMABLE SOLID	A1,A19	
†	FIREWORKS	1.1G	UN0333	II	EXPLOSIVE	108	A5.55
❑	FIREWORKS	1.2G	UN0334	II	EXPLOSIVE	108	A5.56
❑	FIREWORKS	1.3G	UN0335	II	EXPLOSIVE	108	A5.56
	FIREWORKS	1.4G	UN0336	II	EXPLOSIVE	108	A5.56
	FIREWORKS	1.4S	UN0337	II	EXPLOSIVE	108	A5.57

	FIRST AID KITS (must be classified and labelled according to the hazard class of the individual constituent(s)	ID8004					A12.7
	Fischer Tropsch gas; see CARBON MONOXIDE AND HYDROGEN MIXTURE						
	FISH MEAL, or FISH SCRAP, UNSTABLIZED	4.2	UN1374	II	SPONTANE-OUSLY COM-BUSTIBLE	A1,A19	A8.4
	Fissile radioactive materials; see RADIOACTIVE MATERIAL, FISSILE, N.O.S.						
	Flammable gases; see COMPRESSED or LIQUEFIED GASES, FLAMMABLE, N.O.S.						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	Flammable gas (small receptacles not fitted with a dispersion device, not refillable); see RECEPTACLES, SMALL, CONTAINING GAS.						
	Flammable gas lighters; see LIGHTERS (cigarettes), containing flammable gas						
	FLAMMABLE LIQUIDS, CORROSIVE, N.O.S.	3	UN2924	I	FLAMMABLE LIQUID, CORROSIVE		A7.3
				II	FLAMMABLE LIQUID, CORROSIVE		
				III	FLAMMABLE LIQUID, CORROSIVE		
	FLAMMABLE LIQUIDS, N.O.S.	3	UN1993	I	FLAMMABLE LIQUID		A7.3
				II	FLAMMABLE LIQUID		
				III	FLAMMABLE LIQUID		

	FLAMMABLE LIQUIDS, POISONOUS, N.O.S.	3	UN1992	I	FLAMMABLE LIQUID, POISON		A7.3
				II	FLAMMABLE LIQUID, POISON		
				III	FLAMMABLE LIQUID		
	FLAMMABLE SOLIDS, INORGANIC, CORROSIVE, N.O.S.	4.1	UN3180	II	FLAMMABLE SOLID, CORROSIVE		A8.4
				III	FLAMMABLE SOLID, CORROSIVE		
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	FLAMMABLE SOLIDS, ORGANIC, CORROSIVE, N.O.S.	4.1	UN2925	II	FLAMMABLE SOLID, CORROSIVE	A1	A8.4
				III	FLAMMABLE SOLID, CORROSIVE	A1	
	FLAMMABLE SOLIDS, INORGANIC, N.O.S.	4.1	UN1378	II	FLAMMABLE SOLID		A8.4
				III	FLAMMABLE SOLID		
	FLAMMABLE SOLIDS, ORGANIC, N.O.S.	4.1	UN1325	II	FLAMMABLE SOLID		A8.4
				III	FLAMMABLE SOLID		
	flammable solids, oxidizing, n.o.s.	FORBIDDEN					FORBIDDEN
	FLAMMABLE SOLIDS, INORGANIC, POISONOUS, N.O.S.	4.1	UN3179	II	FLAMMABLE SOLID, POISON	A1	A8.4
				III	FLAMMABLE SOLID,	A1	

	FLAMMABLE SOLIDS, ORGANIC, POISONOUS, N.O.S.	4.1	UN2926	II	KEEP AWAY FROM FOOD FLAMMABLE SOLID, POISON		A8.4
				III	FLAMMABLE SOLID, KEEPAWAY FROM FOOD		
❑	FLARES, AERIAL	1.3G	UN0093	II	EXPLOSIVE		A5.58
	FLARES, AERIAL	1.4G	UN0403	II	EXPLOSIVE		A5.58
	FLARES, AERIAL	1.4S	UN0404	II	EXPLOSIVE		A5.58
†	FLARES, AERIAL	1.1G	UN0420	II	EXPLOSIVE		A5.58
❑	FLARES, AERIAL	1.2G	UN0421	II	EXPLOSIVE		A5.58
	Flares, aeroplane; see FLARES, AERIAL						
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	Flares, distress, small; see SIGNAL DEVICES, HAND						
	Flares, highway; see SIGNAL DEVICES, HAND						
	Flares, signal; see CARTRIDGES, SIGNAL						
†	FLARES, SURFACE	1.1G	UN0418	II	EXPLOSIVE		A5.58
❑	FLARES, SURFACE	1.2G	UN0419	II	EXPLOSIVE		A5.58
❑	FLARES, SURFACE	1.3G	UN0092	II	EXPLOSIVE		A5.58
	Flares, water-activated; see CONTRIVANCES, WATER-ACTIVATED, etc.						
†	FLASH POWDER	1.1G	UN0094	II	EXPLOSIVE		A5.59
❑	FLASH POWDER	1.3G	UN0305	II	EXPLOSIVE		A5.59
	Flavouring liquids; see EXTRACTS, FLAVOURING LIQUID						
	Flue dusts, poisonous; see ARSENICAL DUST						
	FLUOBORIC ACID	8	UN1775	II	CORROSIVE	A6,A7, N34,N3	A12.3
	Fluoric acid; see HYDROFLUORIC, ACID SOLUTION, etc.						
†	FLUORINE, COMPRESSED	2.3	UN1045		POISON GAS,	1	A6.7

					OXIDIZER		
	FLUOROACETIC ACID	6.1	UN2642	I	POISON		A10.6
	FLUOROANILINES	6.1	UN2941	III	KEEP AWAY FROM FOOD		A10.5
	2-Fluoroaniline; see FLUOROANILINES						
	4-Fluoroaniline; see FLUOROANILINES						
	o-Fluoroaniline; see FLUOROANILINES						
	p-Fluoroaniline; see FLUOROANILINES						
	FLUOROBENZENE	3	UN2387	II	FLAMMABLE LIQUID		A7.3
	Fluoroethane; see ETHYL FLUORIDE						
	Fluoroform; see TRIFLUOROMETHANE						
	Fluoromethane; see METHYL FLUORIDE						
	FLUOROPHOSPHORIC ACID, ANHYDROUS	8	UN1776	II	CORROSIVE	A6,A7, N34,N3	A12.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
*	FLUOROSILICATES, N.O.S.	6.1	UN2856	III	KEEP AWAY FROM FOOD		A10.6
	FLUOSILICIC ACID	8	UN1778	II	CORROSIVE	A6,A7, N34,N3	A12.3
	FLUOROSULPHONIC ACID	8	UN1777	I	CORROSIVE	A3,A6,A7, A10,N3	A12.3
	FLUOROTOLUENES	3	UN2388	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
	FORMALDEHYDE SOLUTIONS with not less than 25% formaldehyde	8	UN2209	III	CORROSIVE		A12.3
	FORMALDEHYDE SOLUTIONS, flammable	3	UN1198	III	FLAMMABLE LIQUID, CORROSIVE		A7.3
	Formalin; see FORMALDEHYDE, SOLUTIONS						
	FORMIC ACID	8	UN1779	II	CORROSIVE		A12.3
	Formic aldehyde; see FORMALDEHYDE SOLUTIONS						

SYMBOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	Formic ether; see ETHYL FORMATE						
	2-Formyl-3,4-dihydro-2H-pyran; see ACROLEIN DIMER, STABILIZED						
†	FRACTURING DEVICES, EXPLOSIVE, without detonators for oil wells	1.1D	UN0099	II	EXPLOSIVE		A5.60
	FUEL, AVIATION, TURBINE ENGINE	3	UN1863	I	FLAMMABLE LIQUID		A7.3
				II	FLAMMABLE LIQUID		
				III	FLAMMABLE LIQUID		
D	FUEL OIL (No. 1, 2, 4, 5 or 6); also see GAS OIL	3	NA1993	III	FLAMMABLE LIQUID		A7.3
	Fulminate of mercury (dry)	FORBIDDEN					FORBIDDEN
	Fulminate of mercury, wet; see MERCURY FULMINATE, etc.						
	Fulminating gold	FORBIDDEN					FORBIDDEN
	Fulminating mercury	FORBIDDEN					FORBIDDEN
	Fulminating platinum	FORBIDDEN					FORBIDDEN
	Fulminating silver	FORBIDDEN					FORBIDDEN
	Fulminic acid	FORBIDDEN					FORBIDDEN
	FUMARYL CHLORIDE	8	UN1780	II	CORROSIVE		A12.3
	Fumigant; see appropriate pesticide						
	Fuming liquid arsenic; see ARSENIC TRICHLORIDE						
	Fungicide; see appropriate pesticide						
D	FUSEE (railway or highway)	4.1	NA1325	II	FLAMMABLE SOLID		A8.14
†	FURAN	3	UN2389	I	FLAMMABLE LIQUID		A7.3
	FURFURAL	3	UN1199	III	FLAMMABLE LIQUID		A7.3
	FURFURYL ALCOHOL	6.1	UN2874	III	KEEP AWAY FROM FOOD		A10.5

	FURFURYLAMINE	3	UN2526	III	FLAMMABLE LIQUID		A7.3
	Furyl carbinol; see FURFURYL ALCOHOL						
	Fusee, matches; see MATCHES, FUSEE						
	Fusees, railway or highway, explosive; see SIGNAL DEVICES, HAND						
	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	II	EXPLOSIVE		A5.61
❑	FUSE, INSTANTANEOUS, NONDETONATING (QUICKMATCH)	1.3G	UN0101	II	EXPLOSIVE		A5.61
	FUSEL OIL	3	UN1201	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	FUSE, SAFETY	1.4S	UN0105	II	EXPLOSIVE		A5.62
	Fuses, tracer; see TRACERS FOR AMMUNITION						
	Fuzes, combination, percussion and time; see FUZES, DETONATING (UN0257, UN0367); or FUZES, IGNITING (UN0317, UN0368)						
†	FUZES, DETONATING	1.1B	UN0106	II	EXPLOSIVE		A5.63
❑	FUZES, DETONATING	1.2B	UN0107	II	EXPLOSIVE		A5.63
	FUZES, DETONATING	1.4B	UN0257	II	EXPLOSIVE	116	A5.63
	FUZES, DETONATING	1.4S	UN0367	II	EXPLOSIVE	116	A5.63
†	FUZES, DETONATING, with protective features	1.1D	UN0408	II	EXPLOSIVE		A5.63
❑	FUZES, DETONATING, with protective features	1.2D	UN0409	II	EXPLOSIVE		A5.63
	FUZES, DETONATING, with protective features	1.4D	UN0410	II	EXPLOSIVE	116	A5.63
❑	FUZES, IGNITING	1.3G	UN0316	II	EXPLOSIVE		A5.64
	FUZES, IGNITING	1.4G	UN0317	II	EXPLOSIVE		A5.64
	FUZES, IGNITING	1.4S	UN0368	II	EXPLOSIVE		A5.64
	Galactan trinitrate	FORBIDDEN					FORBIDDEN

	GALLIUM	8	UN2803	I	CORROSIVE		A12.8
	Gas candles, charged with flammable gas; see DEVICES, SMALL, HYDROCARBON GAS POWERED						
	Gas, compressed; see COMPRESSED GASES, etc.						
	GAS DRIPS, hydrocarbon	3	UN1864	II	FLAMMABLE LIQUID		A7.3
	GAS GENERATOR ASSEMBLIES (AIRCRAFT), containing a nonflammable, nontoxic gas and a propellant cartridge	2.2	ID8013		NONFLAM-MABLE GAS		A6.23
D	GAS IDENTIFICATION SETS, must be classified and labelled according to the hazard class of the constituent(s)	2.3	NA9035		POISON GAS	6	A6.18
D	GASOHOL (gasoline mixed with ethyl alcohol, max. 20% alcohol)	3	NA1203	II	FLAMMABLE LIQUID		A7.3
	GAS OIL	3	UN1202	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	GASOLINE	3	UN1203	II	FLAMMABLE LIQUID		A7.3
	GAS, REFRIGERATED LIQUID, N.O.S.	2.2	UN3158		NONFLAM-MABLE GAS		A6.12
	Gasoline, casinghead; see NATURAL GASOLINE						
	Gelatine, blasting; see EXPLOSIVE, BLASTING, TYPE A						
	Gelatine dynamites; see EXPLOSIVE, BLASTING, TYPE A						
†	GERMANE	2.3	UN2192		POISON GAS, FLAMMABLE GAS	1	A6.16
	Germanium hydride; see GERMANE						
	Glycerol-1,3-dichlorohydrin; see 1,3-DICHLOROPROPANOL-2						

	Glycerol-1,3-dinitrate	FORBIDDEN					FORBIDDEN
	Glycerol gluconate trinitrate	FORBIDDEN					FORBIDDEN
	Glycerol lactate trinitrate	FORBIDDEN					FORBIDDEN
	GLYCEROL ALPHA-MONOCHLOROHYDRIN	6.1	UN2689	III	KEEP AWAY FROM FOOD		A10.5
	Glyceryl trinitrate; see NITROGLYCERIN, etc.						
	GLYCIDALDEHYDE	3	UN2622	II	FLAMMABLE LIQUID, POISON		A7.3
D	GRENADES, EMPTY PRIMED	1.4S	NA0349	II	NONE		A5.65
†	GRENADES, hand or rifle, with bursting charge	1.1D	UN0284	II	EXPLOSIVE		A5.66
❑	GRENADES, hand or rifle, with bursting charge	1.2D	UN0285	II	EXPLOSIVE		A5.66
†	GRENADES, hand or rifle, with bursting charge	1.1F	UN0292	II	EXPLOSIVE		A5.66
❑	GRENADES, hand or rifle, with bursting charge	1.2F	UN0293	II	EXPLOSIVE		A5.66
	Grenades, illuminating; see AMMUNITION, ILLUMINATING, etc.						
	GRENADES, PRACTICE, hand or rifle	1.4G	UN0452	II	EXPLOSIVE		A5.66
	GRENADES, PRACTICE, hand or rifle	1.4S	UN0110	II	EXPLOSIVE		A5.66
❑	GRENADES, PRACTICE, hand or rifle	1.3G	UN0318	II	EXPLOSIVE		A5.66
❑	GRENADES, PRACTICE, hand or rifle	1.2G	UN0372	II	EXPLOSIVE		A5.66
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	Grenades, smoke; see AMMUNITION, SMOKE, etc.						
	GUANIDINE NITRATE	5.1	UN1467	III	OXIDIZER	A1	A9.8
	Guanyl nitrosaminoguanylidene hydrazine (dry)	FORBIDDEN					FORBIDDEN
†	GUANYL NITROSAMINO-GUANYLIDENE HYDRAZINE, WETTED with not less than 30% water, by mass	1.1A	UN0113	II	EXPLOSIVE	111,117	A5.67
	Guanyl nitrosaminoguanyltetrazene (dry)	FORBIDDEN					FORBIDDEN
†	GUANYL NITROSAMINOGUANYLTETRAZENE, WETTED; OR TETRAZENE, WETTED with not less than 30% water, or mixture of alcohol and water, by mass	1.1A	UN0114	II	EXPLOSIVE	111,117	A5.67
	GUNPOWDER, COMPRESSED or GUNPOWDER IN PELLETS; see BLACK POWDER (UN0028)						

	GUNPOWDER, granular or as a meal; see BLACK POWDER (UN0027)						
	Gutta percha solution; see RUBBER SOLUTION						
	HAFNIUM POWDER, DRY	4.2	UN2545	I	SPONTANE-OUSLY COM-BUSTIBLE	A19,A20, N34	A8.4
				II	SPONTANE-OUSLY COM-BUSTIBLE	A19,A20, N34	
				III	SPONTANE-OUSLY COM-BUSTIBLE		
	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	FLAMMABLE SOLID	A6,A19, A20,N34	A8.4
	Hair, wet; see FIBRES, etc.						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	HALOGENATED IRRITATING LIQUID, N.O.S.	6.1	UN1610	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.5
	Hand signal device; see SIGNAL DEVICES, HAND						
D	HAZARDOUS WASTE, LIQUID, N.O.S.	9	NA3082	III	CLASS 9		A13.14
D	HAZARDOUS WASTE, SOLID, N.O.S.	9	NA3077	III	CLASS 9		A13.14
	Heavy hydrogen; see DEUTERIUM						
	HELIUM, COMPRESSED	2.2	UN1046		NONFLAM-MABLE GAS		A6.3,A6.7
	Helium-oxygen mixture; see RARE GASES and OXYGEN MIXTURES						
	HELIUM, REFRIGERATED LIQUID	2.2	UN1963		NONFLAM-		A6.12

	(cryogenic liquid)				MABLE GAS		
	N-HEPTALDEHYDE	3	UN3056	III	FLAMMABLE LIQUID		A7.3
	n-Heptanal; see N-HEPTALDEHYDE						
	HEPTANES	3	UN1206	II	FLAMMABLE LIQUID		A7.3
	4-Heptanone; see DIPROPYL KETONE						
	N-HEPTENE	3	UN2278	II	FLAMMABLE LIQUID		A7.3
	HEXACHLOROACETONE	6.1	UN2661	III	KEEP AWAY FROM FOOD		A10.5
	HEXACHLOROBENZENE	6.1	UN2729	III	KEEP AWAY FROM FOOD		A10.5
	HEXACHLOROBUTADIENE	6.1	UN2279	III	KEEP AWAY FROM FOOD		A10.5
†	HEXACHLOROCYCLOPENTADIENE	6.1	UN2646	I	POISON	2	A10.7
	HEXACHLOROPHENE	6.1	UN2875	III	KEEP AWAY FROM FOOD		A10.6
	Hexachloro-2-propanone; see HEXACHLOROACETONE						
❑	HEXADECYLTRICHLOROSILANE	8	UN1781	II	CORROSIVE	A7,N34	A12.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	HEXADIENE	3	UN2458	II	FLAMMABLE LIQUID		A7.3
†	HEXAETHYL TETRAPHOSPHATE and COMPRESSED GAS MIXTURES	2.3	UN1612		POISON GAS	3	A6.19
	HEXAETHYL TETRAPHOSPHATE LIQUID	6.1	UN1611	I II III	POISON POSION KEEP AWAY FROM FOOD	A4, N76 N77	A10.5
	HEXAETHYL TETRAPHOSPHATE, SOLID	6.1	UN1611	I II III	POISON POISON KEEP AWAY FROM FOOD	 N76 N77	A10.6

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
❑	HEXAFLUOROACETONE	2.3	UN2420		POISON GAS	2	A6.5
	HEXAFLUOROACETONE HYDRATE	6.1	UN2552	II	POISON		A10.5
	HEXAFLUOROETHANE (R116)	2.2	UN2193		NONFLAM-MABLE GAS		A6.3,A6.5
	HEXAFLUOROPHOSPHORIC ACID	8	UN1782	II	CORROSIVE	A6,A7, N3,N34	A12.3
	HEXAFLUOROPROPYLENE	2.2	UN1858		NONFLAM-MABLE GAS		A6.3,A6.5
	Hexahydrobenzene; see CYCLOHEXANE						
	Hexahydrocresol; see METHYLCYCLOHEXANOLS, etc.						
	Hexahydromethyl phenol; see METHYLCYCLOHEXANOLS,etc.						
	Hexahydrotoluene; see METHYLCYCLOHEXANE						
D	HEXAFLUOROPROPYLENE OXIDE	2.2	NA1956		NONFLAM-MABLE GAS		A6.3,A6.5
	HEXALDEHYDE	3	UN1207	III	FLAMMABLE LIQUID		A7.3
	Hexamethylene; see CYCLOHEXANE						
	HEXAMETHYLENEDIAMINE, SOLID	8	UN2280	III	CORROSIVE		A12.4
	HEXAMETHYLENEDIAMINE SOLUTION	8	UN1783	II III	CORROSIVE CORROSIVE		A12.3
	HEXAMETHYLENE DIISOCYANATE	6.1	UN2281	II	POISON		A10.5
	HEXAMETHYLENEIMINE	3	UN2493	II	FLAMMABLE LIQUID		A7.3
	Hexamethylenetetramine; see HEXAMINE						
	Hexamethylene triperoxide diaine (dry)	FORBIDDEN					FORBIDDEN
	Hexamethylol benzene hexanitrate	FORBIDDEN					FORBIDDEN
	HEXAMINE	4.1	UN1328	III	FLAMMABLE SOLID	A1	A8.4
	HEXANES	3	UN1208	II	FLAMMABLE LIQUID		A7.3
	Hexanitroazoxy benzene	FORBIDDEN					FORBIDDEN
	2,2',4,4',6,6'-Hexanitro- 3,3'	FORBIDDEN					FORBIDDEN

	dihydroxyazobenzene (dry)						
	2,2',3',4,4',6-Hexanitrodiphenylamine	FORBIDDEN					FORBIDDEN
†	HEXANITRODIPHENYLAMINE (DIPICRYLAMINE; HEXYL)	1.1D	UN0079	II	EXPLOSIVE		A5.68
	2,3',4,4'6,6'-Hexanitrodiphenylether	FORBIDDEN					FORBIDDEN
	N,N'-(Hexanitrodiphenyl)	FORBIDDEN					FORBIDDEN
	ethylene dinitramine (dry)						
	Hexanitrodiphenyl urea	FORBIDDEN					FORBIDDEN
	Hexanitroethane	FORBIDDEN					FORBIDDEN
	Hexanitrooxanilide	FORBIDDEN					FORBIDDEN
†	HEXANITROSTILBENE	1.1D	UN0392	II	EXPLOSIVE		A5.68
	Hexanoic acid; see CAPROIC ACID						
	HEXANOLS	3	UN2282	III	FLAMMABLE LIQUID		A7.3
†	HEXATONAL, CAST	1.1D	UN0393	II	EXPLOSIVE		A5.69
	1-HEXENE	3	UN2370	II	FLAMMABLE LIQUID		A7.3
	HEXOGEN; see CYCLOTRIMETHYLENETRI-NITRAMINE, etc.						
†	HEXOLITE, dry or wetted with less than 15% water, by mass	1.1D	UN0118	II	EXPLOSIVE		A5.69
	HEXYL; see HEXANITRODIPHENYLAMINE						
❑	HEXYLTRICHLOROSILANE	8	UN1784	II	CORROSIVE	A7,N34	A12.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	High explosives; see individual explosives' entries						
	HMX; see CYCLOTETRAMETHYLENE-TETRANITRAMINE, etc.						
❑	HYDRAZINE, ANHYDROUS or HYDRAZINE AQUEOUS SOLUTIONS with more than 64% hydrazine, by mass	3	UN2029	I	FLAMMABLE LIQUID, POISON, CORROSIVE	A3,A6, A7,A10	A7.3
	Hydrazine azide	FORBIDDEN					FORBIDDEN
	Hydrazine chlorate	FORBIDDEN					FORBIDDEN

	Hydrazine dicarbonic acid diazide	FORBIDDEN					FORBIDDEN
❑	HYDRAZINE HYDRATE or HYDRAZINE AQUEOUS SOLUTIONS, with not more than 64% hydrazine, by mass	8	UN2030	II	CORROSIVE, POISON		A12.12
	Hydrazine perchlorate	FORBIDDEN					FORBIDDEN
	Hydrazine selenate	FORBIDDEN					FORBIDDEN
	Hydrides, metal, water-active, n.o.s.; see METAL HYDRIDES, WATER-REACTIVE, N.O.S.						
	Hydriodic acid, anhydrous; see HYDROGEN IODIDE, ANHYDROUS						
	HYDRIODIC ACID, SOLUTION	8	UN1787	II III	CORROSIVE CORROSIVE	A3,A6,N41 A3,A6,N41	A12.3
	Hydrobromic acid, anhydrous; see HYDROGEN BROMIDE, ANHYDROUS						
†	HYDROBROMIC ACID, SOLUTION, more than 49% strength	8	UN1788	II	CORROSIVE	A3,A6,N41	A12.3
	HYDROBROMIC ACID, SOLUTION, not more than 49% strength	8	UN1788	II III	CORROSIVE CORROSIVE		A12.3
	Hydrobromic ether; see ETHYL BROMIDE						
❑	HYDROCARBON GAS, COMPRESSED, N.O.S. or HYDROCARBON GAS MIXTURES, COMPRESSED, N.O.S.	2.1	UN1964		FLAMMABLE GAS		A6.3,A6.7

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
❑	HYDROCARBON GAS,LIQUEFIED, N.O.S. or HYDROCARBON GAS MIXTURES, LIQUEFIED, N.O.S	2.1	UN1965		FLAMMABLE GAS		A6.3,A6.5
	Hydrocarbon gas powered small devices; see DEVICES, SMALL, HYDROCARBON GAS POWERED, etc						
	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						
†	HYDROCHLORIC ACID, SOLUTION	8	UN1789	II III	CORROSIVE CORROSIVE	A3,A6,N41 A3,A6,N41	A12.3
	Hydrocyanic acid, anhydrous; see HYDROGEN CYANIDE						
D	HYDROCYANIC ACID, AQUEOUS SOLUTIONS less than 5% HCN	NOT ACCEPTED					NOT ACCEPTED
	HYDROCYANIC ACID, AQUEOUS SOLUTIONSnot more than 20% hydrocyanic acid	NOT ACCEPTED					NOT ACCEPTED
	Hydrocyanic acid, LIQUEFIED; see HYDROGEN CYANIDE, etc.						
	Hydrocyanic acid (prussic), unstabilized	FORBIDDEN					FORBIDDEN
	Hydrofluoboric acid; see FLUOBORIC ACID						
❑	HYDROFLUORIC ACID AND SULPHURIC ACID MIXTURES	8	UN1786	I	CORROSIVE, POISON	A6,A7, N5,N34	A12.3
	Hydrofluoric acid, anhydrous; see HYDROGEN FLUORIDE, ANHYDROUS						
	HYDROFLUORIC ACID, SOLUTION, more than 60% strength	8	UN1790	I	CORROSIVE, POISON	A6,A7, N5,N34	A12.3
	HYDROFLUORIC ACID, SOLUTION, not more than 60% strength	8	UN1790	II	CORROSIVE, POISON	A6,A7, N5,N34	A12.3
	Hydrofluosilicic acid; see FLUOSILICIC ACID						
❑	HYDROGEN AND METHANE MIXTURES, COMPRESSED	2.1	UN2034		FLAMMABLE GAS		A6.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
❑	HYDROGEN BROMIDE, ANHYDROUS	2.3	UN1048		POISON GAS, CORROSIVE	3	A6.5
†	HYDROGEN CHLORIDE, ANHYDROUS	2.3	UN1050		POISON GAS, CORROSIVE	3	A6.5
	HYDROGEN CHLORIDE, REFRIGERATED LIQUID (cryogenic liquid)	NOT ACCEPTED					NOT ACCEPTED
❑	HYDROGEN, COMPRESSED	2.1	UN1049		FLAMMABLE GAS		A6.3,A6.7

	HYDROGEN CYANIDE, ANHYDROUS, STABILIZED	NOT ACCEPTED					NOT ACCEPTED
	HYDROGEN CYANIDE, ANHYDROUS, STABILIZED absorbed in a porous inert material	NOT ACCEPTED					NOT ACCEPTED
†	HYDROGEN FLUORIDE, ANHYDROUS	8	UN1052	I	CORROSIVE, POISON	3	A12.9
†	HYDROGEN IODIDE, ANHYDROUS	2.2	UN2197		NONFLAM-MABLE GAS, CORROSIVE		A6.3,A6.5
	Hydrogen iodide solution; see HYDRIODIC ACID, SOLUTION						
	HYDROGEN PEROXIDE AND PEROXYACETIC ACID MIXTURES, with acids, water and not more than 5% peroxyacetic acid, stabilized	5.1	UN3149	II	OXIDIZER, CORROSIVE	A2,A3, A6	A9.7
	HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS with more than 40%, but not more than 60% hydrogen	NOT ACCEPTED					NOT ACCEPTED
	HYDROGEN PEROXIDE, AQUEOUS SOLUTIONSwith not less than 8%, but less than 20% hydrogen peroxide (stabilized as necessary)	5.1	UN2984	III	OXIDIZER	A1,17	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	OXIDIZER, CORROSIVE	12,A3,A6	A9.7
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	HYDROGEN PEROXIDE, STABILIZED or HYDROGEN PEROXIDE AQUEOUS SOLUTIONS, STABILIZED with more than 60% hydrogen peroxide	NOT ACCEPTED					NOT ACCEPTED
†	HYDROGEN, REFRIGERATED LIQUID (cryogenic liquid)	2.1	UN1966		FLAMMABLE GAS		A6.12
	HYDROGEN SELENIDE, ANHYDROUS	NOT ACCEPTED					NOT ACCEPTED

	Hydrogen sulphate; see SULPHURIC ACID						
†	HYDROGEN SULPHIDE, LIQUEFIED	2.3	UN1053		POISON GAS, FLAMMABLE GAS	2	A6.5
	HYDROQUINONE	6.1	UN2662	III	KEEP AWAY FROM FOOD		A10.6
	Hydrosilicofluoric acid; see FLUOSILICIC ACID						
	3-(2-Hydroxyethoxy)-4-Pyrrolidin-1-Ylbenzenediazonium Zink Chloride; see SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED						
	HYDROXYLAMINE SULPHATE	8	UN2865	III	CORROSIVE		A12.4
	Hydroxyl amine iodide	FORBIDDEN					FORBIDDEN
	HYPOCHLORITE SOLUTIONS with more than 5% but less than 16% available chlorine	8	UN1791	III	CORROSIVE	N34	A12.3
	HYPOCHLORITE SOLUTIONS with 16% or more available chlorine	8	UN1791	II	CORROSIVE	A7,N34	A12.3
	Hyponitrous acid	FORBIDDEN					FORBIDDEN
	Igniter fuse, metal clad; see FUSE, IGNITER, tubular, metal clad						
†	IGNITERS	1.1G	UN0121	II	EXPLOSIVE		A5.70
❑	IGNITERS	1.2G	UN0314	II	EXPLOSIVE		A5.70
❑	IGNITERS	1.3G	UN0315	II	EXPLOSIVE		A5.70
	IGNITERS	1.4G	UN0325	II	EXPLOSIVE		A5.71
	IGNITERS	1.4S	UN0454	II	EXPLOSIVE		A5.71
	3,3'-IMINODIPROPYLAMINE	8	UN2269	III	CORROSIVE		A12.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	INFECTIOUS SUBSTANCES, AFFECTING ANIMALS only	6.2	UN2900		INFECTIOUS SUBSTANCE	101	A10.9
	INFECTIOUS SUBSTANCES, AFFECTING HUMANS	6.2	UN2814		INFECTIOUS SUBSTANCE	101	A10.9
	Inflammable; see Flammable						
	Initiating explosives (dry)	FORBIDDEN					FORBIDDEN

	Ink, printer's, flammable						
	SEE PRINTING INK						
	Inositol hexanitrate (dry)	FORBIDDEN					FORBIDDEN
	INSECTICIDE GAS flammable, N.O.S.	2.1	UN1968		FLAMMABLE GAS		A6.3,A6.5
	INSECTICIDE GAS, N.O.S.	2.2	UN1968		NONFLAM-MABLE GAS		A6.3,A6.5
	INSECTICIDE GAS, TOXIC, N.O.S.	NOT ACCEPTED					NOT ACCEPTED
	Inulin trinitrate (dry)	FORBIDDEN					FORBIDDEN
	Iodine azide (dry)	FORBIDDEN					FORBIDDEN
❑	IODINE MONOCHLORIDE	8	UN1792	II	CORROSIVE	N41	A12.3
❑	IODINE PENTAFLUORIDE	5.1	UN2495	I	OXIDIZER, POISON CORROSIVE		A9.9
	2-IODOBUTANE	3	UN2390	II	FLAMMABLE LIQUID		A7.3
	IODOMETHYLPROPANES	3	UN2391	II	FLAMMABLE LIQUID		A7.3
	IODOPROPANES	3	UN2392	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
	Iodoxy compounds (dry)	FORBIDDEN					FORBIDDEN
	Iridium nitratopentamine iridium nitrate	FORBIDDEN					FORBIDDEN
	Iron chloride; see FERRIC CHLORIDE						
	IRON OXIDE, SPENT, or IRON SPONGE, SPENT obtained from coal gas purification	NOT ACCEPTED					NOT ACCEPTED

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
†	IRON PENTACARBONYL	6.1	UN1994	I	POISON, FLAMMABLE LIQUID	1	A10.3
	Iron sesquichloride; see FERRIC CHLORIDE						
	Irritating material; see TEAR GAS						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	SUBSTANCES, etc						
❑	ISOBUTANE or ISOBUTANE MIXTURES, see also PETROLEUM GASES, LIQUEFIED	2.1	UN1969		FLAMMABLE GAS		A6.3,A6.5
	ISOBUTANOL or ISOBUTYL ALCOHOL	3	UN1212	III	FLAMMABLE LIQUID		A7.3
	ISOBUTYL ACETATE	3	UN1213	II	FLAMMABLE LIQUID		A7.3
	ISOBUTYL ACRYLATE	3	UN2527	III	FLAMMABLE LIQUID		A7.3
	ISOBUTYL ALCOHOL; see ISOBUTANOL						
	ISOBUTYL ALDEHYDE; see ISOBUTYRALDEHYDE						
	ISOBUTYLAMINE	3	UN1214	II	FLAMMABLE LIQUID		A7.3
D❑	ISOBUTYL CHLOROFORMATE	6.1	NA2742	I	POISON, FLAMMABLE LIQUID, CORROSIVE	2	A10.7
❑	ISOBUTYLENE	2.1	UN1055		FLAMMABLE GAS	A1	A6.3,A6.5
	ISOBUTYL FORMATE	3	UN2393	II	FLAMMABLE LIQUID		A7.3
	ISOBUTYL ISOBUTYRATE	3	UN2528	III	FLAMMABLE LIQUID		A7.3
❑	ISOBUTYL ISOCYANATE	3	UN2486	II	FLAMMABLE LIQUID, POISON	1	A7.6
	ISOBUTYL METHACRYLATE	3	UN2283	III	FLAMMABLE LIQUID		A7.3
	ISOBUTYL PROPIONATE	3	UN2394	III	FLAMMABLE LIQUID		A7.3
	ISOBUTYRALDEHYDE or ISOBUTYL ALDEHYDE	3	UN2045	II	FLAMMABLE LIQUID		A7.3
	ISOBUTYRIC ACID	3	UN2529	III	FLAMMABLE LIQUID		A7.3

ISOBUTYRIC ANHYDRIDE	3	UN2530	III	FLAMMABLE LIQUID		A7.3
ISOBUTYRONITRILE	3	UN2284	II	FLAMMABLE LIQUID, POISON		A7.3
ISOBUTYRYL CHLORIDE	3	UN2395	II	FLAMMABLE LIQUID, CORROSIVE		A7.3
Isocrotonic acid, see CROTONIC ACID, liquid						
ISOCYANATES, N.O.S. or ISOCYANATE SOLUTIONS, N.O.S., flashpoint more than 60.5 degreesC and boiling point less than 300 degrees C	6.1	UN2206	II	POISON		A10.5
ISOCYANATES, N.O.S. or ISOCYANATE SOLUTIONS, FLAMMABLE, N.O.S., flashpoint not less than 23 degrees C and not more than 60.5 degrees C and boiling point less than 300 degrees C	6.1	UN3080	II	POISON, FLAMMABLE LIQUID		A10.5
ISOCYANATES, N.O.S. or ISOCYANATE SOLUTIONS, N.O.S., boiling point not less than 300 degrees C	6.1	UN2207	III	KEEP AWAY FROM FOOD		A10.5
ISOCYANATES, N.O.S. or ISOCYANATE SOLUTIONS, N.O.S., flashpoint less than 23 degrees C	3	UN2478	II	FLAMMABLE LIQUID, POISON	5,A3,A7	A7.3
ISOCYANATOBENZOTRIFLUORIDES	6.1	UN2285	II	POISON	5	A10.5
Isododecane, see PENTAMETHYLHEPTANE						
ISOHEPTENE	3	UN2287	II	FLAMMABLE LIQUID		A7.3
ISOHEXENE	3	UN2288	II	FLAMMABLE LIQUID		A7.3
Isooctane, see OCTANES						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	ISOOCTENE	3	UN1216	II	FLAMMABLE LIQUID		A7.3
	ISOPENTANE, see N-PENTANE						

	Isopentanoic acid, see CORROSIVE LIQUIDS, N.O.S.						
	ISOPENTENES	3	UN2371	I	FLAMMABLE LIQUID		A7.3
	Isopentylamine, see AMYLAMINE						
	Isopentyl nitrite, see AMYL NITRITE						
	ISOPHORONEDIAMINE	8	UN2289	III	CORROSIVE		A12.3
	ISOPHORONE DIISOCYANATE	6.1	UN2290	III	KEEP AWAY FROM FOOD		A10.5
	ISOPRENE, INHIBITED	3	UN1218	I	FLAMMABLE LIQUID		A7.3
	ISOPROPANOL	3	UN1219	II	FLAMMABLE LIQUID		A7.3
	ISOPROPENYL ACETATE	3	UN2403	II	FLAMMABLE LIQUID		A7.3
	ISOPROPENYLBENZENE	3	UN2303	III	FLAMMABLE LIQUID		A7.3
	ISOPROPYL ACETATE	3	UN1220	II	FLAMMABLE LIQUID		A7.3
	ISOPROPYL ACID PHOSPHATE	8	UN1793	III	CORROSIVE		A12.4
	ISOPROPYL ALCOHOL, see ISOPROPANOL						
	ISOPROPYLAMINE	3	UN1221	I	FLAMMABLE LIQUID		A7.3
	ISOPROPYLBENZENE	3	UN1918	III	FLAMMABLE LIQUID		A7.3
	Isopropyl bromide, see 2-BROMOPROPANE						
	ISOPROPYL BUTYRATE	3	UN2405	III	FLAMMABLE LIQUID		A7.3
	Isopropyl chloride, see 2-CHLOROPROPANE						
	ISOPROPYL CHLOROACETATE	3	UN2947	III	FLAMMABLE LIQUID		A7.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
†	ISOPROPYL CHLOROFORMATE	3	UN2407	I	FLAMMABLE LIQUID,	2	A7.6

					CORROSIVE, POISON		
	ISOPROPYL 2-CHLOROPROPIONATE	3	UN2934	III	FLAMMABLE LIQUID		A7.3
	Isopropyl-alpha-chloropropionate, see ISOPROPYL 2- CHLOROPROPIONATE						
	Isopropycumyl hydroperoxide, more than 72% in solution	FORBIDDEN					FORBIDDEN
	Isopropyl ether, see DIISOPROPYL ETHER						
	Isopropyl formate, see PROPYL FORMATES						
	ISOPROPYL ISOBUTYRATE	3	UN2406	II	FLAMMABLE LIQUID		A7.3
❑	ISOPROPYL ISOCYANATE	3	UN2483	I	FLAMMABLE LIQUID, POISON	1	A7.6
	Isopropyl mercaptan, see PROPANETHIOLS						
	ISOPROPYL NITRATE	3	UN1222	II	FLAMMABLE LIQUID		A7.3
	Isopropyl phosphoric acid, ISOPROPYL ACID PHOSPHATE						
	ISOPROPYL PROPIONATE	3	UN2409	II	FLAMMABLE LIQUID		A7.3
	Isopropyltoluene, see CYMENES						
	Isopropyltoluol, see CYMENES						
	ISOSORBIDE DINITRATE MIXTURE with not less than 60% lactose, mannose, starch or calcium hydrogen phosphate	4.1	UN2907	II	FLAMMABLE SOLID		A8.4
	Isothiocyanic acid	FORBIDDEN					FORBIDDEN
	Isovaleraldehyde, see VALERALDEHYDE						
	Jet fuel, see FUEL, AVIATION, TURBINE ENGINE						
	JET PERFORATING GUNS, CHARGED, oil well, without detonator	FORBIDDEN					FORBIDDEN
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
D	JET PERFORATING GUNS, CHARGED,	FORBIDDEN					FORBIDDEN

	oil well, without detonator					
	Jet perforators, see CHARGES, SHAPED, COMMERCIAL Jet tappers, without detonator, see CHARGES, SHAPED, COMMERCIAL					
	Jet thrust igniters, for rocket motors or Jato, see IGNITERS					
	Jet thrust unit (Jato) see ROCKET MOTORS					
	Jute, see FIBRES, etc.					
	KEROSENE	3	UN1223	II	FLAMMABLE LIQUID	A7.3
				III	FLAMMABLE LIQUID	
	KETONE OILS, see ACETONE OILS					
	KETONES, LIQUID, N.O.S.	3	UN1224	I	FLAMMABLE LIQUID	A7.3
				II	FLAMMABLE LIQUID	
				III	FLAMMABLE LIQUID	
	KRYPTON, COMPRESSED	2.2	UN1056		NONFLAM MABLE GAS	A6.3,A6.7
	KRYPTON, REFRIGERATED LIQUID (CRYOGENIC LIQUID)	2.2	UN1970		NONFLAM MABLE GAS	A6.12
	Lacquer base or lacquer chips, nitrocellulose, dry, see NITROCELLULOSE, etc.					
	Lacquer base or lacquer chips, plastic, wet with alcohol or solvent, see NITROCELLULOSE, etc., or PAINT, etc.					
	Lacquer liquid, see NITRO-CELLULOSE, etc., or PAINT, etc.					

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)

	LEAD ACETATE	6.1	UN1616	III	KEEP AWAY FROM FOOD		A10.6
	LEAD ARSENATES	6.1	UN1617	II	POISON		A10.6
	LEAD ARSENITES	6.1	UN1618	II	POISON		A10.6
	Lead azide (dry)	FORBIDDEN					FORBIDDEN
†	LEAD AZIDE, WETTED with not less than 20% water or mixture of alcohol and water, by mass	1.1A	UN0129	II	EXPLOSIVE	111,117	A5.72
	Lead azide, wetted with less than 20% water ormixture of alcohol and water	FORBIDDEN					FORBIDDEN
*	LEAD COMPOUNDS, SOLUBLE, N.O.S.	6.1	UN2291	III	KEEP AWAY FROM FOOD		A10.6
	LEAD CYANIDE	6.1	UN1620	II	POISON		A10.6
	LEAD DIOXIDE	5.1	UN1872	III	OXIDIZER	A1	A9.8
	LEAD DROSS; see LEAD SULPHATE, with more than 3% free acid						
D†	LEAD MONONITRORESORCINATE	1.1A	NA0473	II	EXPLOSIVE	111,117	A5.72
	LEAD NITRATE	5.1	UN1469	II	OXIDIZER, POISON		A9.8
	Lead nitroresorcinate (dry)	FORBIDDEN					FORBIDDEN
	LEAD PERCHLORATE	5.1	UN1470	II	OXIDIZER		A9.8
	Lead peroxide; see LEAD DIOXIDE						
	LEAD PHOSPHITE, DIBASIC	4.1	UN2989	II	FLAMMABLE SOLID		A8.4
				III	FLAMMABLE SOLID		
	Lead picrate (dry)	FORBIDDEN					FORBIDDEN
	Lead styphnate (dry)	FORBIDDEN					FORBIDDEN
†	LEAD STYPHNATE or LEAD TRINITRORESORCINATE, WETTED with not less than 20% water or mixture of alcohol and water, by mass	1.1A	UN0130	II	EXPLOSIVE	111,117	A5.72
	Lead styphnate or lead trinitroresorcinate, wetted with less than 20% water or mixture of alcohol water	FORBIDDEN					FORBIDDEN
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**

	LEAD SULPHATE with more than 3% free acid	8	UN1794	II	CORROSIVE		A12.4
	Lead tetraethyl or lead tetramethyl; see MOTOR FUEL ANTI-KNOCK MIXTURES						
	LEAD TRINITRORESORCINATE; see LEAD STYPHNATE, etc.						
	Life rafts, see LIFE-SAVING APPLIANCES						
	LIFE-SAVING APPLIANCES, NOT SELF INFLATING containing dangerous goods as equipment	9	UN3072		CLASS 9		A13.11
	LIFE-SAVING APPLIANCES, SELF INFLATING	9	UN2990		CLASS 9		A13.11
	Lighter flints; see FERROCERIUM						
	Lighter fluid; see FLAMMABLE LIQUID, N.O.S.						
	Lighter replacement cartridges containing liquefied petroleum gases (and similar devices, each not exceeding 65 grams); see LIGHTERS, etc. containing flammable gas						
D	LIGHTERS FOR CIGARS, CIGARETTES, etc. with lighter fluids	NOT ACCEPTED					NOT ACCEPTED
	LIGHTERS, FUSE	1.4S	UN0131	II	EXPLOSIVE		A5.73
	LIGHTERS (cigarettes) containing flammable gas	2.1	UN1057		FLAMMABLE GAS		A6.11
	Lime-Nitrogen; see CALCIUM CYANAMIDE, etc.						
	Lime, unslaked; see CALCIUM OXIDE						
	Limorene, inactive; see DIPENTENE						
	LIQUEFIED GASES, nonflammable charged with nitrogen, carbon dioxide or air	2.2	UN1058		NONFLAM MABLE GAS		A6.3,A6.5
	LIQUEFIED GASES, FLAMMABLE, N.O.S.	2.1	UN3161		FLAMMABLE GAS		A6.5
	Liquefied hydrocarbon gas; see HYDROCARBON GASES, LIQUEFIED, N.O.S., etc.						
	Liquefied natural gas; see METHANE, REFRIGERATED LIQUID or NATURAL GAS, REFRIGERATED LIQUID, etc.						
SYM-BOL	**PROPER SHIPPING NAME/DESCRIPTION**	**HAZARD CLASS/DIV**	**UN/ID NUMBER**	**PG**	**LABELS**	**SPECIAL PROVISION**	**PACKAGING PARAGRAPH**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Liquefied petroleum gas; see PETROLEUM GASES,LIQUEFIED						
	Liquor; see ALCOHOLIC BEVERAGES, etc.						
❑	LITHIUM	4.3	UN1415	II	DANGEROUS WHEN WET	A7,A19, N45	A8.4
	Lithium acetylide ethylenediamine complex; see WATER REACTIVE SOLID, N.O.S.						
†	LITHIUM ALKYLS	4.2	UN2445	I	SPONTANE-OUSLY COM-BUSTIBLE		A8.6
❑	LITHIUM ALUMINIUM HYDRIDE	4.3	UN1410	I	DANGEROUS WHEN WET	A19,N40	A8.4
❑	LITHIUM ALUMINIUM HYDRIDE, ETHEREAL	4.3	UN1411	I	DANGEROUS WHEN WET, FLAMMABLE LIQUID	A2,A3, A11,N34	A8.3
	Lithium amide; see ALKALI METAL AMIDES						
	LITHIUM BATTERIES CONTAINED IN EQUIPMENT	9	UN3091	II	CLASS 9		A13.8
❑	LITHIUM BATTERIES, liquid cathode	9	UN3090	II	CLASS 9		A13.8
	LITHIUM BATTERIES, solid cathode	9	UN3090	II	CLASS 9		A13.8
❑	LITHIUM BOROHYDRIDE	4.3	UN1413	I	DANGEROUS WHEN WET	A19,N40	A8.4
	LITHIUM FERROSILICON	4.3	UN2830	II	DANGEROUS WHEN WET	A19	A8.4
❑	LITHIUM HYDRIDE	4.3	UN1414	I	DANGEROUS WHEN WET	A19,N40	A8.4
	LITHIUM HYDRIDE, FUSED SOLID	4.3	UN2805	II	DANGEROUS WHEN WET	A8,A19, A20	A8.4
	LITHIUM HYDROXIDE, MONOHYDRATE	8	UN2680	II	CORROSIVE		A12.4
	LITHIUM HYDROXIDE, SOLUTION	8	UN2679	II III	CORROSIVE CORROSIVE		A12.3
	LITHIUM HYPOCHLORITE, DRY or LITHIUM HYPOCHLORITE MIXTURES, DRY	5.1	UN1471	II	OXIDIZER	A9,N34	A9.8
	Lithium in cartridges, see LITHIUM						
	LITHIUM NITRATE	5.1	UN2722	III	OXIDIZER	A1	A9.8

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
❑	LITHIUM NITRIDE	4.3	UN2806	I	DANGEROUS WHEN WET	A19,N40	A8.4
	LITHIUM PEROXIDE	5.1	UN1472	II	OXIDIZER	A9,N34	A9.8
	LITHIUM SILICON	4.3	UN1417	II	DANGEROUS WHEN WET	A19,A20	A8.4
	lng, see METHANE, REFRIGERATED LIQUID or NATURAL GAS, REFRIGERATED LIQUID						
	LONDON PURPLE	6.1	UN1621	II	POISON		A10.6
	lpg, see PETROLEUM GASES, LIQUEFIED						
	Lye solid, see SODIUM HYDROXIDE, SOLID						
	Lye solution, see SODIUM HYDROXIDE, SOLUTIONS						
	Lythene, see PETROLEUM SPIRIT						
	MAGNESIUM ALKYLS	4.2	UN3053	I	SPONTANE-OUSLY COM-BUSTIBLE		A8.6
❑	MAGNESIUM ALUMINIUM PHOSPHIDE	4.3	UN1419	I	DANGEROUS WHEN WET, POISON	A19,N34, N40	A8.4
	MAGNESIUM ARSENATE	6.1	UN1622	II	POISON		A10.6
	Magnesium bisulphite solution, see BISULPHITES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.						
	MAGNESIUM BROMATE	5.1	UN1473	II	OXIDIZER	A1	A9.8
	MAGNESIUM CHLORATE	5.1	UN2723	II	OXIDIZER		A9.8
	MAGNESIUM DIAMIDE	4.2	UN2004	II	SPONTANE-OUSLY COM-BUSTIBLE	A8,A19, A20	A8.4
	MAGNESIUM DIPHENYL	4.2	UN2005	I	SPONTANE-OUSLY COM-BUSTIBLE		A8.12
	magnesium dross, wet or hot	FORBIDDEN					FORBIDDEN
	MAGNESIUM FLUOROSILICATE	6.1	UN2853	III	KEEP AWAY FROM FOOD		A10.6
	MAGNESIUM GRANULES, COATED, particle	4.3	UN2950	III	DANGEROUS	A1,A19	A8.4

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	size not less than 149 Microns				WHEN WET		
❑	MAGNESIUM HYDRIDE	4.3	UN2010	I	DANGEROUS WHEN WET	A19,N40	A8.4
	MAGNESIUM OR MAGNESIUM ALLOYS with more than 50% magnesium in pellets, turnings or ribbons	4.1	UN1869	III	FLAMMABLE SOLID	A1	A8.4
	MAGNESIUM NITRATE	5.1	UN1474	III	OXIDIZER	A1	A9.8
	MAGNESIUM PERCHLORATE	5.1	UN1475	II	OXIDIZER		A9.8
	MAGNESIUM PEROXIDE	5.1	UN1476	II	OXIDIZER		A9.8
❑	MAGNESIUM PHOSPHIDE	4.3	UN2011	I	DANGEROUS WHEN WET, POISON	A19,N40	A8.4
	MAGNESIUM, POWDER or MAGNESIUM ALLOYS, POWDER	4.3	UN1418	I	DANGEROUS WHEN WET, SPONTANE-OUSLY COM-BUSTIBLE	A19	A8.4
				II	DANGEROUS WHEN WET, SPONTANE-OUSLY COM-BUSTIBLE	A19	
				III	DANGEROUS WHEN WET, SPONTANE-OUSLY COM-BUSTIBLE	A19	
	magnesium scrap, see MAGNESIUM, etc. or MAGNESIUM ALLOYS, etc.						
	MAGNESIUM SILICIDE	4.3	UN2624	II	DANGEROUS WHEN WET	A19,A20	A8.4
	MAGNETIZED MATERIAL	9	UN2807		MAGNETIZED MATERIAL		A13.8
D	MALEIC ACID	8	NA2215	III	CORROSIVE		A12.4

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	MALEIC ANHYDRIDE	8	UN2215	III	CORROSIVE		A12.4
	MALONONITRILE	6.1	UN2647	II	POISON		A10.6
	MANEB or MANEB PREPARATIONS with not less than 60% maneb	4.2	UN2210	III	SPONTANE-OUSLY COM-BUSTIBLE, DANGEROUS WHEN WET	A1,A19	A8.4
	MANEB STABILIZED or MANEB PREPARATIONS, STABILIZED against self-heating	4.3	UN2968	III	DANGEROUS WHEN WET	A1,A19	A8.4
	MANGANESE NITRATE	5.1	UN2724	III	OXIDIZER	A1	A9.8
	MANGANESE RESINATE	4.1	UN1330	III	FLAMMABLE SOLID	A1	A8.4
	mannitan tetranitrate	FORBIDDEN					FORBIDDEN
	mannitol hexanitrate (dry)	FORBIDDEN					FORBIDDEN
D†	MANNITOL HEXANITRATE, WETTED or NITROMANNITE, WETTED with not less than 40% water, by mass or mixture of alcohol and water	1.1A	NA0133	II	EXPLOSIVE	111	A5.74
†	MANNITOL HEXANITRATE, WETTED or NITROMANNITE, WETTED with not less than 40% water, or mixture of alcohol and water, by mass	1.1D	UN0133	II	EXPLOSIVE	111,117	A5.74
	matches, block, see MATCHES, “STRIKE ANYWHERE”						
†	MATCHES, FUSEE	4.1	UN2254	III	FLAMMABLE SOLID		A8.15
	MATCHES, SAFETY (book, card or strike on box)	4.1	UN1944	III	FLAMMABLE SOLID		A8.15
†	MATCHES, “STRIKE ANYWHERE”	4.1	UN1331	III	FLAMMABLE SOLID		A8.15
	MATCHES, WAX, “VESTA”	4.1	UN1945	III	FLAMMABLE SOLID		A8.15
	Matches, trick, see FIREWORKS						
	matting acid, see SULPHURIC ACID						

D	MEDICINES, corrosive, liquid, N.O.S.	8	NA1760	II III	CORROSIVE CORROSIVE		A12.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
D	MEDICINES, corrosive, solid, N.O.S.	8	NA1759	II III	CORROSIVE CORROSIVE		A12.4
D	MEDICINES, flammable, liquid, N.O.S.	3	NA1993	I II III	FLAMMABLE LIQUID FLAMMABLE LIQUID FLAMMABLE LIQUID		
D	MEDICINES, flammable, solid, N.O.S.	4.1	NA1325	II	FLAMMABLE SOLID		A8.4
D	MEDICINES, oxidizing substance, solid, N.O.S.	5.1	NA1479	II	OXIDIZER		A9.8
D	MEDICINES, poisonous, liquid, N.O.S.	6.1	NA2810	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.5
D	MEDICINES, poisonous, solid, N.O.S.	6.1	NA2811	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.6
*	MEDICINES, LIQUID, FLAMMABLE, POISONOUS, N.O.S.	3	UN3248	II III	FLAMMABLE LIQUID, POISON FLAMMABLE LIQUID		A7.3
*	MEDICINES, LIQUID POISONOUS, N.O.S.	6.1	UN1851	II III	POISON KEEP AWAY FROM FOOD		A10.5
*	MEDICINES, SOLID, POISONOUS, N.O.S.	6.1	UN3249	II III	POISON KEEP AWAY FROM FOOD		A10.6
	memtetrahydrophthalic anhydride, see						

	CORROSIVE LIQUIDS, N.O.S.						
	MERCAPTANS, LIQUID, N.O.S. or MERCAPTAN MIXTURES, LIQUID, N.O.S., flashpoint less than 23 degrees C	3	UN1228	II	FLAMMABLE LIQUID, POISON		A7.3
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	MERCAPTANS, LIQUID, N.O.S. or MERCAPTAN MIXTURES, LIQUID, N.O.S., Flashpoint not less than 23 degrees C	6.1	UN3071	II	POISON, FLAMMABLE LIQUID		A10.5
	5-MERCAPTOTETRAZOL-1-ACETIC ACID	1.4C	UN0048	II	EXPLOSIVE		A5.75
	MERCURIC ARSENATE	6.1	UN1623	II	POISON		A10.6
	MERCURIC CHLORIDE	6.1	UN1624	II	POISON		A10.6
	mercuric compounds, see MERCURY COMPOUNDS, etc.						
	MERCURIC NITRATE	6.1	UN1625	II	POISON	N73	A10.6
†	MERCURIC POTASSIUM CYANIDE	6.1	UN1626	I	POISON	N74,N75	A10.6
	mercuric sulfocyanate, see MERCURY THIOCYANATE						
	mercurol, see MERCURY NUCLEATE						
	mercurous azide	FORBIDDEN					FORBIDDEN
	mercurous compounds, see MERCURY COMPOUNDS, etc.						
	MERCUROUS NITRATE	6.1	UN1627	II	POISON		A10.6
	MERCURY	8	UN2809	I	CORROSIVE		A12.10
	MERCURY ACETATE	6.1	UN1629	II	POISON		A10.6
	mercury acetylide	FORBIDDEN					FORBIDDEN
	MERCURY AMMONIUM CHLORIDE	6.1	UN1630	II	POISON		A10.6
*	MERCURY BASED PESTICIDES, LIQUID, FLAMMABLE, TOXIC, N.O.S., flashpoint less than 23 degrees C	3	UN2778	I	FLAMMABLE LIQUID, POISON		A7.3
				II	FLAMMABLE LIQUID, POISON		

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
*	MERCURY BASED PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S., flashpoint not less than 23 degrees C	6.1	UN3011	I	POISON, FLAMMABLE LIQUID		A10.5
				II	POISON, FLAMMABLE LIQUID		
				III	KEEP AWAY FROM FOOD, FLAMMABLE LIQUID		
*	MERCURY BASED PESTICIDES, LIQUID, TOXIC, N.O.S.	6.1	UN3012	I	POISON		A10.5
				II	POISON		
				III	KEEP AWAY FROM FOOD		
*	MERCURY BASED PESTICIDES, SOLID, TOXIC, N.O.S.	6.1	UN2777	I	POISON		A10.6
				II	POISON		
				III	KEEP AWAY FROM FOOD		
	MERCURY BENZOATE	6.1	UN1631	II	POISON		A10.6
	MERCURY BROMIDES	6.1	UN1634	II	POISON		A10.6
*	MERCURY COMPOUNDS, LIQUID, N.O.S.	6.1	UN2024	I	POISON		A10.5
				II	POISON		
				III	KEEP AWAY FROM FOOD		
*	MERCURY COMPOUNDS, SOLID, N.O.S.	6.1	UN2025	I	POISON		A10.6
				II	POISON		
				III	KEEP AWAY FROM FOOD		
	MERCURY CONTAINED IN MANUFACTURED	8	UN2809	I	CORROSIVE		A12.10

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	ARTICLES						
	MERCURY CYANIDE	6.1	UN1636	II	POISON	N74,N75	A10.6
†	MERCURY FULMINATE, WETTED with not less than 20% water, or mixture of alcohol and water, by mass	1.1A	UN0135	II	EXPLOSIVE	111,117	A5.74
	MERCURY GLUCONATE	6.1	UN1637	II	POISON		A10.6
	MERCURY IODIDE, solid	6.1	UN1638	II	POISON		A10.6
	mercury iodide aquabasic ammonobasic (iodide of Millon's base)	FORBIDDEN					FORBIDDEN
	MERCURY IODIDE, solution	6.1	UN1638	II	POISON		A10.5
	mercury nitride	FORBIDDEN					FORBIDDEN
	MERCURY NUCLEATE	6.1	UN1639	II	POISON		A10.6
	MERCURY OLEATE	6.1	UN1640	II	POISON		A10.6
	MERCURY OXIDE	6.1	UN1641	II	POISON		A10.6
	mercury oxycyanide, not desensitized	FORBIDDEN					FORBIDDEN
	MERCURY OXYCYANIDE, DESENSITIZED	6.1	UN1642	II	POISON		A10.6
	MERCURY POTASSIUM IODIDE	6.1	UN1643	II	POISON		A10.6
	MERCURY SALICYLATE	6.1	UN1644	II	POISON		A10.6
†	MERCURY SULPHATES	6.1	UN1645	II	POISON		A10.6
	MERCURY THIOCYANATE	6.1	UN1646	II	POISON		A10.6
	MESITYL OXIDE	3	UN1229	III	FLAMMABLE LIQUID		A7.3
	METAL ALKYL HALIDES, N.O.S.	4.2	UN3049	I	SPONTANE-OUSLY COM-BUSTIBLE		A8.6
	METAL ALKYL HYDRIDES, N.O.S.	4.2	UN3050	I	SPONTANE-OUSLY COM-BUSTIBLE		A8.6
	METAL ALKYLS, N.O.S.	4.2	UN2003	I	SPONTANE-OUSLY COM-BUSTIBLE		A8.6
D	METAL ALKYL, SOLUTION, N.O.S.	3	NA9195	II	FLAMMABLE LIQUID		A7.3
	METAL CATALYST, DRY	4.2	UN2881	I	SPONTANE-	N34	A8.12

					OUSLY COM-BUSTIBLE		
o	METAL CATALYST, WETTED with not less than 40% water or other suitable liquid, by mass, finely divided, activated or spent	4.2	UN1378	II	SPONTANE-OUSLY COM-BUSTIBLE	A2,A8, N34	A8.4
	METALDEHYDE	4.1	UN1332	III	FLAMMABLE SOLID	A1	A8.4
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	METAL HYDRIDES, FLAMMABLE, N.O.S.	4.1	UN3182	II	FLAMMABLE SOLID		A8.4
				III	FLAMMABLE SOLID		
*	METAL POWDERS, FLAMMABLE, N.O.S.	4.1	UN3089	II	FLAMMABLE SOLID		A8.4
	METAL HYDRIDES, WATER-REACTIVE, N.O.S.	4.3	UN1409	I	DANGEROUS WHEN WET	A19,N34, N40	A8.4
				II	DANGEROUS WHEN WET	A19,N34 N40	
	METALLIC SUBSTANCES, WATER-REACTIVE, N.O.S.	4.3	UN3208	I	DANGEROUS WHEN WET		A8.4
				II	DANGEROUS WHEN WET		
				III	DANGEROUS WHEN WET		
	METALLIC SUBSTANCES, WATER-REACTIVE, SELF-HEATING, N.O.S.	4.3	UN3209	I	DANGEROUS WHEN WET, SPONTANE-OUSLY COM-BUSTIBLE		A8.4
				II	DANGEROUS WHEN WET, SPONTANE-OUSLY COM-BUSTIBLE		
				III	DANGEROUS		

					WHEN WET, SPONTANE-OUSLY COM-BUSTIBLE		
	metal salts of methyl nitramine (dry)	FORBIDDEN					FORBIDDEN
	METAL SALTS OF ORGANIC COMPOUNDS, FLAMMABLE, N.O.S.	4.1	UN3181	I	FLAMMABLE SOLID		A8.4
				II	FLAMMABLE SOLID		
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	METHACRYLALDEHYDE	3	UN2396	II	FLAMMABLE LIQUID, POISON		A7.3
	METHACRYLIC ACID, INHIBITED	8	UN2531	III	CORROSIVE		A12.3
	METHACRYLONITRILE, INHIBITED	3	UN3079	I	FLAMMABLE LIQUID, POISON		A7.3
	METHALLYL ALCOHOL	3	UN2614	III	FLAMMABLE LIQUID		A7.3
	methane and hydrogen, mixtures, see HYDROGEN AND METHANE, MIXTURES, COMPRESSED						
❑	METHANE, COMPRESSED or NATURAL GAS, COMPRESSED (with high methane content)	2.1	UN1971		FLAMMABLE GAS		A6.3,A6.7
†	METHANE, REFRIGERATED LIQUID (cryogenic liquid)or NATURAL GAS, REFRIGERATED LIQUID (cryogenic liquid) (with high methane content)	2.1	UN1972		FLAMMABLE GAS		A6.12
	METHANOL, or METHYL ALCOHOL	3	UN1230	II	FLAMMABLE LIQUID, POISON		A7.3
	methazoic acid	FORBIDDEN					FORBIDDEN
†	METHOXYMETHYL ISOCYANATE	3	UN2605	I	FLAMMABLE LIQUID, POISON	1	A7.6
	4-METHOXY-4-METHYLPENTAN-2-ONE	3	UN2293	III	FLAMMABLE		A7.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
					LIQUID		
	1-METHOXY-2-PROPANOL	3	UN3092	III	FLAMMABLE LIQUID		A7.3
	METHYL ACETATE	3	UN1231	II	FLAMMABLE LIQUID		A7.3
†	METHYL ACETYLENE AND PROPANDIENE MIXTURES, STABILIZED	2.1	UN1060		FLAMMABLE GAS		A6.3,A6.5
	METHYL ACRYLATE, INHIBITED	3	UN1919	II	FLAMMABLE LIQUID		A7.3
	METHYLAL	3	UN1234	II	FLAMMABLE LIQUID		A7.3
	METHYL ALCOHOL, see METHANOL						
	METHYLALLYL CHLORIDE	3	UN2554	II	FLAMMABLE LIQUID		A7.3
❑	METHYLAMINE, ANHYDROUS	2.1	UN1061		FLAMMABLE GAS	3	A6.5
	METHYLAMINE, AQUEOUS SOLUTION	3	UN1235	II	FLAMMABLE LIQUID		A7.3
	methylamine dinitramine and dry salts thereof	FORBIDDEN					FORBIDDEN
	methylamine nitroform	FORBIDDEN					FORBIDDEN
	methylamine perchlorate (dry)	FORBIDDEN					FORBIDDEN
	METHYLAMYL ACETATE	3	UN1233	III	FLAMMABLE LIQUID		A7.3
	methyl amyl ketone, see AMYL METHYL KETONE						
	N-METHYLANILINE	6.1	UN2294	III	KEEP AWAY FROM FOOD		A10.5
	METHYL BENZOATE	6.1	UN2938	III	KEEP AWAY FROM FOOD		A10.5
	ALPHA-METHYLBENZYL ALCOHOL	6.1	UN2937	III	KEEP AWAY FROM FOOD		A10.5
❑	METHYL BROMIDE	2.3	UN1062		POISON GAS, FLAMMABLE GAS	3	A6.17

	methyl bromide and chloropicrin mixtures with more than 2% chloropicrin, see CHLOROPICRIN AND METHYL BROMIDE MIXTURES						
	methyl bromide and chloropicrin mixtures with not more than 2% chloropicrin, see METHYL BROMIDE						
†	METHYL BROMIDE AND ETHYLENE DIBROMIDE MIXTURES, LIQUID	6.1	UN1647	I	POISON	2,N65	A10.7
	METHYL BROMOACETATE	6.1	UN2643	II	POISON		A10.5
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	3-METHYLBUTAN-2-ONE	3	UN2397	II	FLAMMABLE LIQUID		A7.3
	3-METHYL-1-BUTENE	3	UN2561	I	FLAMMABLE LIQUID		A7.3
	2-METHYL-1-BUTENE	3	UN2459	I	FLAMMABLE LIQUID		A7.3
	2-METHYL-2-BUTENE	3	UN2460	II	FLAMMABLE LIQUID		A7.3
	N-METHYLBUTYLAMINE	3	UN2945	II	FLAMMABLE LIQUID		A7.3
	METHYL-TERT-BUTYL ETHER	3	UN2398	II	FLAMMABLE LIQUID		A7.3
	METHYL BUTYRATE	3	UN1237	II	FLAMMABLE LIQUID		A7.3
	METHYL CHLORIDE	2.1	UN1063		FLAMMABLE GAS		A6.5
	methyl chloride and chloropicrin mixtures, see CHLOROPICRIN AND METHYL CHLORIDE MIXTURES						
❑	METHYL CHLORIDE AND METHYLENE CHLORIDE MIXTURE	2.2	UN1912		NONFLAM MABLE GAS		A6.3,A6.5
	METHYL CHLOROACETATE	6.1	UN2295	II	POISON		A10.5
†	METHYL CHLOROFORMATE	6.1	UN1238	I	POISON, FLAMMABLE	1,A3, A6,A7,	A10.7

					LIQUID, CORROSIVE	N34	
	methyl chloroform, see 1.1.1-TRICHLOROETHANE						
†	METHYL CHLOROMETHYL ETHER	6.1	UN1239	I	POISON, FLAMMABLE LIQUID	1	A10.7
	METHYL-2-CHLOROPROPIONATE	3	UN2933	III	FLAMMABLE LIQUID		A7.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
❑	METHYLCHLOROSILANE	2.3	UN2534		POISON GAS, FLAMMABLE GAS	2,A2, A3,A7, N34	A6.20
	METHYL CYANIDE	3	UN1648	II	FLAMMABLE LIQUID, POISON		A7.3
	METHYLCYCLOHEXANE	3	UN2296	II	FLAMMABLE LIQUID		A7.3
	METHYLCYCLOHEXANOLS, flashpoint not more than 60.5 degrees C	3	UN2617	III	FLAMMABLE LIQUID		A7.3
	METHYLCYCLOHEXANONE	3	UN2297	III	FLAMMABLE LIQUID		A7.3
	METHYLCYCLOPENTANE	3	UN2298	II	FLAMMABLE LIQUID		A7.3
	METHYL DICHLOROACETATE	6.1	UN2299	III	KEEP AWAY FROM FOOD		A10.5
D†	METHYLDICHLOROARSINE	6.1	NA1556	I	POISON	2	A10.3
❑	METHYLDICHLOROSILANE	4.3	UN1242	I	DANGEROUS WHEN WET, CORROSIVE, FLAMMABLE LIQUID	A2,A3,A7, N34	A8.3
	methylene chloride, see						

	DICHLOROMETHANE						
	methylene glycol dinitrate	FORBIDDEN					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					FORBIDDEN
	2-METHYL-5-ETHYLPYRIDINE	6.1	UN2300	III	KEEP AWAY FROM FOOD		A10.5
❑	METHYL FLUORIDE	2.1	UN2454		FLAMMABLE GAS		A6.3,A6.5
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	METHYL FORMATE	3	UN1243	I	FLAMMABLE LIQUID		A7.3
	2-METHYLFURAN	3	UN2301	II	FLAMMABLE LIQUID		A7.3
	a-methylglucoside tetranitrate	FORBIDDEN					FORBIDDEN
	a-methylglycerol trinitrate	FORBIDDEN					FORBIDDEN
	5-METHYLHEXAN-2-ONE	3	UN2302	III	FLAMMABLE LIQUID		A7.3
†	METHYLHYDRAZINE	6.1	UN1244	I	POISON, FLAMMABLE LIQUID, CORROSIVE	1,N34	A10.7
❑	METHYL IODIDE	6.1	UN2644	II	POISON	2	A10.7
	METHYL ISOBUTYL CARBINOL	3	UN2053	III	FLAMMABLE LIQUID		A7.3
	METHYL ISOBUTYL KETONE	3	UN1245	II	FLAMMABLE LIQUID		A7.3
	methyl isobutyl ketone peroxide, in solution with more than 9% by mass active oxygen	FORBIDDEN					FORBIDDEN
†	METHYL ISOCYANATE	6.1	UN2480	I	POISON, FLAMMABLE	1,A7	A10.7

					LIQUID		
	METHYL ISOPROPENYL KETONE, INHIBITED	3	UN1246	II	FLAMMABLE LIQUID		A7.3
❑	METHYL ISOTHIOCYANATE	3	UN2477	II	FLAMMABLE LIQUID, POISON	1	A7.6
	METHYL ISOVALERATE	3	UN2400	II	FLAMMABLE LIQUID		A7.3
	METHYL MAGNESIUM BROMIDE IN ETHYL ETHER	4.3	UN1928	I	DANGEROUS WHEN WET, FLAMMABLE LIQUID		A8.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
❑	METHYL MERCAPTAN	2.3	UN1064		POISON GAS, FLAMMABLE GAS	2	A6.5
	methyl mercaptopropionaldehyde, see THIA-4-PENTANAL						
	METHYL METHACRYLATE MONOMER, INHIBITED	3	UN1247	II	FLAMMABLE LIQUID		A7.3
	METHYLMORPHOLINE	3	UN2535	II	FLAMMABLE LIQUID, CORROSIVE		A7.3
	Methyl nitramine (dry),	FORBIDDEN					FORBIDDEN
	metal salts of methyl nitrate	FORBIDDEN					FORBIDDEN
	methyl nitrite	FORBIDDEN					FORBIDDEN
	methyl norbornene dicarboxylic anhydride, see CORROSIVE LIQUIDS, N.O.S.						
❑	METHYL ORTHOSILICATE	3	UN2606	I	FLAMMABLE LIQUID, POISON	2	A7.6
❑	METHYL PARATHION liquid	6.1	NA3018	II	POISON	N76	A10.5
D	METHYL PARATHION solid	6.1	NA2783	II	POISON	N77	A10.6
	METHYLPENTADIENE	3	UN2461	II	FLAMMABLE		A7.3

					LIQUID		
	methylpentanes, see HEXANES						
	2-METHYLPENTAN-2-OL	3	UN2560	III	FLAMMABLE LIQUID		A7.3
	METHYLPHENYLDICHLOROSILANE	8	UN2437	II	CORROSIVE		A12.3
D†	METHYL PHOSPHONIC DICHLORIDE	6.1	NA9206	I	POISON, CORROSIVE	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	POISON, SPONTANE-OUSLY COM-BUSTIBLE	2	A10.7
	methyl picric acid (heavy metal salts of)	FORBIDDEN					FORBIDDEN
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	1-METHYLPIPERIDINE	3	UN2399	II	FLAMMABLE LIQUID		A7.3
	METHYL PROPIONATE	3	UN1248	II	FLAMMABLE LIQUID		A7.3
	METHYL PROPYL ETHER	3	UN2612	II	FLAMMABLE LIQUID		A7.3
	METHYL PROPYL KETONE	3	UN1249	II	FLAMMABLE LIQUID		A7.3
	Methyl sulfate, see DIMETHYL SULFATE						
	Methyl sulfide, see DIMETHYL SULFIDE						
	METHYLTETRAHYDROFURAN	3	UN2536	II	FLAMMABLE LIQUID		A7.3
	METHYL TRICHLOROACETATE	6.1	UN2533	III	KEEP AWAY FROM FOOD		A10.5
❑	METHYLTRICHLOROSILANE	3	UN1250	I	FLAMMABLE LIQUID, CORROSIVE	A7,N34	A7.3
	methyl trimethylol methane trinitrate	FORBIDDEN					FORBIDDEN
	ALPHA-METHYLVALERALDEHYDE	3	UN2367	II	FLAMMABLE LIQUID		A7.3

	METHYL VINYL KETONE	3	UN1251	II	FLAMMABLE LIQUID		A7.3
	mine rescue equipment containing carbon dioxide, see CARBON DIOXIDE						
†	MINES with bursting charge	1.1F	UN0136	II	EXPLOSIVE		A5.76
†	MINES with bursting charge	1.1D	UN0137	II	EXPLOSIVE		A5.76
❑	MINES with bursting charge	1.2D	UN0138	II	EXPLOSIVE		A5.76
❑	MINES with bursting charge	1.2F	UN0294	II	EXPLOSIVE		A5.76
	mixed acid, see NITRATING ACID, MIXTURES						
	MOLYBDENUM PENTACHLORIDE	8	UN2508	III	CORROSIVE		A12.4
	monochloroacetone (unstabilized)	FORBIDDEN					FORBIDDEN
	monochloroethylene, see VINYL CHLORIDE, INHIBITED						
	monoethylamine, see ETHYLAMINE						
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	MORPHOLINE	3	UN2054	III	FLAMMABLE LIQUID		A7.3
	morpholine, aqueous, mixture, see CORROSIVE LIQUID, N.O.S.						
	motorcycles, see ENGINES, INTERNAL COMBUSTION						
❑	MOTOR FUEL ANTI-KNOCK MIXTURES	6.1	UN1649	I	POISON, FLAMMABLE LIQUID	14	A10.5
	MOTOR SPIRIT, see GASOLINE						
	motor vehicle, see ENGINES, INTERNAL COMBUSTION						
	muriatic acid, see HYDROCHLORIC ACID SOLUTION						
	MUSK XYLENE, see 5-TERT-BUTYL-2,4,6-TRINITO-M-XYLENE						
	NAPHTHA	3	UN2553	I	FLAMMABLE LIQUID		A7.3
				II	FLAMMABLE		

					LIQUID		
				III	FLAMMABLE LIQUID		
	NAPHTHALENE, CRUDE or REFINED	4.1	UN1334	III	FLAMMABLE SOLID	A1	A8.4
	naphthalene diozonide	FORBIDDEN					FORBIDDEN
	NAPHTHALENE, MOLTEN	4.1	UN2304	III	FLAMMABLE SOLID	A1	A8.4
	NAPHTHA, petroleum	3	UN1255	I	FLAMMABLE LIQUID		A7.3
				II	FLAMMABLE LIQUID		
				III	FLAMMABLE LIQUID		

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	NAPHTHA, solvent	3	UN1256	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
	ALPHA-NAPHTHYLAMINE	6.1	UN2077	III	KEEP AWAY FROM FOOD		A10.6
	BETA-NAPHTHYLAMINE	6.1	UN1650	II	POISON		A10.6
	naphthyl amineperchlorate	FORBIDDEN					FORBIDDEN
	NAPHTHYLTHIOUREA	6.1	UN1651	II	POISON		A10.6
	NAPHTHYLUREA	6.1	UN1652	II	POISON		A10.6
	NATURAL GAS, COMPRESSED with high methane content; see METHANE, COMPRESSED etc.						
	NATURAL GASOLINE	3	UN1257	I	FLAMMABLE LIQUID		A7.3
				II	FLAMMABLE LIQUID		
	NATURAL GAS, REFRIGERATED LIQUID, with high methane content (cryogenic liquid)	2.1	UN1972		FLAMMABLE GAS		A6.12

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	neohexane, see HEXANES						
	NEON, COMPRESSED	2.2	UN1065		NON-FLAMMABLE GAS		A6.3,A6.7
	NEON, REFRIGERATED LIQUID (cryogenic liquid)	2.2	UN1913		NON-FLAMMABLE GAS		A6.12
	NICKEL CARBONYL	NOT ACCEPTED					NOT ACCEPTED
	NICKEL CYANIDE	6.1	UN1653	II	POISON	N74,N75	A10.6
	NICKEL NITRATE	5.1	UN2725	III	OXIDIZER	A1	A9.8
	NICKEL NITRITE	5.1	UN2726	III	OXIDIZER	A1	A9.8
	Nickel Picrate	FORBIDDEN					FORBIDDEN
	NICOTINE	6.1	UN1654	II	POISON		A10.5
*	NICOTINE COMPOUNDS, LIQUID, N.O.S. or NICOTINE PREPARATIONS, LIQUID, N.O.S.	6.1	UN3144	I II III	POISON POISON KEEP AWAY FROM FOOD	A4	A10.5
*	NICOTINE COMPOUNDS, SOLID, N.O.S. or NICOTINE PREPARATIONS, SOLID, N.O.S.	6.1	UN1655	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.6
	NICOTINE HYDROCHLORIDE or NICOTINE HYDROCHLORIDE SOLUTION	6.1	UN1656	II	POISON		A10.5
	NICOTINE SALICYLATE	6.1	UN1657	II	POISON		A10.6
	NICOTINE SULPHATE, solid	6.1	UN1658	II	POISON		A10.6
	NICOTINE SULPHATE, solution	6.1	UN1658	II	POISON		A10.5
	NICOTINE TARTRATE	6.1	UN1659	II	POISON		A10.6
	nitrated paper (unstable)	FORBIDDEN					FORBIDDEN
*	NITRATES, INORGANIC, N.O.S.	5.1	UN1477	II III	OXIDIZER OXIDIZER		A9.8
	NITRATES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.	5.1	UN3218	II III	OXIDIZER OXIDIZER		A9.7
	nitrates of diazonium compounds	FORBIDDEN					FORBIDDEN
❑	NITRATING ACID MIXTURES, SPENT with	8	UN1826	II	CORROSIVE		A12.11

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	not more than 50% nitric acid						
❑	NITRATING ACID MIXTURES, SPENT with 50% or more nitric acid	8	UN1826	I	CORROSIVE, OXIDIZER		A12.11
❑	NITRATING ACID MIXTURES with not more than 50% nitric acid	8	UN1796	II	CORROSIVE		A12.11
❑	NITRATING ACID MIXTURES with 50% or more nitric acid	8	UN1796	I	CORROSIVE, OXIDIZER		A12.11
❑	NITRIC ACID other than red fuming, with more than 70% nitric acid	8	UN2031	I	CORROSIVE		A12.11
❑	NITRIC ACID, other than red fuming, with not more than 70% nitric acid but more than 20% nitric acid	8	UN2031	II	CORROSIVE		A12.11
†	NITRIC ACID, other than red fuming, with less than 20% nitric acid	8	UN2031	II	CORROSIVE		A12.11
†	NITRIC ACID, RED FUMING	8	UN2032	I	CORROSIVE, OXIDIZER, POISON	2	A12.12
†	NITRIC OXIDE	2.3	UN1660		POISON GAS	2	A6.21
	NITRIC OXIDE AND DINITROGEN TETROXIDE MIXTURES or NITRIC OXIDE AND NITROGEN DIOXIDE MIXTURES	NOT ACCEPTED					NOT ACCEPTED
*	NITRITES, INORGANIC, N.O.S.	5.1	UN2627	II	OXIDIZER	A33	A9.8
	NITRITES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.	5.1	UN3219	II III	OXIDIZER OXIDIZER		A9.7
	N-Nitroaniline	FORBIDDEN					FORBIDDEN
	NITROANILINES (O-,M-,P-,)	6.1	UN1661	II	POISON		A10.6
	NITROANISOLE, LIQUID	6.1	UN2730	III	KEEP AWAY FROM FOOD		A10.5
	NITROANISOLE, SOLID	6.1	UN2730	III	KEEP AWAY FROM FOOD		A10.6
	NITROBENZENE	6.1	UN1662	II	POISON		A10.5
	m-nitrobenzene diazonium perchlorate	FORBIDDEN					FORBIDDEN
	NITROBENZENESULPHONIC ACID	8	UN2305	II	CORROSIVE		A12.4
	nitrobenzol, see NITROBENZENE						

†	5-NITROBENZOTRIAZOL	1.1D	UN0385	II	EXPLOSIVE		A5.77
	NITROBENZOTRIFLUORIDES	6.1	UN2306	II	POISON		A10.5
	NITROBROMOBENZENE, LIQUID	6.1	UN2732	III	KEEP AWAY FROM FOOD		A10.5
	NITROBROMOBENZENE, SOLID	6.1	UN2732	III	KEEP AWAY FROM FOOD		A10.6
†	NITROCELLULOSE, dry or wetted with less than 25% water (or alcohol), by mass	1.1D	UN0340	II	EXPLOSIVE		A5.78
❑	NITROCELLULOSE, PLASTICIZED with not less than 18% plasticizing substance, by mass	1.3C	UN0343	II	EXPLOSIVE		A5.79
	NITROCELLULOSE SOLUTION, FLAMMABLE with not more than 12.6% nitrogen, by mass, and not more than 55% nitrocellulose	3	UN2059	I	FLAMMABLE LIQUID		A7.3
				II	FLAMMABLE LIQUID		
				III	FLAMMABLE LIQUID		
†	NITROCELLULOSE, unmodified or plasticized with less than 18% plasticizing substance, by mass	1.1D	UN0341	II	EXPLOSIVE		A5.78
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
❑	NITROCELLULOSE, WETTED with not less than 25% alcohol, by mass	1.3C	UN0342	II	EXPLOSIVE		A5.79
	NITROCELLULOSE WITH ALCOHOL not less than 25% alcohol by mass, and not more than 12.6% nitrogen, by dry mass	4.1	UN2556	II	FLAMMABLE SOLID		A8.4
	NITROCELLULOSE WITH PLASTICIZING SUBSTANCE, not less than 18%, plasticing substance, by mass, and not more than 12.6% nitrogen, by dry mass	4.1	UN2557	II	FLAMMABLE SOLID		A8.4
	NITROCELLULOSE WITH WATER not less than 25% water, by mass	4.1	UN2555	II	FLAMMABLE SOLID		A8.4
	nitrochlorobenzene, see CHLORONITROBENZENES						
	3-NITRO-4-CHLOROBENZOTRIFLUORIDE	6.1	UN2307	II	POISON		A10.5
	NITROCRESOLS	6.1	UN2446	III	KEEP AWAY		A10.6

					FROM FOOD		
	6-nitro-4-diazotoluene-3-sulphonic acid (dry)	FORBIDDEN					FORBIDDEN
	NITROETHANE	3	UN2842	III	FLAMMABLE LIQUID		A7.3
	nitroethylene polymer	FORBIDDEN					FORBIDDEN
	nitroethyl nitrate	FORBIDDEN					FORBIDDEN
	NITROGEN, COMPRESSED	2.2	UN1066		NONFLAM-MABLE GAS		A6.3,A6.7
	NITROGEN DIOXIDE, LIQUEFIED	NOT ACCEPTED					NOT ACCEPTED
	nitrogen fertilizer solution; see FERTILIZER AMMONIATING SOLUTION, etc.						
	nitrogen, mixtures with rare gases, see RARE GASES AND NITROGEN MIXTURES						
	nitrogen peroxide, see NITROGEN DIOXIDE, LIQUEFIED						
†	NITROGEN, REFRIGERATED LIQUID (cryogenic liquid)	2.2	UN1977		NONFLAM-MABLE GAS		A6.12
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	nitrogen tetroxide and nitric oxide mixtures, see NITRIC OXIDE AND DINITROGEN TETROXIDE MIXTURES						
	nitrogen tetroxide, see NITROGEN DIOXIDE, LIQUEFIED						
	nitrogen trichloride	FORBIDDEN					FORBIDDEN
❑	NITROGEN TRIFLUORIDE	2.3	UN2451		POISON GAS, OXIDIZER		A6.7
	nitrogen triiodide	FORBIDDEN					FORBIDDEN
	nitrogen triiodide monoamine	FORBIDDEN					FORBIDDEN
	NITROGEN TRIOXIDE	NOT ACCEPTED					NOT ACCEPTED
†	NITROGLYCERIN, DESENSITIZED with not less than 40% nonvolatile water insoluble phlegmatizer, by mass	1.1D	UN0143	II	EXPLOSIVE POISON		A5.80

	nitroglycerin, liquid, not desensitized	FORBIDDEN					FORBIDDEN
❑	NITROGLYCERIN, SOLUTION IN ALCOHOL, with more than 1%, but not more than 5% nitroglycerin	3	UN3064	II	FLAMMABLE LIQUID	N8	A7.3
†	NITROGLYCERIN, SOLUTION IN ALCOHOL with more than 1%, but not more than 10% nitroglycerin	1.1D	UN0144	II	EXPLOSIVE		A5.81
	NITROGLYCERIN SOLUTION IN ALCOHOL, with not more than 1% nitroglycerin	3	UN1204	II	FLAMMABLE LIQUID	N34	A7.3
	nitroguanidine nitrate	FORBIDDEN					FORBIDDEN
†	NITROGUANIDINE or PICRITE, dry or wetted with less than 20% water, by mass	1.1D	UN0282	II	EXPLOSIVE		A5.82
	NITROGUANIDINE WETTED, or PICRITE WETTED with not less than 20% water, by mass	4.1	UN1336	I	FLAMMABLE SOLID	A8,A19, A20,N41	A8.4
	1-nitro hydantoin	FORBIDDEN					FORBIDDEN
	NITROHYDROCHLORIC ACID	8	UN1798	I	CORROSIVE	A3,N41	A12.3
	nitro isobutane triol trinitrate	FORBIDDEN					FORBIDDEN
	nitromannite (dry)	FORBIDDEN					FORBIDDEN
	NITROMANNITE, WETTED; see MANNITOL HEXANITRATE, WETTED etc.						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
†	NITROMETHANE	3	UN1261	II	FLAMMABLE LIQUID		A7.3
	N-Nitro-N-methylglycolamide nitrate	FORBIDDEN					FORBIDDEN
	2-Nitro-2-methylpropanol nitrate	FORBIDDEN					FORBIDDEN
	Nitromuriatic acid; see NITROHYDROCHLORIC ACID						
	NITRONAPHTHALENE	4.1	UN2538	III	FLAMMABLE SOLID	A1	A8.4
	NITROPHENOLS (O-,M-,P-,)	6.1	UN1663	III	KEEP AWAY FROM FOOD		A10.6
	m-nitrophenyldinitro methane	FORBIDDEN					FORBIDDEN
	NITROPROPANES	3	UN2608	III	FLAMMABLE LIQUID		A7.3

	P-NITROSODIMETHYLANILINE	4.2	UN1369	II	SPONTANE-OUSLY COM-BUSTIBLE	A19,A20, N34	A8.4
D†	NITROSOGUANIDINE	1.1A	NA0473	II	EXPLOSIVE	111,117	A5.83
†	NITROSTARCH, dry or wetted with less than 20% water, by mass	1.1D	UN0146	II	EXPLOSIVE		A5.84
	NITROSTARCH, WETTED with not less than 20% water by mass	4.1	UN1337	I	FLAMMABLE SOLID	A8,A19, A20,N41	A8.4
	Nitrosugars (dry)	FORBIDDEN					FORBIDDEN
†	NITROSYL CHLORIDE	2.3	UN1069		POISON GAS, CORROSIVE	3	A6.5
	NITROSYLSULPHURIC ACID	8	UN2308	II	CORROSIVE	A3,A6, A7,N34	A12.3
	NITROTOLUENES, LIQUID (o-,m-,p-)	6.1	UN1664	II	POISON		A10.5
	NITROTOLUENES, SOLID (o-,m-,p-)	6.1	UN1664	II	POISON		A10.6
	NITROTOLUIDINES (MONO)	6.1	UN2660	III	KEEP AWAY FROM FOOD		A10.6
†	NITROTRIAZOLONE; or NTO	1.1D	UN0490	II	EXPLOSIVE		A5.77
†	NITRO UREA	1.1D	UN0147	II	EXPLOSIVE		A5.77
	Nitrous oxide and carbon dioxide mixtures; see CARBON DIOXIDE AND NITROUS OXIDE MIXTURES						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	NITROUS OXIDE, COMPRESSED	2.2	UN1070		NONFLAM-MABLE GAS, OXIDIZER		A6.5
	NITROUS OXIDE, REFRIGERATED LIQUID (cryogenic liquid)	2.2	UN2201		NONFLAM-MABLE GAS, OXIDIZER		A6.12
	NITROXYLENES (o-,m-,p-)	6.1	UN1665	II	POISON		A10.5
	Nitroxylol; see NITROXYLENES						
	NONANES	3	UN1920	III	FLAMMABLE LIQUID		A7.3
	Nonflammable gas, n.o.s.; see COMPRESSED or LIQUEFIED GASES, etc.						

	Nonliquefied gases; see COMPRESSED GASES, etc.						
	Nonliquefied hydrocarbon gas; see HYDROCARBON GAS COMPRESSED, N.O.S.						
❑	NONYL TRICHLOROSILANE	8	UN1799	II	CORROSIVE	A7,N34	A12.3
	2,5-NORBORNADIENE or DICYCLOHEPTADIENE	3	UN2251	II	FLAMMABLE LIQUID		A7.3
	Nordhausen Acid; see SULPHURIC ACID, FUMING						
❑	OCTADECYLTRICHLOROSILANE	8	UN1800	II	CORROSIVE	A7,N34	A12.3
	OCTADIENE	3	UN2309	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
	1,7-Octadiene-3,5-diyne-1,8-dimethoxy-9-octade-cynoic acid	FORBIDDEN					FORBIDDEN
	OCTAFLUOROBUT-2-ENE	2.2	UN2422		NONFLAM-MABLE GAS		A6.5
	OCTAFLUOROCYCLOBUTANE	2.2	UN1976		NONFLAM-MABLE GAS		A6.5
	OCTAFLUOROPROPANE	2.2	UN2424		NONFLAM-MABLE GAS		A6.5

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	OCTANES	3	UN1262	II	FLAMMABLE LIQUID		A7.3
	OCTAGEN; see CYLCOTETRAMETHYLENE TETRANITRAMINE, etc.						
†	OCTOLITE or OCTOL dry or wetted with less than 15% water by mass	1.1D	UN0266	II	EXPLOSIVE		A5.85
	OCTYL ALDEHYDES, flammable	3	UN1191	III	FLAMMABLE LIQUID		A7.3
❑	TERT-OCTYL MERCAPTAN	6.1	UN3023	II	POISON, FLAMMABLE LIQUID	2	A10.7

❑	OCTYLTRICHLOROSILANE	8	UN1801	II	CORROSIVE	A7,N34	A12.3
❑	OIL GAS	2.1	UN1071		FLAMMABLE GAS		A6.5
	Oleum; see SULPHURIC ACID, FUMING						
	ORGANIC PEROXIDE TYPE A, LIQUID or SOLID	FORBIDDEN					FORBIDDEN
†	ORGANIC PEROXIDE TYPE B, LIQUID	5.2	UN3101	II	ORGANIC PEROXIDE, EXPLOSIVE	53	TABLE A9.2.5
†	ORGANIC PEROXIDE TYPE B, LIQUID, TEMPERATURE CONTROLLED	5.2	UN3111	II	ORGANIC PEROXIDE, EXPLOSIVE	53	TABLE A9.2.5
†	ORGANIC PEROXIDE, TYPE B, SOLID	5.2	UN3102	II	ORGANIC PEROXIDE, EXPLOSIVE	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
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	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	ORGANIC PEROXIDE, EXPLOSIVE	53	SEE BELOW BY TECHNICAL NAME
	Acetyl Cylcohexanesulfonyl 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	ORGANIC PEROXIDE		SEE BELOW BY TECHNICAL NAME
	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
†	ORGANIC PEROXIDE TYPE C, LIQUID, TEMPERATURE CONTROLLED	5.2	UN3113	II	ORGANIC PEROXIDE		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

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	Organic Peroxide, Liquid, Temperature Controlled						TABLE A9.2.2
	ORGANIC PEROXIDE TYPE C, SOLID	5.2	UN3104	II	ORGANIC PEROXIDE		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	ORGANIC PEROXIDE		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	ORGANIC PEROXIDE		TABLE A9.2.7
	Acetyl acetone peroxide						
	Acetyl benzoyl peroxide						
	tert-Amyl peroxybenzoate						
	tert-Butyl cumyl peroxide						
	tert-Butyl hydroperoxide						
	tert-Butyl peroxybenzoate						
	tert-Butyl peroxycrotonate						
	tert-Butyl peroxydiethylacetate and tert-Butyl eroxybenzoate						
	tert-Buyl 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						
	Ethyl-3,3-di-(tert-amylperoxy)-butryrate						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	Ethyl-3,3-di-(tert-butylperoxy)-butyrate						
	3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononane						
	p-Menthyl hydroperoxide						
	Methyl ethyl ketone peroxide(s)						
	Methyl isobutyl ketone peroxide(s)						
	Peroxyacetic acid, type D, stablized						
	Pinanyl hydroperoxide						
	1,1,3,3-Tertamethylbutyl hydroperoxide						

†	ORGANIC PEROXIDE TYPE D, LIQUID, TEMPERATURE CONTROLLED Acetyl cyclohexanesulfonyl peroxide tert-Amyl peroxy-2-ethlyhexanoate 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	5.2	UN3115	II	ORGANIC PEROXIDE		TABLE A9.2.7

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	ORGANIC PEROXIDE TYPE D, SOLID 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	5.2	UN3106	II	ORGANIC PEROXIDE		TABLE A9.3.7

	3-tert-Butylperoxy-3-phenylphthalide tert-Butylperoxy stearylcarbonate 3-Chloroperoxybenzoic acid 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 proxide, as a paste with silicon oil Di-(1-hydroxycyclohexyl) peroxide Dilauroyl peroxide 2,5-Dimethyl-2,5-di-(benzoyl-peroxy) hexane 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 Dicetyl peroxydicarbonate Dimyristyl peroxydicarbonate	5.2	UN3116	II	ORGANIC PEROXIDE		TABLE A9.3.7
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	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						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	ORGANIC PEROXIDE TYPE E, LIQUID	5.2	UN3107	II	ORGANIC PEROXIDE		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						
†	ORGANIC PEROXIDE TYPE E, LIQUID, TEMPERATURE CONTROLLED	5.2	UN3117	II	ORGANIC PEROXIDE		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 dipersion in water (frozen)						TABLE A9.3.8
	Dipropionyl peroxide						TABLE A9.2.8
	ORGANIC PEROXIDE TYPE E, SOLID	5.2	UN3108	II	ORGANIC PEROXIDE		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	ORGANIC PEROXIDE		TABLE A9.3.8
	ORGANIC PEROXIDE TYPE F, LIQUID	5.2	UN3109	II	ORGANIC PEROXIDE		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 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	5.2	UN3119	II	ORGANIC PEROXIDE	TABLE A9.2.8
	ORGANIC PEROXIDE TYPE F, SOLID Dicumyl peroxide	5.2	UN3110	II	ORGANIC PEROXIDE	TABLE A9.3.8
†	ORGANIC PEROXIDE TYPE F, SOLID, TEMPERATURE CONTROLLED	5.2	UN3120	II	ORGANIC PEROXIDE	TABLE A9.3.8
D	ORGANIC PHOSPHATE, ORGANIC PHOSPHATE COMPOUND or ORGANIC PHOSPHORUS COMPOUND; MIXED WITH COMPRESSED GAS	NOT ACCEPTED				NOT ACCEPTED
❑*	ORGANOCHLORINE PESTICIDES LIQUID, FLAMMABLE, TOXIC, N.O.S. flashpoint less than 23 degrees C	3	UN2762	I II	FLAMMABLE LIQUID, POISON FLAMMABLE LIQUID, POISON	A7.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
*	ORGANOCHLORINE PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S. flashpoint not less than 23 degrees C	6.1	UN2995	I II	POISON, FLAMMABLE LIQUID POISON,		A10.5

					FLAMMABLE LIQUID		
				III	KEEP AWAY FROM FOOD, FLAMMABLE LIQUID		
*	ORGANOCHLORINE PESTICIDES, LIQUID, TOXIC, N.O.S.	6.1	UN2996	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.5
*	ORGANOCHLORINE PESTICIDES, SOLID, TOXIC, N.O.S.	6.1	UN2761	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.6
	ORGANOMETALLIC COMPOUNDS, WATER-REACTIVE, FLAMMABLE, N.O.S.	4.3	UN3207	I	DANGEROUS WHEN WET, FLAMMABLE LIQUID		A8.4
				II	DANGEROUS WHEN WET, FLAMMABLE LIQUID		
				III	DANGEROUS WHEN WET, FLAMMABLE LIQUID		

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	ORGANOMETALLIC DISPERSIONS, WATER-REACTIVE, FLAMMABLE, N.O.S.	4.3	UN3207	I	DANGEROUS WHEN WET, FLAMMABLE		A8.4

				II	LIQUID DANGEROUS WHEN WET, FLAMMABLE LIQUID		
				III	DANGEROUS WHEN WET, FLAMMABLE LIQUID		
	ORGANOMETALLIC SOLUTIONS, WATER-REACTIVE, FLAMMABLE, N.O.S.	4.3	UN3207	I	DANGEROUS WHEN WET, FLAMMABLE LIQUID		A8.4
				II	DANGEROUS WHEN WET, FLAMMABLE LIQUID		
				III	DANGEROUS WHEN WET, FLAMMABLE LIQUID		
*	ORGANOPHOSPHOROUS PESTICIDES, LIQUID, LIQUID, FLAMMABLE, TOXIC, N.O.S., flashpoint less than 23 degrees C	3	UN2784	I	FLAMMABLE LIQUID, POISON		A7.3
				II	FLAMMABLE LIQUID, POISON		

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
*	ORGANOPHOSPHORUS PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S., flashpoint	6.1	UN3017	I	POISON, FLAMMABLE	N76	A10.5

	not less than 23 degrees C				LIQUID		
				II	POISON, FLAMMABLE LIQUID	N76	
				III	KEEP AWAY FROM FOOD, FLAMMABLE LIQUID	N76	
*	ORGANOPHOSPHORUS PESTICIDES, LIQUID, TOXIC, N.O.S.	6.1	UN3018	I	POISON	N76	A10.5
				II	POISON	N76	
				III	KEEP AWAY FROM FOOD	N76	
*	ORGANOPHOSPHORUS PESTICIDES, SOLID, TOXIC, N.O.S.	6.1	UN2783	I	POISON	N77	A10.6
				II	POISON	N77	
				III	KEEP AWAY FROM FOOD	N77	
	ORGANOTIN COMPOUNDS, LIQUID, N.O.S.	6.1	UN2788	I	POISON	A3,N33, N34	A10.5
				II	POISON	A3,N33, N34	
				III	KEEP AWAY FROM FOOD		
	ORGANOTIN COMPOUNDS, SOLID, N.O.S.	6.1	UN3146	I	POISON	A5	A10.6
				II	POISON		
				III	KEEP AWAY FROM FOOD		
*	ORGANOTIN PESTICIDES, LIQUID, FLAMMABLE, TOXIC, N.O.S. flashpoint less than 23 degrees C	3	UN2787	I	FLAMMABLE LIQUID, POISON		A7.3
				II	FLAMMABLE LIQUID, POISON		

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
*	ORGANOTIN PESTICIDES, LIQUID, TOXIC,	6.1	UN3019	I	POISON,		A10.5

	FLAMMABLE, N.O.S. flashpoint more than 23 degrees C				FLAMMABLE LIQUID		
				II	POISON, FLAMMABLE LIQUID		
				III	KEEP AWAY FROM FOOD, FLAMMABLE LIQUID		
*	ORGANOTIN PESTICIDES, LIQUID, TOXIC, N.O.S.	6.1	UN3020	I	POISON		A10.5
				II	POSION		
				III	KEEP AWAY FROM FOOD		
*	ORGANOTIN PESTICIDES, SOLID, TOXIC, N.O.S.	6.1	UN2786	I	POISON		A10.6
				II	POISON		
				III	KEEP AWAY FROM FOOD		
	OSMIUM TETROXIDE	6.1	UN2471	I	POISON	A8,N33, N34	A10.6
	OTHER REGULATED SUBSTANCES, liquid not falling under the definitions of classes 1-8	9	ID8035	III	CLASS 9		A13.4
	OTHER REGULATED SUBSTANCES, solid not falling under the definitions of classes 1-8	9	ID8036	III	CLASS 9		A13.4,A13.5
	OXIDIZING LIQUID, CORROSIVE, N.O.S.	5.1	UN3098	I	OXIDIZER, CORROSIVE		A9.7
				II	OXIDIZER, CORROSIVE		
				III	OXIDIZER, CORROSIVE		
	OXIDIZING LIQUID, N.O.S.	5.1	UN3139	II	OXIDIZER	A2	A9.7
				III	OXIDIZER	A2	

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)

	OXIDIZING LIQUID, POISONOUS, N.O.S.	5.1	UN3099	I	OXIDIZER, POISON		A9.7
				II	OXIDIZER, POISON		
				III	OXIDIZER, KEEP AWAY FROM FOOD		
†	OXIDIZING SOLID, SELF-HEATING, N.O.S.	5.1	UN3100		OXIDIZER, SPONTANE-OUSLY COM-BUSTIBLE		A9.10
	OXIDIZING SOLID, CORROSIVE, N.O.S.	5.1	UN3085	I	OXIDIZER, CORROSIVE		A9.8
				II	OXIDIZER, CORROSIVE		
				III	OXIDIZER, CORROSIVE		
†	OXIDIZING SOLID, FLAMMABLE, N.O.S.	5.1	UN3137		OXIDIZER, FLAMMABLE SOLID		A9.10
	OXIDIZING SOLID, N.O.S.	5.1	UN1479	I	OXIDIZER		A9.8
				II	OXIDIZER		
				III	OXIDIZER		
	OXIDIZING SOLID, POISONOUS, N.O.S.	5.1	UN3087	I	OXIDIZER, POISON		A9.8
				II	OXIDIZER, POISON		
				III	OXIDIZER, KEEP AWAY FROM FOOD		
†	OXIDIZING SOLID, WATER-REACTIVE, N.O.S.	5.1	UN3121		OXIDIZER, DANGEROUS WHEN WET		A9.10
	Oxygen and carbon dioxide mixtures; see CARBON DIOXIDE AND OXYGEN MIXTURES						
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**

SYM-BOL	PROPER SHIPPING NAME/DESCRIPTION	HAZARD CLASS/DIV	UN/ID NUMBER	PG	LABELS	SPECIAL PROVISION	PACKAGING PARAGRAPH
	OXYGEN, COMPRESSED	2.2	UN1072		NONFLAM-MABLE GAS, OXIDIZER		A6.3,A6.7
†	OXYGEN DIFLUORIDE	2.3	UN2190		POISON GAS, OXIDIZER	1	A6.5
	Oxygen Mixtures with rare gases; see RARE GASES AND OXYGEN MIXTURES						
†	OXYGEN, REFRIGERATED LIQUID (cryogenic liquid)	2.2	UN1073		NONFLAM-MABLE GAS, OXIDIZER		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	II III	FLAMMABLE LIQUID FLAMMABLE LIQUID		A7.3
	PAINT or PAINT RELATED MATERIAL	8	UN3066	II III	CORROSIVE CORROSIVE		A12.3
	PAPER, UNSATURATED OIL TREATED incompletely dried (including carbon paper)	4.2	UN1379	III	SPONTANE-OUSLY COM-BUSTIBLE		A8.4
	PARAFORMALDEHYDE	4.1	UN2213	III	FLAMMABLE SOLID	A1	A8.4
	PARALDEHYDE	3	UN1264	III	FLAMMABLE LIQUID		A7.3
	Paranitroaniline, solid; see NITROANILINES						
D	PARATHION	6.1	NA2783	I II	POISON POISON		A10.5
D†	PARATHION AND COMPRESSED GAS MIXTURE	2.3	NA1967		POISON GAS	3	A6.19
	Paris Green, solid; see COPPER ACETOARSENITE						
D	PCB, see POLYCHLORINATED BIPHENYLS						
	PETABORANE	NOT ACCEPTED					NOT ACCEPTED
	PENTACHLOROETHANE	6.1	UN1669	II	POISON		A10.5
	PENTACHLOROPHENOL	6.1	UN3155	II	POISON		A10.6
	Pentaerythrite Tetranitrate (dry)	FORBIDDEN					FORBIDDEN

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
D†	PENTAERYTHRITE TETRANITRATE; PENTAERYTHRITOL TETRANITRATE; PETN; WETTED with not less than 25% water by mass, or PENTAERYTHRITE TETRANITRATE; PENTAERYTHRITOL TETRANITRATE; PETN; DESENSITIZED with not less than 15% phlegmatizer by mass	1.1A	NA0150	II	EXPLOSIVE	111,117	A5.86
†	PENTAERYTHRITE TETRANITRATE; PENTAERYTHRITOL TETRA NITRATE; PETN; WETTED with not less than 25% water by mass, orPENTAERYTHRITE TETRANITRATE; PENTAERYTHRITOL TETRANITRATE; PETN; DESENSITIZED with not less than 15% phlegmatizer by mass	1.1D	UN0150	II	EXPLOSIVE	111,117	A5.86
†	PENTAERYTHRITE TETRANITRATE; PENTAERYTHRITOL TETRANITRATE (PETN) with not less than 7% wax by mass	1.1D	UN0411	II	EXPLOSIVE		A5.87
	PENTAERYTHRITOL TETRANITRATE; see PENTAERYTHRITE TETRANITRATE, etc						
	PENTAFLUOROETHANE	2.2	UN3220		NONFLAM-MABLE GAS		A6.5,A6.7
	PENTAMETHYLHEPTANE	3	UN2286	III	FLAMMABLE LIQUID		A7.3
	PENTAN-2,4-DIONE	3	UN2310	III	FLAMMABLE LIQUID		A7.3
	N-PENTANE or ISOPENTANE	3	UN1265	I	FLAMMABLE LIQUID		A7.3
	Pentanitroaniline (dry)	FORBIDDEN					FORBIDDEN
	1-PENTOL	8	UN2705	II	CORROSIVE		A12.3
†	PENTOLITE, dry or wetted with less than 15% water by mass	1.1D	UN0151	II	EXPLOSIVE		A5.88
	PERCARBONATES, INORGANIC, N.O.S.	5.1	UN3217	III	OXIDIZER		A9.8
*	PERCHLORATES, INORGANIC, N.O.S.	5.1	UN1481	II	OXIDIZER		A9.8
				III	OXIDIZER		

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	PERCHLORATES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.	5.1	UN3211	II	OXIDIZER		A9.7
	Perchloric Acid, more than 72% acid by mass	FORBIDDEN					FORBIDDEN
❑	PERCHLORIC ACID more than 50% but not more than 72% acid, by mass	5.1	UN1873	I	OXIDIZER, CORROSIVE	A2,A3, N41	A9.7
	PERCHLORIC ACID not more than 50% acid by mass	8	UN1802	II	CORROSIVE, OXIDIZER	N41	A12.3
	Perchloroethylene; see TETRACHLOROETHYLENE						
❑	PERCHLOROMETHYL MERCAPTAN	6.1	UN1670	I	POISON	2,A3,A7, N34	A10.7
†	PERCHLORYL FLUORIDE	2.3	UN3083		POISON GAS, OXIDIZER	3	A6.7
	Percussion Caps; see PRIMERS, CAP TYPE						
❑	PERFLUOROMETHYLVINYL ETHER	2.1	UN3153		FLAMMABLE GAS		A6.3,A6.5,A6.7
	Perfluoro-2-butene; see OCTAFLUOROBUT-2-ENE						
❑	PERFLUOROETHYLVINYL ETHER	2.1	UN3154		FLAMMABLE GAS		A6.3,A6.5,A6.7
	PERFUMERY PRODUCTS with flammable solvents	3	UN1266	II III	FLAMMABLE LIQUID FLAMMABLE LIQUID		A7.3
*	PERMANGANATES, INORGANIC, N.O.S. (except ammonium permanganate, the transport of which should be prohibited except with special authorization granted by the competent authority (DOT))	5.1	UN1482	II III	OXIDIZER OXIDIZER	A30	A9.8
	PERMANGANATES, INORGANIC AQUEOUS SOLUTIONS, N.O.S.	5.1	UN3214	II	OXIDIZER		A9.7
*	PEROXIDES, INORGANIC, N.O.S.	5.1	UN1483	II III	OXIDIZER OXIDIZER	A7,A20, N34	A9.8
	Peroxyacetic acid, more than 43% and with more than 6% hydrogen peroxide	FORBIDDEN					FORBIDDEN

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	PERSULPHATES, INORGANIC, N.O.S.	5.1	UN3215	III	OXIDIZER		A9.8
	PERSULPHATES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.	5.1	UN3216	III	OXIDIZER		A9.7
	PESTICIDES, LIQUID, FLAMMABLE, TOXIC, N.O.S. flashpoint less than 23 degrees C	3	UN3021	I	FLAMMABLE LIQUID, POISON		A7.3
				II	FLAMMABLE LIQUID, POISON		
	PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S. flashpoint not less than 23 degrees C	6.1	UN2903	I	POISON, FLAMMABLE LIQUID		A10.5
				II	POISON, FLAMMABLE LIQUID		
				III	KEEP AWAY FROM FOOD, FLAMMABLE LIQUID		
	PESTICIDES, LIQUID, TOXIC, N.O.S.	6.1	UN2902	I	POISON		A10.5
				II	POISON		
				III	KEEP AWAY FROM FOOD		
	PESTICIDES, SOLID, TOXIC, N.O.S.	6.1	UN2588	I	POISON		A10.6
				II	POISON		
				III	KEEP AWAY FROM FOOD		
	PETN; see PENTAERYTHRITE TETRANITRATE						
	PETN/TNT; see PENTOLITE, etc						
	PETROLEUM CRUDE OIL	3	UN1267	I	FLAMMABLE LIQUID		A7.3
				II	FLAMMABLE LIQUID		
				III	FLAMMABLE		

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
					LIQUID		
	PETROLEUM DISTILLATES, N.O.S.	3	UN1268	I	FLAMMABLE LIQUID		A7.3
				II	FLAMMABLE LIQUID		
				III	FLAMMABLE LIQUID		
	Petroleum ether, see PETROLEUM SPIRIT						
❑	PETROLEUM GASES, LIQUEFIED	2.1	UN1075		FLAMMABLE GAS		A6.3,A6.5
	Petroleum naphtha; see NAPHTHA, petroleum						
	PETROLEUM OIL	3	UN1270	I	FLAMMABLE LIQUID		A7.3
				II	FLAMMABLE LIQUID		
				III	FLAMMABLE LIQUID		
	PETROLEUM SPIRIT	3	UN1271	I	FLAMMABLE LIQUID		A7.3
				II	FLAMMABLE LIQUID		
	PETROL; see GASOLINE						
	PHENACYL BROMIDE	6.1	UN2645	II	POISON		A10.6
	PHENETIDINES	6.1	UN2311	III	KEEP AWAY FROM FOOD		A10.5
	PHENOL, MOLTEN	NOT ACCEPTED				NOT ACCEPTED	
	PHENOL, SOLID	6.1	UN1671	II	POISON		A10.6
	PHENOL, SOLUTIONS	6.1	UN2821	II	POISON		A10.5
				III	KEEP AWAY FROM FOOD		
	PHENOLSULPHONIC ACID, LIQUID	8	UN1803	II	CORROSIVE	N41	A12.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
*	PHENOXY PESTICIDES, LIQUID, FLAMMABLE, TOXIC, N.O.S. flashpoint less than 23 degrees C	3	UN2766	I	FLAMMABLE LIQUID, POISON		A7.3
				II	FLAMMABLE LIQUID, POISON		
*	PHENOXY PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S. flashpoint not less than 23 degrees C	6.1	UN2999	I	POISON, FLAMMABLE LIQUID		A10.5
				II	POISON, FLAMMABLE LIQUID		
				III	KEEP AWAY FROM FOOD, FLAMMABLE LIQUID		
*	PHENOXY PESTICIDES, LIQUID, TOXIC, N.O.S.	6.1	UN3000	I	POISON		A10.5
				II	POISON		
				III	KEEP AWAY FROM FOOD		
*	PHENOXY PESTICIDES, SOLID, TOXIC, N.O.S.	6.1	UN2765	I	POISON		A10.6
				II	POISON		
				III	KEEP AWAY FROM FOOD		
	PHENYLACETONITRILE, LIQUID	6.1	UN2470	III	KEEP AWAY FROM FOOD		A10.5
	PHENYLACETYL CHLORIDE	8	UN2577	II	CORROSIVE		A12.3
†	PHENYLCARBYLAMINE CHLORIDE	6.1	UN1672	I	POISON	2	A10.7
	PHENYL CHLOROFORMATE	6.1	UN2746	II	POISON, CORROSIVE		A10.5
	m-Phenylene diaminedi-perchlorate (dry)	FORBIDDEN					FORBIDDEN

	PHENYLENEDIAMINES (o-,m-,p-)	6.1	UN1673	III	KEEP AWAY FROM FOOD		A10.6
	PHENYLHYDRAZINE	6.1	UN2572	II	POISON		A10.5

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	PHENYL ISOCYANATE	6.1	UN2487	II	POISON	2,A3,N33, N34	A10.7
❑	PHENYL MERCAPTAN	6.1	UN2337	II	POISON, FLAMMABLE LIQUID	2	A10.7
	PHENYLMERCURIC ACETATE	6.1	UN1674	II	POISON		A10.6
*	PHENYLMERCURIC COMPOUNDS, N.O.S.	6.1	UN2026	I	POISON		A10.6
				II	POISON		
				III	KEEP AWAY FROM FOOD		
	PHENYLMERCURIC HYDROXIDE	6.1	UN1894	II	POISON		A10.6
	PHENYLMERCURIC NITRATE	6.1	UN1895	II	POISON		A10.6
❑	PHENYL PHOSPHORUS DICHLORIDE	8	UN2798	II	CORROSIVE		A12.3
❑	PHENYL PHOSPHOROUS THIODICHLORIDE	8	UN2799	II	CORROSIVE		A12.3
❑	PHENYLTRICHLOROSILANE	8	UN1804	II	CORROSIVE	A7,N34	A12.3
*	PHENYL UREA PESTICIDES, LIQUID, FLAMMABLE, TOXIC, N.O.S. flashpoint less than 23 degrees C		UN2768	I	FLAMMABLE LIQUID, POISON		A7.3
				II	FLAMMABLE LIQUID, POISON		
*	PHENYL UREA PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S. flash point more than 23 degrees C	6.1	UN3001	I	POISON, FLAMMABLE LIQUID		A10.5
				II	POISON, FLAMMABLE LIQUID		
				III	KEEP AWAY FROM FOOD, FLAMMABLE		

*	PHENYL UREA PESTICIDES, LIQUID, TOXIC, N.O.S.	6.1	UN3002	I II III	LIQUID POISON POISON KEEP AWAY FROM FOOD		A10.5
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
*	PHENYL UREA PESTICIDES, SOLID, TOXIC, N.O.S.	6.1	UN2767	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.6
†	PHOSGENE	2.3	UN1076		POISON GAS, CORROSIVE	1	A6.16
	9-PHOSPHABICYCLONONANES or CYCLOOCTADIENE PHOSPHINES	4.2	UN2940	II	SPONTANE-OUSLY COM-BUSTIBLE	A19	A8.4
†	PHOSPHINE	2.3	UN2199		POISON GAS, FLAMMABLE GAS	1	A6.16
	Phosphoric acid triethyleneimine; see TRI-(1-AZIRIDIYL) PHOSPHINE OXIDE, SOLUTION						
	Phosphoric Anhydride; see PHOSPHORUS PENTOXIDE						
	PHOSPHORIC ACID	8	UN1805	III	CORROSIVE	A7,N34	A12.3
	PHOSPHOROUS ACID, ORTHO	8	UN2834	III	CORROSIVE		A12.4
	PHOSPHORUS, AMORPHOUS	4.1	UN1338	III	FLAMMABLE SOLID	A1,A19	A8.4
	Phosphorus Bromide; see PHOSPHORUS TRIBROMIDE						
	Phosphorus Chloride; see PHOSPHORUS TRICHLORIDE						
	PHOSPHORUS HEPTASULPHIDE, free from yellow or white phosphorus	4.1	UN1339	II	FLAMMABLE SOLID	A20,N34	A8.4
❑	PHOSPHORUS OXYBROMIDE	8	UN1939	II	CORROSIVE	N41,N43	A12.4
	PHOSPHORUS OXYBROMIDE, MOLTEN	NOT ACCEPTED					NOT ACCEPTED

❑	PHOSPHORUS OXYCHLORIDE	8	UN1810	II	CORROSIVE, POISON	2,A7, N34	A12.12
❑	PHOSPHORUS PENTABROMIDE	8	UN2691	II	CORROSIVE	A7,N34	A12.3
	PHOSPHORUS PENTACHLORIDE	8	UN1806	II	CORROSIVE, POISON GAS	A7,N34	A12.3
†	PHOSPHORUS PENTAFLUORIDE	2.3	UN2198		POISON GAS	1	A6.7
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	PHOSPHORUS PENTASULPHIDE, free from yellow or white phosphorus	4.3	UN1340	II	DANGEROUS WHEN WET, FLAMMABLE SOLID	A20	A8.4
	PHOSPHORUS PENTOXIDE	8	UN1807	II	CORROSIVE	A7,N34	A12.4
	PHOSPHORUS SESQUISULPHIDE, free from yellow or white phosphorus	4.1	UN1341	II	FLAMMABLE SOLID	A20,N34	A8.4
❑	PHOSPHORUS TRIBROMIDE	8	UN1808	II	CORROSIVE	A3,A6,A7, N34,N43	A12.3
❑	PHOSPHORUS TRICHLORIDE	8	UN1809	II	CORROSIVE, POISON	2,A3, A7,N34	A12.12
	PHOSPHORUS TRIOXIDE	8	UN2578	III	CORROSIVE		A12.12
	PHOSPHORUS TRISULFIDE, free from yellow or white phosphorus	4.1	UN1343	II	FLAMMABLE SOLID	A20,N34	A8.4
	PHOSPHORUS WHITE, MOLTEN	NOT ACCEPTED					NOT ACCEPTED
	Phosphorus (white or red) and a chlorate, mixtures of	FORBIDDEN					FORBIDDEN
†	PHOSPHORUS, WHITE or YELLOW DRY or UNDER WATER or IN SOLUTION	4.2	UN1381	I	SPONTANE-OUSLY COM-BUSTIBLE, POISON	N34	A8.17
	Phosphoryl Chloride; see PHOSPHORUS OXYCHLORIDE						
	PHTHALIC ANHYDRIDE with more than .05% maleic anhydride	8	UN2214	III	CORROSIVE		A12.4
*	PHTHALIMIDE DERIVATIVE PESTICIDES, LIQUID, FLAMMABLE, TOXIC, N.O.S.,	3	UN2774	I	FLAMMABLE LIQUID,		A7.3

	flashpoint less than 23 degrees C			II	POISON FLAMMABLE LIQUID, POISON		

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
*	PHTHALIMIDE DERIVATIVE PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S., flashpoint not less than 23 degrees C	6.1	UN3007	I II III	POISON, FLAMMABLE LIQUID POISON, FLAMMABLE LIQUID KEEP AWAY FROM FOOD, FLAMMABLE LIQUID		A10.5
*	PHTHALIMIDE DERIVATIVE PESTICIDES, LIQUID, TOXIC, N.O.S.	6.1	UN3008	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.5
*	PHTHALIMIDE DERVATIVE PESTICIDES, SOLID, TOXIC, N.O.S.	6.1	UN2773	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.6
	PICOLINES	3	UN2313	II	FLAMMABLE LIQUID		A7.3
	PICRAMIDE see TRINITROANILINE						
	PICRIC ACID; see TRINITROPHENOL, etc						
D†	PICRIC ACID, WET, with not less than 1O% water	4.1	NA1344	I	FLAMMABLE SOLID	A19,A20, N41	A8.4
	PICRITE; see NITROGUANIDINE, etc						
	PICRYL CHLORIDE; see TRINITROCHLOROBENZENE						
	ALPHA-PINENE	3	UN2368	III	FLAMMABLE		A7.3

					LIQUID		
	PINE OIL	3	UN1272	III	FLAMMABLE		A7.3
	PIPERAZINE	8	UN2579	III	CORROSIVE		A12.4
	PIPERIDINE	3	UN2401	II	FLAMMABLE LIQUID		A7.3
	Pivaloyl Chloride; see TRIMETHYLACETYL CHLORIDE						
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	PLASTIC MOULDING MATERIAL in dough, sheet, or extruded rope form	9	ID8016	III	CLASS 9		A13.4
+	PLASTICS, NITROCELLULOSE BASED, SELF-HEATING, N.O.S.	4.2	UN2006	III	SPONTANE-OUSLY COM-BUSTIBLE		A8.4
	Plastic solvent, N.O.S.; see FLAMMABLE LIQUIDS, N.O.S.						
	Poisonous gases, N.O.S.; see COMPRESSED or LIQUEFIED GASES, TOXIC, N.O.S.						
	POISONOUS LIQUIDS, CORROSIVE, N.O.S.	6.1	UN2927	I	POISON, CORROSIVE		A10.5
				II	POISON, CORROSIVE		
†	POISONOUS LIQUIDS, CORROSIVE, N.O.S. inhalation hazard Packing Group 1, Zone A	6.1	UN2927	I	POISON, CORROSIVE	1	A10.7
†	POISONOUS LIQUIDS, CORROSIVE, N.O.S., inhalation hazard Packing Group 1, Zone B	6.1	UN2927	I	POISON, CORROSIVE	2	A10.7
	POISONOUS LIQUIDS, FLAMMABLE, N.O.S.	6.1	UN2929	I	POISON, FLAMMABLE LIQUID		A10.5
				II	POISON, FLAMMABLE LIQUID		
†	POISONOUS LIQUIDS, FLAMMABLE, N.O.S., inhalation hazard Packing Group 1, Zone A	6.1	UN2929	I	POISON	1	A10.7
†	POISONOUS LIQUIDS, FLAMMABLE, N.O.S.,	6.1	UN2929	I	POISON,	2	A10.7

	inhalation hazard, Packing Group 1, Zone B				FLAMMABLE LIQUID		
	POISONOUS LIQUIDS, N.O.S.	6.1	UN2810	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.5
†	POISONOUS LIQUIDS, N.O.S., inhalation hazard, Packing Group 1, Zone A	6.1	UN2810	I	POISON	1	A10.7

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
†	POISONOUS LIQUIDS, N.O.S., inhalation hazard, Packing Group 1, Zone B	6.1	UN2810	I	POISON	2	A10.7
	POISONOUS LIQUIDS, OXIDIZING, N.O.S.	6.1	UN3122	I II	POISON, OXIDIZER POISON, OXIDIZER	A4	A10.5
†	POISONOUS LIQUIDS, OXIDIZING, N.O.S., inhalation hazard, Packing Group 1, Zone A	6.1	UN3122	I	POISON, OXIDIZER	1	A10.7
†	POISONOUS LIQUIDS, OXIDIZING, N.O.S., inhalation hazard, Packing Group 1, Zone B	6.1	UN3122	I	POISON, OXIDIZER	2	A10.7
	POISONOUS LIQUIDS, WATER-REACTIVE, N.O.S.	6.1	UN3123	I II	POISON, DANGEROUS WHEN WET POISON, DANGEROUS WHEN WET	A4	A10.5
	POISONOUS SOLIDS, CORROSIVE, N.O.S.	6.1	UN2928	I II	POISON, CORROSIVE POISON, CORROSIVE		A10.6
	POISONOUS SOLIDS, FLAMMABLE, N.O.S.	6.1	UN2930	I II	POISON, FLAMMABLE SOLID POISON, FLAMMABLE		A10.6

					SOLID		
	POISONOUS SOLIDS, N.O.S.	6.1	UN2811	I	POISON		A10.6
				II	POISON		
				III	KEEP AWAY FROM FOOD		
	POISONOUS SOLIDS, OXIDIZING, N.O.S.	6.1	UN3086	I	POISON, OXIDIZER		A10.6
				II	POISON, OXIDIZER LIQUID		
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	POISONOUS SOLIDS, SELF-HEATING, N.O.S.	6.1	UN3124	I	POISON, SPONTANE-OUSLY COM-BUSTIBLE	A5	A10.6
				II	POISON, SPONTANE-OUSLY COMBUSTIBLE		
	POISONOUS, SOLIDS, WATER-REACTIVE, N.O.S.	6.1	UN3125	I	POISON, DANGEROUS WHEN WET	A5	A10.6
				II	POISON, DANGEROUS WHEN WET		
	POLYALKYLAMINES,N.O.S., see ALKYLAMINES, N.O.S.						
	POLYCHLORINATED BIPHENYLS	9	UN2315	II	CLASS 9	9	A13.4
	POLYHALOGENATED BIPHENYLS, LIQUID or POLYHALOGENATED TERPHENYLS, LIQUID	9	UN3151	II	CLASS 9		A13.4
	POLYHALOGENATED BIPHENYLS, SOLID, or POLYHALOGENATED TERPHENYLS, SOLIDS	9	UN3152	II	CLASS 9		A13.4
	POLYMERIC BEADS, EXPANDABLE, evolving flammable vapor	9	UN2211	III	CLASS 9		A13.14
	Polystyrene beads, expandable, see POLYMERIC BEADS, EXPANDABLE						

❑	POTASSIUM	4.3	UN2257	I	DANGEROUS WHEN WET	A19,A20, N6,N34	A8.4
	POTASSIUM ARSENATE	6.1	UN1677	II	POISON		A10.6
	POTASSIUM ARSENITE	6.1	UN1678	II	POISON		A10.6
	POTASSIUM BIFLUORIDE, solid	8	UN1811	II	CORROSIVE, POISON	N3,N34,	A12.4
	POTASSIUM BIFLUORIDE, solution	8	UN1811	II	CORROSIVE, POISON	N3,N34	A12.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	Potassium bisulphite solution, see BISULPHITES, INORGANIC, AQUEOUS SOLUTIONS, N.O.S.						
❑	POTASSIUM BOROHYDRIDE	4.3	UN1870	I	DANGEROUS WHEN WET	A19,N40	A8.4
	POTASSIUM BROMATE	5.1	UN1484	II	OXIDIZER		A9.8
	Potassium Carbonyl	FORBIDDEN					FORBIDDEN
	POTASSIUM CHLORATE	5.1	UN1485	II	OXIDIZER	A9,N34	A9.8
	Potassium Chlorate mixed with mineral oil; see EXPLOSIVE, BLASTING, TYPE C						
	POTASSIUM CHLORATE, AQUEOUS SOLUTION	5.1	UN2427	II	OXIDIZER	A2	A9.7
	POTASSIUM CUPROCYANIDE	6.1	UN1679	II	POISON		A10.6
	POTASSIUM CYANIDE	6.1	UN1680	I	POISON	N74,N75	A10.6
	Potassium dichloro isocyanurate or Potassium dichloro-s-triazinetrione; see DICHLOROISOCYANURIC ACID, DRY OR DICHLORO-ISOCYANURIC ACID SALTS, etc						
	POTASSIUM DITHIONITE or POTASSIUM HYDROSULPHITE	4.2	UN1929	II	SPONTANE-OUSLY COM-BUSTIBLE	A8,A19, A20	A8.4
	POTASSIUM FLUORIDE	6.1	UN1812	III	KEEP AWAY FROM FOOD		A10.6
	POTASSIUM FLUOROACETATE	6.1	UN2628	I	POISON		A10.6
	POTASSIUM FLUOROSILICATE	6.1	UN2655	III	KEEP AWAY		A10.6

					FROM FOOD		
	Potassium hydrate; see POTASSIUM HYDROXIDE, SOLID						
	Potassium hydrogen fluoride; see POTASSIUM BIFLUORIDE						
	Potassium hydrogen fluoride solution; see CORROSIVE LIQUID, N.O.S.						
	POTASSIUM HYDROGEN SULPHATE	8	UN2509	II	CORROSIVE	A7,N34	A12.4
	POTASSIUM HYDROSULPHITE, see POTASSIUM DITHIONITE						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	Potassium hydroxide, liquid; see POTASSIUM HYDROXIDE SOLUTION						
	POTASSIUM, HYDROXIDE, SOLID	8	UN1813	II	CORROSIVE		A12.4
	POTASSIUM HYDROXIDE, SOLUTION	8	UN1814	II III	CORROSIVE CORROSIVE		A12.3
	Potassium hypochlorite solution; see HYPOCHLORITE SOLUTIONS, etc						
	POTASSIUM, METAL ALLOYS	4.3	UN1420	I	DANGEROUS WHEN WET	A19,A20	A8.4
	Potassium metal, liquid alloy; see ALKALI METAL ALLOYS, LIQUID, N.O.S.						
	POTASSIUM METAVANADATE	6.1	UN2864	II	POISON		A10.6
	POTASSIUM MONOXIDE	8	UN2033	II	CORROSIVE		A12.4
	POTASSIUM NITRATE	5.1	UN1486	III	OXIDIZER	A1,A29	A9.8
	POTASSIUM NITRATE AND SODIUM NITRITE MIXTURES	5.1	UN1487	II	OXIDIZER		A9.8
	POTASSIUM NITRITE	5.1	UN1488	II	OXIDIZER		A9.8
	POTASSIUM PERCHLORATE, solid or solution	5.1	UN1489	II	OXIDIZER		A9.8
	POTASSIUM PERMANGANATE	5.1	UN1490	II	OXIDIZER		A9.8
❑	POTASSIUM PEROXIDE	5.1	UN1491	I	OXIDIZER	A20,N34	A9.8
	POTASSIUM PERSULPHATE	5.1	UN1492	III	OXIDIZER	A1,A29	A9.8
❑	POTASSIUM PHOSPHIDE	4.3	UN2012	I	DANGEROUS WHEN WET,	A19,N40	A8.4

					POISON		
❑	POTASSIUM SALTS OF AROMATIC NITRO-DERIVATIVES, explosive	1.3C	UN0158	II	EXPLOSIVE		A5.89
	Potassium selenate; see SELENATES						
	Potassium selenite; see SELENITES						
❑	POTASSIUM SODIUM ALLOYS	4.3	UN1422	I	DANGEROUS WHEN WET	A19,A20, N34,N40	A8.3
	POTASSIUM SULPHIDE, ANHYDROUS or POTASSIUM SULPHIDE with less than 30% water of crystallization	4.2	UN1382	II	SPONTANE-OUSLY COM-BUSTIBLE	A19,A20, N34	A8.4
	POTASSIUM SULPHIDE, HYDRATED with not less than 30% water of crystallization	8	UN1847	II	CORROSIVE		A12.4
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
❑	POTASSIUM SUPEROXIDE	5.1	UN2466	I	OXIDIZER	A20	A9.8
†	POWDER CAKE, WETTED, or POWDER PASTE, WETTED with not less than 17% alcohol by mass	1.1C	UN0433	II	EXPLOSIVE		A5.90
❑	POWDER CAKE, WETTED, or POWDER PASTE, WETTED with not less than 25% water, by mass	1.3C	UN0159	II	EXPLOSIVE		A5.91
	POWDER PASTE, WETTED, see POWDER CAKE, WETTED, etc						
†	POWDER, SMOKELESS	1.1C	UN0160	II	EXPLOSIVE		A5.92
❑	POWDER, SMOKELESS	1.3C	UN0161	II	EXPLOSIVE		A5.92
	Power device, explosive; see CARTRIDGES, POWER DEVICE						
	PRIMERS, CAP TYPE	1.4S	UN0044	II	EXPLOSIVE		A5.93
†	PRIMERS, CAP TYPE	1.1B	UN0377	II	EXPLOSIVE		A5.93
	PRIMERS, CAP TYPE	1.4B	UN0378	II	EXPLOSIVE		A5.93
	Primers, small arms; see PRIMERS, CAP TYPE						
❑	PRIMERS, TUBULAR	1.3G	UN0319	II	EXPLOSIVE		A5.94
	PRIMERS, TUBULAR	1.4G	UN0320	II	EXPLOSIVE		A5.94
	PRIMERS, TUBULAR	1.4S	UN0376	II	EXPLOSIVE		A5.94
	PRINTING INK, flammable	3	UN1210	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		

	Projectiles illuminating; see AMMUNITION, ILLUMINATING, etc						
	PROJECTILES, inert with tracer	1.4S	UN0345	II	EXPLOSIVE		A5.95
❑	PROJECTILES, inert, with tracer	1.3G	UN0424	II	EXPLOSIVE		A5.95
	PROJECTILES, inert, with tracer	1.4G	UN0425	II	EXPLOSIVE		A5.95
❑	PROJECTILES, with burster or expelling charge	1.2D	UN0346	II	EXPLOSIVE		A5.95
	PROJECTILES, with burster or expelling charge	1.4D	UN0347	II	EXPLOSIVE		A5.95
❑	PROJECTILES, with burster or expelling charge	1.2F	UN0426	II	EXPLOSIVE		A5.95
	PROJECTILES, with burster or expelling charge	1.2G	UN0434	II	EXPLOSIVE		A5.95
	PROJECTILES, with burster or expelling charge	1.4F	UN0427	II	EXPLOSIVE		A5.95
	PROJECTILES, with burster or expelling charge	1.4G	UN0435	II	EXPLOSIVE		A5.95
	PROJECTILES, with bursting charge	1.4D	UN0344	II	EXPLOSIVE		A5.95
†	PROJECTILES, with bursting charge	1.1D	UN0168	II	EXPLOSIVE		A5.95
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
†	PROJECTILES, with bursting charge	1.1F	UN0167	II	EXPLOSIVE		A5.95
❑	PROJECTILES, with bursting charge	1.2D	UN0169	II	EXPLOSIVE		A5.95
❑	PROJECTILES, with bursting charge	1.2F	UN0324	II	EXPLOSIVE		A5.95
	PROPADIENE, INHIBITED	2.1	UN2200		FLAMMABLE GAS		A6.5
	Propadiene mixed with methyl acetylene; see METHYL ACETYLENE AND PROPADIENE MIXTURES, STABILIZED						
	PROPANE or PROPANE MIXTURES, see also PETROLEUM GASES, LIQUEFIED	2.1	UN1978		FLAMMABLE GAS		A6.3,A6.5
	PROPANETHIOLS	3	UN2402	II	FLAMMABLE LIQUID		A7.3
	N-PROPANOL or NORMAL PROPYL ALCOHOL	3	UN1274	II	FLAMMABLE LIQUID		A7.3
D❑	PROPARGYL ALCOHOL	3	NA1986	II	FLAMMABLE LIQUID, POISON		A7.3
D†	PROPELLANT EXPLOSIVE, LIQUID	1.1C	NA0474	II	EXPLOSIVE		A5.96
D❑	PROPELLANT EXPLOSIVE, LIQUID	1.3C	NA0477	II	EXPLOSIVE		A5.96
D†	PROPELLANT EXPLOSIVE SOLID	1.1C	NA0273	II	EXPLOSIVE		A5.96
D❑	PROPELLANT EXPLOSIVE, SOLID	1.3C	UN0274	II	EXPLOSIVE		A5.96

	PROPIONALDEHYDE	3	UN1275	II	FLAMMABLE LIQUID		A7.3
	PROPIONIC ACID	8	UN1848	III	CORROSIVE		A12.3
	PROPIONIC ANHYDRIDE	8	UN2496	III	CORROSIVE		A12.3
	PROPIONITRILE	3	UN2404	II	FLAMMABLE LIQUID, POISON		A7.3
	PROPIONYL CHLORIDE	3	UN1815	II	FLAMMABLE LIQUID, CORROSIVE		A7.3
	N-PROPYL ACETATE	3	UN1276	II	FLAMMABLE LIQUID		A7.3
	PROPYL ALCOHOL, NORMAL; see N-PROPANOL						
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	PROPYLAMINE	3	UN1277	II	FLAMMABLE LIQUID	N34	A7.3
	N-PROPYLBENZENE	3	UN2364	III	FLAMMABLE LIQUID		A7.3
	PROPYL CHLORIDE	3	UN1278	II	FLAMMABLE LIQUID	N34	A7.3
†	N-PROPYL CHLOROFORMATE	6.1	UN2740	I	POISON, FLAMMABLE LIQUID, CORROSIVE	2,A3, A6,A7, N34	A10.7
❑	PROPYLENE	2.1	UN1077		FLAMMABLE GAS		A6.3,A6.5
	PROPYLENE CHLOROHYDRIN	6.1	UN2611	II	POISON		A10.5
	1,2-PROPYLENEDIAMINE	8	UN2258	III	CORROSIVE	A3,A6,N34	A12.4
	PROPYLENE DICHLORIDE	3	UN1279	II	FLAMMABLE LIQUID	N36	A7.3
	PROPYLENEIMINE, INHIBITED	3	UN1921	I	FLAMMABLE LIQUID	A3,N34	A7.3
	PROPYLENE OXIDE	3	UN1280	I	FLAMMABLE LIQUID	A3,N34	A7.3

	PROPYLENE TETRAMER	3	UN2850	III	FLAMMABLE LIQUID		A7.3
	PROPYL FORMATES	3	UN1281	II	FLAMMABLE LIQUID		A7.3
†	N-PROPYL ISOCYANATE	3	UN2482	I	FLAMMABLE LIQUID, POISON	1,A7	A7.6
	Propyl mercaptan; see PROPANETHIOLS						
	N-PROPYL NITRATE	3	UN1865	II	FLAMMABLE LIQUID		A7.3
❑	PROPYLTRICHLOROSILANE	8	UN1816	II	CORROSIVE	A7,N34	A12.3
	Prussic acid; see HYDROGEN CYANIDE etc.						
	PYRIDINE	3	UN1282	II	FLAMMABLE LIQUID, POISON		A7.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	Pyridine perchlorate	FORBIDDEN					FORBIDDEN
†	PYROPHORIC LIQUIDS, ORGANIC, N.O.S.	4.2	UN2845	I	SPONTANE-OUSLY COM-BUSTIBLE		A8.6
†	PYROPHORIC LIQUIDS, INORGANIC, N.O.S.	4.2	UN3194	I	SPONTANE-OUSLY COM-BUSTIBLE		A8.6
†	PYROPHORIC METALS, N.O.S., or PYROPHORIC ALLOYS, N.O.S.	4.2	UN1383	I	SPONTANE-OUSLY COM-BUSTIBLE		A8.12
†	PYROPHORIC SOLIDS, ORGANIC, N.O.S.	4.2	UN2846	I	SPONTANE-OUSLY COM-BUSTIBLE		A8.12
	PYROPHORIC SOLIDS, INORGANIC, N.O.S.	4.2	UN3200	I	SPONTANE-OUSLY COM-BUSTIBLE		A8.12
†	PYROPHORIC ORGANOMETALLIC COMPOUNDS, N.O.S.	4.2	UN3203	I	SPONTANE-OUSLY COM-BUSTIBLE		A8.12

PYROSULPHURYL CHLORIDE	8	UN1817	II	CORROSIVE		A12.3
PYRROLIDINE	3	UN1922	II	FLAMMABLE LIQUID		A7.3
Quebrachitol pentanitrate	FORBIDDEN					FORBIDDEN
Quicklime; see CALCIUM OXIDE						
QUICKMATCH, see FUSE, INSTANTANEOUS, NONDETONATING						
QUINOLINE	6.1	UN2656	III	KEEP AWAY FROM FOOD		A10.5
QUINONE, see BENZOQUINONE						
(R12B1), see CHLORODIFLUOROBROMOMETHANE						
(R12), see DICHLORODIFLUOROMETHANE						
(R12B2), see DIBROMODIFLUOROMETHANE						
(R13B1), see BROMOTRIFLUOROMETHANE						
(R13), see CHLOROTRIFLUOROMETHANE						
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
(R14), see TETRAFLUOROMETHANE						
(R21), see DICHLOROFLUOROMETHANE						
(R22), see CHLORODIFLUOROMETHANE						
(R23), see TRIFLUOROMETHANE						
(R114), see DICHLOROTETRAFLUOROETHANE						
(R115), see CHLOROPENTAFLUOROETHANE						
(R116), see HEXAFLUOROETHANE						
(R124), see 1-CHLORO-1,2,2,2 TETRAFLUOROETHANE						
(R133a), see 1-CHLORO-2,2,2 TRIFLUOROETHANE						
(R134a), see 1,1,1,2-TETRAFLUOROETHANE						
(R142B), see CHLORODIFLUOROETHANES						
(R143), see TRIFLUOROETHANE, COMPRESSED						
(R152a), see DIFLUOROETHANE						
(R218), see OCTAFLUOROPROPANE						
(R500), see DICHLORODIFLUOROMETHANE AND DIFLUOROETHANE AZEOTROPIC MIXTURE, etc.						
(R502), see CHLORODIFLUOROMETHANE AND CHLOROPENTAFLUOROETHANE MIXTURE, etc.						

	(R503), see CHLOROTRIFLUOROMETHANE AND TRIFLUOROMETHANE AZEOTROPIC MIXTURE, etc.						
	(R1113), see TRIFLUOROCHLOROETHYLENE, INHIBITED						
	(R1132a), see 1,1-DIFLUOROETHYLENE						
	(RC318), see OCTAFLUOROCYCLOBUTANE						
	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE, ARTICLES MANUFACTURED FROM NATURAL or DEPLETED URANIUM or NATURAL THORIUM	7	UN2910		NONE		A11.12,A11.16
	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE, EMPTY PACKAGING	7	UN2910		EMPTY		A3.1.12.3
	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE, INSTRUMENTS or ARTICLES	7	UN2910		NONE		A11.12,A11.14
	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE, LIMITED QUANTITY OF MATERIAL	7	UN2910		NONE		A11.11,A11.12
†*	RADIOACTIVE MATERIAL, FISSILE, N.O.S.	7	UN2918		RADIO-ACTIVE		A11.8,A3.1.12.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
*❑	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA), N.O.S.	7	UN2912		RADIO-ACTIVE		A11.11,A11.14, A11.16,A11.17
*†	RADIOACTIVE MATERIAL, N.O.S.	7	UN2982		RADIO-ACTIVE		A11.6,A11.7, A11.11,A11.14,A11.16
*†	RADIOACTIVE MATERIAL, SPECIAL FORM, N.O.S.	7	UN2974		RADIO-ACTIVE		A11.6,A11.7, A11.11,A11.14
	Railway torpedo, see SIGNALS, RAILWAY TRACK, EXPLOSIVE						
	RARE GASES AND NITROGEN MIXTURES	2.2	UN1981		NONFLAM-MABLE GAS		A6.3,A6.7
	RARE GASES AND OXYGEN MIXTURES	2.2	UN1980		NONFLAM-MABLE GAS		A6.3,A6.7
	RARE GASES MIXTURES	2.2	UN1979		NONFLAM-MABLE GAS		A6.3,A6.7
	RDX, see CYCLOTRIMETHYLENE TRINITRAMINE, etc.						
	RECEPTACLES, SMALL, CONTAINING GAS non-flammable, without release device,	2.2	UN2037		NONFLAM-MABLE GAS		A6.3,A6.5

	not refillable						
	RECEPTACLES, SMALL, CONTAINING GAS (flammable) without release device, not refillable	2.1	UN2037		FLAMMABLE GAS		A6.3,A6.5
	Red phosphorus, see PHOSPHORUS, AMORPHOUS						
	REFRIGERANT GASES, N.O.S.	2.2	UN1078		NONFLAM-MABLE GAS		A6.3,A6.5
D❑	REFRIGERANT GAS, N.O.S. or DISPERSANT GAS, N.O.S.	2.1	NA1954		FLAMMABLE GAS		A6.3,A6.5
D	REFRIGERATING MACHINE	3	NA1993	III	FLAMMABLE LIQUID		A7.4
❑	REFRIGERATING MACHINES, containing flammable nonpoisonous, LIQUEFIED gas	2.1	ID8023		FLAMMABLE GAS		A6.10
	REFRIGERATING MACHINES, containing nonflammable non-poisonous, LIQUEFIED gas or ammonia solutions	2.2	UN2857		NONFLAM-MABLE GAS		A6.10
D	REGULATED MEDICAL WASTE	6.2	NA9275	II	INFECTIOUS SUBSTANCE		A10.10
	RELEASE DEVICES, EXPLOSIVE	1.4S	UN0173	II	EXPLOSIVE		A5.97
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	RESIN SOLUTION, flammable	3	UN1866	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
	RESORCINOL	6.1	UN2876	III	KEEP AWAY FROM FOOD		A10.6
	Rifle grenade, see GRENADES, hand or rifle, etc.						
	Rifle powder, see POWDER, SMOKELESS						
	RIVETS, EXPLOSIVE	1.4S	UN0174	II	EXPLOSIVE		A5.97
	Road asphalt or tar liquid, see TARS, LIQUID, etc.						
❑	ROCKET MOTORS	1.3C	UN0186	II	EXPLOSIVE	109	A5.98
❑	ROCKET MOTORS	1.1C	UN0280	II	EXPLOSIVE	109	A5.98
❑	ROCKET MOTORS	1.2C	UN0281	II	EXPLOSIVE	109	A5.98
❑	ROCKET MOTORS, LIQUID FUELED	1.2J	UN0395	II	EXPLOSIVE	109	A5.99

❑	ROCKET MOTORS, LIQUID FUELED	1.3J	UN0396	II	EXPLOSIVE	109	A5.99
†	ROCKET MOTORS WITH HYPERGOLIC LIQUIDS with or without an expelling charge	1.3L	UN0250	II	EXPLOSIVE	109	A5.100
†	ROCKET MOTORS WITH HYPERGOLIC LIQUIDS with or without an expelling charge	1.2L	UN0322	II	EXPLOSIVE	109	A5.100
	ROCKETS, LINE-THROWING	1.4G	UN0453	II	EXPLOSIVE		A5.101
❑	ROCKETS, LINE-THROWING	1.2G	UN0238	II	EXPLOSIVE		A5.101
❑	ROCKETS, LINE-THROWING	1.3G	UN0240	II	EXPLOSIVE		A5.101
❑	ROCKETS, LIQUID FUELED with bursting charge	1.2J	UN0398	II	EXPLOSIVE		A5.99
❑	ROCKETS, LIQUID FUELED with bursting charge	1.1J	UN0397	II	EXPLOSIVE		A5.99
❑	ROCKETS, with bursting charge	1.1F	UN0180	II	EXPLOSIVE		A5.102
❑	ROCKETS, with bursting charge	1.1E	UN0181	II	EXPLOSIVE		A5.102
❑	ROCKETS, with bursting charge	1.2E	UN0182	II	EXPLOSIVE		A5.102
❑	ROCKETS, with bursting charge	1.2F	UN0295	II	EXPLOSIVE		A5.102
❑	ROCKETS, with expelling charge	1.2C	UN0436	II	EXPLOSIVE		A5.102
❑	ROCKETS, with expelling charge	1.3C	UN0437	II	EXPLOSIVE		A5.102
	ROCKETS, with expelling charge	1.4C	UN0438	II	EXPLOSIVE		A5.102
❑	ROCKETS, with inert head	1.3C	UN0183	II	EXPLOSIVE		A5.102
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	ROSIN OIL	3	UN1286	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
	RUBBER SOLUTION	3	UN1287	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
	RUBIDIUM	4.3	UN1423	I	DANGEROUS WHEN WET	22,A7,A19, N34,N40, N45	A8.4
	RUBIDIUM HYDROXIDE	8	UN2678	II	CORROSIVE		A12.4
	RUBIDIUM HYDROXIDE SOLUTION	8	UN2677	II	CORROSIVE		A12.3
	Safety fuse, see FUSE, SAFETY						
	Safety squibs, see IGNITERS						
	SAMPLES, EXPLOSIVE, other than	use class/	UN0190	II	use label	113	A5.103

	initiating explosives	division of sample			based on hazard class/division		
	Sand acid, see FLUOSILICIC ACID						
†	SEED CAKE, containing vegetable oil solvent extractions and expelled seeds, containing 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	NONE	N7	A8.4
†	SEED CAKE with more than 1.5% oil and not more than 11% moisture	4.2	UN1386	III	NONE	N7	A8.4
†	SEED CAKE with not more than 1.5% oil and not more than 11% moisture	4.2	UN2217	III	NONE	N7	A8.4
	SELENATES or SELENITES	6.1	UN2630	I	POISON		A10.6
	SELENIC ACID	8	UN1905	I	CORROSIVE	N34	A12.4
	SELENIUM DISULPHIDE	6.1	UN2657	II	POISON		A10.6
†	SELENIUM HEXAFLUORIDE	2.3	UN2194		POISON GAS	1	A6.7
	Selenium nitride	FORBIDDEN					FORBIDDEN
D	SELENIUM OXIDE	6.1	NA2811	I	POISON		A10.6
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	SELENIUM OXYCHLORIDE	8	UN2879	I	CORROSIVE, POISON	A3,A6,A7, N34	A12.3
	SELENIUM POWDER	6.1	UN2658	III	KEEP AWAY FROM FOOD		A10.6
	SELF-HEATING LIQUID, INORGANIC, N.O.S.	4.2	UN3186	II	SPONTANE-OUSLY COM-BUSTIBLE		A8.3
				III	SPONTANE-OUSLY COM-BUSTIBLE		
	SELF-HEATING LIQUID, INORGANIC, CORROSIVE, N.O.S.	4.2	UN3188	II	SPONTANE-OUSLY COM-BUSTIBLE, CORROSIVE		A8.3
				III	SPONTANE-		

					OUSLY COM-BUSTIBLE, CORROSIVE		
	SELF-HEATING LIQUID, INORGANIC, POISONOUS, N.O.S.	4.2	UN3187	II	SPONTANE-OUSLY COM-BUSTIBLE, POISON		A8.3
				III	SPONTANE-OUSLY COM-BUSTIBLE, POISON		
	SELF-HEATING LIQUID, ORGANIC, N.O.S.	4.2	UN3183	II	SPONTANE-OUSLY COM-BUSTIBLE		A8.3
				III	SPONTANE-OUSLY COM-BUSTIBLE		

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	SELF-HEATING LIQUID, ORGANIC, CORROSIVE, N.O.S.	4.2	UN3185	II	SPONTANE-OUSLY COM-BUSTIBLE, CORROSIVE		A8.3
				III	SPONTANE-OUSLY COM-BUSTIBLE, CORROSIVE		
	SELF-HEATING LIQUID, ORGANIC, POISONOUS, N.O.S.	4.2	UN3184	II	SPONTANE-OUSLY COM-BUSTIBLE, POISON		A8.3
				III	SPONTANE-OUSLY COM-		

					BUSTIBLE, POISON		
	SELF-HEATING METAL POWDERS, N.O.S.	4.2	UN3189	II	SPONTANE-OUSLY COM-BUSTIBLE		A8.4
				III	SPONTANE-OUSLY COM-BUSTIBLE		
	SELF-HEATING SOLID, INORGANIC, N.O.S.	4.2	UN3190	II	SPONTANE-OUSLY COM-BUSTIBLE		A8.4
				III	SPONTANE-OUSLY COM-BUSTIBLE		
	SELF-HEATING SOLID, INORGANIC, CORROSIVE, N.O.S.	4.2	UN3192	II	SPONTANE-OUSLY COM-BUSTIBLE, CORROSIVE		A8.4
				III	SPONTANE-OUSLY COMBUS-TIBLE, CORROSIVE		
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	SELF-HEATING SOLID, INORGANIC, POISONOUS, N.O.S.	4.2	UN3191	II	SPONTANE-OUSLY COM-BUSTIBLE, POISON		A8.4
				III	SPONTANE-OUSLY COM-BUSTIBLE, KEEP AWAY FROM FOOD		
	SELF-HEATING SOLID, ORGANIC, CORROSIVE, N.O.S.	4.2	UN3126	II	SPONTANE-OUSLY COM-BUSTIBLE, CORROSIVE		A8.4

				III	SPONTANE-OUSLY COM-BUSTIBLE, CORROSIVE		
	SELF-HEATING SOLID, ORGANIC, N.O.S.	4.2	UN3088	II	SPONTANE-OUSLY COM-BUSTIBLE		A8.4
				III	SPONTANE-OUSLY COM-BUSTIBLE		
	SELF-HEATING SOLID, ORGANIC, OXIDIZING, N.O.S.	4.2	UN3127		SPONTANE-OUSLY COM-BUSTIBLE, OXIDIZER		A8.6
	SELF-HEATING SOLID, ORGANIC, POISONOUS, N.O.S.	4.2	UN3128	II	SPONTANE-OUSLY COM-BUSTIBLE, POISON		A8.4
				III	SPONTANE-OUSLY COM-BUSTIBLE, KEEP AWAY FROM FOOD		
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	Self-propelled vehicle, see BATTERY-POWERED VEHICLE, etc. or BATTERY-POWERED EQUIPMENT, etc. or ENGINES, INTERNAL COMBUSTION, etc. or WHEELCHAIR, ELECTRIC, etc.						
	SELF-REACTIVE LIQUID TYPE B	NOT ACCEPTED					NOT ACCEPTED
	SELF-REACTIVE LIQUID TYPE C (specific technical name required)	4.1	UN3223	II	FLAMMABLE SOLID		A8.8
	SELF-REACTIVE LIQUID TYPE D (specific technical name required)	4.1	UN3225	II	FLAMMABLE SOLID		A8.8
	SELF-REACTIVE LIQUID TYPE E (specific technical name required)	4.1	UN3227	II	FLAMMABLE SOLID		A8.8

	SELF-REACTIVE LIQUID TYPE F (specific technical name required)	4.1	UN3229	II	FLAMMABLE SOLID		A8.8
	SELF-REACTIVE LIQUID TYPE B, TEMPERATURE CONTROLLED (specific technical name required)	NOT ACCEPTED					NOT ACCEPTED
	SELF-REACTIVE LIQUID TYPE C TEMPERATURE CONTROLLED (specific technical name required)	NOT ACCEPTED					NOT ACCEPTED
	SELF-REACTIVE LIQUID TYPE D, TEMPERATURE CONTROLLED (specific technical name required)	NOT ACCEPTED					NOT ACCEPTED
	SELF-REACTIVE LIQUID TYPE E, TEMPERATURE CONTROLLED (specific technical name required)	NOT ACCEPTED					NOT ACCEPTED
	SELF-REACTIVE LIQUID TYPE F, TEMPERATURE CONTROLLED (specific technical name required)	NOT ACCEPTED					NOT ACCEPTED
	SELF-REACTIVE SOLID TYPE B (see below for specific technical name)	4.1	UN3222	II	FLAMMABLE SOLID		(see technical name below for packaging paragraph reference)
	2-diazo-1-naphthol-4-sulphochloride					53	A8.10
	2-diazo-1-naphthol-5-sulphochloride					53	A8.10
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	SELF-REACTIVE SOLID TYPE C (see below for specific technical name)	4.1	UN3224	II	FLAMMABLE SOLID		(see technical name below for packaging paragraph reference)
	n,n'-dinitroso-n,n'-dimethylterephthalamide, 72% or less as a paste					41,53	A8.7
	n,n'-dinitrosopentamethylene tetramine, 82% or less with phlegmatizer					41,53	A8.8
	SELF-REACTIVE SOLID TYPE D (see below for specific technical name)	4.1	UN3226	II	FLAMMABLE SOLID		(see technical name below for packaging para-

							graph reference)
	1,1'-azodi-(hexahydrobenzonitrile)						A8.8
	benzene-1,3-disulphohydrazide, not more than 52% as a paste						A8.8
	benzene sulphohydrazide						A8.8
	4-(benzyl(ethyl)amino)-3-ethoxybenzenediazonium zinc chloride	NOT ACCEPTED					NOT ACCEPTED
	3-chloro-4-diethylamino-benzenediazonium zinc chloride						A8.9
	diphenyloxide-4,4'-disulphohydrazide						A8.7
	4-dipropylaminobenzenediazonium zinc chloride						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	FLAMMABLE SOLID		A8.9
	SELF-REACTIVE SOLID TYPE F (specific technical name required)	4.1	UN3230	II	FLAMMABLE SOLID		A8.9
	SELF-REACTIVE SOLID TYPE B, TEMPERATURE CONTROLLED (specific technical name required)	NOT ACCEPTED					NOT ACCEPTED
	SELF-REACTIVE SOLID TYPE C, TEMPERATURE CONTROLLED (specific technical name required)	NOT ACCEPTED					NOT ACCEPTED
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	SELF-REACTIVE SOLID TYPE D, TEMPERATURE CONTROLLED (specific technical name required)	NOT ACCEPTED					NOT ACCEPTED
	SELF-REACTIVE SOLID TYPE E, TEMPERATURE CONTROLLED (specific technical name required)	NOT ACCEPTED					NOT ACCEPTED
	SELF-REACTIVE SOLID TYPE F, TEMPERATURE CONTROLLED, (specific technical name required)	NOT ACCEPTED					NOT ACCEPTED
	SHALE OIL	3	UN1288	I	FLAMMABLE		A7.3

					LIQUID		
				II	FLAMMABLE LIQUID		
				III	FLAMMABLE LIQUID		
	Shaped charges, commercial; see CHARGES, SHAPED, COMMERCIAL						
	SIGNAL DEVICES, HAND	1.4G	UN0191	II	EXPLOSIVE		A5.104
	SIGNAL DEVICES, HAND	1.4S	UN0373	II	EXPLOSIVE		A5.104
†	SIGNALS, DISTRESS, ship	1.1G	UN0194	II	EXPLOSIVE		A5.104
❑	SIGNALS, DISTRESS, ship	1.3G	UN0195	II	EXPLOSIVE		A5.104
	Signals, highway, see SIGNAL DEVICES, HAND; or FIREWORKS						
†	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.1G	UN0192	II	EXPLOSIVE		A5.105
❑	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.3G	UN0492	II	EXPLOSIVE		A5.105
	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.4G	UN0493	II	EXPLOSIVE		A5.105
	SIGNALS, RAILWAY TRACK, EXPLOSIVE	1.4S	UN0193	II	EXPLOSIVE		A5.105
	Signals, ship distress, water-activated; see CONTRIVANCES, WATER-ACTIVATED, etc						
	SIGNALS, SMOKE	1.1G	UN0196	II	EXPLOSIVE		A5.104
	SIGNALS, SMOKE	1.2G	UN0313	II	EXPLOSIVE		A5.104
	SIGNALS, SMOKE	1.4G	UN0197	II	EXPLOSIVE		A5.104
❑	SIGNALS, SMOKE	1.3G	UN0487	II	EXPLOSIVE		A5.104
	SILANE	2.1	UN2203		FLAMMABLE GAS		A6.7
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	Silicofluoric acid, see FLUOSILICIC ACID						
	Silicon chloride, see SILICON TETRACHLORIDE						
	SILICON POWDER, AMORPHOUS	4.1	UN1346	III	FLAMMABLE SOLID	A1	A8.4
	SILICON TETRACHLORIDE	8	UN1818	II	CORROSIVE	A3,A6	A12.3
❑	SILICON TETRAFLUORIDE	2.3	UN1859		POISON GAS, CORROSIVE	4	A6.7
	Silver acetylide (dry)	FORBIDDEN					FORBIDDEN
	SILVER ARSENITE	6.1	UN1683	II	POISON		A10.6

	Silver azide (dry)	FORBIDDEN					FORBIDDEN
	Silver chlorite (dry)	FORBIDDEN					FORBIDDEN
	SILVER CYANIDE	6.1	UN1684	II	POISON		A10.6
	Silver fulminate (dry)	FORBIDDEN					FORBIDDEN
	SILVER NITRATE	5.1	UN1493	II	OXIDIZER		A9.8
	Silver oxalate (dry)	FORBIDDEN					FORBIDDEN
	Silver picrate (dry)	FORBIDDEN					FORBIDDEN
	SILVER PICRATE, WETTED, with not less than 30% water, by mass	4.1	UN1347	I	FLAMMABLE SOLID		A8.4
	SLUDGE, ACID	8	UN1906	II	CORROSIVE	A3,A7,N34	A12.3
D	SMOKELESS POWDER FOR SMALL ARMS (100 POUNDS OR LESS)	4.1	NA1325	I	FLAMMABLE SOLID		A8.18
	SODA LIME with more than 4% sodium hydroxide	8	UN1907	III	CORROSIVE		A12.4
❑	SODIUM	4.3	UN1428	II	DANGEROUS WHEN WET	A7,A8,A19, A20,N34	A8.4
	SODIUM ALUMINATE, SOLID	8	UN2812	III	CORROSIVE		A12.4
	SODIUM ALUMINATE, SOLUTION	8	UN1819	II	CORROSIVE		A12.3
				III	CORROSIVE		
	SODIUM ALUMINUM HYDRIDE	4.3	UN2835	II	DANGEROUS WHEN WET	A8,A19, A20	A8.4
	SODIUM AMMONIUM VANADATE	6.1	UN2863	II	POISON		A10.6
	SODIUM ARSANILATE	6.1	UN2473	III	KEEP AWAY FROM FOOD		A10.6
	SODIUM ARSENATE	6.1	UN1685	II	POISON		A10.6

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	SODIUM ARSENITE, AQUEOUS SOLUTIONS	6.1	UN1686	II	POISON		A10.5
				III	KEEP AWAY FROM FOOD		
	SODIUM ARSENITE, SOLID	6.1	UN2027	II	POISON		A10.6
	SODIUM AZIDE	6.1	UN1687	II	POISON		A10.6
	Sodium bifluoride, see SODIUM HYDROGEN FLUORIDE						
	Sodium bisulphate, solid or solution, see						

	SODIUM HYDROGEN SULPHATE, SOLUTION						
	SODIUM BOROHYDRIDE	4.3	UN1426	I	DANGEROUS WHEN WET	N40	A8.4
	SODIUM BROMATE	5.1	UN1494	II	OXIDIZER		A9.8
	SODIUM CACODYLATE	6.1	UN1688	II	POISON		A10.6
	SODIUM CHLORATE	5.1	UN1495	II	OXIDIZER	A9,N34	A9.8
	Sodium chlorate, mixed with dinitrotoluene, see EXPLOSIVE BLASTING, TYPE C						
	SODIUM CHLORATE, AQUEOUS SOLUTION	5.1	UN2428	II	OXIDIZER	A2	A9.7
	SODIUM CHLORITE	5.1	UN1496	II	OXIDIZER	A9,N34	A9.8
	SODIUM CHLORITE SOLUTION with more than 5% available chlorine	8	UN1908	II	CORROSIVE	A3,A6, A7,N34	A12.3
	SODIUM CHLOROACETATE	6.1	UN2659	III	KEEP AWAY FROM FOOD		A10.6
	SODIUM CUPROCYANIDE, SOLID	6.1	UN2316	I	POISON		A10.6
	SODIUM CUPROCYANIDE, SOLUTION	6.1	UN2317	I	POISON		A10.5
	SODIUM CYANIDE	6.1	UN1689	I	POISON	N74,N75	A10.6
	sodium 2-diazo-1-naphthol-4-sulphonate, see SELF-REACTIVE SOLID TYPE D						
	sodium 2-diazo-1-naphthol-5-sulphonate, see SELF-REACTIVE SOLID TYPE D						
	Sodium dichloroisocyanurate or sodium dichloro-s-triazinetrione, see DICHLOROISOCYANURIC ACID, etc						
❑	SODIUM DINITRO-O-CRESOLATE, dry or wetted, with less than 15% water, by mass	1.3C	UN0234	II	EXPLOSIVE		A5.106

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	SODIUM DINITRO-O-CRESOLATE, WETTED, with not less than 15% water, by mass	4.1	UN1348	I	FLAMMABLE SOLID, POISON	A8,A19, A20,N41	A8.4
	SODIUM DITHIONITE or SODIUM HYDROSULPHITE	4.2	UN1384	II	SPONTANE-OUSLY COM-BUSTIBLE	A19,A20	A8.4
	SODIUM FLUORIDE	6.1	UN1690	III	KEEP AWAY		A10.6

					FROM FOOD		
	SODIUM FLUOROACETATE	6.1	UN2629	I	POISON		A10.6
	SODIUM FLUOROSILICATE	6.1	UN2674	III	KEEP AWAY FROM FOOD		A10.6
	Sodium hydrate solution; see SODIUM HYDROXIDE SOLUTION						
	SODIUM HYDRIDE	4.3	UN1427	I	DANGEROUS WHEN WET	A19,N40	A8.4
	SODIUM HYDROGEN FLUORIDE, SOLID	8	UN2439	II	CORROSIVE	N3,N34	A12.4
	SODIUM HYDROGEN FLUORIDE, solution	8	UN2439	II	CORROSIVE	N3,N34	A12.3
	SODIUM HYDROGEN SULFATE, SOLUTION	8	UN2837	II	CORROSIVE	A7,N34	A12.3
				III	CORROSIVE	A7,N34	
D	SODIUM HYDROSULPHIDE, SOLUTION	8	NA2922	II	CORROSIVE, POISON		A12.3
	SODIUM HYDROSULPHIDE, with less than 25% water of crystallization	4.2	UN2318	II	SPONTANE-OUSLY COM-BUSTIBLE	A7,A19, A20	A8.4
	SODIUM HYDROSULPHIDE, with not less than 25% water of crystallization	8	UN2949	II	CORROSIVE	A7	A12.4
	SODIUM HYDROSULPHITE; see SODIUM DITHIONITE						
	SODIUM HYDROXIDE, SOLID	8	UN1823	II	CORROSIVE		A12.4
	SODIUM HYDROXIDE, SOLUTION	8	UN1824	II	CORROSIVE	N34	A12.3
	Sodium hypochlorite, solution; see HYPOCHLORITE SOLUTIONS, etc.						
	Sodium metal, liquid alloy; see ALKALI METAL ALLOYS, LIQUID, N.O.S.						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	SODIUM METHYLATE	4.2	UN1431	II	SPONTANE-OUSLY COM-BUSTIBLE, CORROSIVE	A19	A8.4
	SODIUM METHYLATE SOLUTIONS in alcohol	3	UN1289	II	FLAMMABLE LIQUID		A7.3

				III	FLAMMABLE LIQUID		
	SODIUM MONOXIDE	8	UN1825	II	CORROSIVE		A12.4
	SODIUM NITRATE	5.1	UN1498	III	OXIDIZER	A1,A29	A9.8
	SODIUM NITRATE AND POTASSIUM NITRATE MIXTURES	5.1	UN1499	III	OXIDIZER	A1,A29	A9.8
	SODIUM NITRITE	5.1	UN1500	III	OXIDIZER	A1,A29	A9.8
	SODIUM PENTACHLOROPHENATE	6.1	UN2567	II	POISON		A10.6
	SODIUM PERCARBONATES	5.1	UN2467	III	OXIDIZER	27,A1,A29	A9.8
	SODIUM PERCHLORATE	5.1	UN1502	II	OXIDIZER		A9.8
	SODIUM PERMANGANATE	5.1	UN1503	II	OXIDIZER		A9.8
❑	SODIUM PEROXIDE	5.1	UN1504	I	OXIDIZER	A20,N34	A9.8
	SODIUM PEROXOBORATE, ANHYDROUS	5.1	UN3247	II	OXIDIZER		A9.8
	SODIUM PERSULPHATE	5.1	UN1505	III	OXIDIZER	A1	A9.8
	SODIUM PHENOLATE, SOLID	8	UN2497	III	CORROSIVE		A12.4
❑	SODIUM PHOSPHIDE	4.3	UN1432	I	DANGEROUS WHEN WET, POISON	A19,N40	A8.4
❑	SODIUM PICRAMATE, dry or wetted, with less than 20% water, by mass	1.3C	UN0235	II	EXPLOSIVE		A5.106
	SODIUM PICRAMATE, WETTED, with not less than 20% water, by mass	4.1	UN1349	I	FLAMMABLE SOLID	A8,A19, N41	A8.4
	Sodium picryl peroxide	FORBIDDEN					FORBIDDEN
	Sodium potassium alloys; see POTASSIUM SODIUM ALLOYS						
*❑	SODIUM SALTS OF AROMATIC NITRO DERIVATIVES, N.O.S. explosive	1.3C	UN0203	II	EXPLOSIVE		A5.107
	Sodium selinite; see SELENITES						
	Sodium selenate; see SELENATES						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
D	SODIUM SELENITE	6.1	NA2630	II	POISON		A10.6
	SODIUM SULPHIDE, ANHYDROUS or SODIUM SULPHIDE with less than 30% water of crystallization	4.2	UN1385	II	SPONTANE-OUSLY COM-BUSTIBLE	A19,A20, N34	A8.4
	SODIUM SULPHIDE, HYDRATED with at least	8	UN1849	II	CORROSIVE		A12.4

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	30% water						
	SODIUM SUPEROXIDE	5.1	UN2547	I	OXIDIZER	A20,N34	A9.8
	Sodium tetranitride	FORBIDDEN					FORBIDDEN
❑	SOUNDING DEVICES, EXPLOSIVE	1.2F	UN0204	II	EXPLOSIVE		A5.108
❑	SOUNDING DEVICES, EXPLOSIVE	1.1F	UN0296	II	EXPLOSIVE		A5.108
❑	SOUNDING DEVICES, EXPLOSIVE	1.1D	UN0374	II	EXPLOSIVE		A5.108
❑	SOUNDING DEVICES, EXPLOSIVE	1.2D	UN0375	II	EXPLOSIVE		A5.108
	STANNIC CHLORIDE, ANHYDROUS	8	UN1827	II	CORROSIVE		A12.3
	STANNIC CHLORIDE, PENTAHYDRATE	8	UN2440	III	CORROSIVE		A12.4
	STANNIC PHOSPHIDES	4.3	UN1433	I	DANGEROUS WHEN WET, POISON	A19,N40	A8.4
	steel swarf, see FERROUS METAL, etc						
†	STIBINE	2.3	UN2676		POISON GAS, FLAMMABLE GAS	1	A6.5
	Storage batteries, wet, see BATTERIES, WET, etc						
	STRONTIUM ARSENITE	6.1	UN1691	II	POISON		A10.6
	STRONTIUM CHLORATE, SOLID or SOLUTION	5.1	UN1506	II	OXIDIZER	A1,A9,N34	A9.8
	STRONTIUM NITRATE	5.1	UN1507	III	OXIDIZER	A1,A29	A9.8
	STRONTIUM PERCHLORATE	5.1	UN1508	II	OXIDIZER		A9.8
	STRONTIUM PEROXIDE	5.1	UN1509	II	OXIDIZER		A9.8
	STRONTIUM PHOSPHIDE	4.3	UN2013	I	DANGEROUS WHEN WET, POISON	A19,N40	A8.4
	STRYCHNINE or STRYCHNINE SALTS	6.1	UN1692	I II	POISON POISON		A10.6
	STYPHNIC ACID, see TRINITRORESORCINOL, etc						
	STYRENE MONOMER, INHIBITED	3	UN2055	III	FLAMMABLE LIQUID		A7.3
	SUBSTANCES, EXPLOSIVE, N.O.S.	1.1L	UN0357	II	EXPLOSIVE	101	A5.109
❑	SUBSTANCES, EXPLOSIVE, N.O.S.	1.2L	UN0358	II	EXPLOSIVE	101	A5.109

❑	SUBSTANCES, EXPLOSIVE, N.O.S.	1.3L	UN0359	I	EXPLOSIVE	101	A5.109
	SUBSTANCES, EXPLOSIVE, N.O.S.	1.1A	UN0473	II	EXPLOSIVE	101,111	A5.109
	SUBSTANCES, EXPLOSIVE, N.O.S.	1.1C	UN0474	II	EXPLOSIVE	101	A5.109
	SUBSTANCES, EXPLOSIVE, N.O.S.	1.1D	UN0475	II	EXPLOSIVE	101	A5.109
	SUBSTANCES, EXPLOSIVE, N.O.S.	1.1G	UN0476	II	EXPLOSIVE	101	A5.109
❑	SUBSTANCES, EXPLOSIVE, N.O.S.	1.3C	UN0477	II	EXPLOSIVE	101	A5.109
❑	SUBSTANCES, EXPLOSIVE, N.O.S.	1.3G	UN0478	II	EXPLOSIVE	101	A5.109
	SUBSTANCES, EXPLOSIVE, VERY INSENSITIVE, N.O.S. or SUBSTANCES EVI, N.O.S. substances which in contact with water emit flammable gases, see WATER-REACTIVE, etc.	1.5D	UN0482	II	EXPLOSIVE	101	A5.109
	SUBSTITUTED NITROPHENOL PESTICIDES, LIQUID, FLAMMABLE, TOXIC, N.O.S., flashpoint less than 23 degrees C	3	UN2780	I	FLAMMABLE LIQUID, POISON		A7.3
				II	FLAMMABLE LIQUID, POISON		
*	SUBSTITUTED NITROPHENOL PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S., flashpoint not less than 23 degrees C	6.1	UN3013	I	POISON, FLAMMABLE LIQUID		A10.5
				II	POISON, FLAMMABLE LIQUID		
				III	KEEP AWAY FROM FOOD, FLAMMABLE LIQUID		

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
*	SUBSTITUTED NITROPHENOL PESTICIDES, LIQUID, TOXIC, N.O.S.	6.1	UN3014	I	POISON		A10.5
				II	POISON		
				III	KEEP AWAY		

					FROM FOOD		
*	SUBSTITUTED NITROPHENOL PESTICIDES, SOLID, TOXIC, N.O.S.	6.1	UN2779	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.6
	Sucrose octanitrate (dry)	FORBIDDEN					FORBIDDEN
	SULPHAMIC ACID	8	UN2967	III	CORROSIVE		A12.4
	SULPHUR	4.1	UN1350	III	FLAMMABLE SOLID	A1	A8.4
D	SULPHUR	9	NA1350	III	CLASS 9	A1	A13.4
	Sulphur and chlorate, loose mixtures of	FORBIDDEN					FORBIDDEN
❑	SULPHUR CHLORIDES	8	UN1828	I	CORROSIVE, POISON	5,A3,N34	A12.3
	Sulphur dichloride, see SULPHUR CHLORIDES						
❑	SULPHUR DIOXIDE LIQUEFIED	2.3	UN1079		POISON GAS	3	A6.5
	Sulphur dioxide solution, see SULPHUROUS ACID Sulphuretted hydrogen, see HYDROGEN SULPHIDE, LIQUEFIED						
	SULPHUR HEXAFLUORIDE	2.2	UN1080		NONFLAM-MABLE GAS		A6.3,A6.5
	SULPHURIC ACID	8	UN1830	II	CORROSIVE	A3,A7, N34	A12.3
❑	SULPHURIC ACID, FUMING	8	UN1831	I	CORROSIVE, POISON	2,A3,A6, A7,N34	A12.12
❑	SULPHURIC ACID, SPENT	8	UN1832	II	CORROSIVE	A3,A7,N34	A12.3
	sulphuric and hydrofluoric acid mixtures, see HYDROFLUORIC ACID AND SULPHURIC ACID MIXTURES						
	Sulphuric anhydride, see SULPHUR TRIOXIDE, INHIBITED						

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	SULPHUR, MOLTEN	NOT ACCEPTED					NOT ACCEPTED
D	SULPHUR, MOLTEN	NOT ACCEPTED					NOT ACCEPTED

	SULPHUROUS ACID	8	UN1833	II	CORROSIVE		A12.3
†	SULPHUR TETRAFLUORIDE	2.3	UN2418		POISON GAS	1	A6.7
†	SULPHUR TRIOXIDE, INHIBITED	8	UN1829	I	CORROSIVE, POISON	2,A7,N34	A12.12
D†	SULPHUR TRIOXIDE, UNINHIBITED	6.1	NA1829	I	POISON, CORROSIVE	2,A7,N34	A10.7
†	SULPHURYL CHLORIDE	8	UN1834	I	CORROSIVE	1,A3,N34	A12.12
❑	SULPHURYL FLUORIDE	2.3	UN2191		POISON GAS	4	A6.5
	TARS, LIQUID, including road asphalt and oils, bitumen and cut backs	3	UN1999	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
❑	TEAR GAS CANDLES	6.1	UN1700	II	POISON, FLAMMABLE SOLID		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	POISON		A10.8
	Tear gas devices, containing tear gas substances, see AEROSOLS, etc						
	Tear gas grenades, see TEAR GAS CANDLES						
	TEAR GAS SUBSTANCES LIQUID, N.O.S.	6.1	UN1693	I	POISON		A10.5
				II	POISON		
❑	TEAR GAS SUBSTANCES, SOLID, N.O.S.	6.1	UN1693	I	POISON	A10.6	
				II	POISON		
†	TELLURIUM HEXAFLUORIDE	2.3	UN2195		POISON GAS	1	A6.7
*	TERPENE HYDROCARBONS, N.O.S.	3	UN2319	III	FLAMMABLE LIQUID		A7.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	TERPINOLENE	3	UN2541	III	FLAMMABLE		A7.3

					LIQUID		
	Tetraazido benzene quinone	FORBIDDEN					FORBIDDEN
	TETRABROMOETHANE	6.1	UN2504	III	KEEP AWAY FROM FOOD		A10.5
	TETRACHLOROETHANE	6.1	UN1702	II	POISON	N36	A10.5
	TETRACHLOROETHYLENE	6.1	UN1897	III	KEEP AWAY FROM FOOD	N36	A10.5
	Tetraethylammonium perchlorate (dry)	FORBIDDEN					FORBIDDEN
†	TETRAETHYL DITHIOPYROPHOSPHATE	6.1	UN1704	II	POISON		A10.6
†	TETRAETHYL DITHIOPYROPHOSPHATE AND GASES IN SOLUTION, or TETRAETHYL DITHIOPYROPHOSPHATE AND GASES, MIXTURES (LC50 less than or equal to 200 ppm)	2.3	UN1703		POISON GAS	1	A6.19
†	TETRAETHYL DITHIOPYROPHOSPHATE AND GASES IN SOLUTION, or TETRAETHYL DITHIOPYROPHOSPHATE AND GAS MIXTURE (LC50 over 200, but not greater than 5000 ppm)	2.3	UN1703		POISON GAS	6	A6.19
	TETRAETYLENEPENTAMINE	8	UN2320	III	CORROSIVE		A12.3
D†	TETRAETHYL LEAD,LIQUID	6.1	NA1649	I	POISON, FLAMMABLE LIQUID		A10.5
†	TETRAETHYL PYROPHOSPHATE AND COM-PRESSED GAS MIXTURES (LC50 less than or equal to 200 ppm)	2.3	UN1705		POISON GAS	1	A6.19
†	TETRAETHYL PYROPHOSPATE AND COMPRESSED GAS MIXTURES (LC50 over 200 ppm, but not greater than 5000 ppm)	2.3	UN1705		POISON GAS	6	A6.19
D❑	TETRAETHYL PYROPHOSPHATE (liquid)	6.1	NA3018	I	POISON		A10.5
D❑	TETRAETHYL PYROPHOSPHATE (solid)	6.1	NA2783	I	POISON	N77	A10.6
	TETRAETHYL SILICATE	3	UN1292	III	FLAMMABLE LIQUID		A7.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)

	1,1,1,2-TETRAFLUOROETHANE (R134a)	2.2	UN3159		NONFLAM-MABLE GAS		A6.7
❑	TETRAFLUOROETHYLENE, INHIBITED	2.1	UN1081		FLAMMABLE GAS		A6.5
	TETRAFLUOROMETHANE (R14)	2.2	UN1982		NONFLAM-MABLE GAS		A6.7
	1,2,3,6-TETRAHYDROBENZALDEHYDE	3	UN2498	III	FLAMMABLE LIQUID		A7.3
	TETRAHYDROFURAN	3	UN2056	II	FLAMMABLE LIQUID		A7.3
	TETRAHYDROFURFURYLAMINE	3	UN2943	III	FLAMMABLE LIQUID		A7.3
	TETRAHYDROPHTHALIC ANHYDRIDES with more than 0.05% of maleic anhydride	8	UN2698	III	CORROSIVE		A12.4
	1,2,3,6-TETRAHYDROPYRIDINE	3	UN2410	II	FLAMMABLE LIQUID		A7.3
	TETRAHYDROTHIOPHENE	3	UN2412	II	FLAMMABLE LIQUID		A7.3
	TETRAMETHYLAMMONIUM HYDROXIDE	8	UN1835	II	CORROSIVE		A12.3
	Tetramethylene diperoxide dicarbamide	FORBIDDEN					FORBIDDEN
	TETRAMETHYLSILANE	3	UN2749	I	FLAMMABLE LIQUID		A7.3
†	TETRANITROANILINE	1.1D	UN0207	II	EXPLOSIVE		A5.110
	Tetranitro diglycerin	FORBIDDEN					FORBIDDEN
	TETRANITROMETHANE	NOT ACCEPTED					NOT ACCEPTED
	2,3,4,6-Tetranitrophenol	FORBIDDEN					FORBIDDEN
	2,3,4,6-Tetranitrophenyl methyl nitramine	FORBIDDEN					FORBIDDEN
	2,3,4,6-Tetranitrophenylnitramine	FORBIDDEN					FORBIDDEN
	Tetranitroresorcinol (dry)	FORBIDDEN					FORBIDDEN
	2,3,5,6-Tetranitroso-1,4-dinitrobenzene	FORBIDDEN					FORBIDDEN
	2,3,5,6-Tetranitroso nitrobenzene (dry)	FORBIDDEN					FORBIDDEN
	TETRAPROPYL ORTHOTITANATE	3	UN2413	III	FLAMMABLE LIQUID		A7.3

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)

SYM-BOL	PROPER SHIPPING NAME/DESCRIPTION	HAZARD CLASS/DIV	UN/ID NUMBER	PG	LABELS	SPECIAL PROVISION	PACKAGING PARAGRAPH
	TETRAZENE, see GUANYL NITROSAMINOGUANYLTETRAZENE, wetted, etc.						
	Tetrazine	FORBIDDEN					FORBIDDEN
	Tetrazolyl azide (dry)	FORBIDDEN					FORBIDDEN
	TETRAZOL-1-ACETIC ACID	1.4C	UN0407	II	EXPLOSIVE		A5.111
	TETRYL, see TRINITROPHENYLMETHYLNITRAMINE						
	THALLIUM CHLORATE	5.1	UN2573	II	OXIDIZER, POISON		A9.8
*	THALLIUM COMPOUNDS, N.O.S.	6.1	UN1707	II III	POISON KEEP AWAY FROM FOOD		A10.6
	THALLIUM NITRATE	6.1	UN2727	II	POISON, OXIDIZER		A10.6
D	THALLIUM SULPHATE, SOLID	6.1	NA1707	II	POISON		A10.6
	THIA-4-PENTANAL	6.1	UN2785	III	KEEP AWAY FROM FOOD		A10.6
	THIOACETIC ACID	3	UN2436	II	FLAMMABLE LIQUID		A7.3
	Thiocarbonylchloride, see THIOPHOSGENE						
	THIOGLYCOL	6.1	UN2966	II	POISON		A10.5
	THIOGLYCOLIC ACID	8	UN1940	II	CORROSIVE	A7,N34	A12.3
	THIOLACTIC ACID	6.1	UN2936	II	POISON		A10.6
❑	THIONYL CHLORIDE	8	UN1836	I	CORROSIVE, POISON	2,A3, A10,N34	A12.12
	THIOPHENE	3	UN2414	II	FLAMMABLE LIQUID		A7.3
❑	THIOPHOSGENE	6.1	UN2474	II	POISON	2,A7, N33,N34	A10.7
❑	THIOPHOSPHORYL CHLORIDE	8	UN1837	II	CORROSIVE	A3,A7,N34	A12.3

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
†	THORIUM METAL, PYROPHORIC	7	UN2975		RADIO-ACTIVE SPONTANE-OUSLY COM-BUSTIBLE		A11.9
❑	THORIUM NITRATE, SOLID	7	UN2976		RADIO-ACTIVE, OXIDIZER		A11.10
	Tin chloride, fuming, see STANNIC CHLORIDE, ANHYDROUS						
	TINCTURES, MEDICINAL	3	UN1293	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
	Tinning flux, see ZINC CHLORIDE, ANHYDOUS						
	Tin perchloride or Tin tetrachloride, see STANNIC CHLORIDE, ANHYDROUS						
	TITANIUM DISULPHIDE	4.2	UN3174	III	SPONTANE-OUSLY COM-BUSTIBLE		A8.4
	TITANIUM HYDRIDE	4.1	UN1871	II	FLAMMABLE SOLID	A19,A20, N34	A8.4
	TITANIUM POWDER, DRY	4.2	UN2546	I	SPONTANE-OUSLY COM-BUSTIBLE	A19,A20, N5,N34	A8.4
				II	SPONTANE-OUSLY COM-BUSTIBLE	A19,A20, N5,N34	
				III	SPONTANE-OUSLY COM-BUSTIBLE		

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	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	FLAMMABLE SOLID	A19,A20, N34	A8.4
	TITANIUM SPONGE GRANULES or TITANIUM SPONGE POWDERS	4.1	UN2878	III	FLAMMABLE SOLID	A1	A8.4
D	TITANIUM SULPHATE SOLUTION	8	NA1760	II	CORROSIVE		A12.4
❑	TITANIUM TETRACHLORIDE	8	UN1838	II	CORROSIVE, POISON	2,A3, A6,N41	A12.12
	TITANIUM TRICHLORIDE MIXTURES	8	UN2869	II III	CORROSIVE CORROSIVE	A7,N34	A12.4
	TITANIUM TRICHLORIDE, PYROPHORIC, or TITANIUM TRICHLORIDE MIXTURES, PYROPHORIC	4.2	UN2441	I	SPONTANE-OUSLY COM-BUSTIBLE, CORROSIVE	A7,A8, A19,A20, N34	A8.6
	(TNT mixed with aluminium), see TRITONAL						
	tnt, see TRINITROTOLUENE, etc						
	TOLUENE	3	UN1294	II	FLAMMABLE LIQUID		A7.3
	TOLUENE DIISOCYANATE	6.1	UN2078	II	POISON		A10.5
	TOLUENE SULPHONIC ACID, LIQUID with less than 5% free sulphuric acid	8	UN2586	III	CORROSIVE		A12.3
	TOLUENE SULPHONIC ACID, LIQUID with more than 5% free sulphuric acid	8	UN2584	II	CORROSIVE		A12.3
	TOLUENE SULPHONIC ACID, SOLID with less than 5% free sulphonic acid	8	UN2585	III	CORROSIVE		A12.4
	TOLUENE SULPHONIC ACID, SOLID, with more than 5% free sulphonic acid	8	UN2583	II	CORROSIVE		A12.4
	TOLUIDINES, LIQUID	6.1	UN1708	II	POISON		A10.5
	TOLUIDINES, SOLID	6.1	UN1708	II	POISON		A10.6
	2,4-TOLUYLENEDIAMINE	6.1	UN1709	III	KEEP AWAY FROM FOOD		A10.6

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
❑	TORPEDOES, LIQUID FUELED, with inert head	1.3J	UN0450	II	EXPLOSIVE		A5.112
†	TORPEDOES, LIQUID FUELED, with or without bursting charge	1.1J	UN0449	II	EXPLOSIVE		A5.112
†	TORPEDOES, with bursting charge	1.1E	UN0329	II	EXPLOSIVE		A5.112
†	TORPEDOES, with bursting charge	1.1F	UN0330	II	EXPLOSIVE		A5.112
+	TORPEDOES, with bursting charge	1.1D	UN0451	II	EXPLOSIVE		A5.112
❑	TRACERS FOR AMMUNITION	1.3G	UN0212	II	EXPLOSIVE		A5.113
	TRACERS FOR AMMUNITION	1.4G	UN0306	II	EXPLOSIVE		A5.113
	Tractors, see ENGINES, INTERNAL COMBUSTION						
	TRIALLYLAMINE	3	UN2610	III	FLAMMABLE LIQUID		A7.3
	TRIALLYL BORATE	6.1	UN2609	III	KEEP AWAY FROM FOOD		A10.5
*	TRIAZINE PESTICIDES, LIQUID, FLAMMABLE, TOXIC, N.O.S., flashpoint less than 23 degrees C	3	UN2764	I	FLAMMABLE LIQUID, POISON		A7.3
				II	FLAMMABLE LIQUID, POISON		
*	TRIAZINE PESTICIDES, LIQUID, TOXIC, FLAMMABLE, N.O.S., flashpoint not less than 23 degrees C	6.1	UN2997	I	POISON, FLAMMABLE LIQUID		A10.5
				II	POISON, FLAMMABLE LIQUID		
				III	KEEP AWAY FROM FOOD, FLAMMABLE LIQUID		
*	TRIAZINE PESTICIDES, LIQUID, TOXIC, N.O.S.	6.1	UN2998	I	POISON		A10.5
				II	POISON		
				III	KEEP AWAY FROM FOOD		

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
*	TRIAZINE PESTICIDES, SOLID, TOXIC, N.O.S.	6.1	UN2763	I II III	POISON POISON KEEP AWAY FROM FOOD		A10.6
	TRI-(1-AZIRIDINYL) PHOSPHINE OXIDE SOLUTION	6.1	UN2501	II III	POISON KEEP AWAY FROM FOOD		A10.5
	TRIBUTYLAMINE	8	UN2542	III	CORROSIVE		A12.3
	TRICHLOROACETIC ACID	8	UN1839	II	CORROSIVE	A7,N34	A12.4
	TRICHLOROACETIC ACID, SOLUTION	8	UN2564	II	CORROSIVE	A3,A6, A7,N34	A12.3
†	TRICHLOROACETYL CHLORIDE	8	UN2442	II	CORROSIVE, POISON	1,A3, A7,N34	A12.12
	TRICHLOROBENZENES, LIQUID	6.1	UN2321	III	KEEP AWAY FROM FOOD		A10.5
	TRICHLOROBUTENE	6.1	UN2322	II	POISON		A10.5
	1,1,1-TRICHLOROETHANE	6.1	UN2831	III	KEEP AWAY FROM FOOD	N36	A10.5
	TRICHLOROETHYLENE	6.1	UN1710	III	KEEP AWAY FROM FOOD	N36	A10.5
	TRICHLOROISOCYANURIC ACID, DRY	5.1	UN2468	II	OXIDIZER		A9.8
	Trichloromethyl perchlorate	FORBIDDEN					FORBIDDEN
†	TRICHLOROSILANE	4.3	UN1295	I	DANGEROUS WHEN WET, FLAMMABLE LIQUID, CORROSIVE	A7,N34	A8.3
D	(MONO-(TRICHLORO) TETRA-(MONOPOTASSIUM DICHLORO)-PENTA-S-TRIAZINETRIONE, DRY (containing over 39% available chlorine)	5.1	NA2468	II	OXIDIZER		A9.8

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	Trichloro-s-triazinetrione dry, containing over 39% available chlorine, see TRICHLOROISOCYANURIC ACID, DRY						
	TRICRESYL PHOSPHATE with more than 3% ortho isomer	6.1	UN2574	II	POISON	A3,N33, N34	A10.5
	TRIETHYLAMINE	3	UN1296	II	FLAMMABLE LIQUID		A7.3
	TRIETHYLENETETRAMINE	8	UN2259	II	CORROSIVE		A12.3
	TRIETHYL PHOSPHITE	3	UN2323	III	FLAMMABLE LIQUID		A7.3
	TRIFLUOROACETIC ACID	8	UN2699	I	CORROSIVE	A3,A6,A7, N3,N34	A12.3
❑	TRIFLUOROACETYL CHLORIDE	2.2	UN3057		NONFLAM-MABLE GAS, CORROSIVE		A6.5
❑	TRIFLUOROCHLOROETHYLENE, INHIBITED (R1113)	2.1	UN1082		FLAMMABLE GAS		A6.3,A6.5
❑	TRIFLUOROETHANE, COMPRESSED (R143)	2.1	UN2035		FLAMMABLE GAS		A6.3,A6.5
	TRIFLUOROMETHANE (R23)	2.2	UN1984		NONFLAM-MABLE GAS		A6.3,A6.5
D	TRIFLUOROMETHANE AND CHLOROTRIFLUORO-METHANE MIXTURE (constant boiling mixture) (R-503), see REFRIGERANT GAS, N.O.S.						
	TRIFLUOROMETHANE, REFRIGERATED LIQUID (cryogenic liquids)	2.2	UN3136		NONFLAM-MABLE GAS		A6.12
	3-TRIFLUOROMETHYLANILINE	6.1	UN2948	II	POISON		A10.5
	2-TRIFLUOROMETHYLANILINE	6.1	UN2942	III	KEEP AWAY FROM FOOD		A10.5
	Triformoxime trinitrate	FORBIDDEN					FORBIDDEN

	TRIISOBUTYLENE	3	UN2324	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
SYM-BOL (1)	**PROPER SHIPPING NAME/DESCRIPTION (2)**	**HAZARD CLASS/DIV (3)**	**UN/ID NUMBER (4)**	**PG (5)**	**LABELS (6)**	**SPECIAL PROVISION (7)**	**PACKAGING PARAGRAPH (8)**
	TRIISOCYANATOISOCYANURATE OF, ISOPHORONEDIISOCYANTE SOLUTION, 70%, by mass	3	UN2906	III	FLAMMABLE LIQUID		A7.3
	TRIISOPROPYL BORATE	3	UN2616	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
D†	TRIMETHOXYSILANE	6.1	NA9269	I	POISON, FLAMMABLE LIQUID	2	A10.7
❑	TRIMETHYLACETYL CHLORIDE	8	UN2438	II	CORROSIVE, FLAMMABLE LIQUID, POISON	2,A3, A6,A7, N34	A12.12
❑	TRIMETHYLAMINE, ANHYDROUS	2.1	UN1083		FLAMMABLE GAS		A6.3,A6.5
	TRIMETHYLAMINE, AQUEOUS SOLUTIONS not more than 50% trimethylamine, by mass	3	UN1297	I	FLAMMABLE LIQUID		A7.3
				II	FLAMMABLE LIQUID		
				III	FLAMMABLE LIQUID		
	1,3,5-TRIMETHYLBENZENE	3	UN2325	III	FLAMMABLE LIQUID		A7.3
	TRIMETHYL BORATE	3	UN2416	II	FLAMMABLE LIQUID		A7.3
	TRIMETHYLCHLOROSILANE	3	UN1298	I	FLAMMABLE LIQUID, CORROSIVE	A3,A7, N34	A7.3
	TRIMETHYLCYCLOHEXYLAMINE	8	UN2326	III	CORROSIVE		A12.3

	Trimethylene glycol diperchlorate	FORBIDDEN					FORBIDDEN
	TRIMETHYLHEXAMETHYLENEDIAMINES	8	UN2327	III	CORROSIVE		A12.3
	TRIMETHYLHEXAMETHYLENE DIISOCYANATE	6.1	UN2328	III	KEEP AWAY FROM FOOD		A10.5

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	Trimethylol nitromethane trinitrate	FORBIDDEN					FORBIDDEN
	TRIMETHYL PHOSPHITE	3	UN2329	III	FLAMMABLE LIQUID		A7.3
	1,3,5-Trimethyl-2,4,6-trinitrobenzene	FORBIDDEN					FORBIDDEN
	Trinitroacetic acid	FORBIDDEN					FORBIDDEN
	Trinitroacetonitrile	FORBIDDEN					FORBIDDEN
	Trinitroamine cobalt	FORBIDDEN					FORBIDDEN
†	TRINITROANILINE or PICRAMIDE	1.1D	UN0153	II	EXPLOSIVE		A5.110
†	TRINITROANISOLE	1.1D	UN0213	II	EXPLOSIVE		A5.110
†	TRINITROBENZENE, dry or wetted, with less than 30% water, by mass	1.1D	UN0214	II	EXPLOSIVE		A5.110
†	TRINITROBENZENESULPHONIC ACID	1.1D	UN0386	II	EXPLOSIVE		A5.110
	TRINITROBENZENE, WETTED with not less than 30% water, by mass	4.1	UN1354	I	FLAMMABLE SOLID	A2,A8, A19,N41	A8.4
†	TRINITROBENZOIC ACID, dry or wetted with less than 30% water, by mass	1.1D	UN0215	II	EXPLOSIVE		A5.114
	TRINITROBENZOIC ACID, WETTED with not less than 30% water, by mass	4.1	UN1355	I	FLAMMABLE SOLID	A2,A8, A19,N41	A8.4
†	TRINITROCHLOROBENZENE or PICRYL CHLORIDE	1.1D	UN0155	II	EXPLOSIVE		A5.110
†	TRINITRO-M-CRESOL	1.1D	UN0216	II	EXPLOSIVE		A5.110
	2,4,6-Trinitro-1,3-diazobenzene	FORBIDDEN					FORBIDDEN
	Trinitroethanol	FORBIDDEN					FORBIDDEN
	Trinitroethylnitrate	FORBIDDEN					FORBIDDEN
†	TRINITROFLUORENONE	1.1D	UN0387	II	EXPLOSIVE		A5.110
	Trinitromethane	FORBIDDEN					FORBIDDEN
	1,3,5-Trinitronaphthalene	FORBIDDEN					FORBIDDEN
†	TRINITRONAPHTHALENE	1.1D	UN0217	II	EXPLOSIVE		A5.110
†	TRINITROPHENETOLE	1.1D	UN0218	II	EXPLOSIVE		A5.110

†	TRINITROPHENOL or PICRIC ACID, dry or wetted with less than 30% water, by mass	1.1D	UN0154	II	EXPLOSIVE		A5.110
	TRINITROPHENOL, WETTED with not less than 30% water, by mass	4.1	UN1344	I	FLAMMABLE SOLID	A8,A19, N41	A8.4

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	2,4,6-Trinitrophenyl guanidine (dry)	FORBIDDEN					FORBIDDEN
	TRINITROPHENYLMETHYL-NITRAMINE or TETRYL	1.1D	UN0208	II	EXPLOSIVE		A5.114
	2,4,6-Trinitrophenyl nitramine	FORBIDDEN					FORBIDDEN
	2,4,6-Trinitrophenyl trimethylol methyl nitramine trinitrate (dry)	FORBIDDEN					FORBIDDEN
†	TRINITRORESORCINOL or STYPHNIC ACID, dry or wetted with less than 20% water, or mixture of alcohol and water, by mass	1.1D	UN0219	II	EXPLOSIVE		A5.115
†	TRINITRORESORCINOL or STYPHNIC ACID, WETTED with not less than 20% water, or mixture of alcohol and water, by mass	1.1D	UN0394	II	EXPLOSIVE		A5.115
	2,4,6-Trinitroso-3-methyl nitraminoanisole	FORBIDDEN					FORBIDDEN
	Trinitrotetramine cobalt nitrate	FORBIDDEN					FORBIDDEN
†	TRINITROTOLUENE or TNT AND TRINITRO-BENZENE MIXTURES or TRINITROTOLUENE or TNT AND HEXANITROSTILBENE MIXTURES	1.1D	UN0388	II	EXPLOSIVE		A5.116
†	TRINITROTOLUENE or TNT, dry or wetted with less than 30% water, by mass	1.1D	UN0209	II	EXPLOSIVE		A5.116
†	TRINITROTOLUENE or TNT MIXTURES, CON-TAINING TRINITROBENZENE AND HEXANITROSTILBENE	1.1D	UN0389	II	EXPLOSIVE		A5.116
	TRINITROTOLUENE or TNT, WETTED, with not less than 30% water, by mass	4.1	UN1356	I	FLAMMABLE SOLID	A2,A8, A19,N41	A8.4
	2,4,6-Trinitro-1,3,6-triazido benzene (dry)	FORBIDDEN					FORBIDDEN
	Tri-(b-nitroxyethyl) ammonium nitrate	FORBIDDEN					FORBIDDEN
	TRIPROPYLAMINE	3	UN2260	III	FLAMMABLE		A7.3

					LIQUID, CORROSIVE		
	TRIPROPYLENE	3	UN2057	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	Tris, bis-bifluoroamino diethoxy propane (TVOPA)	FORBIDDEN					FORBIDDEN
†	TRITONAL	1.1D	UN0390	II	EXPLOSIVE		A5.110
	TUNGSTEN HEXAFLUORIDE	NOT ACCEPTED					NOT ACCEPTED
	TURPENTINE	3	UN1299	III	FLAMMABLE LIQUID		A7.3
	TURPENTINE SUBSTITUTE	3	UN1300	I	FLAMMABLE LIQUID		A7.3
				II	FLAMMABLE LIQUID		
				III	FLAMMABLE LIQUID		
	UNDECANE	3	UN2330	III	FLAMMABLE LIQUID		A7.3
	URANIUM HEXAFLUORIDE, FISSILE (containing more than 1% U-235)	7	UN2977		RADIO-ACTIVE CORROSIVE		A11.8,A3.1.12.3
	URANIUM HEXAFLUORIDE, fissile excepted or nonfissile	7	UN2978		RADIOACTIVE, CORROSIVE		A11.11,A11.17
	URANIUM METAL, PYROPHORIC	7	UN2979		RADIO-ACTIVE, SPONTANE-OUSLY COM-BUSTIBLE		A11.9
	URANYL NITRATE HEXAHYDRATE SOLUTION	7	UN2980		RADIO-ACTIVE, CORROSIVE		A11.6,A11.7,A11.8, A11.11,A11.17

	URANYL NITRATE, SOLID	7	UN2981		RADIO-ACTIVE, OXIDIZER		A11.10
	UREA HYDROGEN PEROXIDE	5.1	UN1511	III	OXIDIZER, CORROSIVE	A1,A7, A29	A9.8

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
†	UREA NITRATE, dry or wetted with less than 20% water, by mass	1.1D	UN0220	II	EXPLOSIVE		A5.117
	UREA NITRATE, WETTED with not less than 20% water, by mass	4.1	UN1357	I	FLAMMABLE SOLID	A8,A19, N41	A8.4
	Urea peroxide, see UREA HYDROGEN PEROXIDE						
	VALERALDEHYDE	3	UN2058	II	FLAMMABLE LIQUID		A7.3
	Valeric acid, see CORROSIVE LIQUID, N.O.S.						
	VALERYL CHLORIDE	8	UN2502	II	CORROSIVE	A3,A6,A7, N34	A12.3
	VANADIUM OXYTRICHLORIDE	8	UN2443	II	CORROSIVE	A3,A6,A7, N34	A12.3
	VANADIUM PENTOXIDE, nonfused form	6.1	UN2862	II	POISON		A10.6
	VANADIUM TETRACHLORIDE	8	UN2444	I	CORROSIVE	A3,A6,A7, N34	A12.3
	VANADIUM TRICHLORIDE	8	UN2475	III	CORROSIVE		A12.4
	VANADIUM TRIOXIDE, nonfused form	6.1	UN2860	II	POISON		A10.6
	VANADYL SULPHATE	6.1	UN2931	II	POISON		A10.6
	vehicles, self-propelled see ENGINES, INTERNAL COMBUSTION or BATTERY POWERED EQUIPMENT, etc or BATTERY POWERED VEHICLE, etc or WHEELCHAIR, ELECTRIC						
	Very signal cartridge, see CARTRIDGES, SIGNAL						
	VINYL ACETATE, INHIBITED	3	UN1301	II	FLAMMABLE LIQUID		A7.3

	VINYL BROMIDE, INHIBITED	2.1	UN1085		FLAMMABLE GAS		A6.3,A6.5
	VINYL BUTYRATE, INHIBITED	3	UN2838	II	FLAMMABLE LIQUID		A7.3
❑	VINYL CHLORIDE, INHIBITED	2.1	UN1086		FLAMMABLE GAS		A6.3,A6.5

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	VINYL CHLOROACETATE	6.1	UN2589	II	POISON, FLAMMABLE LIQUID		A10.5
	VINYL ETHYL ETHER, INHIBITED	3	UN1302	II	FLAMMABLE LIQUID	A3	A7.3
❑	VINYL FLUORIDE, INHIBITED	2.1	UN1860		FLAMMABLE GAS		A6.3,A6.5
†	VINYLIDENE CHLORIDE, INHIBITED	3	UN1303	I	FLAMMABLE LIQUID		A7.3
	VINYL ISOBUTYL ETHER, INHIBITED	3	UN1304	II	FLAMMABLE LIQUID		A7.3
†	VINYL METHYL ETHER, INHIBITED	2.1	UN1087		FLAMMABLE GAS		A6.3,A6.5
	Vinyl nitrate polymer	FORBIDDEN					FORBIDDEN
	VINYLPYRIDINES, INHIBITED	6.1	UN3073	II	POISON, FLAMMABLE LIQUID		A10.6
	VINYLTOLUENE, INHIBITED mixed isomers	3	UN2618	III	FLAMMABLE LIQUID		A7.3
❑	VINYLTRICHLOROSILANE	3	UN1305	I	FLAMMABLE LIQUID, CORROSIVE	A3,A7, N34	A7.3
	WARHEADS,ROCKET with burster or expelling charge	1.4D	UN0370	II	EXPLOSIVE		A5.118
	WARHEADS, ROCKET with burster or	1.4F	UN0371	II	EXPLOSIVE		A5.118

	expelling charge						
†	WARHEADS, ROCKET with bursting charge	1.1D	UN0286	II	EXPLOSIVE		A5.118
❑	WARHEADS, ROCKET with bursting charge	1.2D	UN0287	II	EXPLOSIVE		A5.118
	WARHEADS, ROCKET with bursting charge	1.1F	UN0369	II	EXPLOSIVE		A5.118
†	WARHEADS, TORPEDO with bursting charge	1.1D	UN0221	II	EXPLOSIVE		A5.118

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	WATER-REACTIVE LIQUID, N.O.S.	4.3	UN3148	I	DANGEROUS WHEN WET		A8.3
				II	DANGEROUS WHEN WET		
				III	DANGEROUS WHEN WET		
	WATER-REACTIVE LIQUID, CORROSIVE, N.O.S.	4.3	UN3129	I	DANGEROUS WHEN WET, CORROSIVE		A8.3
				II	DANGEROUS WHEN WET, CORROSIVE		
				III	DANGEROUS WHEN WET, CORROSIVE		
	WATER-REACTIVE LIQUID, POISONOUS, N.O.S.	4.3	UN3130	I	DANGEROUS WHEN WET, POISON	A4	A8.3
				II	DANGEROUS WHEN WET, POISON		
				III	DANGEROUS WHEN WET, POISON		

	WATER-REACTIVE SOLID, N.O.S.	4.3	UN2813	I II III	DANGEROUS WHEN WET, DANGEROUS WHEN WET DANGEROUS WHEN WET	N40	A8.4

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	WATER-REACTIVE SOLID, CORROSIVE, N.O.S.	4.3	UN3131	I II III	DANGEROUS WHEN WET, CORROSIVE DANGEROUS WHEN WET, CORROSIVE DAGNEROUS WHEN WET, CORROSIVE	N40	A8.4
	WATER-REACTIVE SOLID, FLAMMABLE, N.O.S.	4.3	UN3132	I II III	DANGEROUS WHEN WET, FLAMMABLE SOLID DANGEROUS WHEN WET, FLAMMABLE SOLID DANGEROUS WHEN WET, FLAMMABLE SOLID	N40	A8.4
	WATER-REACTIVE SOLID, OXIDIZING, N.O.S.	4.3	UN3133		DANGEROUS WHEN WET,		A8.6

	WATER-REACTIVE SOLID, POISONOUS, N.O.S.	4.3	UN3134	I	OXIDIZER DANGEROUS WHEN WET, POISON	A5,N40	A8.4
				II	DANGEROUS WHEN WET, POISON		
				III	DANGEROUS WHEN WET, KEEP AWAY FROM FOOD		

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	WATER-REACTIVE SOLID, SELF-HEATING, N.O.S.	4.3	UN3135	I	DANGEROUS WHEN WET, SPONTANE-OUSLY COM-BUSTIBLE	N40	A8.4
				II	DANGEROUS WHEN WET, SPONTANE-OUSLY COM-BUSTIBLE		
				III	DANGEROUS WHEN WET, SPONTANE-OUSLY COM-BUSTIBLE		
	WHEELCHAIR, ELECTRIC (spillable or non-spillable type batteries)	9	UN3171	III	CLASS 9		A13.6
	White spirit, see TURPENTINE SUBSTITUTE						
	WHITE ASBESTOS (Chrysotile, actinolite, antho-phyllite, tremolite)	9	UN2590	III	CLASS 9		A13.12
	WOOD PRESERVATIVES, LIQUID	3	UN1306	II	FLAMMABLE LIQUID		A7.3

				III	FLAMMABLE LIQUID		
	XENON	2.2	UN2036		NONFLAM-MABLE GAS		A6.3,A6.7
	XENON, REFRIGERATED LIQUID (cryogenic liquid)	2.2	UN2591		NONFLAM-MABLE GAS		A6.12
	XYLENES	3	UN1307	II	FLAMMABLE LIQUID		A7.3
				III	FLAMMABLE LIQUID		
	XYLENOLS	6.1	UN2261	II	POISON		A10.6
	XYLIDINES, solid or solution	6.1	UN1711	II	POISON		A10.5

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
❑	XYLYL BROMIDE	6.1	UN1701	II	POISON	A3,A6,A7, N33	A10.8
	p-Xylyl diazide	FORBIDDEN					FORBIDDEN
	ZINC AMMONIUM NITRITE	5.1	UN1512	II	OXIDIZER		A9.8
	ZINC ARSENATE or ZINC ARESINITE or ZINC ARSENATE AND ZINC ARSENITE MIXTURES	6.1	UN1712	II	POISON		A10.6
	ZINC ASHES	4.3	UN1435	III	DANGEROUS WHEN WET	A1,A19	A8.4
	Zinc bisulphite solution, see BISULFITES, INORGANIC AQUEOUS SOLUTIONS, N.O.S.						
	ZINC BROMATE	5.1	UN2469	III	OXIDIZER	A1,A29	A9.8
	ZINC CHLORATE	5.1	UN1513	II	OXIDIZER	A9,N34	A9.8
	ZINC CHLORIDE, ANHYDROUS	8	UN2331	III	CORROSIVE		A12.4
	ZINC CHLORIDE, SOLUTION	8	UN1840	III	CORROSIVE		A12.3
	ZINC CYANIDE	6.1	UN1713	I	POISON		A10.6
	ZINC DITHIONITE or ZINC HYDROSULFITE	9	UN1931	III	CLASS 9		A13.3
	Zinc ethyl, see DIETHYLZINC						
	ZINC FLUOROSILICATE	6.1	UN2855	III	KEEP AWAY FROM FOOD		A10.6
	ZINC HYDROSULPHITE, see ZINC DITHIONITE						

	Zinc muriate solution, see ZINC CHLORIDE, SOLUTION						
	ZINC NITRATE	5.1	UN1514	II	OXIDIZER		A9.8
	ZINC PERMANGANATE	5.1	UN1515	II	OXIDIZER		A9.8
	ZINC PEROXIDE	5.1	UN1516	II	OXIDIZER		A9.8
	ZINC PHOSPHIDE	4.3	UN1714	I	DANGEROUS WHEN WET, POISON	A19,N40	A8.4

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
	ZINC POWDER or ZINC DUST	4.3	UN1436	I	DANGEROUS WHEN WET, SPONTANE-OUSLY COM-BUSTIBLE	A19,N40	A8.4
				II	DANGEROUS WHEN WET, SPONTANE-OUSLY COM-BUSTIBLE	A19	
				III	DANGEROUS WHEN WET, SPONTANE-OUSLY COM-BUSTIBLE		
	ZINC RESINATE	4.1	UN2714	III	FLAMMABLE SOLID	A1	A8.4
	ZINC SELENATE, see SELENATES						
	ZINC SELENITE, see SELENITES						
	Zinc silicofluoride, see						

	ZINC FLUOROSILICATE						
	ZIRCONIUM, DRY, coiled wire, finished metal sheets, strip (thinner than 254 microns but not thinner than 18 microns)	4.1	UN2858	III	FLAMMABLE SOLID	A1	A8.4
	ZIRCONIUM, DRY, finished sheets, strip, or coiled wire (thinner than 18 microns)	4.2	UN2009	III	SPONTANE-OUSLY COM-BUSTIBLE	A1,A19	A8.4
	ZIRCONIUM HYDRIDE	4.1	UN1437	II	FLAMMABLE SOLID	A19,A20, N34	A8.4
	ZIRCONIUM NITRATE	5.1	UN2728	III	OXIDIZER	A1,A29	A9.8
❑	ZIRCONIUM PICRAMATE, dry or wetted with less than 20% water, by mass	1.3C	UN0236	II	EXPLOSIVE		A5.119
	ZIRCONIUM PICRAMATE, WETTED with not less than 20% water, by mass	4.1	UN1517	I	FLAMMABLE SOLID	N41	A8.4

SYM-BOL (1)	PROPER SHIPPING NAME/DESCRIPTION (2)	HAZARD CLASS/DIV (3)	UN/ID NUMBER (4)	PG (5)	LABELS (6)	SPECIAL PROVISION (7)	PACKAGING PARAGRAPH (8)
❑	ZIRCONIUM POWDER, DRY	4.2	UN2008	I	SPONTANE-OUSLY COM-BUSTIBLE	A19,A20, N5,N34	A8.4
				II	SPONTANE-OUSLY COM-BUSTIBLE	A19,A20, N5,N34	
				III	SPONTANE-OUSLY COM-BUSTIBLE		
	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	FLAMMABLE SOLID	A19,A20, N34	A8.4
	ZIRCONIUM SCRAP	4.2	UN1932	III	SPONTANE-OUSLY COM-BUSTIBLE	N34	A8.4
D	ZIRCONIUM SULFATE	8	NA9163	III	CORROSIVE	N34	A12.4

ZIRCONIUM SUSPENDED IN A LIQUID	3	UN1308	II	FLAMMABLE LIQUID	A7.3
ZIRCONIUM TETRACHLORIDE	8	UN2503	III	CORROSIVE	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. When a special provision specifies packagings or packaging requirements, they are in addition to the standard requirements already prescribed in this manual. The following list identifies the requirements of the special provisions referred to in column 7 of table A4.1:

1. Numeric Provisions.

1 This material is poisonous by inhalation, meets the criteria for Class 2.3, Hazard Zone A or Class 6.1, Hazard Zone A, and must be described as an inhalation hazard.

2 This material is poisonous by inhalation, meets the criteria for Class 2.3, Hazard Zone B or Class 6.1, Hazard Zone B, and must be described as an inhalation hazard.

3 This material is poisonous by inhalation, meets the criteria for Class 2.3, Hazard Zone C, and must be described as an inhalation hazard.

4 This material is poisonous by inhalation, meets the criteria for Class 2.3, Hazard Zone D, and must be described 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)) in Class 2.3, Hazard Zone A, B, C, or D, or Class 6.1, Hazard Zone A or B, use an appropriate Class 2.3 or Class 6.1 generic PSN.

6 This material is poisonous by inhalation and must be described as an inhalation hazard.

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 Packaging for certain PCBs for disposal and storage is prescribed by EPA in 40 CFR 761.60 and 761.65.

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.

14 Motor fuel antiknock mixtures is one or more organic lead mixtures, such as tetraethyl lead, triethylmethyl lead, diethyldimethyl lead, ethyltrimethyl lead, and tetramethyl lead, with one or more halogen compounds such as ethylene dibromide and ethylene dichloride, hydrocarbon solvents or other equally efficient stabilizers, or tetraethyl lead.

17 Aqueous solutions of hydrogen peroxide containing less than 8 percent hydrogen peroxide are not subject to the requirements of this manual.

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).

27 Sodium carbonate peroxyhydrate is considered nonhazardous.

28 The dihydrated sodium salt of dichloroisocyanuric acid is not subject to the requirements of this manual.

31 Materials which 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.

41 When UN 2972 is packaged according to A8.8.1 or A8.8.4, or UN 2973 is packaged according to A8.7, an EXPLOSIVE label is not required.

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.

101 Specify the name of the particular substance or article.

102 This article may be transported as Class 1.4D if all of the conditions specified in 49 CFR 173.63(a) are met.

103 Detonators which will not mass detonate and undergo only limited preparation 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.

Table A4.2. Continued.

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.

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.

108 Fireworks must be constructed and packaged so that loose pyrotechnic composition is not present in packages during transportation.

109 Except as provided in A5.98, rocket motors must be nonpropulsive in transportation. 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.

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 173.230.

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.

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.

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.

2. "N" Codes. 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 A12.5.4.

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.

Table A4.2. Continued.

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 POP 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:

1. A combination packaging consisting of a 4G fiberboard box with inner receptacles of glass or earthenware.
2. A single packaging of a 4C2 sift-proof, natural wood box.
3. 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 which 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, only copper cartridges are permitted as inner packagings when the hazardous materials 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 POP 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 POP 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 POP 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 POP 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 POP 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 POP 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 POP test requirements for domestic shipment. Net weight of contents may not exceed 15 kg (33 pounds).

Table A4.2. Continued.

N80 Packages consisting of one inner metal can, not over 2.5 kg (5.5 pound) capacity, packed in an outer wooden or fiberboard box, or a wooden barrel, are authorized and need not conform to the POP test requirements for domestic shipment.

3. "A" Codes. These special provisions are in addition to other requirements for military air shipment.

A1 Single packaging is not permitted on passenger aircraft. Theta 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 with a dagger are not permitted on passenger aircraft. Deviations are not allowed.

A5 Solids having an inhalation toxicity of PG I and are identified with a dagger 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.
losed metal receptacles before packing in 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.

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.

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. These materials must be stored away from fire hazards. Class 1 materials must be handled carefully. Do not drop. Handle dropped Class 1 material according to A3.2.1.1. Explosive safety must be according to A3.2.1.3.

A5.3. Removing Explosive Devices. Remove explosive devices from aircraft systems before shipment by military cargo aircraft when possible. However, where removal of such explosives is not feasible, shipment of aircraft systems with explosive devices installed may be made provided that:

- The safety devices are in place and are secured to the maximum extent possible (including blocking or banding when advantageous) to prevent arming.
- The aircraft system's packaging provides reasonable security against tampering with the installed explosive items or the arming systems.
- The aircraft system's packaging is properly marked with respect to the explosives involved in the shipment.
- 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 must identify all of the installed explosive components. Reference this paragraph on the Shipper's Declaration rather than the specific paragraphs for the individual installed devices.

A5.4. Chemical Ammunitions. Chemical ammunitions are dangerous materials which may be 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 A3.2.1.3.

A5.4.1. **Handling Chemical Ammunitions.** Chemical munitions should receive maximum preferential handling. Use the same materials handling equipment for high explosive munitions that is used for chemical munitions.

A5.4.2. **Reporting and Disposing of Chemical Ammunitions.** Immediately report any chemical munitions found to be leaking to the agency initiating the shipment. (However, if the leak is due to causes other than faulty munitions construction, it must be reported according to 1.7.) Dispose of leaking or damaged chemical munitions according to applicable service directives. The report should include the following:

- Type and amount of chemical munitions.
- Lot number.
- Date discovered.
- Detailed information concerning the nature and possible cause of leak.
- Disposition or recommendation for disposition.

A5.5. Captured Ammunition and Ammunition With Unknown Characteristics. Transport this ammunition on military aircraft only under the following provisions:

- Explosive ordinance disposal (EOD) personnel have inspected the items and completed necessary action to make them safe for air shipment, and have signed a certificate to this effect.
- Ammunition similar to the categories listed in attachment 4 must be packed and marked as provided for in the respective paragraphs.
- The shipper has certified on the Shipper's Declaration (in addition to the EOD certification) that subject shipment has been prepared according to the applicable packaging paragraph. Reference this paragraph and the applicable packaging paragraph on the Shipper's Declaration.
- If the movement is classified, a controlled classified Shipper's Declaration containing complete data on the shipment, including handling and storage precautions, must accompany the manifest and be available to the aircraft commander and handling crews.

A5.6. Ammonium Nitrate-Fuel Oil Mixture (containing only prilled ammonium nitrate and fuel oil). Package:

A5.6.1. In inner oil-resistant bags or plastic sheets, then packed in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box.
A5.6.2. In inner oil-resistant bags or plastic sheets, then packed in an outer fiber (1G) or removable head steel (1A2) drum.

A5.7. Ammonium Nitrate. Package ammonium nitrate in inner kraft paper or plastic bags, or in plastic sheets. Pack inner packagings in one of the following outer packagings:
A5.7.1. Removable head wood barrel (2C2).
A5.7.2. Ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box.
A5.7.3. Removable head steel drum (1A2).

A5.8. Ammonium Perchlorate and Ammonium Picrate. Pack water-soluble substances in waterproof receptacles. All packages must be lead-free (except UN 0402). Package:
A5.8.1. In inner metal, paper, or plastic receptacles. Pack inner packagings in a removable head wood barrel (2C2).
A5.8.2. In inner plastic sheets, then packed in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box or fiber (1G) drum.

A5.9. Ammunition Illuminating; Ammunition Incendiary; Ammunition Incendiary, White Phosphorus; Ammunition Practice; Ammunition Proof; Ammunition Smoke; Ammunition Smoke, White Phosphorus; Ammunition, Tear-Producing; and Ammunition, Toxic. Inner packagings are not necessary. However, open ends of inner packaging (when used) must be fitted with padded end caps or the outer packaging must be padded. Pack in one of the following outer packagings:
A5.9.1. Fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), steel (4A1), or steel with inner liner or coating (4A2) box.
A5.9.2. Removable head steel (1A2) or fiber (1G) drum.
A5.9.3. Crates for large articles. Also, large articles without propelling charge and without means of ignition or initiation may be carried unpacked if secured to pallets or securely blocked and braced.

A5.10. Articles, Explosive, Extremely Insensitive. Inner packagings are not necessary. Pack in one of the following outer packagings:
A5.10.1. Ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel (4A1) box.
A5.10.2. Removable head steel drum (1A2).
A5.10.3. Large articles without their means of initiation, or with their means of initiation containing at least two effective protective features, may be carried unpacked if secured to pallets or securely blocked and braced.

A5.11. Articles, Explosive NOS and Articles Pyrophoric. Ship these items according to a CAA. See 1.6.4. for more information on CAAs.

A5.12. Articles, Pyrotechnic. Package as follows:
A5.12.1. Package UN0428 and UN0429 in inner metal, plastic, or wood receptacles. Pack inner packagings in an outer ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel with inner liner or coating (4A2) box. Metal inner packagings must be padded with cushioning material.
A5.12.2. Package UN0430, UN0431, and UN0432 in inner fiberboard, metal, plastic, or wood receptacles. Pack inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel (4A1) box.

A5.13. Barium Styphnate. Package in inner plastic, rubber, textile, or rubberized textile bags. Pack inner bags in an intermediate plastic, rubber, textile, or rubberized textile bag, wood barrel, or plastic receptacle. Pack this configuration in an outer removable head wood barrel (2C2), removable head plastic (1H2), or removable head steel (1A2) drum. Coatings other than lead are authorized for removable head steel drums. The outer barrels and drums must have a watertight seal. The intermediate and outer packagings must be filled with water or an appropriate water-saturated material when the intermediate packaging is a rubber or rubberized textile bag. The intermediate packaging must be entirely surrounded inside the outer packaging with wetted cushioning material.

A5.14. Black Powder or Gunpowder; Black Powder, Compressed or Gunpowder, Compressed; Black Powder, in Pellets or Gunpowder, in Pellets. Packaged as follows:

A5.14.1. Package UN0028 in inner plastic bags, kraft paper or wax paper sheets. Pack inner packagings in an outer fiberboard (4G), sift-proof wood (4C2), plywood (4D), or reconstituted wood (4F) box.
A5.14.2. Package UN0027 in inner fiberboard, metal, paper, plastic, or rubberized textile receptacles. Pack inner packagings in an outer fiberboard (4G), sift-proof wood (4C2), plywood (4D), or reconstituted wood (4F) box, or removable head wood barrel (2C2).
A5.14.3. Package UN0027 in an outer removable head aluminum (1B2), fiber (1G), or removable head steel (1A2) drums. Removable head steel drums (1A2) must be dust tight. Inner packagings are not necessary.

A5.15. Bombs and Bombs, Photo-Flash. Inner packagings are not necessary. Pack in one of the following outer packagings:
A5.15.1. Ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel (4A1) box.
A5.15.2. Removable head steel drum (1A2).
A5.15.3. Large articles without their means of initiation, or with their means of initiation containing at least two effective protective features, may be carried unpacked if secured to pallets or securely blocked and braced.

A5.16. Bombs With Flammable Liquid. Ship these items according to a CAA. See 1.6.4 for more information on CAAs. This item contains ethylene oxide. If ethylene oxide odor or leakage is detected, the area must be kept well ventilated. The item must be removed from transportation as soon as practical. Prolonged exposure to ethylene oxide fumes is hazardous to health (see A17.2.4.)

A5.17. Boosters with Detonator. Package in inner metal, plastic, or wood receptacles. Pack inner packagings in an outer ordinary wood (4C1), plywood (4D), reconstituted wood (4F),or steel (4A1) box. Dividing partitions in the outer packaging may be used in place of inner packagings. Detonators with radioactive components are also subject to attachment 11 requirements for radioactive material.

A5.18. Boosters. Package as follows:
A5.18.1. Use this packaging for boosters which are finished articles consisting of closed metal, plastic, or fiberboard receptacles that contain a detonating explosive, or consist of a plastic-bonded detonating explosive. Pack in outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box. Inner packaging is not necessary.
A5.18.2. Use this packaging for cast or pressed boosters in tube or capsules without end closures. Package in inner fiberboard, metal, or plastic receptacles, or in plastic or paper sheets. Pack inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box.

A5.19. Bursters. Package in inner metal, plastic, or wood receptacles. Pack inner packagings in an outer ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel with inner liner or coating (4A2) box. Metal inner packagings must be padded with cushioning material.

A5.20. Cartridges Flash and Cartridges, Signal. Package in inner fiberboard, metal, kraft paper (for cartridge of 1.4G and 1.4S), plastic, or wood receptacles. Pack inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel with inner liner or coating (4A2) box.

A5.21. Cartridges for Weapons; Cartridges for Weapons, Inert Projectile or Cartridges, Small Arms; Cartridges for Weapons, Blank, or Cartridges, Small Arms, Blank. Package in inner fiberboard, metal, plastic, or wood receptacles. Metal clips or dividing partitions in the outer packaging may be used in place of inner packagings. Open ends of inner packagings must be fitted with padded end caps or the outer packaging must be padded. Pack in one of the following outer packagings:
A5.21.1. Fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), steel (4A1), or steel with inner liner or coating (4A2) box.
A5.21.2. Removable head steel drum (1A2).

A5.22. Cartridges, Oil Well. Package in inner fiberboard, plastic, or metal receptacles. Pack inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box.
A5.23. Cartridges, Power Device. Package in inner fiberboard, plastic, metal, or wood receptacles. Pack inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel with inner liner or coating (4A2) box.

A5.24. Cases, Cartridge, Empty With Primer and Cases, Combustible, Empty, Without Primer. Package in inner plastic or textile bags, fiberboard, plastic or wood boxes. Bags are authorized as inner packagings for small cases only. Dividing partitions may be used in the outer packaging in place of inner packagings. Pack inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel (4A1) box.

A5.25. Charges, Bursting, Plastics Bonded. Package in an outer ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel (4A1) box. Inner packagings are not necessary.

A5.26. Charges, Demolition. Package in inner fiberboard, metal, plastic, or wood boxes, or metal cans. Pack inner packagings in an outer ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel with inner liner or coating (4A2) box.

A5.27. Charges, Depth. Inner packagings are not necessary. Package in one of the following outer packagings:
A5.27.1. Ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel (4A1) box.
A5.27.2. Removable head steel drum (1A2).
A5.27.3. Large articles without their means of initiation, or with their means of initiation containing at least two effective protective features, may be carried unpacked if secured to pallets or securely blocked and braced.

A5.28. Charges, Explosive, Commercial. Package in inner plastic bags, fiberboard boxes, or fiberboard, plastic, or metal tubes. Pack inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), steel (4A1), or steel with inner liner or coating (4A2) box. Dividing partitions may be used in the outer packaging in place of inner packagings.

A5.29. Charges, Propelling, for Cannon. Inner packagings are not necessary. Pack in one of the following outer packagings:
A5.29.1. Ordinary wood (4C1), sift-proof wood (4C2), plywood (4D), reconstituted wood (4F), steel (4A1), or steel with inner liner or coating (4A2) box. Ordinary wood (4C1) is authorized for cased charges only.
A5.29.2. Removable head steel drum (1A2).

A5.30. Charges, Propelling, for Rocket Motors. The inside of metal packagings must be galvanized, painted, or otherwise protected. Bare steel must not come into contact with smokeless powder. Metal receptacles must be so constructed that the risk of explosion, by reason of increase in internal pressure (from internal or external causes), is reduced. Plastic inner packagings must not be liable to generate sufficient static electricity that a discharge could cause the packaged articles to function. Package:
A5.30.1. In inner kraft paper, plastic, textile, or rubberized textile bags. Pack inner packagings in an outer fiberboard (4G), ordinary wood (4C1), sift-proof wood (4C2), plywood (4D), reconstituted wood (4F), or solid plastic (4H2) box.
A5.30.2. In inner kraft paper, plastic, textile, or rubberized textile bags. Pack inner packagings in an outer removable head steel (1A2), fiber (1G), or plywood (1D) drum.
A5.30.3. In inner fiberboard, metal, or plastic receptacles. Pack inner packagings in an outer fiberboard (4G), ordinary wood (4C1), sift-proof wood (4C2), plywood (4D), reconstituted wood (4F), or solid plastics (4H2) box.
A5.30.4. In a composite packaging constructed of a plastic receptacle with an outer solid plastic box (6HH2).

A5.31. Charges, Shaped, Commercial. Package shaped charges to prevent contact between charges. Conical cavities must face inward in pairs or groups to minimize the shaped charge (jetting) effect in the event of accidental initiation. Package shaped charges in inner fiberboard or other type material tubes, then packed in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box. Dividing partitions may be used in the outer packaging in place of inner packagings.

A5.32. Charges, Shaped, Flexible, Liner. Inner packagings are not necessary. Pack in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel with inner liner or coating (4A2) box. The ends of the charges must be sealed or the use of bags or plastic material as inner packagings is required.

A5.33. Charges, Supplementary Explosive. Package in inner metal, plastic, wood, or fiberboard boxes. Pack inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel with inner liner or coating (4A2) box.

A5.34. Components, Explosive Train, NOS. Ship according to a CAA. See 1.6.4 for more information on CAAs.

A5.35. Contrivances, Water-Activated. Package as follows:
A5.35.1. In inner fiberboard or metal receptacles. Pack inner packagings in an outer ordinary wood (4C1) with metal liner, plywood (4D), reconstituted wood (4F), or steel (4A1) box. Dividing partitions may be used in outer packagings in place of inner packagings. Packagings must be sealed against the entry of water.
A5.35.2. Large articles without their means of initiation, or with their means of initiation containing at least two effective protective features, may be carried unpacked if secured to pallets or securely blocked and braced.

A5.36. Cord, Detonating, Flexible. Package on inner reels, then pack in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box. The ends of the detonating cord must be sealed and tied securely.

A5.37. Cord or Fuse, Detonating, Metal Clad Cord or Fuse, Detonating Mild Effect Metal Clad. Package in inner plastic bags, kraft paper or plastic sheets. Reels may be used in place of inner packagings. Pack inner packagings or reels in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box. The ends of the detonating cord must be sealed. Void spaces must be filled with packing material.

A5.38. Cord, Igniter. Package in inner fiberboard receptacles or on reels. Pack inner packaging or reels in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box.

A5.39. Cutters, Cable, Explosive. Package in inner fiberboard receptacles, then pack in an outer ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel with inner liner or coating (4A2) box.

A5.40. Cyclotetramethylenetetranitramine (Octogen; or HMX) Desensitized; Cyclotetramethylenetetranitramine (HMX; or Octogen) Wetted with not less than 15 percent water; Cyclotrimethylenetrinitramine (Cyclonite; Hexogen; or RDX) Desensitized; Cyclotrimethylenetrinitramine (Cyclonite; Hexogen; or RDX) Wetted with not less than 15 percent water by mass; Cyclotrimethylenetrinitramine (Cyclonite; Hexogen; or RDX) and Cyclotetramethylenetetranitramine (HMX; or Octogen) Mixtures Desensitized with not less than 10 percent phlegmatizer by mass; and Cyclotrimethylenetrinitramine (Cyclonite; Hexogen; or RDX) Wetted with not less than 15 percent water by mass. Package wetted explosives according to A5.40.1 or A5.40.2. Package desensitized explosives according to A5.40.3 or A5.40.4.
A5.40.1. Inner plastic or rubberized textile bags, then packed in one of the following outer packagings:
A5.40.1.1. Removable head wood barrel (2C2).
A5.40.1.2. Fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box.
A5.40.1.3. Removable head steel (1A2) or fiber (1G) drum.
A5.40.2. Inner rubber, textile, or rubberized textile bags, then packed in an intermediate rubber or rubberized textile bag. Pack this configuration in one of the following outer packagings:
A5.40.2.1. Removable head wood barrel (2C2).
A5.40.2.2. Removable head steel (1A2) or fiber (1G) drum.
A5.40.3. Inner fiberboard box, plastic or rubberized textile bag, then packed in one of the following outer packagings:
A5.40.3.1. Removable head wood barrel (2C2).
A5.40.3.2. Fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box.
A5.40.3.3. Removable head steel (1A2) or fiber (1G) drum.
A5.40.4. Inner fiberboard box, rubber, textile, or rubberized textile bags, then packed in an intermediate rubber, textile, or rubberized textile bag. Pack this configuration in one of the following outer packagings:
A5.40.4.1. Removable head wood barrel (2C2).
A5.40.4.2. Removable head steel (1A2) or fiber (1G) drum.
A5.41. Deflagrating Metal Salts of Aromatic Nitroderivatives, NOS. Pack water-soluble substances in waterproof receptacles. All packages must be lead-free. Package as follows:
A5.41.1. In inner metal, paper, or plastic receptacles. Pack inner packagings in an outer removable head wood (2C2) barrel.

A5.41.2. In inner plastic sheets, then packed in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box or fiber (1G) drum.

A5.42. Detonator Assemblies, Non electric:
A5.42.1. **General Requirements.** Blasting caps do not have to be attached to the safety fuse, metal clad mild detonating cord, detonating cord, or shock tubes. There is no quantity limitation for detonators that can be classed as 1.4B or 1.4S, except for the gross weight limitations of the container used. Detonator assemblies with detonating cord may have no more than 50 detonators packed in one inner packaging, and no more than 500 detonators packed in one outer packaging. Detonator assemblies with safety fuse or shock tube may have no more than 50 detonators packed in one inner packaging, and no more than 1,000 detonators packed in one outer packaging. For detonators not identified above, the following quantity limitations apply:

- For detonators containing no more than 10 g (.35 oz) of explosives (excluding ignition and delay charges), no more than 50 detonators may be packed in one inner packaging and no more than 500 detonators may be packed in one outer packaging.
- For detonators containing no more than 3 g (.11 oz) of explosive (excluding ignition and delay charges), no more than 100 detonators may be packed in one inner packaging and no more than 1,000 detonators may be packed in one outer packaging.

A5.42.2. **Packaging Requirements.** Inner packagings are not required if the packing configuration restricts free movement of the caps and protects them from impact forces. Package items in inner fiberboard, metal, or paper receptacles. Pack inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), steel (4A1), or steel with inner liner or coating (4A2) box.

A5.43. Detonators, Electric:
A5.43.1. **General Requirements.** Detonators containing no more than 10 g (0.35 oz) of explosive (excluding ignition and delay charges) may have no more than 50 detonators packed in one inner packaging and no more than 500 detonators packed in one outer packaging. Detonators containing no more than 3 g (0.11 oz) of explosive (excluding ignition and delay charges) may have no more than 100 detonators packed in one inner packaging and no more than 500 detonators packed in one outer packaging. There is no quantity limitation for detonators that are classed as 1.4B or 1.4S, except for the gross weight limitations of the container used.
A5.43.2. **Packaging Requirements.** Inner packaging is not required for electric blasting caps which 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, so as to restrict free movement of the caps and to protect them from impact forces. Package items in inner fiberboard, metal, or paper receptacles. Pack inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel with inner liner or coating (4A2) box.

A5.44. Detonators for Ammunition. Cushion detonators to prevent movement and contact between them. Package in inner fiberboard, plastic, or wood boxes; fiberboard, plastic, or wood trays; or metal cans. All inner packagings must be fitted with dividing partitions. Pack inner packagings in an outer ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel (4A1) box.

A5.45. Detonators, Non electric. Plastic inner packagings must not be liable to generate sufficient static electricity that a discharge could cause the packaged articles to function.
A5.45.1. Package detonators that are blasting caps (including percussion activity) or delay connectors in metal tubes as follows:

- Detonators containing no more than 10 g (0.35 oz) of explosive (excluding ignition and delay charges) may have no more than 50 detonators in one inner packaging and no more than 500 detonators in one outer packaging. Detonators containing no more than 3 g (0.11 oz) of explosive (excluding ignition and delay charges) may have no more than 100 detonators in one inner packaging and no more than 5,000 detonators in one outer packaging.
- Package detonators in inner fiberboard, metal, or plastic receptacles with the open end of any detonator covered with appropriate cushioning material.
- Tightly pack inner packagings in an intermediate package of fiberboard or wood boxes, kraft paper or plastic sheets. Intermediate packagings must be separated from the outside packaging by at least 25 mm (1 in) of cushioning material.
- Pack the inner configuration in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel with inner liner or coating (4A2) box.

A5.45.2. Except as specified in A5.45.1, package all detonators as follows:

- Detonators containing no more than 10 g (0.35 oz) of explosive (excluding ignition and delay charges) may have no more than 50 detonators in one inner packaging and no more than 500 detonators in one outer packaging. Detonators containing no more than 3 g (0.11 oz) of explosive (excluding ignition and delay charges) may have no more than 100 detonators in one inner packaging and no more than 5,000 detonators in one outer packaging. There is no quantity limitation for detonators that are classed as 1.4B or 1.4S, except for the gross weight limitations of the container used.
- Package items in inner fiberboard, plastic, or metal receptacles. Pack inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel with inner liner or coating (4A2) box.

A5.46. Diazodinitrophenol Wetted. Package in inner plastic, rubber, textile, or rubberized textile bags. Pack inner packagings in an intermediate plastic, rubber, textile, or rubberized textile bag, wood barrel, or plastic receptacle. Pack this configuration in an outer removable head wood barrel (2C2), removable head plastic (1H2) or removable head steel (1A2) drum. Coatings other than lead are authorized for removable head steel drums. The barrels and drums must have a watertight seal. The intermediate and outer packagings must be filled with water or an appropriate water-saturated material when the intermediate packaging is a rubber or rubberized textile bag. The intermediate packaging must be entirely surrounded inside the outer packaging with wetted cushioning material.

A5.47. Dinitroglycoluril; Dinitrophenol; Dinitrophenolates; Dinitroresorcinol; and Dipicryl Sulphide. Pack water-soluble substances in waterproof receptacles. All packages must be lead-free. Package as follows:
A5.47.1. In inner metal, paper, or plastic receptacles. Pack inner packagings in an outer removable head wood barrel (2C2).
A5.47.2. In inner plastic sheets, then packed in outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box or fiber (1G) drum.

A5.48. Dinitrosobenzene. Package in inner plastic bags, then pack in an outer fiber drum (1G).

A5.49. Explosive, Blasting, Type A; Explosive, Blasting, Type B (1.1D); and Explosive, Blasting, Type E (1.1D). Package:
A5.49.1. In inner waterproof receptacles, then packed in an outer removable head wood barrel (2C2).
A5.49.2. In inner waterproof sheets, then packed in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box. If a waterproof sheet is used, it must be impervious to any liquid explosive ingredients of the item
A5.49.3. In an outer fiber drum (1G). No inner packaging is required.

A5.50. Explosive, Blasting, Type B (1.5D) or Agent Blasting, Type B. Package:
A5.50.1. In inner waterproof material receptacles, then packed in an outer removable head wood barrel (2C2).
A5.50.2. In inner waterproof sheets, then packed in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box. If a waterproof sheet is used, it must be impervious to any liquid explosive ingredients of the item.
A5.50.3. In an outer fiber drum (1G). No inner packaging is required.
A5.50.4. In inner plastic sheets, then packed in an outer fiberboard (4G), ordinary wood (4C1), or plywood (4D) box.
A5.50.5. In inner metal cans, then packed in an outer fiber (1G) or removable head steel (1A2) drum.

A5.51. Explosive, Blasting, Type C. Package:
A5.51.1. In inner waxed paper, plastic, or rubberized textile bags. Pack inner packagings in an outer removable head wood barrel (2C2).
A5.51.2. In inner waxed paper, plastic, or rubberized textile sheets. Pack inner packagings in an outer ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box.

A5.52. Explosive, Blasting, Type D. Package:
A5.52.1. In inner waxed paper, plastic, or rubberized textile bags. Pack inner packagings in an outer removable head wood barrel (2C2).
A5.52.2. In inner waxed paper, plastic, textile, or rubberized textile sheets. Pack inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F) box, or fiber drum (1G).

A5.53. Explosive, Blasting, Type E (1.5D) or Agent Blasting, Type E. Package:
A5.53.1. In inner oil-resistant bags or plastic sheets, then packed in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box. Inner packaging is not required when packed in an outer fiberboard (4G) box.
A5.53.2. In inner oil-resistant bags or plastic sheets, then packed in an outer fiber (1G) or removable head steel (1A2) drum.

A5.54. Explosive Pest Control Devices. Package in inner fiberboard, metal, plastic, or wood receptacles. Metal clips or dividing partitions in the outer packaging may be used in place of inner packagings. Open ends of inner packagings must be fitted with padded end caps or the outer packaging must be padded. Pack items in one of the following outer packagings:
A5.54.1. Fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), steel (4A1), or steel with inner liner or coating (4A2) box.
A5.54.2. Removable head steel drum (1A2).

A5.55. Fireworks (1.1G). Package:
A5.55.1. In inner fiberboard or plastic receptacles, then packed in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box.
A5.55.2. In inner paper sheets, then packed in an outer fiber drum (1G).

A5.56. Fireworks (1.2G, 1.3G, and 1.4G). Package:
A5.56.1. In inner fiberboard or plastic receptacles, then packed in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box.
A5.56.2. In inner paper sheets, then packed in an outer fiber (1G) or removable head plastic (1H2) drum.

A5.57. Fireworks (1.4S). Package in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel (4A1) box. Inner packagings are not necessary.

A5.58. Flares, Aerial or Surface. Package:
A5.58.1. In inner fiberboard, metal, or plastic receptacles. Pack inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), steel (4A1), or solid plastics (4H2) box. Dividing partitions in the outer package may be used in place of inner packagings.
A5.58.2. In inner kraft paper sheets, then packed in an outer fiber (1G) or removable head plastic (1H2) drum. Dividing partitions in the outer package may be used in place of inner packagings.

A5.59. Flash Powder. Package in inner metal, plastic, or wood receptacles. Pack inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), steel with inner liner or coating (4A2) box, or fiber drum (1G). Do not package more than 50 g (1.8 oz) of flash powder in each inner packaging.

A5.60. Fracturing Devices, Explosive. Package in inner fiberboard, metal, plastic, or wood receptacles. Pack inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel (4A1) box.

A5.61. Fuse, Igniter or Fuse, Instantaneous, Non detonating. Package in inner plastic bags, reels, kraft paper sheets, or plastic sheets. Pack inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box.

A5.62. Fuse, Safety. Package in inner plastic bags, then packed in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), steel with inner liner or coating (4A2) box, or fiber drum (1G). Inner packagings are not required if the ends of the articles are sealed.
A5.63. Fuzes, Detonating. Package in inner fiberboard, metal, plastic, or wood receptacles; or plastic or wood trays. Pack inner packagings in an outer ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel (4A1) box. Dividing partitions in the outer packaging may be used in place of inner packagings. The detonating fuses must be separated from each other in the inner packaging, including when dividing partitions are used.

A5.64. Fuzes, Igniting. Package in inner fiberboard, metal, plastic, or wood receptacles; or plastic or wood trays. Pack inner packagings in an outer ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel (4A1) box. Dividing partitions in the outer packaging may be used in place of inner packagings.

A5.65. Grenades, Empty Primed:
A5.65.1. **General Requirements.** Pack primers with shock absorbent layers of felt, paper, or plastic to prevent detonation within the outer packaging. Primers fitted with anvil, composition is not covered with a disk of metal foil or other material (varnished only), must be packed in fiberboard or plastic trays in single layer rows with not more than 500 primers in any inner packaging. Primers not fitted with anvil, composition covered, may have not more than 5,000 primers in any inner packaging. Package:
A5.65.2. In inner fiberboard, metal, plastic, or wood boxes, or metal cans. Pack inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel with inner liner or coating (4A2) box.
A5.65.3. In inner sleeved fiberboard or sleeved plastic tray, then packed in an intermediate fiberboard box. Pack this configuration in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel with inner liner or coating (4A2) box.

A5.66. Grenades and Grenades, Practice. Pack in an outer ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel (4A1) box. Inner packagings are not necessary.

A5.67. Guanyl Nitrosaminoguanylidene Hydrazine, Wetted and Guanyl Nitrosaminoguanyltetrazene, Wetted. Package in inner plastic, rubber, textile, or rubberized textile bags. Pack inner packagings in an intermediate plastic, rubber, textile, or rubberized textile bag, wood barrel, or plastic receptacle. Pack this configuration in an outer removable head wood barrel (2C2), removable head plastic (1H2) or removable head steel (1A2) drum. Coatings other than lead are authorized for removable head steel drums. The barrels and drums must have a watertight seal. The intermediate and outer packagings must be filled with water or an appropriate water-saturated material when the intermediate packaging is a rubber or rubberized textile bag. The intermediate packaging must be entirely surrounded inside the outer packaging with wetted cushioning material.

A5.68. Hexanitrodiphenylamine (Dipicrylamine; Hexyl); and Hexanitrostilbene. Package:
A5.68.1. In inner waxed paper, plastic, or rubberized textile bags. Pack inner packagings in an outer removable head wood barrel (2C2).
A5.68.2. In inner waxed paper, plastic, textile, or rubberized textile sheets. Pack inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F) box, or fiber drum (1G).

A5.69. Hexatonal, Cast and Hexolite. Package wetted explosives as specified in A5.69.1 or A5.69.2. Package dry explosives as specified in A5.69.3 or A5.69.4.
A5.69.1. Package in inner plastic bags, then pack in an outer removable head wood barrel (2C2), fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box.
A5.69.2. Package in inner plastic sheets, then pack in an outer fiber drum (1G).
A5.69.3. Package in inner paper or plastic bags, then pack in an outer removable head wood barrel (2C2), fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box.
A5.69.4. Package in inner fiberboard box or plastic sheets, then packed in an outer fiber drum (1G).

A5.70. Igniters (1.1G, 1.2G, and 1.3G). Package in inner metal, plastic, or wood receptacles. Pack the inner packagings in an outer ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel with inner liner or coating (4A2) box. Igniters (1.1G) packed in inner metal packagings must be padded with cushioning material.

A5.71. Igniters (1.4G and 1.4S). Package in inner fiberboard, metal, or wood receptacles, paper sheets or plastic trays. Pack the inner packaging in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel with inner liner or coating (4A2) box.
A5.72. Lead Azide, Wetted; Lead Mononitroresorcinate; Lead Styphnate, Wetted; and Lead Trinitroresorcinate. Package in inner plastic, rubber, textile, or rubberized textile bags. Pack inner packaging in an intermediate plastic, rubber, textile, or rubberized textile bag, wood barrel, or plastic receptacle. Pack this configuration in an outer removable head wood barrel (2C2), removable head plastic (1H2) or removable head steel (1A2) drum. Coatings other than lead are authorized for removable head steel drums. The barrels and drums must have a watertight seal. The intermediate and outer

packagings must be filled with water or an appropriate water-saturated material when the intermediate packaging is a rubber or rubberized textile bag. The intermediate packaging must be entirely surrounded inside the outer packaging with wetted cushioning material.

A5.73. Lighters, Fuse. Package in inner fiberboard, metal, or wood receptacles, paper sheets or plastic trays. Pack the inner packaging in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel with inner liner or coating (4A2) box.

A5.74. Mannitol Hexanitrate (Nitromannite), Wetted and Mercury Fulminate, Wetted. Package in inner plastic, rubber, textile, or rubberized textile bags. Pack inner packaging in an intermediate plastic, rubber, textile, or rubberized textile bag, wood barrel, or plastic receptacle. Pack this configuration in an outer removable head wood barrel (2C2), removable head plastic (1H2) or removable head steel (1A2) drum. Coatings other than lead are authorized for removable head steel drums. The barrels and drums must have a watertight seal. The intermediate and outer packagings must be filled with water or an appropriate water-saturated material when the intermediate packaging is a rubber or rubberized textile bag. The intermediate packaging must be entirely surrounded inside the outer packaging with wetted cushioning material.

A5.75. 5-Mercaptotetrazol-1-Acetic Acid. Package in inner plastic bags, then packed in an outer fiber drum (1G).

A5.76. Mines. Inner packagings are not necessary. Pack in one of the following outer packagings:
A5.76.1. Ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel (4A1) box.
A5.76.2. Removable head steel drum (1A2).
A5.76.3. Large articles without their means of initiation, or with their means of initiation containing at least two effective protective features, may be carried unpacked if secured to pallets or securely blocked and braced.

A5.77. 5-Nitrobenzotriazol; Nitrotriazolone (NTO); and Nitro Urea. Pack water-soluble substances in waterproof receptacles. All packages must be lead-free. Package:
A5.77.1. In inner metal, paper, or plastic receptacles. Pack inner packagings in an outer removable head wood barrel (2C2).
A5.77.2. In inner plastic sheets, then packed in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box or fiber (1G) drum.

A5.78. Nitrocellulose. Ship according to a competent authority approval (CAA). See 1.6.4 for more information on CAAs.

A5.79. Nitrocellulose, Plasticized and Nitrocellulose, Wetted Items. Package:
A5.79.1. In an outer removable head aluminum (1B2) or removable head steel (1A2) drum. Inner packagings are not necessary.
A5.79.2. In inner waterproof paper, plastic, or rubberized textile bags, then packed in an outer removable head wood barrel (2C2).
A5.79.3. In inner plastic or rubberized textile sheets, then packed in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box, or fiber drum (1G).

A5.80. Nitroglycerin, Desensitized. Package in inner metal cans, glass or plastic receptacles. Pack the inner packagings in an outer ordinary wood box (4C1).

A5.81. Nitroglycerin Solution in Alcohol. Package in inner metal cans, glass or plastic receptacles. Pack the inner packagings in an outer ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box.

A5.82. Nitroguanidine or Picrite. Package:
A5.82.1. In inner paper or plastic bags, then packed in an outer removable head wood barrel (2C2).
A5.82.2. In inner plastic sheets, then packed in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box.
A5.82.3. In inner plastic sheets, then packed in an outer fiber (1G), plywood (1D), or removable head steel (1A2) drum.

A5.83. Nitrosoguanidine. Package in inner plastic, rubber, textile, or rubberized textile bags. Pack inner packaging in an intermediate plastic, rubber, textile, or rubberized textile bag, wood barrel, or plastic receptacle. Pack this configuration in an outer removable head wood barrel (2C2), removable head plastic (1H2) or removable head steel (1A2) drum. Coatings other than lead are authorized for removable head steel drums. The barrels and drums must have a watertight seal. The intermediate and outer packagings must be filled with water or an appropriate water-saturated material when the intermediate packaging is a rubber or rubberized textile bag. The intermediate packaging must be entirely surrounded inside the outer packaging with wetted cushioning material.

A5.84. Nitrostarch. Package:
A5.84.1. In an outer removable head aluminum (1B2), removable head steel (1A2), or removable head plastic (1H2) drum. Inner packagings are not necessary.
A5.84.2. In inner plastic bags, then pack in an outer removable head wood barrel (2C2).
A5.84.3. In inner plastic sheets, then pack in an outer ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box, or fiber drum (1G).

A5.85. Octolite or Octol. Pack wetted explosives as specified in A5.85.1 or A5.85.2. Package dry explosives as specified in A5.85.3 or A5.85.4.
A5.85.1. Package in inner plastic bags, then pack in an outer removable head wood barrel (2C2), fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box.
A5.85.2. Package in inner plastic sheets, then pack in an outer fiber drum (1G).
A5.85.3. Package in inner paper or plastic bags, then pack in an outer removable head wood barrel (2C2), fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box.
A5.85.4. Package in inner fiberboard box or plastic sheets, then pack in an outer fiber drum (1G).

A5.86. Pentaerythrite Tetranitrate, Wetted with not less than 25 percent water by mass, or Pentaerythrite Tetranitrate, Desensitized with not less than 15 percent plegmatizer by mass. Packaged as follows:
A5.86.1. This packaging is only authorized for NA 0105. Package in inner plastic, rubber, textile, or rubberized textile bags. Pack inner packaging in an intermediate plastic, rubber, textile, or rubberized textile bag, wood barrel, or plastic receptacle. Pack this configuration in an outer removable head wood barrel (2C2), removable head plastic (1H2) or removable head steel (1A2) drum. Coatings other than lead are authorized for removable head steel drums. The barrels and drums must have a watertight seal. The intermediate and outer packagings must be filled with water or an appropriate water-saturated material when the intermediate packaging is a rubber or rubberized textile bag. The intermediate packaging must be entirely surrounded inside the outer packaging with wetted cushioning material.
A5.86.2. Package wetted explosives according to A5.86.2.1 or A5.86.2.2. Package desensitized explosives according to A5.86.2.3 or A5.86.2.4.
A5.86.2.1. Package in inner plastic or rubberized textile bags, then pack in one of the following outer packagings:
A5.86.2.1.1. Removable head wood barrel (2C2).
A5.86.2.1.2. Fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box.
A5.86.2.1.3. Removable head steel (1A2) or fiber (1G) drum.
A5.86.2.2. Package in inner rubber, textile, or rubberized textile bags, then pack in an intermediate rubber or rubberized textile bag. Pack this configuration in one of the following outer packagings:
A5.86.2.2.1. Removable head wood barrel (2C2).
A5.86.2.2.2. Removable head steel (1A2) or fiber (1G) drum.
A5.86.2.3. Package in inner fiberboard box, plastic or rubberized textile bag, then pack in one of the following outer packagings:
A5.86.2.3.1. Removable head wood barrel (2C2).
A5.86.2.3.2. Fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box.
A5.86.2.3.3. Removable head steel (1A2) or fiber (1G) drum.
A5.86.2.4. Package in inner fiberboard box, rubber, textile, or rubberized textile bags, then pack in an intermediate rubber, textile or rubberized textile bag. Pack this configuration in one of the following outer packagings:
A5.86.2.4.1. Removable head wood barrel (2C2).
A5.86.2.4.2. Removable head steel (1A2) or fiber (1G) drum.

A5.87. Pentaerythrite Tetranitrate, Pentaerythritol Tetranitrate, or PETN with not less than 7 percent wax by mass. Package in inner kraft paper, plastic, textile, or rubberized textile bags. All inner packagings must be sealed. Pack inner packagings in one of the following outer packagings:
A5.87.1. Fiberboard (4G), ordinary wood (4C1), sift-proof wood (4C2), plywood (4D), or reconstituted wood (4F) box.
A5.87.2. Removable head wood barrel (2C2), plywood (1D) or fiber (1G) drum.

A5.88. Pentolite. Pack wetted explosives as specified in A5.88.1 or A5.88.2. Package dry explosives as specified in A5.88.3 or A5.88.4.
A5.88.1. Package in inner plastic bags, then pack in an outer removable head wood barrel (2C2), fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box.
A5.88.2. Package in inner plastic sheets, then pack in an outer fiber drum (1G).
A5.88.3. Package in inner paper or plastic bags, then pack in an outer removable head wood barrel (2C2), fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box.
A5.88.4. Package in inner fiberboard box or plastic sheets, then pack in an outer fiber drum (1G).

A5.89. Potassium Salts of Aromatic Nitro-Derivatives. Package in inner fiberboard boxes, metal cans, waterproof paper or plastic receptacles. Pack inner packagings in an outer sift-proof wood (4C2), plywood (4D), or reconstituted wood (4F) box. Packages must be lead-free. Plastic used must not be liable to generate static electricity by contained substances.

A5.90. Powder Cake, Wetted or Powder Paste, Wetted with not less than 17 percent alcohol by mass. Pack water-soluble substances in waterproof receptacles. All packages must be lead-free. Package:
A5.90.1. In inner metal, paper, or plastic receptacles. Pack the inner packagings in an outer removable head wood barrel (2C2).
A5.90.2. In inner plastic sheets, then pack in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box or fiber (1G) drum.

A5.91. Powder Cake, Wetted or Powder Paste, Wetted with not less than 25 percent water by mass. Package:
A5.91.1. In an outer removable head aluminum (1B2), removable head steel (1A2), or removable head plastic (1H2) drum. Inner packagings are not necessary. Metal drums used for powder paste must be so constructed that explosion is not possible by reason of increase in internal pressure or external causes.
A5.91.2. Package in inner plastic bags, then pack in an outer removable head wood barrel (2C2).
A5.91.3. Package in inner plastic sheets, then pack in an outer ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box, or fiber drum (1G).

A5.92. Powder, Smokeless. Package in inner kraft paper, plastic, textile, or rubberized textile bags. All inner packagings must be sealed. Pack inner packagings in one of the following outer packagings:
A5.92.1. Fiberboard (4G), ordinary wood (4C1), sift-proof wood (4C2), plywood (4D), or reconstituted wood (4F) box.
A5.92.2. Removable head wood barrel (2C2), plywood (1D) or fiber (1G) drum.
A5.92.3. Inner fiberboard, metal, or plastic receptacles. Pack the inner packagings in an outer fiberboard (4G), ordinary wood (4C1), sift-proof wood (4C2), plywood (4D), or reconstituted wood (4F) box. Metal receptacles must be constructed so that the risk of explosion caused by increased internal pressure (from internal or external causes) is reduced.
A5.92.4. Outer removable head steel (1A2), fiber (1G), or plywood (1D) drums, steel (3A1) or removable head steel (3A2) jerricans. Inner packagings are not necessary. The inside of drums and jerricans must be galvanized, painted, or otherwise protected. Bare steel must not come into contact with the smokeless powder. They must be constructed without pockets or crevices that could trap or nip the smokeless powder. Metal receptacles must be constructed so that the risk of explosion caused by increased internal pressure (from internal or external causes) is reduced.

A5.93. Primers, Cap Type:
A5.93.1. **General Requirements.** Pack the primers with shock absorbent layers of felt, paper, or plastic to prevent detonation within the outer packaging. Primers fitted with anvil, composition is not covered with a disk of metal foil or other material (varnished only), must be packed in fiberboard or plastic trays in single layer rows with not more than 500 primers in any inner packaging. Primers not fitted with anvil, composition covered, may have not more than 5,000 primers in any inner packaging. Package:

A5.93.2. In inner fiberboard, metal, plastic, or wood boxes, or metal cans. Pack inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel with inner liner or coating (4A2) box.
A5.93.3. In inner sleeved fiberboard or sleeved plastic tray, then packed in an intermediate fiberboard box. Pack this configuration in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel with inner liner or coating (4A2) box.

A5.94. Primers, Tubular. Package in inner fiberboard, metal, or wood boxes, fiberboard tubes, or plastic trays. Pack inner packagings in an outer ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel (4A1) box.

A5.95. Projectiles. Inner packagings are not necessary. Pack items in one of the following outer packagings:
A5.95.1. Ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel (4A1) box.
A5.95.2. Removable head steel drum (1A2).
A5.95.3. Large articles without their means of initiation, or with their means of initiation containing at least two effective protective features, may be carried unpacked if secured to pallets or securely blocked and braced. This packaging is not authorized for UN0434 and UN0435.

A5.96. Propellent Explosive, Liquid or Solid:
A5.96.1. Ship propellent explosive liquid according to a competent authority approval (CAA). See 1.6.4 for more information on CAAs.
A5.96.2. Package propellent explosive solid in inner kraft paper, plastic, textile, or rubberized textile bags. Seal all inner packagings. Pack inner packagings in one of the following outer packagings:
A5.96.2.1. Fiberboard (4G), ordinary wood (4C1), sift-proof wood (4C2), plywood (4D), or reconstituted wood (4F) box.
A5.96.2.2. Removable head wood barrel (2C2), plywood (1D) or fiber (1G) drum.
A5.96.2.3. In inner fiberboard, metal, or plastic receptacles. Pack inner packagings in an outer fiberboard (4G), ordinary wood (4C1), sift-proof wood (4C2), plywood (4D), or reconstituted wood (4F) box. Metal receptacles must be constructed so that the risk of explosion caused by increased internal pressure (from internal or external causes) is reduced.
A5.96.2.4. In outer removable head steel (1A2), fiber (1G), or plywood (1D) drums; steel (3A1) or removable head steel (3A2) jerricans. Inner packagings are not necessary. The inside of drums and jerricans must be galvanized, painted, or otherwise protected. Bare steel must not come into contact with the smokeless powder. They must be constructed without pockets or crevices that could trap or nip the smokeless powder. Metal receptacles must be constructed so that the risk of explosion caused by increased internal pressure (from internal or external causes) is reduced.

A5.97. Release Devices, Explosive and Rivets Explosive. Package in inner fiberboard, metal (for rivets, explosive only), plastic, or wood receptacles. Pack the inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel with inner liner or coating (4A2) box.

A5.98. Rocket Motors, Solid Fueled. Package in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box. Inner packagings are not necessary. Igniters or igniter components may be shipped in the same outside container with the rocket motor, if separately packaged according to A5.70 or A5.71. For a rocket motor to be considered nonpropulsive in transportation, it must be capable of unrestrained burning and must not move appreciably in any direction when ignited.

A5.99. Rocket Motors, Liquid Fueled and Rockets, Liquid Fueled. Ship these items according to a competent authority approval (CAA). See 1.6.4 for more information on CAAs. Handling instructions and shipping requirements of A5.100 must be followed.

A5.100. Rocket Motors with Hypergolic Liquids:
A5.100.1. **Packaging Requirements.** Package in an outer ordinary wood (4C1), plywood (4D), reconstituted wood (4F), solid plastic (4H2), or steel (4A1) box. Inner packagings are not necessary. The solid plastic packaging must be reinforced with metal at the corners and edge. Large articles without their means of ignition may be carried unpackaged if securely fastened to pallets or securely blocked and braced. For a rocket motor to be considered nonpropulsive in transportation, it must be capable of unrestrained burning and must not move appreciably in any direction when ignited.

A5.100.2. **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.

A5.100.3. **Shipping Requirements.** The following requirements must be met:

- 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.
- 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:
  - Protective clothing, gloves, and a positive pressure breathing apparatus for all personnel aboard the aircraft.
  - Fume-detecting equipment.
  - A qualified technical escort or courier with equipment to monitor the item for leaks and is prepared to take emergency inflight action.

A5.100.3.1. When a leak is detected, either by observation of the indicator or by monitoring equipment:

- Get personnel out of the cargo compartment.
- Alert pilot and crew.
- Depressurize cargo compartment and ventilate as soon as possible.
- All personnel should go on 100 percent oxygen.
- Declare an in-flight emergency.
- Be prepared to jettison cargo if possible.
- Descend and land as soon as possible.
- Aircraft must be parked in an isolated area.
- Aircraft must be unloaded by EOD personnel as soon as possible.

A5.101. Rockets, Line-Throwing. Package in inner fiberboard or metal receptacles. Pack the inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box, or fiber drum (1G).

A5.102. Rockets. Package in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel (4A1) box. Inner packagings are not necessary.

A5.103. Samples, Explosive. Give explosive samples a tentative classification for shipment according to the procedures established in TB 700-2/NAVSEAINST 8020.3/TO 11A-1-47/DLAR 8220.1, *DoD Explosive Hazard Classification Procedures*. Package according to the applicable paragraph as identified by the tentative classification. Cite this paragraph and the applicable packaging paragraph on the Shipper's Declaration.

A5.104. Signal Devices, Hand; Signals, Distress; and Signals, Smoke. Package:

A5.104.1. In inner fiberboard boxes, then pack in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel (4A1) box. Outer boxes of natural wood may be provided with a tin-plate liner having a sealed lid.

A5.104.2. In inner metal or plastic receptacles, or kraft paper sheets, then pack in an outer fiber drum (1G).

A5.105. Signals, Railway Track, Explosive. Package in inner metal, plastic, wood, or fiberboard receptacles. Pack the inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel (4A1) box, or fiber drum (1G). Separate the signals to prevent contact with one another and kept away from the interior walls of the outer container using adequate cushioning material. When signals are housed in magazines for fitting into automatic units, the magazine may replace the inner packaging provided adequate cushioning material is used. If tin-plate inner packagings are used, they must be sealed.

A5.106. Sodium Dinitro-O-Cresolate and Sodium Picramate. Pack water-soluble substances in waterproof receptacles. All packages must be lead-free. Package:
A5.106.1. In inner metal, paper, or plastic receptacles. Pack the inner packagings in an outer removable head wood barrel (2C2).
A5.106.2. In inner plastic sheets, then pack in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box or fiber (1G) drum.

A5.107. Sodium Salts of Aromatic Nitro-Derivatives NOS. Package in inner fiberboard boxes, metal cans, waterproof paper or plastic receptacles. Pack inner packagings in an outer sift-proof wood (4C2), plywood (4D), or reconstituted wood (4F) box. Packages must be lead-free. Plastic used must not be liable to generate static electricity by contained substances.

A5.108. Sounding Devices, Explosive. Individually wrap in inner corrugated fiberboard sheets or inserted in fiberboard tubes, then pack in an intermediate fiberboard, metal, or plastic receptacle. Pack this configuration in an outer ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel (4A1) box.

A5.109. Substances, Explosive, NOS and Substances, Explosive, Very Insensitive, NOS. Ship according to a competent authority approval (CAA). See 1.6.4 for more information on CAAs.

A5.110. Tetranitroaniline; Trinitroaniline or Picramide; Trinitroanisole; Trinitrobenzene; Trinitrobenzenesulphonic Acid; Trinitrochlorobenzene or Picryl Chloride; Trinitro-M-Cresol; Trinitrofluorenone; Trinitronaphthalene; Trinitrophenetole; Trinitrophenol or Picric Acid; Trinitroresorcinol or Styphnic Acid; Trinitrotoluene (TNT) and Trinitrobenzene Mixtures or Trinitrotoluene (TNT) and Hexanitrostilbene Mixtures; Trinitrotoluene (TNT) Mixtures Containing Trinitrobenzene and Hexanitrostilbene; and Tritonal. Pack water-soluble substances in waterproof receptacles. All packages must be lead-free. Package:
A5.110.1. In inner metal, paper, or plastic receptacles. Pack the inner packagings in an outer removable head wood barrel (2C2).
A5.110.2. In inner plastic sheets, then pack in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box or fiber (1G) drum.
A5.110.3. In inner plastic sheets, then pack in an outer removable head plastic drum (1H2). This packaging is only authorized for UN 0219.

A5.111. Tetrazol-1-Acetic Acid. Package in inner plastic bags, then pack in an outer fiber drum (1G).

A5.112. Torpedoes and Torpedoes, Liquid Fueled. Package in an outer ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel (4A1) box. Inner packagings are not necessary.

A5.113. Tracers for Ammunition. Package in inner plastic bags, fiberboard boxes, or fiberboard, plastic, or metal tubes. Pack the inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F), steel (4A1), or steel with inner liner or coating (4A2) box. Dividing partitions may be used in the outer packaging in place of inner packagings.

A5.114. Trinitrobenzoic Acid; Trinitrophenylmethylnitramine or Tetryl. Package:
A5.114.1. In inner waxed paper, plastic, or rubberized textile bags. Pack inner packagings in an outer removable head wood barrel (2C2).
A5.114.2. In inner waxed paper, plastic, textile, or rubberized textile sheets. Pack inner packagings in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), reconstituted wood (4F) box, or fiber drum (1G).

A5.115. Trinitroresorcinol, Wetted or Styphnic Acid, Wetted. Package:
A5.115.1. In inner rubber, rubberized textile, or plastic bags. Pack inner packagings in an outer fiberboard box (4G).
A5.115.2. In inner rubber, rubberized textile, or plastic bags, then packed in intermediate rubber, rubberized textile, or plastic bags. Pack this configuration in an outer removable head steel drum (1A2) with coating other than lead.

A5.116. Trinitrotoluene (TNT). Package:
A5.116.1. In inner plastic bags, then pack in an outer removable head wood barrel (2C2).

A5.116.2. In inner plastic sheets, then pack in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box.
A5.116.3. In inner metal, paper, or plastic receptacles. Pack the inner packagings in an outer fiber drum (1G) or plastic sift-proof bag (5H2). Plastic sift-proof bags may only be used for flake or prilled TNT in the dry state. The maximum net mass per bag must not exceed 30 kg (66 pounds).

A5.117. Urea Nitrate. Pack water-soluble substances in waterproof receptacles. All packages must be lead-free. Package:
A5.117.1. In inner metal, paper, or plastic receptacles. Pack inner packagings in an outer removable head wood barrel (2C2).
A5.117.2. In inner plastic sheets, then packed in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box or fiber (1G) drum.

A5.118. Warheads, Rocket and Warheads, Torpedo. Inner packagings are not necessary. Pack in one of the following outer packagings:
A5.118.1. Ordinary wood (4C1), plywood (4D), reconstituted wood (4F), or steel (4A1) box.
A5.118.2. Removable head steel drum (1A2).
A5.118.3. Large articles without their means of initiation, or with their means of initiation containing at least two effective protective features, may be carried unpacked if secured to pallets or securely blocked and braced.

A5.119. Zirconium Picramate. Pack water-soluble substances in waterproof receptacles. All packages must be lead-free. Package:
A5.119.1. In inner metal, paper, or plastic receptacles. Pack the inner packagings in an outer removable head wood barrel (2C2).
A5.119.2. In inner plastic sheets, then pack in an outer fiberboard (4G), ordinary wood (4C1), plywood (4D), or reconstituted wood (4F) box or fiber (1G) drum.

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, nonpoisonous compressed gas), and Class 2.3 (poisonous gas).

A6.2. General Handling Instructions for Compressed Gases:

- Store compressed gases in a cool, ventilated area away from fire hazards, sources of heat, ignition, or sparks.
- 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.
- 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.

A6.3. Compressed Gases Limited Quantities:

A6.3.1. Package aerosol products:

A6.3.1.1. 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 containing a non-toxic substance not exceeding 1 L (34 fluid-ounces) provided all of the following conditions are met:

- Pressure in the aerosol container must not exceed 1245 kPa at 55 degrees C (180 psig at 130 degrees F). 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), a DOT 2P, IP7, IP7A, or IP7B inner metal receptacle must be used. 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), a DOT 2Q, IP7A, or IP7B inner metal receptacle must be used.
- Inner receptacles 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).
- Liquid content of the material and the gas must not completely fill the receptacle at 55 degrees C (130 degrees F).
- 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.
- The valves must be protected by a cap or other suitable means.
- 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 (POP marked) packaging is not required.
- The complete package must not exceed 30 kg (66 lbs) gross weight.

A6.3.1.2. 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:

- Pressure in the aerosol container must not exceed 1500 kPa at 55 degrees C (217 psig at 130 degrees F). 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), a DOT 2P, IP7, IP7A, or IP7B inner metal receptacle must be used. 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), a DOT 2Q, IP7A, or IP7B inner metal receptacle must be used. 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) an IP7B inner metal receptacle must be used.
- Inner receptacles 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).
- Liquid content of the material and the gas must not completely fill the receptacle at 55 degrees C (130 degrees F).
- 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.
- The valves must be protected by a cap or other suitable means.
- Tightly pack aerosol containers in an outer fiberboard (4G), wooden (4C1, 4C2), plywood (4D), reconstituted (4F), or plastic (4H1, 4H2) box. The outer container must meet the PG II requirements.

A6.3.1.3. In inner nonrefillable metal receptacles charged with 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 provided all of the following conditions are met:

A6.3.1.3.1. The capacity of each inner receptacle must not exceed 575 mL (20 fluid ounces).
A6.3.1.3.2. Pressure in the receptacle must not exceed 970 kPa at 55 degrees C (140 psig at 130 degrees F).
A6.3.1.3.3. The liquid content of the product and gas must not completely fill the receptacle at 55 degrees C (130 degrees F).
A6.3.1.3.4. 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.
A6.3.1.3.5. The valves must be protected by a cap or other suitable means.
A6.3.1.3.6. 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 (POP marked) packaging is not required.
A6.3.1.3.7. The complete package must not exceed 30 kg (66 lbs) gross weight.
A6.3.1.4. In inner non-refillable metal receptacles containing a biological product or medical preparation that could be deteriorated by heat and is nonflammable provided all of the following conditions are met:

- The requirements of A6.3.1.3.1 through A6.3.1.3.5 apply.
- Tightly pack aerosol containers in an outer fiberboard (4G), wooden (4C1, 4C2), plywood (4D), reconstituted (4F), or plastic (4H1, 4H2) box. The outer container must meet the PG II requirements.

A6.3.2. Package limited quantities of compressed gases, **other than aerosols**, as identified in this paragraph. Unless otherwise specified, specification (UN POP marked) packaging is not required. Each package must not exceed 30 kg (66 lbs) gross weight.
A6.3.2.1. 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 a strong outer packaging.
A6.3.2.2. 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:

- 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).
- 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).

A6.3.2.3. 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) in strong outside containers.
A6.3.2.4. 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 nonrefillable 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).
A6.3.2.5. 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 except each:

- 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.
- Cylinder must comply with the filling requirements of A3.2.2.5.
- Actuating cartridge must be approved according to 49 CFR 173.86 and meet the definition of an actuating cartridge, explosive, fire extinguisher, or valve.

A6.3.2.6. A cylinder that is part of a tire inflate system in a motor vehicle, charged with a nonliquefied, nonflammable compressed gas, and is excepted from the requirements of this manual except:

- 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.
- Cylinder must comply with the filling requirements of A3.2.2.5.
- Each cylinder must be securely installed in the trunk of the motor vehicle, and the valve must be protected against accidental discharge.

A6.3.2.7. In fire extinguishers charged with a limited quantity of compressed gas of not more than 1655 kPa at 21 degrees C (240 psig at 70 degrees F). These fire extinguishers are excepted from specification requirements provided:

A6.3.2.7.1. They are shipped as inside containers.
A6.3.2.7.2. The contents are not flammable, poisonous, or corrosive.
A6.3.2.7.3. Internal volume is not over 18 L (1,100 cubic inches). For fire extinguishers not over a 570.7 mL (35 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 570.7 mL (35 cubic inches) may not contain liquefied compressed gas.
A6.3.2.7.4. 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).
A6.3.2.7.5. Fire extinguishers are tested to three times the charged pressure at 21 degrees C (70 degrees F), but not less than 827 kPa (120 psig) without failure before the initial shipment. For any subsequent shipments, they must meet retest requirements of 29 CFR 1910.157(e).
A6.3.2.7.6. When DOT 2P or 2Q containers are used, A6.3.2.7.4 and A6.3.2.7.5 do not apply.
A6.3.2.8. Compressed gasses in the following materials are not regulated:

- Inflated tires, when inflated to a pressure not greater than its rated inflation pressure.
- Inflated balls used for sports.
- Carbonated beverages.
- Refrigerating machines, including dehumidifiers, air conditioners, and components thereof such as precharged tubing containing 12 kg (25 pounds) or less of nonflammable liquefied gas.

A6.4. Acetylene Gas. Ship in DOT 8 or 8AL cylinders.

- Fill the cylinders with a porous material charged with a suitable solvent as identified in 49 CFR, paragraph 178.59 or 178.60.
- 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.
- 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 that pressure must not be exceeded.

A6.5. Liquefied Compressed Gases. See figure A6.1. Package liquefied compressed gases:

Ammonia Solutions, containing more than 44 percent ammonia
Ammonia, Anhydrous
Borontrichloride
Bromide Chloride
Bromotrifluoroethylene
Bromotrifluoromethane(R-13B1 or H-1301)
Butadiene, Inhibited
Carbon Dioxide, Liquefied
Carbon Dioxide, Nitrous Oxide Mixture
Carbon Dioxide-Oxygen Mixture
Chlorine
Compressed Gases, NOS
Cyclopropane Dichlorodifluoromethane (R-12)
Dichlorodifluoromethane and Difluoroethane Mixture (constant boiling mixture)(R-500)
Dichlorodifluoromethane (R-12)-Dichlorotetrafluoroethane (R-114) Mixture
Dichlorodifluoromethane (R-12)-Chlorodifluoromethane (R-22) Mixture
Dichlorodifluoromethane (R-12)-Trichlorofluoromethane (R-11) Mixture
Dichlorodifluoromethane (R-12)-Trichlorofluoromethane (R-11) Chlorodifluoromethane (R-22) Mixture
Dichlorodifluoromethane (R-12)-Trichlorotrifluoroethane (R-113) Mixture
Difluoroethane (R-152a)

Figure A6.1. Liquefied Compressed Gases Continued.

Dimethyl Ether
Dimethylamine, Anhydrous
Engine Starting Fluid

Ethane or Ethane, Compressed
Ethylene or Ethylene, Compressed
Fertilizer Ammoniating Solution containing free Ammonia (more than 25.3 psig (174.4 kPa))
Hexafluoropropylene
Hydrocarbon Gas, Liquefied
Hydrogen Bromide
Hydrogen Chloride or Hydrogen Chloride, Anhydrous
Hydrogen Sulfide
Insecticide, Liquefied Gas (containing no poisonous material)
Isobutane or Isobutane Mixtures
Liquefied Hydrocarbon Gas
Liquefied Nonflammable Gas, charged with Nitrogen, Carbon Dioxide, or Air
Methyl Acetylene-Propadiene, Stabilized
Methylamine, Anhydrous
Methyl Chloride
Methyl Chloride-Methylene Chloride Mixture
Methyl Mercaptan
Nitrosyl Chloride
Nitrous Oxide or Nitrous Oxide, Compressed
Refrigerant Gases, NOS
Sulfur Dioxide
Sulfur Hexafluoride
Sulfuryl Fluoride
Tetrafluoroethylene, Inhibited
Trifluorochloroethylene
Trimethylamine, Anhydrous
Vinyl Chloride
Vinyl Fluoride, Inhibited
Vinyl Methyl Ether, Inhibited

Figure A6.1. Liquefied Compressed Gases.

A6.5.1. Ship compressed gases identified in figure A6.1 in accordance with the filling, pressure, and container requirements of table A6.1. Where charging requirements are not specifically prescribed, liquefied gases (except gas in solution) must comply with A3.2.2.5 and shipped in specification containers as follows: DOT 3, 3A, 3AA, 3B, 3BN, 3D, 3E, 4, 4A, 4B, 4BA, 4BW, 4B 240ET, 4E, 9, 25, 26, 38, 39, 40, and 41. DOT 4E, 9, 39, 40, or 41 containers must not be charged and shipped with a mixture containing a pyroforic liquid, carbon bisulfide (disulfide), ethyl chloride, ethylene oxide, nickel carbonyl, spirits of nitroglycerin, or poisonous 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. A nonpoisonous and nonflammable mixture (including insecticides) that contains a compressed gas must be shipped according to this paragraph.

A6.5.2. DOT 3AL cylinders are authorized for carbonyl sulfide, cyclobutane, dimethyl ether, hydrogen selenide, propylene, silane, and vinyl bromide. Shipments are authorized on cargo aircraft only.

A6.5.3. DOT 3AL cylinders may be used for nitrous oxide as long as the following conditions are complied with:

- The cylinder must only be equipped with brass or stainless steel valve.
- 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. Ship a mixture containing any Class 2.3 material or irritating material, in such proportion that the mixture would be classed as poisonous, in containers authorized in attachment 10.

A6.5.5 Ship refrigerant gases that are nonpoisonous and nonflammable under this attachment in cylinders as 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. Ship engine-starting fluids containing compressed gas (or gases) that are flammable in cylinders as 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 should not be over 966 kPa at 55 degrees C (140 psia at 130 degrees F).

- If the pressure is over 966 kPa at 55 degrees C (140 psia at 130 degrees F), a DOT 2P container must be used.
- 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.
- 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.

A6.5.6.2. Pack inside nonrefillable metal containers in a strong tight outside packaging.

A6.6. Fluorine Gas. Use DOT 3A1000, 3AA1000, or 3BN400 cylinders equipped with valve protection caps. Safety relief devices are prohibited on cylinders containing fluorine. Cylinders must not be charged to over 2758 kPa at 21 degrees C (400 psig at 70 degrees F) and must not contain over 2.7 kg (6 pounds) of gas.

A6.7. Nonliquefied Compressed Gases. See figure A6.2. Package nonliquified compressed gases as follows:

Air, Compressed
Argon
Boron Trifluoride
Carbon Monoxide
Compressed Gases NOS
Deuterium Helium
Helium Oxygen Mixture
Hydrocarbon Gas, Nonliquified
Krypton, Compressed
Hydrogen
Neon Gas
Nitrogen
Nonliquefied Hydrocarbon Gas
Oxygen
Silicon Tetrafluoride

Figure A6.2. Nonliquefied Compressed Gases.

A6.7.1. Ship nonliquefied, compressed gases identified in figure A6.2 in accordance with the filling, pressure, and container requirements of table A6.1. Where charging requirements are not specifically prescribed in table A6.1, nonliquefied gases must comply with A3.2.2.5 and shipped in specification cylinders 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, 3D, 4, 4A, 25, 26, and 38 is authorized, but new construction of these cylinders is not authorized.
A6.7.2. Cylinders DOT-3HT, 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. Package cylinders in strong outside containers.
A6.7.3. 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 exterior wooden containers (MIL-P-14232).
A6.7.4. 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.
A6.7.5. 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.
A6.7.6. Ship LAU-7/A launcher-receiver assemblies charged with nitrogen not over 1724 kPa (250 psig).

A6.7.7. 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.

A6.7.8. Use cylinder, DOT 39. For flammable gases, the internal volume must not exceed 1.2 L (75 cubic inches). Aluminum cylinders are authorized for oxygen only under the following conditions:

- Cylinder threads must be straight threads.
- Valves must be made of brass or stainless steel.
- Each cylinder must be cleaned to comply with the requirements of Federal Specification RR-C-901c, paragraphs 3.7.2, 3.8.2, and 4.4.2.5.

A6.7.9. Use cylinder, DOT 3AL only for the following nonliquefied gases: air, argon, carbon monoxide, diborane, ethylene, helium, mercury free hydrogen, krypton, methane, nitrogen, neon, oxygen, and xenon. Flammable gases in 3AL cylinders are authorized for transportation on cargo aircraft only. When used in oxygen service, the cylinders must comply with 49 CFR 173.302(a)(5).

A6.7.10. Ship DSCS III Satellites charged with nitrogen. The system must consist of two DOT 3AU cylinders, each containing 5.664 cubic meters (200 cubic feet) of nitrogen. The nitrogen must be vented into the DSCS III Satellite sensor at a rate not to exceed 0.05664 (2 cubic feet) per hour during transport. The nitrogen will flow through 6.35 mm (one quarter inch) inside diameter rubber tubing. The system must be equipped with a safety valve, enabling the nitrogen flow to be shut off in the event of a problem. DSCS III Satellite may only be transported on C-5 or C-141 aircraft. No more than two satellites may be transported on any single aircraft.

Table A6.1. Packaging Restrictions for Liquefied Compressed Gases.

Name of Gas	Maximum Permitted Filling Density in Percent (See A3.2.2.5)	Containers
Anhydrous ammonia	54	DOT-4, DOT-3A480, DOT-3AA480, DOT-3A480X, DOT-4A480, DOT-4AA480, DOT-3, DOT-3E1800, DOT-3AL480
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

Table A6.1. Continued

Name of Gas	**Maximum Permitted Filling Density in Percent (See A3.2.2.5)**	**Containers**
Carbon dioxide (see notes 3 and 4)	68	DOT-3A1800, DOT-3AX1800, DOT-3AA1800, DOT-3AAX1800, DOT-3, DOT-3E1800, DOT-3HT2000, DOT-39, DOT-3AL1800
Chlorine (see note 1)	125	DOT-3A480, DOT-3AA480, DOT-3E1800, DOT-25, DOT-3, DOT-3BN480
Chlorodifluroethane (R142b) or 1-Chloro-1,1-Difluoroethane (see note 4)	100	DOT-3A150, DOT-3AA150, DOT-3AL150, DOT-3B150, DOT-4B150, DOT-3E1800, DOT-4BA225, DOT-4BW225, DOT-39
Chlorodifluoromethane (R22) (see note 4)	105	DOT-3A240, DOT-3AA240, DOT-4B240, DOT-4BA240, DOT-4BW240, DOT-4EZ240, DOT-3B240, DOT-4B240ET, DOT-39, DOT-41, DOT-3E1800, DOT-ALA240
Chloropentafluorethane (R-115)	110	DOT-3A225, DOT-3AA225, DOT-3B225 DOT-4A225, DOT-4B225, DOT-4BA225, DOT-4BW225, DOT-3E1800, DOT-39 DOT-3AL225

Table A6.1. Continued.

Name of Gas	Maximum Permitted Filling Density in Percent (See A3.2.2.5)	Containers
Chlorotrifluoromethane (R-13) (see note 4)	100	DOT-3A1800, DOT-3AA1800, DOT-3, DOT 3E1800 DOT-39 DOT-3AL1800
Cyclopropane (see notes 4 and 5)	55	DOT-3A225, DOT-3A480X, DOT-3AA225, DOT-3B225, DOT-4A225, DOT-4AA480, DOT-4B225, DOT-4BA225, DOT-4BW225, DOT-4B240ET, DOT-3, DOT-3E1800, DOT-39, DOT-3AL225
Dichlorodifluoromethane (see note 4)	119	DOT-3A225, DOT-3AA225, DOT-3B225, DOT-4A225, DOT-4B225, DOT-4BA225, DOT-4BW225, DOT-4B240ET, DOT-4E225, DOT-9, DOT-39, DOT-41, DOT-3E1800, DOT-3AL225
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

Table A6.1. Continued.

Name of Gas	**Maximum Permitted Filling Density in Percent (See A3.2.2.5)**	**Containers**
Difluoroethane (R-152a) (see note 4)	79	DOT-3A150, DOT-3AA150, DOT-3B150, DOT-4B150, DOT-4BA225, DOT-4BW225, DOT-3E1800, DOT-3AL150
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, ICC-3E1800, DOT-4BW225
Ethane (see notes 4 and 5)	35.8	DOT-3A1800, DOT-3AA1800, DOT-3 DOT 3E1800, DOT-3AX1800, DOT-39, DOT-AL1800 DOT-3AAX1800 DOT-3T1800
Ethane (see notes 4 and 5)	36.8	DOT-3A2000, DOT-39, DOT-3AX2000, DOT-3AA2000, DOT-3T2000 DOT-3AL2000 DOT-3AAX2000
Ethylene (see notes 4 and 5)	31.0	DOT-3A1800, DOT -3AA1800, DOT -3 DOT-3E1800, DOT-39, DOT-3T1800 DOT-3AAX1800, DOT-3AL1800, DOT-3AX1800

Table A6.1. Continued.

Name of Gas	Maximum Permitted Filling Density in Percent (See A3.2.2.5)	Containers
Ethylene (see notes 4 and 5)	32.5	DOT-3A2000, DOT-3AA200, DOT-39, DOT-3T2000 DOT-3AAX2000, DOT-3AX2000, DOT-3AL2000
Ethylene (see notes 4 and 5)	35.5	DOT-3A2400,, DOT-3AA2400, DOT-39, DOT-3AX2400, DOT-3AAX2400, DOT-3T2400 DOT-3AL2400
Hydrogen chloride	65	DOT-3A1800, DOT-3AA1800, DOT-3AX1800, DOT-3, DOT-3E1800, DOT-3AAX1800, DOT-3T1800
Hydrogen sulfide (see note 6)	62.5	DOT-3A480, DOT -3AA480, DOT-3B480, DOT-4A480. DOT-4B480, DOT-4BA480, DOT-26-480 DOT-3E1800, DOT-4BW480 DOT-3AL480
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-4B300, DOT-4BA300, DOT-4BW300, DOT-9, DOT-40, DOT-41, DOT-3E1800

Table A6.1. Continued.

Name of Gas	Maximum Permitted Filling Density in Percent (See A3.2.2.5)	Containers

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-3, DOT-3A, DOT-3AA, DOT-3B, DOT-3D, DOT-3BN, DOT-3E, DOT-3HT, DOT-4, DOT-4A, DOT-4B, DOT-4BA, DOT-4DA, DOT-4D DOT-4DS, DOT-9, DOT-26, DOT-38 DOT-39, DOT-40, DOT-41, DOT-4B240ET, DOT-4BW, DOT-4E, DOT-25
Methylacetylene-propadiene stabilized (see note 2)	Not liquid full at 54 degrees C (130 degrees F)	DOT-3A240, DOT-3AA240 DOT-3B240, DOT-4BA240, without brazed seams; DOT-4B240, without brazed seams; DOT-4B240ET, DOT-3E1800, DOT-4BW240, DOT-41, DOT-4E240, DOT-4, DOT-3AL240
Methyl chloride	84	DOT-3A225 DOT-3B225 DOT-3AA225 DOT-4A225 DOT-4B225, DOT-4BA225, DOT-4BW225, DOT-3, DOT-4, DOT-4B240ET, DOT-25, DOT-26-300, DOT-38, DOT-3E1800, Cylinders complying with 3A150, 3B150, 4A150, and 4B150 manufactured before 7 December 1936 are also authorized.

Table A6.1. Continued.

Name of Gas	Maximum Permitted Filling Density in Percent (See A3.2.2.5)	Containers

Methyl mercaptan	80	DOT-3A240, DOT-3AA240, DOT-3E1800, DOT-3B240, DOT-4B240 DOT-4BA204, DOT-4B240ET, DOT-4BW240
Monomethylamine, anhydrous	60	DOT-3A150, DOT-3AA150, DOT-3B150, DOT-4B150, DOT-4BA225, DOT-3E1800, DOT-4BW225
Nitrosyl, Chloride	110	DOT-3BN400 only
Nitrous Oxide (see notes 3, 4, and 7)	68	DOT-3A1800, DOT-3AA1800, DOT-3, DOT-3E1800, DOT-3AAX1800, DOT-3T1800, DOT-3AL1800, DOT-3HT2000, DOT-3AX1800, 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-4BW240, DOT-3AA240, DOT-4E240, DOT-3b240, DOT-9, DOT-3E1800, DOT-39 DOT-4A240, DOT-3AL240, DOT-4B240, DOT-4BA240

Table A6.1. Continued.

Name of Gas	**Maximum Permitted Filling Density in Percent (See A3.2.2.5)**	**Containers**

Sulfur dioxide	125	DOT-3A225, DOT-3AA225, DOT-3E1800, DOT-3B225, DOT-4B225, DOT-4BW225, DOT-4B240ET, DOT-4, DOT-25, DOT-26-150, DOT-39, DOT-3AL225, DOT-4A225 DOT-4BA225, DOT-3, DOT-38
Sulfur hexafluoride	120	DOT-3A1000, DOT- 3AA1000, DOT-3, DOT-3E1800 DOT-3AL1000, DOT-3AAX2400, DOT-3T1800
Sulfuryl fluoride	106	DOT-3A480, DOT-3AA480, DOT3E1800, DOT-4B480 DOT-4BA480 DOT-4BW480
Tetrafluoroethylene, inhibited	90	DOT-3AA1200, DOT-3A1200, DOT-3E1800
Trifluorochloro ethylene	115	DOT-3A300, DOT-3AA300, DOT-3E1800, DOT-3B300, DOT-4A300, DOT-4B300, DOT-4BA300 DOT-4BW300
Trimethylamine, anhydrous	57	DOT-3A150, DOT-3AA150, DOT-3B150 DOT-4AB150 DOT-4BA225, DOT-3E1800 DOT-4BW225

Table A6.1. Continued.

Name of Gas	Maximum Permitted Filling Density in Percent (See A3.2.2.5)	Containers
Vinyl chloride (see note 2)	84	DOT-4B150, without brazed seams; DOT-4BA225, without brazed seams; DOT-3A150 DOT- 3AA150, DOT-25 DOT-3E1800, DOT-4BW225 DOT-3AL150
Vinyl fluoride, inhibited	62	DOT-3A1800, DOT-3AA1800 DOT-3E1800 DOT-3AL1800
Vinyl methyl ether (see note 2)	68	DOT-4B150, without brazed seams; DOT-4BA225, without brazed seams; DOT-3A150, DOT-3AA150 DOT-3B150, DOT-25 DOT 3E1800 DOT-4BW225

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. These cylinders are only authorized for nonflammable gases. Cylinders must be shipped in strong outside containers.
4. DOT-2P, 2Q, 3E, 3HT, 4BA spherical type, 4D, 4DA, 9, 39, 40, 41, and 4DS spheres and cylinders must be shipped 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. Each valve outlet must be sealed by a threaded cap or a threaded solid plug.
7. DOT-3AL cylinders must be 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.

A6.8. Liquefied Petroleum Gas. See figure A6.3. Package liquefied petroleum gas:

Butane	Isobutylene
Propane	Butylene
Propylene	Isobutane

Figure A6.3. Liquefied Petroleum Gas.

A6.8.1. Use cylinders, DOT 3, 3A, 3AA, 3AL, 3B, 3E, 4, 4A, 4B, 4BA, 4BW, 4B240FLW, 4B240ET, 4B240X, 4E, 9, 25, 26, 38, 39, or 41. The internal volume of DOT 39 cylinders must not be over 1.2 L (75 cubic inches). Use of existing cylinders, DOT 3, 4, 4A, 4B240X, 9, 25, 26, 38, and 40 is authorized, but new construction of these cylinders is not authorized.

A6.8.2. 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, for transporting liquefied petroleum gases.

A6.8.3. Use cylinders, DOT 3C or 4C, for liquefied petroleum gas when the capacity of cylinders is not over 60.5 L (3,881 cubic inches, 16 gallons) with 5 percent tolerance. The liquefied petroleum gas must not exceed a gas pressure over 1000 kPa (145 psig) at 55 degrees C (130 degrees F). The requirements of table A6.1 must be met for the gases named.

A6.8.4. 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 186 kPa (27 psig) at 21 degrees C (70 degrees F) and 579 kPa (84 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.

NOTE: Any filling density prescribed in table A6.2 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 A3.2.2.5.7).

Table A6.2. 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
0.271-0.289	26
0.290-0.306	27
0.307-0.322	28
0.323-0.338	29
0.339-0.354	30
0.355-0.371	31
0.372-0.398	32
0.399-0.425	33
0.426-0.440	34
0.441-0.452	35
0.453-0.462	36
0.463-0.472	37
0.473-0.480	38
0.481-0.488	39
0.489-0.495	40
0.496-0.503	41
0.504-0.510	42
0.511-0.519	43
0.520-0.527	44
0.528-0.536	45
0.537-0.544	46
0.545-0.552	47
0.553-0.560	48
0.561-0.568	49
0.569-0.576	50
0.577-0.584	51
0.585-0.592	52
0.593-0.600	53
0.601-0.608	54
0.609-0.617	55
0.618-0.626	56
0.627-0.634	57

A6.9. Fire Extinguishers:

A6.9.1. Securely fasten authorized fire extinguishers shipped as installed components of equipment in the holder provided on the equipment and protect from possible accidental damage. If these fire extinguishers are not fastened in a holder designed for them, they must be boxed as described and securely fastened within the equipment to prevent accidental tipping or loosening.

A6.9.2. Pack charged aircraft fire extinguishers, DOT 3HT, 4D, 4DA, and 4DS, in strong outside wood or fiberboard box.

A6.9.3. Transport extinguisher (FEU-1/M) 10 gallon (37.8 L) capacity on military aircraft without special packing and crating. Caution must be used during handling and transportation to avoid damage to valves.

A6.9.4. Fire extinguisher, DOT 4BW240, on a cart does not require additional packaging.

A6.10. Refrigerating Machines, Air Conditioners, Hydraulic Accumulators, and Pneumatic Accumulators:

A6.10.1. **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 A6.3.2.8 for small quantities):

- Each pressure vessel is charged to not more than 2268 kg (5,000 pounds) of group 1 refrigerant, or 22.7 kg (50 pounds) of other refrigerant according to American National Standard B9.1.

- Machines containing two or more charged vessels may not contain any more than 907 kg (2,000 pounds) of group 1 refrigerant, or 45.4 kg (100 pounds) of other refrigerant per vessel.
- Each pressure vessel is equipped with a safety relief device meeting the requirements of American National Standard B9.1.
- Each pressure vessel is equipped with an individual shut-off valve at each opening except openings used for safety devices or other connections. Shut-off valves must be closed during transportation.
- Pressure vessels are manufactured, inspected, and tested according to American National Standard B9.1, or when over 152.4 mm (6 inches) internal diameter, according to American Society of Mechanical Engineers (ASME) Code.
- All parts subject to refrigerant pressure during shipment are tested under American National Standard B9.1.
- The liquid portion of refrigerant, if any, does not completely fill any pressure vessel at 55 degrees C (130 degrees F).
- Filling densities prescribed in A3.2.2.5 are not exceeded.

A6.10.2. **Hydraulic Accumulators.** The following apply to hydraulic accumulators containing nonliquefied, nonflammable gas, and nonflammable liquids fabricated from materials that do not fragment upon rupture:

A6.10.2.1. 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. Certification is not required.

A6.10.2.2. When charged to not more than 1379 kPa (200 psig) at 21 degrees C (70 degrees F), the following conditions apply:

- Ship each accumulator as an inside package.
- Each accumulator may not have a gas space over 40.7 L (2,500 cubic inches) under stored pressure.
- 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.

A6.10.2.3. With a charging pressure over 1379 kPa (200 psig) at 21 degrees C (70 degrees F) the following conditions apply:

- Each accumulator must be in compliance with the requirements stated in A6.10.2.2.
- Each accumulator must be designed and fabricated with a burst pressure of not less than five times its charged pressure when shipped.

A6.11. Cigarette Lighters or Other Similar Devices Charged With Fuel:

A6.11.1. The offering for transportation of 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 is forbidden, unless the design of the device and its packaging has been approved according to 2.4 or by the DOT. Ship a cigarette lighter or other similar device charged with a flammable gas according to the following:

- No more than 70 mL (2.3 fluid ounces) of liquefied gas may be loaded into each device.
- 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).
- 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).
- Overpack devices in packaging that is designed or arranged to prevent movement of the device itself.

A6.12. Cryogenic Liquids. See figure A6.4.

Argon, Refrigerated Liquid
Carbon Dioxide, Refrigerated Liquid
Carbon Monoxide, Cryogenic Liquid
Ethylene, Refrigerated Liquid
Helium, Refrigerated Liquid
Hydrogen, Refrigerated Liquid
Neon, Refrigerated Liquid
Nitrogen, Refrigerated Liquid
Oxygen, Refrigerated Liquid.

Figure A6.4. 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:**

- Do not load a cylinder with a cryogenic liquid colder than the design service temperature of the packaging.
- Do not load a cylinder with any material which may combine chemically with any residue in the packaging to produce an unsafe condition.
- The jacket covering the insulation on a cylinder used to transport any flammable cryogenic liquid must be made of steel.
- 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.
- Do not install an aluminum valve, pipe, or fitting on any cylinder used to transport any flammable cryogenic liquid.
- Provide each cylinder with one or more pressure relief devices.
- 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.
- 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.
- 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 specific venting instructions in the additional handling information block of the Shipper's Declaration for Dangerous Goods (unless venting procedures are provided in a separate instruction accompanying the shipment or attached to the cargo) and must provide required equipment (see A17.2.5). Crew members must monitor vent valves during flight. Containers charged with a nonflammable, nonpoisonous cryogenic liquid, with a net capacity of 25 liters (6.6 gallons) or less, are excepted from the overboard venting requirement. Tubing or hose for venting to the outside of the aircraft is required. 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. Make sure there are:

- 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.
- 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.

A6.12.4. **Packaging Requirements.** All containers must be designed to hold low temperature liquefied gases and must be strong enough to withstand all shocks and loading normally incident to air shipment and associated handling. The cryogenic liquids of argon, helium, neon, nitrogen, and oxygen must be loaded according to table A6.3. Hydrogen (minimum 95 percent parahydrogen) must be loaded and shipped according to table A6.4. Container accessories must be protected against damage in handling. Ship in containers as follows:

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. Not more than one container may be shipped 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. A maximum of one container may be shipped 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. Not more than five containers may be shipped 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. Not more than two containers may be shipped 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.

Table A6.3. Filling Density 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

Table A6.4. Filling Density 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.

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. Wooden boxes (4C1, 4C2, 4D, or 4F) with glass, earthenware, or metal inner receptacles not over 500 g (17.6 ounces) capacity each.
A6.13.2. Metal drums, (1A1), not over 100 L (26 gallon) capacity each.
A6.13.3. Fiberboard box (4G) with inside glass, earthenware, or metal inner receptacles not over 500 g (17.6 ounces) capacity each. Gross weight must not exceed 30 kg (66 pounds).
A6.13.4. Any 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. Package ethylene oxide as follows:
A6.14.1. In inner glass ampoules or vials and placed in a fiberboard (4G) box. The total quantity of ethylene oxide must not exceed 100 g (3.5 ounces) per package.
A6.14.2. In inner aluminum receptacles and placed in a fiberboard (4G) box constructed with top and bottom pads and perimeter liner. The inner aluminum receptacles must not contain more than 135 g (4.8 ounces.) The inner aluminum receptacles must be cushioned with an incombustable material. No more than 12 inner receptacles may be packed in one fiberboard (4G) box, and no more than 10 fiberboard (4G) boxes may be overpacked.
A6.14.3. In inner metal receptacles and placed in a wooden (4C1, 4C2, 4D, or 4F), or fiberboard (4G) box. The capacity of the inner metal receptacles must not exceed 340 g (12 ounces). The metal receptacles must be capable of withstanding a 1124 kPa (180 psig) burst pressure. Each inner metal receptacle 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 receptacles may be packed in one outer box. Each receptacle must not be liquid full below 82 degrees C (180 degrees F).
A6.14.4. In 1A1 steel drums of no more than 231 L (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. In 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 specification cylinder prescribed for any compressed gas except acetylene.

A6.16. Arsine; Cyanogen Chloride, Inhibited; Cyanogen, Liquefied; Germane; Phosgene; Phosphine:
A6.16.1. **Handling Instructions.** These items are extremely dangerous. Wear approved chemical safety mask and clothing when handling this material. See 2.9 for additional information.
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 A3.2.2.5). 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:
A6.17.1. **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**.**
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 poisonous material must meet the requirements of the PG I performance level. The proper shipping name "GAS IDENTIFICATION SETS" is only valid for domestic movement. International shipments must be classified, packaged, and labeled according to the hazard class of the materials contained in the kit.
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 poisonous material is absorbed in a medium such as activated charcoal or silical gel, pack gas identification sets as follows:
A6.18.2.1. If the liquid poisonous material does not exceed 5 ml (0.2 fluid ounces) or the solid poisonous 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 poisonous materials may be packed in one outer wooden box.

A6.18.2.2. If the liquid poisonous material does not exceed 5 ml (0.2 fluid ounces) or the solid poisonous 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 poisonous 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).

A6.19.1. **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.

A6.19.2. **Packaging Requirements.** 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:

- Each cylinder must not be charged with more than 5 kg (11.0 pounds) of the mixture. The maximum filling density of the cylinder must not exceed 80 percent of its water capacity.
- Each cylinder must be charged in compliance with A3.2.2.5.
- No cylinder may be equipped with an eduction tube or a fusible plug.
- No cylinder may be equipped with any valve unless the valve is a type approved by the Associate Administrator for Hazardous Materials Safety.

A6.19.2.1. 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 A6.19.2.2, 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.

A6.19.2.2. 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. Methylchlorosilane. Class 2.3, PG I, hazard zone A (poisonous by inhalation). Pack class 2.3, PG I, poisonous by inhalation, in nonbulk packagings as follows:

A6.20.1. In DOT cylinders as identified in 49 CFR, part 178 (specifications for packagings), subpart C (specifications for cylinders), except that specification 8, 8AL, and 39 cylinders are not authorized.

A6.20.2. Pack in metal drums (1A1, 1B1, or 1N1), then place in metal drums (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 1.50 mm (0.059 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 (1A1, 1B1, or 1N1) must not exceed 220 L (58 gallons). The inner drum must also meet the following requirements:

- Satisfactorily withstand a hydrostatic pressure test (as outlined in 49 CFR, paragraph 178.605) of 550 kPa (80 psig).
- 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.
- Have screw-type closures that are:
  - Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.

  - Physically held in place by any means capable of preventing back-off or loosening of the closure by impact or vibration during transportation.
  - 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).
- Meet the following minimum thickness requirements:
  - 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).
  - 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).

A6.20.2.1. 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.

A6.20.3. 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 (4A1 or 4A2), aluminum box (4B1 or 4B2), 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:

A6.21.1. **Handling Instructions.** Nitric oxide is extremely dangerous and poisonous. Wear an approved safety mask and clothing when handling this material. See 2.9 for additional requirements.

A6.21.2. **Packaging Requirements.** Pack nitric oxide in DOT 3A, 3AA, 3E, or 3AL cylinders, designed and marked for a service pressure of 12,411 kPa (1800 psi) or higher, 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. Valve outlets must be 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 (4C1, 4C2, 4D, or 4F) designed 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 during transit, or by packing in strong wooden boxes designed to protect valves from injury or accidental functioning under conditions incident to transportation.

A6.22. Ethyl Methyl Ether Packaging. Each packaging must meet the requirements of the PG I performance level.

A6.22.1. Package items in combination packages consisting of glass, earthenware, plastic, metal receptacles, or glass ampoules, then packed in steel drums (1A1 or 1A2), aluminum drums (1B1 or 1B2), metal drums other than steel or aluminum (1N1 or 1N2), plywood drum (1D), fiber drum (1G), plastic drum (1H1 or 1H2), steel jerrican (3A1 or 3A2), plastic jerrican (3H1 or 3H2), steel box (4A1 or 4A2), aluminum box (4B1 or 4B2), natural wood box (4C1 or 4C2), plywood box (4D), reconstituted wood box (4F), fiberboard box (4G), expanded plastic box (4H1), solid plastic box (4H2).

A6.22.2. Package items in single packagings consisting of steel drums (1A1 or 1A2), aluminum drum (1B1 or 1B2), metal drum other than steel or aluminum (1N1 or 1N2), plastic drum (1H1 or 1H2), steel jerrican (3A1 or 3A2), plastic jerrican (3H1 or 3H2), plastic receptacle in steel, aluminum, fiber or plastic drum (6HA1, 6HB1, 6HG1, 6HH), plastic receptacle in steel, aluminum, wooden, plywood, or fiberboard box (6HA2, 6HB2, 6HC, 6HD2, 6HG2), glass, porcelain or stoneware in steel, aluminum or fiber drum (6PA1, 6PB1, 6PG1), glass, porcelain or stoneware in steel, aluminum, wooden, or fiberboard box (6PA2, 6PB2, 6PC, 6PG2), glass, porcelain or stoneware in solid or expanded plastic packaging (6PH1 or 6PH2), or 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:

- 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).
- 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
- 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 I performance level, or in the original manufacturer's transit box.

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 A3.2.3.1 for inner container quantity requirements): Package in:
A7.3.1. Steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum, other than steel or aluminum (1N1 or 1N2) with inside glass, earthenware, plastic, or metal receptacles.
A7.3.2. Plywood drum (1D), fiber drum (1G), or plastic drum (1H1 or 1H2), with inside glass, earthenware, plastic, or metal receptacles.
A7.3.3. Wooden barrel (2C2), with inside glass, earthenware, plastic, or metal receptacles. Not authorized for PG I material.
A7.3.4. Steel jerrican (3A1 or 3A2) or plastic jerrican (3H1 or 3H2), with inside glass, earthenware, plastic, or metal receptacles.
A7.3.5. Steel box (4A1 or 4A2) or aluminum box (4B1 or 4B2) with inside glass, earthenware, plastic, or metal receptacles.
A7.3.6. Natural wood box (4C1 or 4C2), plywood box (4D), or reconstituted wood box (4F), with inside glass, earthenware, plastic, or metal receptacles.
A7.3.7. Fiberboard box (4G) with inside glass, earthenware, plastic, or metal receptacles.
A7.3.8. Expanded plastic box (4H1) or solid plastic box (4H2) with inside glass, earthenware, plastic, or metal receptacles.
A7.3.9. Steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum, other than steel or aluminum (1N1 or 1N2).
A7.3.10. Plastic drum (1H1 or 1H2).
A7.3.11. Wooden barrel (2C1). Not authorized for PG I material.
A7.3.12. Steel jerrican (3A1 or 3A2) or plastic jerrican (3H1 or 3H2).
A7.3.13. Single, composite package comprised of a plastic receptacle in steel, aluminum, fiber, or plastic drum (6HA1, 6HB1, 6HG1, or 6HH).
A7.3.14. Single, composite package comprised of a plastic receptacle in steel, aluminum, wooden, plywood, or fiberboard box (6HA2, 6HB2, 6HC, 6HD2, or 6HG2).
A7.3.15. Single, composite package comprised of glass, porcelain, or stoneware in steel, aluminum, or fiber drum (6PA1, 6PB1, or 6PG1).
A7.3.16. Single, composite package comprised of glass, porcelain, or stoneware, in steel, aluminum, wooden, or fiberboard box (6PA2, 6PB2, 6PC, or 6PG2).
A7.3.17. Single, composite package comprised of glass, porcelain, or stoneware in solid or expanded plastic packaging (6PH1 or 6PH2).
A7.3.18. Single, composite package comprised of a plastic receptacle in a plywood drum (6HD1.) Not authorized for PG I material.
A7.3.19. DOT specification cylinders as prescribed for any compressed gas, except DOT 8 (acetylene) and DOT 3HT.
A7.3.20. Pack BLU-27 fire bombs according to SPI 1325-912-3175. Pack BLU-32 fire bombs according to SPI 1325-912-3175 or SPI 1325-483-3035. Do not stack containers more than two high for air transportation. Ship fire bombs as flammable liquids, NOS.
A7.3.21. For hydrazine, use special design cylindrical container having a water capacity of 13.4 kg (29.5 pounds) and equipped with two Teflon bladders, one inside the other. Not more than two cylinders, each containing 12.5 kg (27.5 pounds) or less hydrazine, must be packed in a strong plywood box according to SPI 1420-979-4573. Authorized for hydrazine only.

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 name of contents on the outside container.

A7.5. Aircraft Hydraulic Power Unit Fuel Tank:

A7.5.1. **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 A7.5.1.1 or A7.5.1.2.

A7.5.1.1. 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 which will adequately protect all fittings. The maximum quantity of fuel per unit and package is 42 L (11 gallons).

A7.5.1.2. 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 which will adequately protect all fittings. The maximum quantity of fuel per unit and package is 42 L (11 gallons).

A7.5.2. **Emergency Procedures.** In the event of a leak during transportation of hydrazine, crew members should use their aircraft oxygen masks in a positive pressure mode.

A7.6. Tert-butyl Isocyanate; n-Butyl Isocyanate; Ethyl Isocyanate; Isobutyl Isocyanate; Isopropyl Isocyanate; Methoxymethyl Isocyanate; n-Propyl Isocyanate. Crotonaldehyde, Stabilized; Diketene, Inhibited; Dimethylhydrazine, Symmetrical; Isopropyl Chloroformate; Methyl Orthosilicate. Although table A4.1 may list the material as PG II, due to the inhalation hazard, PG I packaging is required.

A7.6.1. Package in DOT cylinders as identified in 49 CFR, part 178 (Specifications for Packagings), subpart C (Specifications for Cylinders), except that specification 8, 8AL, and 39 cylinders are not authorized. Cylinders must also meet the requirements of A3.2.2.5.

A7.6.2. Pack in metal drums (1A1, 1B1, or 1N1), then place in metal drums (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 1.50 mm (0.059 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). The inner drum must also meet the following requirements:

- Satisfactorily withstand a hydrostatic pressure test (as outlined in 49 CFR, paragraph 178.605) of 550 kPa (80 psig).
- 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.
    - Have screw-type closures that meet all the following requirements:
    - Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.
    - Physically held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation.
- 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).
- Meet the following minimum thickness requirements:
    - 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).
    - 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).

A7.6.2.1. 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, 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.

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 (4A1 or 4A2), aluminum box (4B1 or 4B2), 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, Inhibited; 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). The inner drum must meet the following requirements:

- 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.
  - Have screw-type closures that meet all the following requirements:
  - Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.
- Physically held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation.
- 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).
- Meet the following minimum thickness requirements:
  - 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.
  - 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.
  - 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.

A7.6.4.1. 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, 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.

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 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. Package in: (see also A3.2.4):
A8.3.1. Steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum, other than steel or aluminum (1N1 or 1N2) with inside glass, earthenware, plastic, or metal receptacles.
A8.3.2. Plywood drum (1D), fiber drum (1G), or plastic drum (1H1 or 1H2), with inside glass, earthenware, plastic, or metal receptacles.
A8.3.3. Wooden barrel (2C2), with inside glass, earthenware, plastic, or metal receptacles. Not authorized for PG I material.
A8.3.4. Steel jerrican (3A1 or 3A2) or plastic jerrican (3H1 or 3H2), with inside glass, earthenware, plastic, or metal receptacles.
A8.3.5. Steel box (4A1 or 4A2) or aluminum box (4B1 or 4B2) with inside glass, earthenware, plastic, or metal receptacles.
A8.3.6. Natural wood box (4C1 or 4C2), plywood box (4D), or reconstituted wood box (4F), with inside glass, earthenware, plastic, or metal receptacles.
A8.3.7. Fiberboard box (4G) with inside glass, earthenware, plastic, or metal receptacles.
A8.3.8. Expanded plastic box (4H1) or solid plastic box (4H2) with inside glass, earthenware, plastic, or metal receptacles.
A8.3.9. Steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum, other than steel or aluminum (1N1 or 1N2).
A8.3.10. Plastic drum (1H1 or 1H2).
A8.3.11. Wooden barrel (2C1). Not authorized for PG I material.
A8.3.12. Steel jerrican (3A1 or 3A2) or plastic jerrican (3H1 or 3H2).
A8.3.13. Single composite package comprised of a plastic receptacle in steel, aluminum, fiber, or plastic drum (6HA1, 6HB1, 6HG1, or 6HH).
A8.3.14. Single, composite package comprised of a plastic receptacle in steel, aluminum, wooden, plywood, or fiberboard box (6HA2, 6HB2, 6HC, 6HD2, or 6HG2).
A8.3.15. Single, composite package comprised of glass, porcelain, or stoneware in steel, aluminum, or fiber drum (6PA1, 6PB1, or 6PG1).
A8.3.16. Single, composite package comprised of glass, porcelain, or stoneware, in steel, aluminum, wooden, or fiberboard box (6PA2, 6PB2, 6PC, or 6PG2).
A8.3.17. Single, composite package comprised of glass, porcelain, or stoneware in solid or expanded plastic packaging (6PH1 or 6PH2).
A8.3.18. Single, composite package comprised of a plastic receptacle in a plywood drum (6HD1).
A8.3.19. DOT specification cylinders as prescribed for any compressed gas, except DOT 8 (acetylene) and DOT 3HT.

A8.4. Packaging for Class 4 Solids. Package in: (see also A3.2.4):
A8.4.1. Steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum, other than steel or aluminum (1N1 or 1N2) with inside glass, earthenware, plastic, or metal receptacles.
A8.4.2. Plywood drum (1D), fiber drum (1G), or plastic drum (1H1 or 1H2), with inside glass, earthenware, plastic, or metal receptacles.
A8.4.3. Wooden barrel (2C2), with inside glass, earthenware, plastic, or metal receptacles.
A8.4.4. Steel jerrican (3A1 or 3A2) or plastic jerrican (3H1 or 3H2), with inside glass, earthenware, plastic, or metal receptacles.

A8.4.5. Steel box (4A1 or 4A2) or aluminum box (4B1 or 4B2) with inside glass, earthenware, plastic, or metal receptacles.
A8.4.6. Natural wood box (4C1 or 4C2), plywood box (4D), or reconstituted wood box (4F), with inside glass, earthenware, plastic, or metal receptacles.
A8.4.7. Fiberboard box (4G) with inside glass, earthenware, plastic, or metal receptacles.
A8.4.8. Solid plastic box (4H2) with inside glass, earthenware, plastic, or metal receptacles.
A8.4.9. Steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum, other than steel or aluminum (1N1 or 1N2).
A8.4.10. Plywood drum (1D). Not authorized for PG I material.
A8.4.11. Plastic drum (1H1 or 1H2).
A8.4.12. Fiber drum (1G). Not authorized for PG I material.
A8.4.13. Wooden barrel (2C1 or 2C2). Not authorized for PG I material.
A8.4.14. Steel jerrican (3A1 or 3A2) or plastic jerrican (3H1 or 3H2).
A8.4.15. Steel box with liner (4A2), or aluminum box with liner (4B2).
A8.4.16. Steel box (4A1), aluminum box (4B1). Not authorized for PG I material.
A8.4.17. Natural wood box sift-proof (4C2).
A8.4.18. Natural wood box (4C1). Not authorized for PG I material.
A8.4.19. Plywood box (4D) or reconstituted wood box (4F). Not authorized for PG I material.
A8.4.20. Fiberboard box (4G). Not authorized for PG I material.
A8.4.21. Expanded plastic box (4H1) or solid plastic box (4H2). Not authorized for PG I material.
A8.4.22. Bag, woven plastic (5H1, 5H2, or 5H3); bag, plastic film (5H4); bag, textile (5L1, 5L2, or 5L3); bag, paper, multiwall, water-resistant (5M2). Not authorized for PG I material.
A8.4.23. Single, composite package comprised of a plastic receptacle in steel, aluminum, plywood, fiber, or plastic drum (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1).
A8.4.24. Single, composite package comprised of a plastic receptacle in steel, aluminum, wood, plywood, or fiberboard box (6HA2, 6HB2, 6HC, 6HD2, or 6HG2).
A8.4.25. Single, composite package comprised of glass, porcelain, or stoneware in steel, aluminum, plywood, or fiber drum (6PA1, 6PB1, 6PD1, or 6PG1).
A8.4.26. Single, composite package comprised of glass, porcelain, or stoneware, in steel, aluminum, wooden, or fiberboard box (6PA2, 6PB2, 6PC, or 6PG2).
A8.4.27. Single, composite package comprised of glass, porcelain, or stoneware in expanded or solid plastic packaging (6PH1 or 6PH2).

A8.5. Class 4 Materials requiring CAA. Ship the following Class 4 proper shipping names according to a competent authority approval (CAA). See 1.6.4 for more information on CAAs.

- 5-Tert-Butyl-2,4,6-Trinitro-m-Xylene (Musk Xylene).
- Self-heating substances, solid, oxidizing, NOS.
- Self-reactive substances sample, NOS.
- Self-reactive substances trial quantities, NOS.
- Water reactive solid, oxidizing, NOS.

A8.6. Pyrophoric Liquid Materials (Class 4.2). Include the following: (see also A3.2.4).

- Aluminum Alkyl Halides.
- Aluminum Alkyl Hydrides.
- Aluminum Alkyls.
- Aluminum Borohydride.
- Barium Alloys, Pyrophoric.
- Diethyl zinc.
- Dimethylzinc.
- Lithium Alkyls.
- Magnesium Alkyls.
- Metal Alkyl Halides, NOS.
- Metal Alkyl Hydrides, NOS.
- Metal Alkyl, NOS.
- Pyrophoric, Liquid, NOS.

- Titanium Trichlororide, Pyrophoric.

A8.6.1. Package in specification steel or nickel cylinders prescribed for any compressed gas except acetylene having a minimum design pressure of 1206 kPa (175 psi). Cylinders with valves must be equipped with steel valve protection caps or collars, unless overpacked.

A8.6.1.1. Overpack in a 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. Use 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. Use 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:

- Inner packaging must have no opening exceeding 25 mm (1 inch) in diameter and must be surrounded with non combustible absorbent cushioning material.
- 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.
- Each layer of inner packagings must be separated by a metal plate separator in addition to the noncombustible absorbent cushioning material.

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.

A8.7.1. Package in a fiber drum (1G) with a plastic liner or internal coating. Maximum gross weight is 50 kg (110 pounds).

A8.7.2. Package in a sift-proof fiber drum (1G). Maximum gross weight must not exceed 110 pounds (50 kg).

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 in a fiber drum (1G) with a plastic liner or internal coating. Maximum gross weight is 50 kg (110 pounds).

A8.8.2. Package in an inner container which must be a single plastic bag. Outer packaging must be a fiberboard box (4G). Maximum gross weight is 50 kg (110 pounds).

A8.8.3. Package in an inner packaging which must be either plastic boxes, plastic bottles or jars. Outer packaging must be a fiberboard box (4G). Maximum weight of inner packaging is 5 kg (11 pounds). Maximum gross weight: 40 kg (88 pounds).

A8.8.4. Outer package must be a sift-proof fiber drum (1G). Maximum gross weight is 55 kg (110 pounds).

A8.9. 3-Chloro-4-Diethylaminobenzenediazonium Zinc 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 in a fiber drum (1G) with a plastic liner or internal coating. Maximum gross weight is 50 kg (110 pounds).

A8.9.2. Package in an inner packaging which must be a plastic bag. Place in an outer packaging which must be either a steel removable head drum (1A2) or an aluminum removable head drum (1B2). 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 in a fiber drum (1G) with plastic liner or internal coating. 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 wooden boxes (4C1, 4C2, 4D, or 4F), or fiber drums (1G) with inner glass receptacles not 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.

A8.12. Calcium Pyrophoric; Magnesium Diphenyl; Metal Catalyst, Dry; Pyrophoric Metals, NOS and Pyrophoric Solids, NOS.
A8.12.1. Package in wooden boxes (4C1, 4C2, 4D, or 4F) with inner metal receptacles which have a positive (not friction) means of closure. Inner metal receptacles must not contain more than 15 kg (33 pounds) each.
A8.12.2. Package in fiberboard boxes (4G) with inner metal receptacles which have a positive (not friction) means of closure. Inner metal receptacles must not contain more than 7.5 kg (17 pounds) each.
A8.12.3. Package in steel drums (1A1 or 1A2) with a gross weight not exceeding 150 kg (331 pounds) each.
A8.12.4. Package in fiber (1G) or plywood (1D) drums with inner metal receptacles which have a positive (not friction) means of closure. Inner metal receptacles must not contain more than 15 kg (33 pounds) each.

A8.13. Films, Nitrocellulose Base (gelatin coated [except scrap]).
A8.13.1. Package in steel drums (1A2), aluminum drums (1B2), steel jerricans (3A2), wooden boxes (4C1, 4C2), plywood boxes (4D), reconstituted wood boxes (4F), or plywood drums (1D) with each reel in a tightly closed metal can or strong fiberboard inner packaging with its cover securely held in place with adhesive tape or adhesive paper.
A8.13.2. Package in a fiberboard box (4G) or fiber drum (1G) with a single tightly closed metal can or strong fiberboard inner packaging with cover securely held in place with adhesive tape or adhesive paper. This type packaging authorized only for film not exceeding 600 m (1969 feet).

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.** Package fusees (railway or highway) in steel drums (1A2), steel jerricans (3A2), wooden box (4C1, 4C2), plywood box (4D), reconstituted wood box (4F), fiberboard box (4G), plywood drum (1D), or fiber drum (1G).

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. Package matches, strike-anywhere in a steel drum (1A2), aluminum drum (1B2), steel jerrican (3A2), wooden box (4C1, 4C2), plywood box (4D), reconstituted wood box (4F), fiberboard box (4G), plywood drum (1D), or fiber drum (1G) with inside securely closed chipboard, fiberboard, wooden, or metal inner 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. 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. Package fusee matches in a steel drum (1A2), aluminum drum (1B2), steel jerrican (3A2), wooden box (4C1, 4C2), plywood box (4D), reconstituted wood box (4F), fiberboard box (4G), plywood drum (1D), or fiber drum (1G) with inside securely closed chipboard, fiberboard, wooden, or metal inner 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.
A8.15.3. Tightly pack safety matches (strike-on-box, book, and card) or wax vesta matches in securely closed inside containers then packed in a steel drum (1A2), aluminum drum (1B2), steel jerrican (3A2), wooden box (4C1, 4C2), plywood box (4D), reconstituted wood box (4F), fiberboard box (4G), plywood drum (1D), or fiber drum (1G). Safety matches may be packed in the same outside container with non hazardous materials.

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, when dry, must be cast solid and shipped in containers as follows:
A8.17.1.1. Steel drums (1A2) not over a 114 L (30 gallons) capacity each.
A8.17.1.2. In projectiles or bombs without bursting elements.
A8.17.2. 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. 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 A3.2.1.1. 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.

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 control temperature is the temperature above which a material may not be offered for transportation. The emergency temperature is the temperature at which emergency procedures must be initiated due to imminent danger resulting from overheating of the shipment. 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.

A9.4. 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 are as follows:

- **Technical Name.** The first column specifies the technical name. Use the technical name to determine the applicable UN identification number in column 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.
- **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.
- **Concentration of Dilutents.** The fourth column specifies the concentration (mass percent) of dilutent type A (column 4a), dilutent 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.
- **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.
- **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.
- **Notes.** Column 7 identifies additional requirements when applicable. The notes are provided at the end of the table.

Table A9.1.

ORGANIC PEROXIDES See A9.4 for instructions on use of this table.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUTENT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)
ACETYL ACETONE PEROXIDE	UN3105	≤42	≥48			≥8			2
ACETYL ACETONE PEROXIDE as a paste	UN3106	≤32							9
ACETYL BENZOL PEROXIDE	UN3105	≤45	≥55						
ACETYL CYCLOHEXANESULFONYL PEROXIDE	UN3112	≤82			≥12		-10	0	
ACETYL CYCLOHEXANESULFONYL PEROXIDE	UN3115	≤32		≥68			-10	0	
tert-AMYL HYDROPEROXIDE	UN3107	≤88	≥6			≥6			

Table A9.1. Continued.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUETANT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)
tert-AMYL PEROXYBENZOATE	UN3105	≤96	≥4						
tert-AMYL PEROXY-2-ETHYLHEXANOATE	UN3115	≤100					20	25	
tert-AMYL PEROXYNEODECANOATE	UN3115	≤77		≥23			0	10	
tert-AMYL PEROXYPIVALATE	UN3113	≤77		≥23			10	15	
tert-AMYL PEROXY-3,5,5-TRIMETHYLHEXANOATE	UN3101	≤100							
tert-BUTYL CUMYL PEROXIDE	UN3105	≤100							
n-BYTYL-4,4-DI-(TERTBUTYL-PEROXY)-VALERATE	UN3103	>52,≤100							

Table A9.1. Continued.

TECHNICAL	UN	CONCEN-	DILUETANT MASS %			WATER		TEMP (C)	NOTES

NAME (1)	NUMBER (2)	TRATION (3)	A (4a)	B (4b)	I (4c)	(MASS %) (5)	CON-TROL (6a)	EMER-GENCY (6b)	(7)
n-BYTYL-4,4-DI-(TERTBUTYL-PEROXY)-VALERATE	UN3106	≤52			≥48				
tert-BUTYL HYDROPEROXIDE	UN3103	>73≤90				≥10			
tert-BUTYL HYDROPEROXIDE	UN3105	≤80	≥20						3
tert-BUTYL HYDROPEROXIDE	UN3109	≤72				≥28			
tert-BUTYL HYDROPEROXIDE and di-tert-BUTYL PEROXIDE	UN3103	≤82 ≥9				≥7			
tert-BUTYL MONOPEROXYMALEATE	UN3102	>52,≤100							

Table A9.1. Continued.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUETANT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)
tert-BUTYL MONOPEROXYMALEATE	UN3103	≤52	≥48						
tert-BUTYL MONO-PEROXYMALEATE as a paste	UN3108	≤42							
tert-BUTYL MONO-PEROXYPHTHATE	UN3102	≤100							
tert-BUTYL PEROXYACETATE	UN3101	>52,≤77	≥23						
tert-BUTYL PEROXYACETATE	UN3103	≤52	≥48						
tert-BUTYL PEROXYBENZOATE	UN3103	>77,≤100	≥22						
tert-BUTYL PEROXYBENZOATE	UN3105	>52,≤77	≥23						1
tert-BUTYL PEROXYBENZOATE	UN3106	≤52			≥48				

Table A9.1. Continued.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUETANT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)

tert-BUTYL PEROXYCROTONATE	UN3105	≤77	≥23						
tert-BUTYL PEROXYDIETHYL-ACETATE	UN3113	≤100					20	25	
tert-BUTYL PEROXYDIETHYL ACETATE and tert-BUTYL PEROXYBENZOATE	UN3105	≤33 ≤33	≥33						
tert-BUTYL PEROXY-2-ETHYLHEXANOATE	UN3113	>52,≤100					20	25	
tert-BUTYL PEROXY-2-ETHYLHEXANOATE	UN3117	≤52		≥48			20	25	

Table A9.1. Continued.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUETANT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)
tert-BUTYL PEROXY-2-ETHYLHEXANOATE and 2,2-DI-(TERT-BUTYLPEROXY)BUTANE	UN3115	≤31 ≤36		≥33			35	40	
tert-BUTYL PEROXY-2-ETHYLHEXANOATE and 2,2-DI-(TERT-BUTYLPEROXY)BUTANE	UN3106	≤12 ≤14	≥14		≥60				
tert-BUTYL PEROXYISOBUTYRATE	UN3111	>52,≤77		≥23			15	20	
tert-BUTYL PEROXYISOBUTYRATE	UN3115	≤52		≥48			15	20	
tert-BUTYL PEROXY ISOPROPYL CARBONATE	UN3103	≤77	≥23						
tert-BUTYL PEROXY-NEODECANOATE	UN3115	>77,≤100					-5	5	

Table A9.1. Continued.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUETANT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)
tert-BUTYL PEROXY-NEODECANOATE	UN3115	≤77		≥23			0	10	

3-tert-BUTYLPEROXY-3-PHENYLPHTHALIDE	UN3106	≤100							
tert-BUTYL PEROXYPIVALATE	UN3113	>67,≤77	≥23				0	10	
tert-BUTYL PEROXYPIVALATE	UN3115	≤67		≥33			0	10	
tert-BUTYLPEROXY STARYLCARBONATE	UN3106	≤100							
tert-BUTYL PEROXY-3,5,5-TRIMETHYLHEXANOATE	UN3105	≤100							
3-CHLOROPEROXYBENZOIC ACID	UN3102	>57,≤86				≥14			

Table A9.1. Continued.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUETANT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)
3-CHLOROPEROXYBENZOIC ACID	UN3106	≤57			≥3	≥40			
CUMYL HYDROPEROXIDE	UN3109	≤90	≥10						
CUMYL PEROXYNEODECANOATE	UN3115	≤77		≥23			-10	0	
CUMYL PEROXYPIVALATE	UN3115	≤77		≥23			-5	5	
CYCLOHEXANONE PEROXIDE(S)	UN3104	≤91				≥9			
CYCLOHEXANONE PEROXIDE(S) as a paste	UN3106	≤72							4,9
CYCLOHEXANONE PEROXIDE(S)	UN3105	≤72	≥28						4
CYCLOHEXANONE PEROXIDE(S)	EXEMPT	≤32			≥68				
DIACETONE ALCOHOL PEROXIDES	UN3115	≤57		≥26		≥8			4

Table A9.1. Continued.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUETANT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)
DIACETYL PEROXIDE	UN3115	≤27		≥73					5
DI-TERT-AMYL PEROXIDE	UN3107	≤100							

DIBENZOYL PEROXIDE	UN3102	>52,≤100			≥48				2
DIBENZOYL PEROXIDE	UN3102	>78≤94				≥6			2
DIBENZOYL PEROXIDE	UN3104	≤77				≥23			
DIBENZOYL PEROXIDE	UN3106	≤62			≥28	≥10			
DIBENZOYL PEROXIDE as a paste	UN3106	>52,≤62							9
DIBENZOYL PEROXIDE as a paste	UN3108	≤52							9
DIBENZOYL PEROXIDE	UN3106	>35,≤52			≥48				
DIBENZOYL PEROXIDE	EXEMPT	≤35			≥65				

Table A9.1. Continued.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUETANT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)
DIBENZYL PEROXYDICARBONATE	UN3112	≤87				≥13	25	30	
DI-(4-tert-BUTYLCYCLOHEXYL) PEROXYDICARBONATE	UN3114	≤100					30	35	
DI-(4-tert-BUTYLCYCLOHEXYL) PEROXYDICARBONATE as a stable dispersion in water	UN3119	≤42					30	35	
DI-tert-BUTYL PEROXIDE	UN3107	≤100							
2,2-DI-(tert-BUTYLPEROXY)BUTANE	UN3103	≤52	≥48						
1,1-DI-(tert-BUTYLPEROXY)-CYCLOHEXANE	UN3101	>80,≤100							
1,1-DI-(tert-BUTYLPEROXY)-CYCLOHEXANE	UN3103	>52,≤80	≥20						

Table A9.1. Continued.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUETANT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)
1,1-DI-(tert-BUTYLPEROXY)-CYCLOHEXANE	UN3105	≤52	≥48						

1,1-DI-(tert-BUTYLPEROXY)-CYCLOHEXANE	UN3106	≤42	≥13		≥45				
1,1-DI-(tert-BUTYLPEROXY)-CYCLOHEXANE	UN3107	≤27	≥36						10
2,2-DI-(4,4-tert-BUTYLPER-OXYCYCLO HEXYL)PROPANE	UN3106	≤42			≥58				
DI-N-BUTYL PEROXYDICARBONATE	UN3115	>27,≤52		≥48			-15	-5	
DI-N-BUTYL PEROXYDICARBONATE	UN3117	,≤27		≥73			-10	0	
DI-SEC-BUTYL PEROXYDICARBONATE	UN3113	>52,≤100					-20	-10	

Table A9.1. Continued.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUETANT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)
DI-SEC-BUTYL PEROXYDICARBONATE	UN3115	≤52		≥48			-15	-5	
DI-(2-tert-BUTYLPEROXYISO-PROPYL)-BENZENE(S)	UN3106	>42,≤100			≥57				
DI-(2-tert-BUTYLPEROXYISO-PROPYL)-BENZENE(S)	EXEMPT	≤42			≥58				
DI-(tert-BUTYLPEROXY)PHTHALATE	UN3105	>42,≤52	≥48						
DI-(tert-BUTYLPEROXY)PHTHALATE as a paste	UN3106	≤52							
DI-(tert-BUTYLPEROXY)PHTHALATE	UN3107	≤42	≥58						
2,2-DI-(tert-BUTYLPEROXY)-PROPANE	UN3105	≤52	≥48						

Table A9.1. Continued.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUETANT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)
2,2-DI-(tert-BUTYLPEROXY)-PROPANE	UN3106	≤42	≥13		≥45				
1,1-DI-(tert-BUTYLPEROXY)-3,3,5-TRIMETHYL CYCLOHEXANE	UN3101	>57,≤100							

1,1-DI-(tert-BUTYLPEROXY)-3,3,5-TRIMETHYL CYCLOHEXANE	UN3106	≤57			≥43				
1,1-DI-(tert-BUTYLPEROXY)-3,3,5-TRIMETHYL CYCLOHEXANE	UN3107	≤57	≥43						
DICETYL PEROXYDICARBONATE	UN3116	≤100					20	25	
DICETYL PEROXYDICARBONATE as a stable dispersion in water	UN3119	≤42					30	35	
DI-4-CHLOROBENZOYL PEROXIDE	UN3102	≤77				≥23			

Table A9.1. Continued.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUETANT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)
DI-4-CHLOROBENZOYL PEROXIDE as a paste	UN3106	≤52							
DI-4-CHLOROBENZOYL PEROXIDE	EXEMPT	≤32			≥68				
DICUMYL PEROXIDE	UN3110	>42,≤100			≤57				
DICUMYL PEROXIDE	EXEMPT	≤42			≥58				
DICYCLOHEXYL PEROXYDICARBONATE	UN3112	>91,≤100					5	10	
DICYCLOHEXYL PEROXYDICARBONATE	UN3114	≤91				≥9	5	10	
DIDECANOYL PEROXIDE	UN3114	≤100					15	20	

Table A9.1. Continued.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUETANT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)
DI-2,4-DICHLOROBENZOYL PEROXIDE	UN3102	≤77				≥23			

DI-2,4-DICHLOROBENZOYL PEROXIDE as a paste with silicon oil	UN3106	≤52							
DI-(2-ETHYLHEXYL) PEROXYDICARBONATE	UN3113	>77≤100					-20	-10	
DI-(2-ETHYLHEXYL) PEROXYDICARBONATE	UN3115	≤77					-15	-5	
DI-(2-ETHYLHEXYL) PEROXYDICARBONATE as a stable dispersion in water	UN3117	≤42					-15	-5	

Table A9.1. Continued.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUETANT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)
DI-(2-ETHYLHEXYL) PEROXYDICARBONATE as a stable dispersion in water (frozen)	UN3117	≤42					-15	-5	
DIETHYL PEROXYDICARBONATE	UN3115	≤27		≥73			-10	0	
2,2-DIHYDROPEROXYPROPANE	UN3102	≤27			≥73				
DI-(1-HYDROXYCYCLOHEXYL) PEROXIDE	UN3106	≤100							
DIISOBUTYRYL PEROXIDE	UN3111	>32,≤52		≥48			-20	-10	
DIISOBUTYRYL PEROXIDE	UN3115	≤32		≥68			-20	-10	
DIISOPROPYL PEROXYDICARBONATE	UN3112	>52,≤100					-15	-5	

Table A9.1. Continued.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUETANT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)
DIISOPROPYL PEROXYDICARBONATE	UN3115	≤52		≥48			-10	0	
DIISOTRIDECYL PEROXYDICARBONATE	UN3115	≤100					-10	0	

DILAUROYL PEROXIDE	UN3106	≤100							
DILAUROYL PEROXIDE as a stable dispersion in water	UN3109	≤42							
DI-(2-METHYLBENZOYL)PEROXIDE	UN3112	≤87				≥13	30	35	
2,5-DIMETHYL-2,5-DI-(BENZOYL-PEROXY) HEXANE	UN3102	>82,<100							
2,5-DIMETHYL-2,5-DI-(BENZOYL-PEROXY) HEXANE	UN3106	≤82			≥18				

Table A9.1. Continued.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUETANT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)
2,5-DIMETHYL-2,5-DI-(BENZOYL-PEROXY) HEXANE	UN3104	≤82				≥18			
2,5-DIMETHYL-2,5-DI-(tert-BUTYL-PEROXY)HEXANE	UN3105	>52,≤100							
2,5-DIMETHYL-2,5-DI-(tert-BUTYL-PEROXY)HEXANE	UN3106	≤52			≥48				
2,5-DIMETHYL-2,5-DI-(tert-BUTYL-PEROXY)HEXANE-3	UN3103	>52,≤100							
2,5-DIMETHYL-2,5-DI-(tert-BUTYL-PEROXY)HEXANE-3	UN3106	≤52			≥48				
2,5-DIMETHYL-2,5-DI-(2- ETHYL HEXANOYLPEROXY)HEXANE	UN3115	≤100					20	25	

Table A9.1. Continued.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUETANT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)
2,5-DIMETHYL-2,5-DIHYDROPEROXYHEXANE	UN3104	≤82				≥18			
2,5-DIMETHYL-2,5-DI-(3,5,5-TRI-METHYLHEXANOYL-PEROXY) HEXANE	UN3105	≤77	≥23						
DIMYRISTYL PEROXYDICARBONATE	UN3116	≤100					20	25	

DIMYRISTYL PEROXYDICARBONATE as a stable dispersion in water	UN3119	≤42					20	25	
DI-N-NONANOYL PEROXIDE	UN3116	≤100					0	10	
DI-N-OCTANOYL PEROXIDE	UN3114	≤100					10	15	

Table A9.1. Continued.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUETANT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)
DIPEROXY AZELAIC ACID	UN3116	≤27			≥73		35	40	
DIPEROXY DODECANE DIACID	UN3116	>13,≤42			≥58		40	45	
DIPEROXY DODECANE DIACID	EXEMPT	≤13							
DI-(2-PHENOXYETHYL) PEROXYDICARBONATE	UN3102	>85,≤100							
DI-(2-PHENOXYETHYL) PEROXYDICARBONATE	UN3106	≤85				≥15			
DIPROPIONYL PEROXIDE	UN3117	≤27		≥73			15	20	
DI-N-PROPYL PEROXYDICARBONATE	UN3113	≤100					-25	-15	
DISTEARYL PEROXYDICARBONATE	UN3106	≤87			≥13				

Table A9.1. Continued.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUETANT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)
DISUCCINIC ACID PEROXIDE	UN3102	>72,≤100							7
DISUCCINIC ACID PEROXIDE	UN3116	≤72				≥28	10	15	7
DI-(3,5,5-TRIMETHYL-1,2-DIOXO-LANYL-3) PEROXIDE as a paste	UN3116	≤52					30	35	9
DI-(3,5,5-TRIMETHYL-1,2-DIOXO-LANYL-3)PEROXIDE as a paste	UN3116	≤52					30	33	9
DI-(3,5,5-TRIMETHYLHEXANOYL) PEROXIDE	UN3115	≤82	≥18						

ETHYL-3,3-DI-(tert-BUTYLPEROXY) -BUTRYRATE	UN3105	≤67	≥33						
ETHYL-3,3-DI-(tert-BUTYLPEROXY) -BUTYRATE	UN3103	>77,≤100							

Table A9.1. Continued.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUETANT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)
ETHYL-3,3-DI-(tert-BUTYLPEROXY) -BUTYRATE	UN3105	≤77	≥23						
ETHYL-3,3-DI-(tert-AMYLPEROXY) -BUTYRATE	UN3106	≤52			≥48				
3,3,6,6,9,9-HEXAMETHYL-1,2,4,5-TETRAOXACYCLONONANE	UN3102	>52,≤100							
3,3,6,6,9,9-HEXAMETHYL-1,2,4,5-TETRAOXACYCLONONANE	UN3105	≤52	≥48						
3,3,6,6,9,9-HEXAMETHYL-1,2,4,5-TETRAOXACYCLONONANE	UN3106	≤52			≥48				
ISOPROPYLCUMYL HYDROPEROXIDE	UN3109	≤72	≥28						

Table A9.1. Continued.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUETANT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)
p-METHYL HYDROPEROXIDE	UN3105	>55,≤100							
p-METHYL HYDROPEROXIDE	UN3113	≤55	≥45						
METHYLCYCLOHEXANONE PEROXIDE(S)	UN3115	≤67		≥33			35	40	
METHYL ETHYL KETONE PEROXIDE(S)	UN3101	≤52	≥48						4
METHYL ETHYL KETONE PEROXIDE(S)	UN3105	≤45	≥55						4
METHYL ETHYL KETONE PEROXIDE(S)	UN3107	≤40	≥60						4,11

METHYL ISOBUTYL KETONE PEROXIDE(S)	UN3105	≤62	≥19						4

Table A9.1. Continued.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUETANT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)
ORGANIC PEROXIDE, SOLID TEMPERATURE CONTROLLED	UN3114								6
ORGANIC PEROXIDE, LIQUID, SAMPLE	UN3103								6
ORGANIC PEROXIDE, LIQUID TEMPERATURE CONTROLLED	UN3113								6
ORGANIC PEROXIDE, SOLID, SAMPLE	UN3104								6
PEROXYACETIC ACID, TYPE D,STABILIZED	UN3105	≤43							8
PEROXYACETIC ACID, TYPE E,STABILIZED	UN3107	≤43							8

Table A9.1. Continued.

TECHNICAL NAME (1)	UN NUMBER (2)	CONCEN-TRATION (3)	DILUETANT MASS % A (4a)	B (4b)	I (4c)	WATER (MASS %) (5)	CON-TROL (6a)	TEMP (C) EMER-GENCY (6b)	NOTES (7)
PEROXYACETIC ACID, TYPE F,STABILIZED	UN3109	≤43							8
PINANYL HYDROPEROXIDE	UN3105	>55,≤100							
PINANYL HYDROPEROXIDE	UN3109	≤55	≥45						
TETRAHYDRONAPHTHYL HYDROPEROXIDE	UN3106	≤100							
1,1,3,3-TETRAMETHYLBUTYL HYDROPEROXIDE	UN3105	≤100							
1,1,3,3-TETRAMETHYLBUTYL PEROXY-2-ETHYLHEXANOATE	UN3115	≤100					20	25	
	UN3115	≤37		≥63			-10	0	

Notes applicable to table A9.1.

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 dilutent may be replaced by ditert-butyl peroxide.

4. Available oxygen must be less than or equal to 9 percent.

5. Only non-metalic 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 Dilutent type A, with or without water.

10. With greater than 3 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 Class 5.2 organic peroxides are not specified by packaging paragraphs. 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 tables A9.2 or A9.3 must pass PG II performance tests and must be POP marked. Table A9.2 applies to liquid organic peroxides. Table
A9.3 applies to solid organic peroxides. To determine the packaging requirements for organic peroxides:

- Determine the applicable generic PSN.
- 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.
- Turn to table A9.2 or table A9.3 as specified by column 8 of table A4.1.
- 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.
- 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.
- 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 (See A9.5 for instructions on use of this table.)

TYPE CONTAINERS AND MATERIALS	PACKAGING CODE	Maximum Quantity or Net Mass Permitted per Container							
		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

TABLE A9.2 Continued

PACKAGING FOR LIQUID ORGANIC PEROXIDES See A9.5 for instructions on use of this table.)

TYPE CONTAINERS AND MATERIALS	PACKAGING CODE	Maximum Quantity or Net Mass Permitted per Container							
		A9.2.1	A9.2.2	A9.2.3	A9.2.4	A9.2.5	A9.2.6	A9.2.7	A9.2.8
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

TABLE A9.2 Continued

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	PACKAGING 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
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:

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 See A9.5 for instructions on use

		Maximum Quantity or Net Mass Permitted per Container							
TYPE CONTAINERS AND MATERIALS	PACKAGING CODE	A9.3.1	A9.3.2	A9.3.3	A9.3.4	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

Table A9.3 Continued

PACKAGING FOR SOLID ORGANIC PEROXIDES See A9.5 for instructions on use

TYPE CONTAINERS AND MATERIALS	PACKAGING CODE	Maximum Quantity or Net Mass Permitted per Container							
		A9.3.1	A9.3.2	A9.3.3	A9.3.4	A9.3.5	A9.3.6	A9.3.7	A9.3.8
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
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:

- The sample must be packaged according to table A9.2. or table A9.3.
- The maximum quantity must not exceed 10 kg (22 pounds) per shipment.
- 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 A3.2.5.2 for additional packaging requirements): Package in:
A9.7.1. Steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum other than steel or aluminum (1N1 or 1N2), with inside glass, earthenware, plastic, or metal receptacles.
A9.7.2. Plywood drum (1D), fiber drum (1G), or plastic drum (1H1 or 1H2), with inside glass, earthenware, plastic, or metal receptacles.
A9.7.3. Wooden barrel (2C2) with inside glass, earthenware, plastic, or metal receptacles. Not authorized for PG I material.
A9.7.4. Steel jerrican (3A1 or 3A2) or plastic jerrican (3H1 or 3H2) with inside glass, earthenware, plastic, or metal receptacles.
A9.7.5. Steel box (4A1 or 4A2) or aluminum box (4B1 or 4B2) with inside glass, earthenware, plastic, or metal receptacles.
A9.7.6. Natural wood box (4C1 or 4C2), plywood box (4D), or reconstituted wood box (4F), with inside glass, earthenware, plastic, or metal receptacles.
A9.7.7. Fiberboard box (4G) with inside glass, earthenware, plastic, or metal receptacles.
A9.7.8. Expanded plastic box (4H1) or solid plastic box (4H2) with inside glass, earthenware, plastic, or metal receptacles.
A9.7.9. Steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum other than steel or aluminum (1N1 or 1N2).
A9.7.10. Plastic drum (1H1 or 1H2).
A9.7.11. Wooden barrel (2C1). Not authorized for PG I material.
A9.7.12. Steel jerrican (3A1 or 3A2) or plastic jerrican (3H1 or 3H2).
A9.7.13. Single composite package comprised of a plastic receptacle in steel, aluminum, fiber, or plastic drum. (6HA1, 6HB1, 6HG1, or 6HH).
A9.7.14. Single, composite package comprised of a plastic receptacle in steel, aluminum, wooden, plywood, or fiberboard box (6HA2, 6HB2, 6HC, 6HD2, or 6HG2).
A9.7.15. Single, composite package comprised of glass, porcelain, or stoneware in steel, aluminum, or fiber drum (6PA1, 6PB1, or 6PG1).
A9.7.16. Single, composite package comprised of glass, porcelain, or stoneware, in steel, aluminum, wooden, or fiberboard box (6PA2, 6PB2, 6PC, or 6PG2).
A9.7.17. Single, composite package comprised of glass, porcelain, or stoneware in solid or expanded plastic packaging (6PH1 or 6PH2).

A9.7.18. Single, composite package comprised of a plastic receptacle in a plywood drum (6HD1). Not authorized for PG 1 material.
A9.7.19. DOT specification cylinders as prescribed for any compressed gas, except DOT 8 (acetylene) and DOT 3HT.

A9.8. Packaging for Class 5.1 Solids. Package in: (see A3.2.5.2):
A9.8.1. Steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum other than steel or aluminum (1N1 or 1N2), with inside glass, earthenware, plastic, or metal receptacles.
A9.8.2. Plywood drum (1D), fiber drum (1G), or plastic drum (1H1 or 1H2), with inside glass, earthenware, plastic, or metal receptacles.
A9.8.3. Wooden Barrel (2C2), with inside glass, earthenware, plastic, or metal receptacles.
A9.8.4. Steel jerrican (3A1 or 3A2) or plastic jerrican (3H1 or 3H2) with inside glass, earthenware, plastic, or metal receptacles.
A9.8.5. Steel box (4A1 or 4A2) or aluminum box (4B1 or 4B2) with inside glass, earthenware, plastic, or metal receptacles.
A9.8.6. Natural wood box (4C1 or 4C2), plywood box (4D), or reconstituted wood box (4F), with inside glass, earthenware, plastic, or metal receptacles.
A9.8.7. Fiberboard box (4G) with inside glass, earthenware, plastic, or metal receptacles.
A9.8.8. Solid plastic box (4H2) with inside glass, earthenware, plastic, or metal receptacles.
A9.8.9. Steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum other than steel or aluminum (1N1 or 1N2).
A9.8.10. Plywood drum (1D). Not authorized for PG I material.
A9.8.11. Plastic drum (1H1 or 1H2).
A9.8.12. Fiber drum (1G).
A9.8.13. Wooden barrel (2C1 or 2C2). Not authorized for PG I material.
A9.8.14. Steel jerrican (3A1 or 3A2) or plastic jerrican (3H1 or 3H2).
A9.8.15. Steel box with liner (4A2), or aluminum box with liner (4B2).
A9.8.16. Steel box (4A1) or aluminum box (4B1). Not authorized for PG I material.
A9.8.17. Natural wood box , siftproof (4C2).
A9.8.18. Plywood box (4D), reconstituted wood box (4F), or natural wood box (4C1). Not authorized for PG I material.
A9.8.19. Fiberboard box (4G). Not authorized for PG I material.
A9.8.20. Expanded plastic box (4H1) or solid plastic box (4H2).
A9.8.21. Bag, woven plastic (5H1, 5H2, or 5H3)**;** bag, plastic film (5H4); bag, textile (5L1, 5L2, or 5L3); bag, paper, multiwall, water-resistant (5M2). Not authorized for PG I material.
A9.8.22. Single, composite package comprised of a plastic receptacle in steel, aluminum, plywood, fiber, or plastic drum (6HA1, 6HB1, 6HD1, 6HG1, or 6HH).
A9.8.23. Single, composite package comprised of a plastic receptacle in steel, aluminum, wood, plywood, or fiberboard box (6HA2, 6HB2, 6HC, 6HD2, or 6HG2).
A9.8.24. Single, composite package comprised of glass, porcelain, or stoneware in steel, aluminum, plywood, or fiber drum (6PA1, 6PB1, 6PD1, or 6PG1).
A9.8.25. Single, composite package comprised of glass, porcelain, or stoneware, in steel, aluminum, wooden, or fiberboard box (6PA2, 6PB2, 6PC, or 6PG2).
A9.8.26. Single, composite package comprised of glass, porcelain, or stoneware in expanded or solid plastic packaging (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 1.6.4 for more information on CAAs.

A9.11. Bromine Pentafluoride or Bromine Trifluoride. 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.

CLASS 6--POISONOUS (TOXIC) MATERIALS AND INFECTIOUS SUBSTANCES

A10.1. General Requirements. This attachment contains information concerning the packaging and general handling instructions for Class 6.1 poisons. These poisons can react through the skin, respiratory tract, or gastrointestinal tract. In general, solid poisons that are 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. General Handling Instructions:

- 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.
- Keep away from oxidizing materials.
- Make sure personnel exposed to leaking materials wear a gas mask or self-contained breathing apparatus (specific recommendations can be obtained from the medical services.)
- Store away from acids or acid fumes.

A10.3. Packaging for Certain Packing Group I Poisonous (6.1) 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 A3.2.2. 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 A3.2.2.5). 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 A3.2.2.
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 A3.2.2.

A10.5. Packaging for Liquid Class 6.1 Materials. Package in:
A10.5.1. Steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum, other than steel or aluminum (1N1 or 1N2) with inside glass, earthenware, plastic, or metal receptacles.
A10.5.2. Plywood drum (1D), fiber drum (1G), or plastic drum (1H1 or 1H2), with inside glass, earthenware, plastic, or metal receptacles.
A10.5.3. Wooden barrel (2C2), with inside glass, earthenware, plastic, or metal receptacles. Not authorized for PG I material.
A10.5.4. Steel jerrican (3A1 or 3A2) or plastic jerrican (3H1 or 3H2), with inside glass, earthenware, plastic, or metal receptacles.

A10.5.5. Steel box (4A1 or 4A2) or aluminum box (4B1 or 4B2) with inside glass, earthenware, plastic, or metal receptacles.
A10.5.6. Natural wood box (4C1 or 4C2), plywood box (4D), or reconstituted wood box (4F), with inside glass, earthenware, plastic, or metal receptacles.
A10.5.7. Fiberboard box (4G) with inside glass, earthenware, plastic, or metal receptacles.
A10.5.8. Expanded plastic box (4H1) or solid plastic box (4H2) with inside glass, earthenware, plastic, or metal receptacles.
A10.5.9. Steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum, other than steel or aluminum (1N1 or 1N2).
A10.5.10. Plastic drum (1H1 or 1H2).
A10.5.11. Wooden barrel (2C1). Not authorized for PG I material.
A10.5.12. Steel jerrican (3A1 or 3A2) or plastic jerrican (3H1 or 3H2).
A10.5.13. Single, composite package comprised of a plastic receptacle in steel, aluminum, fiber, or plastic drum (6HA1, 6HB1, 6HG1, or 6HH).
A10.5.14. Single, composite package comprised of a plastic receptacle in steel, aluminum, wooden, plywood, or fiberboard box (6HA2, 6HB2, 6HC, 6HD2, or 6HG2).
A10.5.15. Single, composite package comprised of glass, porcelain, or stoneware in steel, aluminum, or fiber drum (6PA1, 6PB1, or 6PG1).
A10.5.16. Single, composite package comprised of glass, porcelain, or stoneware, in steel, aluminum, wooden, or fiberboard box (6PA2, 6PB2, 6PC, or 6PG2).
A10.5.17. Single, composite package comprised of glass, porcelain, or stoneware in solid or expanded plastic packaging (6PH1 or 6PH2).
A10.5.18. Single, composite package comprised of a plastic receptacle in a plywood drum (6HD1). Not authorized for PG I material.
A10.5.19. 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. Package in:
A10.6.1. Steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum other than steel or aluminum (1N1 or 1N2), with inside glass, earthenware, plastic, or metal receptacles.
A10.6.2. Plywood drum (1D), fiber drum (1G), or plastic drum (1H1 or 1H2), with inside glass, earthenware, plastic, or metal receptacles.
A10.6.3. Wooden barrel (2C2), with inside glass, earthenware, plastic, or metal receptacles.
A10.6.4. Steel jerrican (3A1 or 3A2) or plastic jerrican (3H1 or 3H2) with inside glass, earthenware, plastic, or metal receptacles.
A10.6.5. Steel box (4A1 or 4A2) or aluminum box (4B1 or 4B2) with inside glass, earthenware, plastic, or metal receptacles.
A10.6.6. Natural wood box (4C1 or 4C2), plywood box (4D), or reconstituted wood box (4F), with inside glass, earthenware, plastic, or metal receptacles.
A10.6.7. Fiberboard box (4G) with inside glass, earthenware, plastic, or metal receptacles.
A10.6.8. Solid plastic box (4H2) with inside glass, earthenware, plastic, or metal receptacles.
A10.6.9. Steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum other than steel or aluminum (1N1 or 1N2).
A10.6.10. Plywood drum (1D). Not authorized for PG I material.
A10.6.11. Plastic drum (1H1 or 1H2).
A10.6.12. Fiber drum (1G).
A10.6.13. Wooden barrel (2C1 or 2C2). Not authorized for PG I material.
A10.6.14. Steel jerrican (3A1 or 3A2) or plastic jerrican (3H1 or 3H2).
A10.6.15. Steel box with liner (4A2), or aluminum box with liner (4B2).
A10.6.16. Steel box (4A1) or aluminum box (4B1). Not authorized for PG I material.
A10.6.17. Natural wood box sift-proof (4C2).
A10.6.18. Plywood box (4D), reconstituted wood box (4F), or natural wood box (4C1.) Not authorized for PG I material.
A10.6.19. Fiberboard box (4G). Not authorized for PG I material.
A10.6.20. Expanded plastic box (4H1) or solid plastic box (4H2).
A10.6.21. Bag, woven plastic (5H1, 5H2, or 5H3)**;** bag, plastic film (5H4); bag, textile (5L1, 5L2, or 5L3); bag, paper, multiwall, water-resistant (5M2). Not authorized for PG I material.

A10.6.22. Single, composite package comprised of a plastic receptacle in steel, aluminum, plywood, fiber, or plastic drum (6HA1, 6HB1, 6HD1, 6HG1, or 6HH).
A10.6.23. Single, composite package comprised of a plastic receptacle in steel, aluminum, wood, plywood, or fiberboard box (6HA2, 6HB2, 6HC, 6HD2, or 6HG2).
A10.6.24. Single, composite package comprised of glass, porcelain, or stoneware in steel, aluminum, plywood, or fiber drum (6PA1, 6PB1, 6PD1, or 6PG1).
A10.6.25. Single, composite package comprised of glass, porcelain, or stoneware, in steel, aluminum, wooden, or fiberboard box (6PA2, 6PB2, 6PC, or 6PG2).
A10.6.26. Single, composite package comprised of glass, porcelain, or stoneware in expanded or solid plastic packaging (6PH1 or 6PH2).

A10.7. Class 6.1, PG I, Hazard Zone A and B (Poisonous by Inhalation). Pack Class 6.1, PG I, materials that are poisonous by inhalation as identified in table A4.1, and fall within the boundaries of hazard zone A or B of figure A4.6, in nonbulk packagings as follows:
A10.7.1. In DOT cylinders as identified in 49 CFR, part 178 (Specifications for Packagings), subpart C (Specifications for Cylinders), except that specification 8, 8AL, and 39 cylinders are not authorized. Cylinders must also meet the requirements of A3.2.2.
A10.7.2. In a metal drum (1A1, 1B1, or 1N1), then place in a metal 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 1.50 mm (0.059 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). The outer drum (1A2 or 1H2) must withstand a hydrostatic test pressure of 100kPa (15 psi). The inner drum must also meet the following requirements:

- Satisfactorily withstand a hydrostatic pressure test (as outlined in 49 CFR, paragraph 178.605) of 550 kPa (80 psig).
- 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.
- Have screw-type closures that meet all the following requirements:
  - Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.
  - Physically held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation.
  - 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).
- Meet the following minimum thickness requirements:
  - 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).
  - 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).

A10.7.2.1. 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.
A10.7.3. 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 (4A1 or 4A2), aluminum box (4B1 or 4B2), 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 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).

A10.7.4. 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. The inner drum must also meet the following requirements:

- 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.
- Have screw-type closures that are:
  - Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.
  - Physically held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation.
  - 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).
- Meet the following minimum thickness requirements:
  - 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.
  - 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.
  - 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.

A10.7.4.1. 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.

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. 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. Use inner packagings that consist of a watertight primary receptacle, then place in a watertight secondary packaging. 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. This inner packaging must then be placed in an outer packaging of adequate strength for its capacity, mass, and intended use. The outer packaging must also meet the following requirements:

- Each package for infectious substances must be capable of passing the tests specified in 49 CFR, paragraph 178.609.
- Each package must be at least 100 mm (3.9 inches) in the smallest overall external dimensions.
- Each package of infectious substances must have an itemized list of the contents enclosed between the secondary packaging and the outer packaging.

A10.9.2. Package infectious substances according to the following guidelines. Exceptional cases, such as whole organs, may require special packaging. If special packaging is used it must meet the requirements of A10.9.1.
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.
A10.9.2.5. 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 +141 degrees F).
A10.9.3. 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.
A10.9.4. 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.
A10.9.5. Diagnostic specimens and biological products are not subject to the requirements of A10.9 if they do not contain any material that is or could be classified as an infectious substance.
A10.9.6. In addition to the requirements of this paragraph, the requirements of 42 CFR, Public Health, chapter 1, part 72 must be followed.

A10.10. Regulated Medical Waste. Package regulated medical waste in packaging that meet the PG II performance level. Additional packagings requirements are:

- Rigid, leak resistant, and impervious to moisture.
- Of sufficient strength to prevent tearing or bursting under normal conditions of handling and use.
- Sealed to prevent leakage during transport.
- 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.

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:

- 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 radioactivity material) as listed in A11.5. Activity limits not listed in A11.5 are determined per 49 CFR 173.433.
- The limits on activity contained in a type B, type B(U), or type B(M) package are those prescribed in A11.5 or in the applicable approval certificate of 49 CFR 173.471 or 173.473.

A11.4. Determining of A_1 and A_2 Values for Radionuclides:

- 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 (♋,n) or (♒,n) neutron sources.
- 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. A_1 and A_2 Values for Radionuclides are shown in table A11.1.

Table A11.1. Table of A_1 and A_2 Values for Radionuclides.

Symbol of Radionuclide	Element and Atomic Number	A_1(Ci) (Special form)	A_2(Ci) (Normal form)
^{227}Ac	Actinium (89)	1,000	0.003
^{228}Ac		10	4
^{105}Ag	Silver (47)	40	40
^{110m}Ag		7	7
^{111}Ag		100	20
^{241}Am	Americium (95) note 1	8	0.008
^{243}Am		8	0.008
^{37}Ar (compressed	Argon (18)	1,000	1,000
or uncompressed)			
^{41}Ar (uncompressed)		20	20
^{41}Ar (compressed)		1	1
^{73}As	Arsenic (33)	1,000	400
^{74}As		20	20
^{76}As		10	10
^{77}As		300	20
^{211}At	Astatine (85)	200	7
^{193}Au	Gold (79)	200	200
^{196}Au		30	30
^{198}Au		40	20
^{199}Au		200	25
^{131}Ba	Barium (56)	40	40
^{133}Ba		40	10
^{140}Ba		20	20
^{7}Be	Beryllium (4)	300	300
^{206}Bi	Bismuth (83)	5	5
^{207}Bi		10	10
^{210}Bi (Rae)		100	4
^{212}Bi		6	6
^{249}Bk	Berkelium (97)	1,000	1
^{77}Br	Bromine (35)	70	25
^{82}Br		6	6
^{11}C	Carbon (6)	20	20
^{14}C		1,000	60
^{45}Ca	Calcium (20)	1,000	25
47Ca		20	20
^{109}Cd	Cadmium (48)	1,000	70
^{115m}Cd		30	30
^{115}Cd		80	20

^{139}Ce	Cerium (58)	100	100
^{141}Ce		300	25
^{143}Ce		60	20
^{144}Ce		10	7
^{249}Cf	Californium (98)	2	0.002
^{250}Cf		7	0.007
^{252}Cf		2	0.009
^{36}Cl	Chlorine (17)	300	10

Table A11.1. Continued.

Symbol of Radionuclide	Element and Atomic Number	A_1(Ci) (Special form)	A_2(Ci) (Normal form)
^{242}Cm	Curium (96)	200	0.2
^{243}Cm		9	0.009
^{245}Cm		6	0.006
^{246}Cm		6	0.006
^{56}Co	Cobalt (27)	5	5
^{57}Co		90	90
^{58m}Co		1,000	1,000
^{58}Co		20	20
^{60}Co		7	7
^{51}Cr	Chromium (24)	600	600
^{129}Cs	Cesium (55)	40	40
^{131}Cs		1,000	1,000
^{134m}Cs		1,000	10
^{134}Cs		10	10
^{135}Cs		1,000	25
^{136}Cs		7	7
^{137}Cs		30	10
^{64}Cu	Copper (29)	80	25
^{67}Cu		200	25
^{165}Dy	Dysprosium (66)	100	20
^{166}Dy		1,000	200
^{169}Er	Erbium (68)	1,000	25
^{171}Er		50	20
^{152M}EU	Europium (63)	30	30
^{152}Eu		20	10
^{154}Eu		10	5
^{155}Eu		400	60
^{18}F	Fluorine (9)	20	20
^{52}Fe	Iron (26)	5	5
^{55}Fe		1,000	1,000

^{59}Fe		10	10
^{67}Ga	Gallium (31)	100	100
^{68}Ga		20	20
^{72}Ga		7	7
^{153}Gd	Gadolinium (64)	200	100
^{159}Gd ^{68}Ge	Germanium (32)	300 20	20 10
^{71}Ge		1,000	1,000
^{3}H	Hydrogen (1)(See T-Tritium)		
181	Hafnium (72)	30	25
197m	Mercury (80)	200	200
197		200	200
^{203}Hg		80	25
^{166}Ho	Holmium (67)	30	30
^{123}I	Iodine (53)	50	50
^{125}I		1000	70

Table A11.1. Continued

Symbol of Radionuclide	Element and Atomic Number	A_1(Ci) (Special form)	A_2(Ci) (Normal form)
^{129}I		1,000	2
^{131}I		40	10
^{132}I		7	7
^{133}I		30	10
^{134}I		8	8
^{135}I		10	10
^{111}In	Indium (49)	30	25
^{113m}In		60	60
^{114m}In		30	20
^{115m}In		100	20
^{190}Ir	Iridium (77)	10	10
^{192}Ir		20	10
^{194}Ir		10	10
^{42}K	Potassium (19)	10	10
^{43}K		20	10
^{85m}Kr (uncompressed)	Krypton (36)	100	100
^{85m}Kr (compressed)		3	3
85Kr (uncompressed)		1,000	1,000
85Kr (compressed)		5	5
^{87}Kr (uncompressed)		20	20
^{87}Kr (compressed)		0.6	0.6
^{140}La	Lanthanum (57)	30	30

LSA	Low specific activity material - see A11.17		
^{177}Lu	Lutetium (71)	300	25
MFP	Mixed fission products	10	0.4
^{28}Mg	Magnesium (12)	6	6
^{52}Mn	Manganese (25)	5	5
^{54}Mn		20	20
^{56}Mn		5	5
^{99}Mo	Molybdenum (42)	100	20
^{13}N	Nitrogen (7)	20	10
^{22}Na	Sodium (11)	8	8
^{24}Na		5	5
^{93m}Nb	Niobium (41)	1,000	200
^{95}Nb		20	20
^{97}Nb		20	20
^{147}Nd	Neodymium (60)	100	20
^{149}Nd		30	20
^{59}Ni	Nickel (28)	1,000	900
^{63}Ni		1,000	100
^{65}Ni		10	10
^{237}Np	Neptunium (93)	5	0.005
^{239}Np		200	25
^{185}Os	Osmium (76)	20	20
^{191}Os		600	200
^{191m}Os		200	200

Table A11.1. Continued

Symbol of Radionuclide	Element and Atomic Number	A_1(Ci) (Special form)	A_2(Ci) (Normal form)
^{32}P	Phosphorus (15)	30	30
^{230}Pa	Protactinium (91)	20	0.8
^{231}Pa		2	0.002
^{233}Pa		100	100
^{201}Pb	Lead (82)	20	20
^{210}Pb		100	0.2
^{212}Pb		6	5
^{103}Pd	Palladium (46)	1,000	700
^{109}Pd		100	20
^{147}Pm	Promethium (61)	1,000	25
^{149}Pm		100	20
^{210}Po	Polonium (84)	200	0.2
^{142}Pr	Praseodymium (59)	10	10
^{143}Pr		300	20

^{191}Pt	Platinum (78)	100	100
^{193m}Pt		200	200
^{197m}Pt		300	20
^{197}Pt		300	20
^{238}Pu	Plutonium (94) note 1	3	0.003
^{239}Pu		2	0.002
^{240}Pu		2	0.002
^{241}Pu		1,000	0.1
^{242}Pu		3	0.003
^{223}Ra	Radium (88)	50	0.2
^{224}Ra		6	0.5
^{226}Ra		10	0.05
^{228}Ra		10	0.05
^{81}Rb	Rubidium (37)	30	25
^{86}Rb		30	30
^{87}Rb		Unlimited	Unlimited
Rb (natural)		Unlimited	Unlimited
^{186}Re	Rhenium (75)	100	20
^{187}Re		Unlimited	Unlimited
^{188}Re		10	10
Re (natural)		Unlimited	Unlimited
^{103m}Rh	Rhodium (45)	1,000	1,000
^{105}Rh		200	25
^{222}Rh	Radon (86)	10	2
^{97}Ru	Ruthenium (44)	80	80
^{103}Ru		30	25
^{105}Ru		20	20
^{106}Ru		10	7
^{35}S	Sulphur (16)	1,000	60
^{122}Sb	Antimony (51)	30	30
^{124}Sb		5	5
^{125}Sb		40	25
^{46}Sc	Scandium (21)	8	8
^{47}Sc		200	20

Table A11.1. Continued

Symbol of Radionuclide	Element and Atomic Number	A_1(Ci) (Special form)	A_2(Ci) (Normal form)
^{75}Se	Selenium (34)	40	40
^{31}Si	Silicon (14)	100	20
^{147}Sm	Samarium (62)	Unlimited	Unlimited
^{151}Sm		1,000	90

^{153}Sm		300	20
^{113}Sn	Tin (50)	60	60
^{119m}Sn		100	100
^{125}Sn		10	10
^{85m}Sr	Strontium (38)	80	80
^{85}Sr		30	30
^{87m}Sr		50	50
^{89}Sr		100	10
^{90}Sr		10	0.4
^{91}Sr		10	10
^{92}Sr		10	10
$_{T}$ (uncompressed)	Tritium (1)	1,000	1,000
$_{T}$ (compressed)		1,000	1,000
$_{T}$ (activated		1,000	1,000
luminous paint)			
$_{T}$ (absorbed on			
solid carrier)		1,000	1,000
$_{T}$ (tritiated water)		1,000	1,000
$_{T}$ (other forms)		20	20
^{182}Ta	Tantalum (73)	20	20
^{160}Tb	Terbium (65)	20	10
^{96m}Tc	Technetium (43)	1,000	1,000
^{96}Tc		6	6
^{97m}Tc		1,000	200
97Tc		1,000	400
^{99m}Tc		100	100
^{99}Tc		1,000	25
^{125m}Te	Tellurium (52)	1,000	100
^{127m}Te		300	20
^{127}Te		300	20
^{129m}Te		30	10
^{129}Te		100	20
^{131m}Te		10	10
^{132}Te		7	7
^{227}Th	Thorium (90)	200	0.2
^{228}Th		6	0.008
^{230}Th		3	0.003
^{231}Th		1,000	25
^{232}Th		Unlimited	Unlimited
^{234}Th		10	10
$_{Th}$ (natural) $_{Th}$ (Irradiated) Note 2		Unlimited	Unlimited

^{200}Tl	Thallium (81)	20	20

Table A11.1. Continued

Symbol of Radionuclide	Element and Atomic Number	A_1(Ci) (Special form)	A_2(Ci) (Normal form)
^{201}Tl		200	200
^{204}Tl		300	10
^{170}TM	Thulium (69)	300	10
^{171}TM		1,000	100
^{230}U	Uranium (92)	100	0.1
^{232}U		30	0.03
^{233}U		100	0.1
^{234}U		100	0.1
^{235}U		100	0.2
^{236}U		200	0.2
^{238}U		Unlimited	Unlimited
U (natural)		Unlimited	Unlimited
U (enriched)<20%		Unlimited	Unlimited
20% or greater		100	0.1
U (depleted)		Unlimited	Unlimited
U (irradiated) Note 3			
^{48}V	Vanadium (23)	6	6
^{181}W	Tungsten (74)	200	100
^{185}W		1,000	25
^{187}W		40	20
^{127}Xe (uncompressed)	Xenon (54)	70	70
^{127}Xe (compressed)		5	5
^{131m}Xe (compressed)		10	10
^{131m}Xe (uncompressed)		100	100
^{133}Xe (uncompressed)		1,000	1,000
^{133}Xe (compressed)		5	5
^{135}Xe (uncompressed)		70	70
^{135}Xe (compressed)		2	2
^{87}Y	Yttrium (39)	20	20
^{90}Y		10	10
^{91}My		30	30
^{91}Y		30	30
^{92}Y		10	10
^{93}Y		10	10
^{169}Yb	Ytterbium (70)	80	80
^{175}Yb		400	25
^{65}Zn	Zinc (30)	30	30

^{69m}Zn		40	20
^{69}Zn		300	20
^{93}Zr	Zirconium (40)	1,000	200
^{95}Zr		20	20
^{97}Zr		20	20

NOTES:

1. For shipments solely within the United States, the A_1 value is 20 curies for americium and plutonium contained in Am-Be or Pu-Be neutron sources or in nuclear-powered pacemakers.
2. The values of A_1 and A_2 must be calculated according to the procedure specified in 49 CFR 173.433, taking into account the activity of the fission products and of the uranium-233 in addition to that of the thorium.
3. The values of A_1 and A_2 must be calculated according to the procedure specified in 49 CFR 173.433, taking into account the activity of the fission products and plutonium isotopes in addition to that of the uranium.

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**.** Each shipper of a DOT 7A package must maintain on file for at least 1 year after the latest shipment and must provide to HQ AFMC/LGTP (on request) 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. DOT 7A packaging designed according to the requirements of 49 CFR 178.350 in effect on 30 June 1983, and constructed before 1 July 1985, may continue to be used. Packaging either designed or constructed after 30 June 1985, must meet the requirements of 49 CFR 178.350 applicable at the time of their design or construction.

A11.6.2. DOT 55 metal-encased shielded packaging must be requalified under DOT 7A requirements. Each packaging designed for liquids must also meet the requirements of 49 CFR 173.412. Use of this packaging as DOT 55 is not authorized.

A11.6.3. Any type B, B(U), or B(M) packaging, authorized in A11.7.

A11.6.4. Any foreign-made packaging that 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. The packaging must conform to the requirements of the country of origin (as indicated by the packaging marking) 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. For domestic shipments of special form radioactive materials (300 Ci or less) only, DOT 55 metal-encased shielded packaging constructed before 1 April 1975. Such packaging constructed after 31 March 1975 must not be designated as DOT 55. Use of this packaging is not authorized unless approved in A11.7.2.

A11.7.2. Any type B, type B(U), or type B(M) packaging that meets the applicable requirements in the regulations of the US Nuclear Regulatory Commission (10 CFR, part 71) and has been approved by that Commission may be shipped per 49 CFR 173.471.

A11.7.3. Any type B(U) or B(M) packaging that meets the applicable requirements of the regulations of the International Atomic Energy Agency (IAEA) in its "Regulations for the Safe Transport of Radioactive Materials, Safety Series No. 6, " and for which the foreign competent authority certificate has been revalidated by DOT (Associate Administrator for Hazardous Material Safety) according to 49 CFR 173.472. Authorized only for export and import shipments.

A11.7.4. 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) or generate more than 10 watts of radioactive decay heat.

A11.7.5. DOT 20 WC, wooden protective jacket, when used with a single, snug-fitting inner DOT 2R, or a DOT 55 container constructed before April 1, 1975. Such packaging constructed after March 31, 1975, must not be designated as DOT 55, but must be requalified as a DOT 7A. For liquid contents, the inner packaging must comply with 49 CFR 173.412. Not authorized for special form radioactive material.

A11.7.6. DOT 20WC, wooden protective jacket, with a single, snug-fitting inner type A packaging that has a metal outer wall or an inner DOT 55 packaging constructed before 1 April 1975. Such packaging, constructed after March 31, 1975,

may not be designated as DOT 55 but must be requalified as a DOT 7A. Radioactive decay heat must not be over 100 watts. Authorized only for special form radioactive material.
A11.7.7. DOT 21WC, wooden protective overpack, with a single inner DOT 2R or an inner DOT 55 container constructed before April 1, 1975. Such packaging, constructed after March 31, 1975, must not be designated as DOT 55, but must be requalified as a DOT 7A. 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.

A11.8. Authorized Packaging-Fissile Materials:
A11.8.1. Except as provided in A3.2.6.14, 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 the following radioactive materials:

- Not more than 500 grams of uranium^{235} in a single shipment as fissile class III, or not more than 40 grams of uranium^{235} per package as fissile class II. For fissile class II shipments, the transport index assigned to each package must not be less than 0.4 for each gram of uranium^{235} above 15 grams up to the maximum of 40 grams (transport index of 10).
- Not more than 320 grams of plutonium^{239} as plutonium-beryllium neutron sources in special form. Total radioactivity content must not be more than 20 Ci. The transport index to be assigned to each package must be 0.5 for each 20 grams, or fraction thereof, of fissile plutonium.

A11.8.1.4. Any other type A, type B, type B(U), or type B(M) packaging for fissile radioactive materials that also meets the applicable standards for fissile materials in 10 CFR, part 71, and is used according to 49 CFR 173.471.
A11.8.1.5. Any other type A, type B, type B(U), or type B(M) 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, Safety Series No. 6," 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:

- The quantity may not exceed 350 grams of uranium^{235} in any nonpyrophoric form, enriched to any degree in the uranium^{235} isotope.
- 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.
- Closures must conform to 49 CFR 178.352.
- 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.
- 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.
- Each inner container must be capable of venting if subjected to the thermal test described in 10 CFR, part 71.
- Liquid contents must be packaged per 49 CFR 173.412.
- 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 as a fissile class I package 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 Specification 6J or 17H Packages.

Maximum U-235 per Package (grams)	MinimumTransport Index per Package as Fissile Class II	Maximum Packages per Transport Vehicle as Fissile Class III
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 1

Note 1. Fissile Class I.

Table A11.3. Allowable Content of Uranium Hexafluoride (UF_6). "Heels" in a Specification 7A Cylinder.

Maximum Cylinder Diameter		**Cylinder Volume**		**Maximum Uranium 235 Enrich-ment (Weight %)**	**Maximum "Heel" Weight Per Cylinder**			
					UF_6		**Uranium 235**	
5	**Centimeters**	**Cubic Feet**	**L**		**kg**	**(lb)**	**kg**	**(lb)**
8	12.7	0.311	8.8	100.0	0.045	0.01	0.031	0.07
	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	25.0	.383	0.84
48	122	108.9	3084	4.5	22.7	50	.690	1.52
		(10 ton)						
		142.7	4041	4.5	22.7	50.0	.690	1.52
		(14 ton)						

A11.8.1.8. Containers specified in A11.8.2.5 for materials, quantities, and conditions as authorized and prescribed in A11.8.2.5.

A11.8.2. Package fissile radioactive materials with radioactive content over A_1 or A_2 in either:

A11.8.2.1. DOT 6L, Metal Packaging. 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). Radioactive decay heat output must not be more than 5 watts. 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. Packages are authorized as fissile class II and III with materials limited per table A11.4:

Table A11.4. Authorized Contents in Kilograms (Kg) and Conditions for Specification 6L Packages.

Uranium-235		**Plutonium (Note 1)**		**Fissile Class II Transport Index**	**Fissile Class III Maximum Number of Packages per Transport Vehicle**
H/X□3 (Note 2)	3□H/Z□20	H/X□10	10□H/X□20		
14	3.6 (Note 3)	.... 2.5	.... 2.4	1.3 1.8	80 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. For fissile materials:

- Fissile class I packages are limited to the following amounts of fissile radioactive materials: 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.
- Fissile class II and fissile class III maximum quantities of fissile material and other restrictions are given in table A11.5. For a fissile class II package, the minimum transport index to be assigned is shown in table For a fissile class III shipment, the allowable number of similar packages per transport vehicle is shown in table A11.5. Each fissile class III shipment is also subject to the requirements in A3.2.6.12. 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, a tight-fitting steel insert must be used to reduce a larger diameter inner containment vessel specified in 49 CFR 178.104-3(b) to the 12 centimeters (4.75 inches) limit.

Table A11.5. Authorized Contents for Specification 6M Packages (note 1)

Uranium-235 (note 5)			Uranium-235 (note 4 and 7)			Plutonium (note 2, 3, and 4)			Fissile Class II Trans-port Index	Fissile Class III Maximum Number of Packages per Transport Vehicle
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		
3.6	4.4	2.9	7.2	7.6	5.3	3.1	4.1	3.4	0.1	1,250
4.2	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 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. Maximum permitted uranium-235 enrichment is 93.5 percent.
8. H/X is ratio of hydrogen to fissile atoms in the inner containment with all sources of hydrogen in the containment considered.

A11.8.2.3. Type B, 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 V of the IAEA "Regulations for the Safe Transport of Radioactive Materials, Safety Series No. 6," 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 or 21PF-1, 21PF-2, 21PF-1A, or 21PF-1B phenolic-foam insulated overpacks with snug fitting inner metal cylinders meeting all of the applicable requirements of A3.1, A3.2.6.1, and A3.2.6.2.1, and the following:

- Handling procedures and packaging criteria must comply with US Department of Energy Report Number ORO-651 or ANSI Standard N14.1.
- DOT 21PF-1 overpacks in use or under construction before 1 April 1989 must be modified to DOT 21PF-1A before April 1, 1991. Use of unmodified DOT 21PF-1 overpacks is prohibited. All new construction to DOT 21PF-1 beginning after March 31, 1989 must meet DOT 21PF-1B.
- Quantities of uranium hexafluoride are authorized as shown in table A11.6, with each package to be shipped as fissile class II and assigned a minimum transport index as also shown.

Table A11.6. Authorized Quantities of Uranium Hexafluoride (UF_6) as Fissile Class II.

Protective Overpack Specification Number	Maximum Inner Cylinder Diameter		Maximum Weight of UF_6 Contents		Maximum U^{235} Enrichment (weight %)	Fissile Class II Transport Index
	Centimeter	Inch	Kilograms	Pounds		
20PF-1	12.7	5	25	55	100.0	0.1
20PF-2	20.3	8	116	255	12.5	4.0
20PF-3	30.5	12	209	460	5.0	1.1
21PF-1	76 (Note 2)	30(Note 2)	2,247	4,950	5.0	5.0
(Notes 1&4)	76 (Note 3)	30 Note 3)	2,279	5,020	5.0	5.0
21PF-2 (Note 1)	76 (Note 2)	30 (Note 2)	2,247	4,950	5.0	5.0
	76 (Note 3)	30 Note 3)	2,279	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: ORO-651).
3. Model 30B inner cylinder (reference: ORO-651).
4. 21PF-1 series includes the 21PF-1, 21PF-1A, and 21PF-1B. Allowable quantities are identical for all three overpacks.

A11.9. Authorized Packaging-Pyrophoric Radioactive Materials:
A11.9.1. Package pyrophoric radioactive materials in quantities not over A_2 per package in type A packagings constructed of materials that do not react nor be decomposed by the contents. Contents must be:

- In solid form and must not be fissile unless excepted by A3.2.6.14.
- Contained in sealed and corrosion resistant receptacles with positive closures (friction or slip-fit covers or stoppers are not authorized).
- Free of water and any contaminants that increase the reactivity of the material.
- Made inert to prevent self-ignition during transport by either:
  - 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.
  - Filling the innermost receptacle with an appropriate inert gas.

A11.9.2. In addition to the applicable requirements of A3.1, each package must be capable of passing the test conditions of 49 CFR 173.465 without leakage of contents.

A11.10. Authorized Packaging-Oxidizing Radioactive Materials. Pack certain oxidizing radioactive materials, which are not fissile materials and not in quantities over A_2, in suitable inside packagings of glass, metal, or compatible plastic and suitably cushioned with a material which will not react with the contents. Inner packaging and cushioning must be enclosed within an outside packaging of wood, metal, or plastic. The package must be capable of meeting the applicable test requirements of 49 CFR 173.465 without leakage of contents. The maximum quantity in any package must not be over 11.3 kg (25 pounds).

A11.11. 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, certification, shipping paper, marking, and labeling requirements if:

- The materials are packaged in strong, tight packages that will not leak any of the radioactive materials under normal transportation conditions.
- The radiation level at any point on the external surface of the package is not over 0.5 mrem/h.
- The nonfixed (removable) radioactive surface contamination on the external surface of the package is not over the limits specified in A3.2.6.16.1.
- Except as provided in A11.16, the package does not contain more than 15 grams of uranium^{235}.
- 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. Certify excepted radioactive materials prepared for shipment under A11.11, A11.14, or A11.16 as being acceptable for transportation by having a notice enclosed in or on the package, included with the packing list, or otherwise forwarded with the package. This notice must include the name of the consignor or consignee and the statement "This package conforms to the conditions and limitations specified in 49 CFR 173.421 for radioactive material, excepted package-limited quantity of material, UN2910"; "49 CFR 173.422 for radioactive material, excepted package-instruments or articles, UN2910"; or "49 CFR 173.424 for radioactive material, excepted package-articles manufactured from natural or depleted uranium or natural thorium, UN2910"; or "49 CFR 173.427 for radioactive material, excepted package-empty packaging, UN2910," as appropriate.
A11.12.2. A limited quantity radioactive material classed radioactive material and prepared for shipment under provisions of A11.11, A11.13, A11.14, or A11.16 are not subject to the requirements of this manual except for A3.2.6.5.5, and incident reporting.
A11.12.3. The DD Form 1387 shipping label must be annotated "Nonhazardous."

A11.13. Multiple Hazard Limited Quantity Radioactive Materials. Except as provided in A11.13.2, when a limited quantity radioactive material meets the definition of another hazard class, it must be:

- Classed for the additional hazard.
- Packaged to conform with requirements specified in A11.11. or A11.14 as appropriate.
- Offered for transportation per requirements applicable to the hazard for which it is classed.

A11.13.1. 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:

- Classed as a radioactive material if the material is not a hazardous waste or hazardous substance.
- Classed as a Class 9 material if the material is a hazardous waste or hazardous substance.
- Packaged to conform with requirements specified in A11.11. or A11.14 as appropriate.
- Offered for transportation according to requirements applicable to the hazard for which it is classed.

A11.13.2. 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. Exceptions 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, certification, shipping paper, marking, and labeling requirements if:

- The activity of the instrument or article is not over the applicable limit listed in table A11.7.
- The total activity per package is not over the applicable limit listed in table A11.7.
- The radiation level at 10 cm (4 inches) from any point on the external surface of any unpackaged instrument or article is not over 10 mrem/h.
- The radiation level at any point on the external surface of a package bearing the article or instrument is not over 0.5 mrem/h; or, for exclusive use domestic shipments, 2 mrem/h.
- The nonfixed (removable) radioactive surface contamination on the external surface of the package is not over the limits specified in A3.2.6.16.1.
- Except as provided in A11.16, the package does not contain more than 15 grams of uranium^{235}.
- 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 A11.12 and A11.14 are shown in table A11.7.

Table A11.7. Activity Limits for Limited Quantities Instruments and Articles.

Nature of Contents	Instrument and Article Limits (Note 1)	Package Limits	Materials Package Limits
Solids			
Special Form	10^{-2} A_1	A_1	10^{-3} A_1
Other Forms	10^{-2} A_2	A_2	10^{-3} A_2
Liquids			
Tritiated Water			
<0.1 Ci/liter			1000Ci
0.1 Ci to 1.0 Ci/liter			100Ci
>1.0 Ci/liter			1 Ci
Other Liquids	10^{-3} A_2	10^{-1} A_2	10^{-4} A_2
Gases			
Tritium (Note 2)	20 Ci	200 Ci	20 Ci
Special Form	10^{-3} A_1	10^{-2} A_1	10^{-3} A_1
Other 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.

A11.16. Excepted Articles Containing Natural Uranium or Thorium. Manufactured articles, in which the sole radioactive material content is natural or depleted uranium or natural thorium, are excepted from the specification packaging, shipping papers, certification, marking, and labeling requirements if:

- The outer surface of the uranium or thorium is enclosed in an inactive sheath made of metal or other durable protective material.
- The conditions specified in A11.11 are met.
- The article is otherwise prepared for shipment as specified in A11.12.

A11.17. Transport Requirements for Low Specific Activity (LSA) Radioactive Materials. LSA materials must be transported in a DOT 7A type A package. The requirements of 49 CFR 173.412 (a), (b), (d) and 49 CFR 173.412 (n) do not apply.

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. Store corrosive materials in a cool, well ventilated area away from sources of heat and oxidizing agents. Both the vapor and the liquid are corrosive and irritating and cause burns to the body and damage to the aircraft. Properly placard the storage area. Gas masks or respirators, rubber gloves, goggles, and other protective clothing must be readily available.

A12.3. Packaging for Liquid Class 8 Materials. Package in (see A3.2.7):
A12.3.1. Steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum, other than steel or aluminum (1N1 or 1N2) with inside glass, earthenware, plastic, or metal receptacles.
A12.3.2. Plywood drum (1D), fiber drum (1G), or plastic drum (1H1 or 1H2), with inside glass, earthenware, plastic, or metal receptacles.
A12.3.3. Wooden barrel (2C2), with inside glass, earthenware, plastic, or metal receptacles. Not authorized for PG I material.
A12.3.4. Steel jerrican (3A1 or 3A2) or plastic jerrican (3H1 or 3H2), with inside glass, earthenware, plastic, or metal receptacles.
A12.3.5. Steel box (4A1 or 4A2) or aluminum box (4B1 or 4B2) with inside glass, earthenware, plastic, or metal receptacles.
A12.3.6. Natural wood box (4C1 or 4C2), plywood box (4D), or reconstituted wood box (4F), with inside glass, earthenware, plastic, or metal receptacles.
A12.3.7. Fiberboard box (4G) with inside glass, earthenware, plastic, or metal receptacles.
A12.3.8. Expanded plastic box (4H1) or solid plastic box (4H2) with inside glass, earthenware, plastic, or metal receptacles.
A12.3.9. Steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum, other than steel or aluminum (1N1 or 1N2).
A12.3.10. Plastic drum (1H1 or 1H2).
A12.3.11. Wooden barrel (2C1). Not authorized for PG I material.
A12.3.12. Steel jerrican (3A1 or 3A2) or plastic jerrican (3H1 or 3H2).
A12.3.13. Single, composite package comprised of a plastic receptacle in steel, aluminum, fiber, or plastic drum (6HA1, 6HB1, 6HG1, or 6HH).
A12.3.14. Single, composite package comprised of a plastic receptacle in steel, aluminum, wooden, plywood, or fiberboard box (6HA2, 6HB2, 6HC, 6HD2, or 6HG2).
A12.3.15. Single, composite package comprised of glass, porcelain, or stoneware in steel, aluminum, or fiber drum (6PA1, 6PB1, or 6PG1).
A12.3.16. Single, composite package comprised of glass, porcelain, or stoneware, in steel, aluminum, wooden, or fiberboard box (6PA2, 6PB2, 6PC, or 6PG2).
A12.3.17. Single, composite package comprised of glass, porcelain, or stoneware in solid or expanded plastic packaging (6PH1 or 6PH2).
A12.3.18. Single, composite package comprised of a plastic receptacle in a plywood drum (6HD1.) Not authorized for PG I material.
A12.3.19. DOT specification cylinders as prescribed for any compressed gas, except DOT 8 (acetylene) and DOT 3HT.
A12.3.20. DS2 may be packaged in:
A12.3.20.1. 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).
A12.3.20.2. 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. Package in (also see A3.2.7):
A12.4.1. Steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum, other than steel or aluminum (1N1 or 1N2) with inside glass, earthenware, plastic, or metal receptacles.

A12.4.2. Plywood drum (1D), fiber drum (1G), or plastic drum (1H1 or 1H2), with inside glass, earthenware, plastic, or metal receptacles.
A12.4.3. Wooden barrel (2C2), with inside glass, earthenware, plastic, or metal receptacles.
A12.4.4. Steel jerrican (3A1 or 3A2) or plastic jerrican (3H1 or 3H2), with inside glass, earthenware, plastic, or metal receptacles.
A12.4.5. Steel box (4A1 or 4A2) or aluminum box (4B1 or 4B2) with inside glass, earthenware, plastic, or metal receptacles.
A12.4.6. Natural wood box (4C1 or 4C2), plywood box (4D), or reconstituted wood box (4F), with inside glass, earthenware, plastic, or metal receptacles.
A12.4.7. Fiberboard box (4G) with inside glass, earthenware, plastic, or metal receptacles.
A12.4.8. Solid plastic box (4H2) with inside glass, earthenware, plastic, or metal receptacles.
A12.4.9. Steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum, other than steel or aluminum (1N1 or 1N2).
A12.4.10. Plywood drum (1D). Not authorized for PG I material.
A12.4.11. Plastic drum (1H1 or 1H2).
A12.4.12. Fiber drum (1G).
A12.4.13. Wooden barrel (2C1 or 2C2). Not authorized for PG I material.
A12.4.14. Steel jerrican (3A1 or 3A2) or plastic jerrican (3H1 or 3H2).
A12.4.15. Steel box with liner (4A2), or aluminum box with liner (4B2).
A12.4.16. Steel box (4A1), or aluminum box (4B1). Not authorized for PG I material.
A12.4.17. Natural wood box sift-proof (4C2).
A12.4.18. Plywood box (4D) or reconstituted wood box (4F). Natural wood box (4C1). Not authorized for PG I material.
A12.4.19. Fiberboard box (4G). Not authorized for PG I material.
A12.4.20. Expanded plastic box (4H1) or solid plastic box (4H2). Not authorized for PG I material.
A12.4.21. Bag, woven plastic (5H1, 5H2, or 5H3); bag, plastic film (5H4); bag, textile (5L1, 5L2, or 5L3); bag, paper, multiwall, water-resistant (5M2).
A12.4.22. Single, composite package comprised of a plastic receptacle in steel, aluminum, plywood, fiber, or plastic drum (6HA1, 6HB1, 6HD1, 6HG1, or 6HH).
A12.4.23. Single, composite package comprised of a plastic receptacle in steel, aluminum, wood, plywood, or fiberboard box (6HA2, 6HB2, 6HC, 6HD2, or 6HG2).
A12.4.24. Single, composite package comprised of glass, porcelain, or stoneware in steel, aluminum, plywood, or fiber drum (6PA1, 6PB1, 6PD1, or 6PG1).
A12.4.25. Single, composite package comprised of glass, porcelain, or stoneware, in steel, aluminum, wooden, or fiberboard box (6PA2, 6PB2, 6PC, or 6PG2).
A12.4.26. Single, composite package comprised of glass, porcelain, or stoneware in expanded or solid plastic packaging (6PH1 or 6PH2).

A12.5. Batteries, Wet, Filled with Acid; Batteries, Wet, Filled with Alkali; or Batteries, Wet, Nonspillable.
Completely protect against short circuit and securely cushion electric storage batteries containing electrolyte acid or alkali corrosive battery fluid within the outer container. Place batteries inside an acid-proof liner, adequately sealed to prevent leakage in the event of a spill, within the outer container. Pack batteries so that the fill openings or vents if any are upward. Do not pack with other articles except as provided in A13.6.1.3 and A12.5.4. However, batteries may be packed with portable searchlights, battery parts, or hydrometers, if properly cushioned and securely packed in a separate container.
A12.5.1. Packagings identified in this paragraph must meet PG II performance standards. The following specification packagings are authorized for batteries packed without other materials:
A12.5.1.1. According to military specification MIL-P-6063 (for aircraft batteries and cells).
A12.5.1.2. Ordinary wood (4C1), sift-proof wood (4C2), plywood (4D), or reconstituted wood (4F) box.
A12.5.1.3. Fiberboard box (4G).
A12.5.1.4. Plywood (1D) or fiber (1G) drum.
A12.5.1.5. Plastic drum (1H2), plastic jerrican (3H2), or solid plastic box (4H2).
A12.5.2. The following nonspecification packagings are **authorized for domestic only** shipments of batteries packed without other materials:
A12.5.2.1. 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).

A12.5.2.2. 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).
A12.5.2.3. 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).
A12.5.2.4. 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 on 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.
A12.5.3. Electric storage batteries protected against short circuits 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 1/2 times the width of the skid or pallet. The unit must weigh not less than 136 kg (300 pounds) 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 pounds), it must not fail with a superimposed weight of 1814 kg (4,000 pounds). Battery terminals must not be relied on to support any part of the superimposed weight. Each pallet or skid must be marked and labeled as required by attachment 14 and attachment 15.
A12.5.4. Package electrolyte, acid, or alkali corrosive battery fluid, packed with storage batteries wet or dry, in one of the following packagings:
A12.5.4.1. Ordinary wood (4C1), sift-proof wood (4C2), plywood (4D) box or reconstituted wood (4F) box, with inside glass receptacles not over 4.0 L (1 gallon) capacity each. Maximum quantity per outside container is 8.0 L (2 gallons.) Cushion and separate the inside containers from batteries by a strong solid wooden partition.
A12.5.4.2. Wooden box (4C1 or 4C2), plywood box (4D), or reconstituted wood (4F) box, with inside plastic bottles not over 1 L (1 quart) capacity each. 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).

A12.6. Bombs, Smoke, Nonexplosive. Ship bombs, smoke, nonexplosive provided they are without ignition elements, bursting charges, detonating fuses, or other explosive components. The following outer packagings are authorized:
A12.6.1. Ordinary wood (4C1), sift-proof wood (4C2), plywood (4D), or reconstituted wood (4F) box.
A12.6.2. Plywood drum (1D).

A12.7. Chemical Kits. Except as otherwise specified in this paragraph, pack, mark, and label chemical kits as prescribed by this manual for the specific corrosive materials contained in the kit.
A12.7.1. Chemical kits shipped domestically as NA 1760 and containing corrosive liquids in inner receptacles of not over 177 ml (6 fluid ounces) capacity each are excepted from specification packaging if the following requirements are met:

- The kit must be a strong wooden or metal container or be packed in a strong wooden or metal container.
- The inside containers of corrosive liquids must be cushioned with sufficient absorbent cushioning material to completely absorb the contents of the individual containers, and must be protected from damage by other materials in the kit.
- 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.

A12.7.2. 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.
A12.7.3. Package chemical kits containing hazardous materials in inner receptacles of no more than 250 mL (8.5 fluid ounces) for liquids or 250 g (9 ounces) for solids in one of the outer packagings specified in A12.7.3.1 through A12.7.3.3. 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. 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. The PG assigned to the kit as a whole must be the most stringent PG assigned to any individual substance in the kit. The following outer packagings are authorized:
A12.7.3.1. Ordinary wood (4C1), sift-proof wood (4C2), plywood (4D), or reconstituted wood (4F) box.
A12.7.3.2. Expanded plastic (4H1) or solid plastic (4H2) box.
A12.7.3.3. Fiberboard (4G) box.

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 or 4C2), plywood box (4D), reconstituted wood box (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. 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.

A12.9. Hydrogen Fluoride, Anhydrous. Package hydrogen fluoride (hydrofluoric acid, anhydrous) in cylinders, DOT 3, 3A, 3AA, 3B, 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 Contained in Articles):
A12.10.1. Handling Instructions. Mercury, metallic is a 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 alloys. It expands on freezing, and may crack glass containers.
A12.10.2. Packaging Requirements. Mercury must be in packagings that 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. Package mercury:
A12.10.2.1. In combination packagings, with inside glass, earthenware, or suitable plastic receptacles of not more than 250 mL (8 ounce) capacity each. The following outer packagings are authorized:
A12.10.2.1.1. Steel drum (1A2) or steel jerrican (3A2).
A12.10.2.1.2. Plywood (4D) or fiber (1G) drum.
A12.10.2.1.3. Ordinary wood (4C1), sift-proof wood (4C2), plywood (4D), or reconstituted wood (4F) box.
A12.10.2.1.4. Fiberboard box (4G).
A12.10.2.2. In iron or steel "quicksilver flasks," packaged in the following outer packagings:
A12.10.2.2.1. Steel drum (1A2) or steel jerrican (3A2).
A12.10.2.2.2. Plywood (4D) or fiber (1G) drum.
A12.10.2.2.3. Ordinary wood (4C1), sift-proof wood (4C2), plywood (4D), or reconstituted wood (4F) box.
A12.10.2.2.4. Fiberboard box (4G).
A12.10.2.3. 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).
A12.10.2.4. Specification packagings are not required for manufactured articles or apparatuses containing mercury when packaged as follows:
A12.10.2.4.1. 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.
A12.10.2.4.2. 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.

A12.10.2.5. Package electrons tubes, mercury vapor tubes, and similar tubes as follows:
A12.10.2.5.1. 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.
A12.10.2.5.2. 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.
A12.10.2.5.3. 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.
A12.10.2.5.4. Tubes which are completely jacketed in sealed leak-proof metal cases and are packed in the manufacturer's original packaging.
A12.10.2.6. Mercurial barometers complying with A12.10.2.4.1, 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 concentrations of up to and including 78 percent. In addition to the POP 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:

- Type 304 heat-treated (quenched in water at 1040 degrees C [1900 degrees F]).
- Stabilized type 347 in the as-welded condition.
- Stabilized type 347 stress-relieved (845-900 degrees C [1550-1650 degrees F]).
- Stabilized type 347 heat-treated (quenched in water at 1040 degrees C [1900 degrees F]).
- 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 more than 70 percent concentration in:
A12.11.4.1. Steel drum (1A2) or aluminum drum (1B2) with inside glass or earthenware containers not over 1 L (1 quart) capacity each or glass ampules not over 0.5 L (1 pint) capacity each.
A12.11.4.2. Plywood drum (1D) or fiber drum (1G) with inside glass or earthenware containers not over 1 L (1 quart) capacity each or glass ampules not over 0.5 L (1 pint) capacity each.
A12.11.4.3. Plastic drum (1H2) or plastic jerrican (3H2) with inside glass or earthenware containers not over 1 L (1 quart) capacity each or glass ampules not over 0.5 L (1 pint) capacity each.
A12.11.4.4. Wooden box (4C1 or 4C2), plywood box (4D), or reconstituted wood box (4F) with inside glass or earthenware containers not over 1 L (1 quart) capacity each or glass ampules not over 0.5 L (1 pint) capacity each.
A12.11.4.5. Fiberboard box (4G) with inside glass or earthenware containers not over 1 L (1 quart) capacity each or glass ampules not over 0.5 L (1 pint) capacity each.
A12.11.5. Package nitric acid of less than 90 percent concentration in a wooden box (4C1 or 4C2), plywood box (4D), or reconstituted wood box (4F) with inside glass bottles not over 2.5 L (0.66 gallons) capacity each.
A12.11.6. Pack nitric acid of 70 percent or less concentration in:
A12.11.6.1. Steel drum (1A2) or aluminum drum (1B2) with inside glass, earthenware, or plastic containers not over 2.5 L (0.66 gallons) capacity each or glass ampules not over 0.5 L (1 pint) capacity each.
A12.11.6.2. Plywood drum (1D) or fiber drum (1G) with inside glass, earthenware, or plastic containers not over 2.5 L (0.66 gallons) capacity each or glass ampules not over 0.5 L (1 pint) capacity each.

A12.11.6.3. Plastic drum (1H2) or plastic jerrican (3H2) with inside glass, earthenware, or plastic containers not over 2.5 L (0.66 gallons) capacity each or glass ampules not over 0.5 L (1 pint) capacity each.
A12.11.6.4. Wooden box (4C1 or 4C2), plywood box (4D), or reconstituted wood box (4F) with inside glass, earthenware, or plastic containers not over 2.5 L (0.66 gallons) capacity each or glass ampules not over 0.5 L (1 pint) capacity each.
A12.11.6.5. Fiberboard box (4G) with inside glass, earthenware, or plastic containers not over 2.5 L (0.66 gallons) capacity each or glass ampules not over 0.5 L (1 pint) capacity each.
A12.11.6.6. Expanded plastic box (4H1) with inside glass bottles of not over 2.5 L (0.66 gallons.)
A12.11.6.7. Single, composite package comprised of glass, porcelain, or stoneware in steel, aluminum, or plywood drum (6PA1, 6PB1, or 6PD1).
A12.11.6.8. Single, composite package comprised of glass, porcelain, or stoneware, in steel, aluminum, or wooden box (6PA2, 6PB2, or 6PC).
A12.11.6.9. Single, composite package comprised of glass, porcelain, or stoneware in expanded or solid plastic packaging (6PH1 or 6PH2).

A12.12. Packaging for Class 8 Materials With an Inhalation Hazard (Hazard Zone A and B). Although table A4.1 may list the material as PG II, due to the inhalation hazard, PG I packaging is required. Package Class 8 materials (allyl chloroformate, bromine, and trichloroacetyl chloride) with an Inhalation Hazard (Hazard Zone A and B) as follows:
A12.12.1. In DOT cylinders as identified in 49 CFR, part 178 (Specifications for Packagings), subpart C (Specifications for Cylinders), except that specification 8, 8AL, and 39 cylinders are not authorized.
A12.12.2. Packed in a metal drum (1A1, 1B1, or 1N1), then placed in a metal 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 1.50 mm (0.059 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). The inner drum must also meet the following requirements:

- Satisfactorily withstand a hydrostatic pressure test (as outlined in 49 CFR, paragraph 178.605) of 550 kPa (80 psig).
- 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.
- Have screw-type closures that meet all the following requirements:
  - Closed tightly to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.
  - Physically held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation.
  - 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).
- Meet the following minimum thickness requirements:
  - 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).
  - 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).

A12.12.2.1. 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.
A12.12.3. 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 (4A1 or 4A2), aluminum box (4B1 or 4B2), 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).

A12.12.4. 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. The inner drum must also meet the following requirements:

- 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.
- Have screw-type closures that meet all the following requirements:
  - Closed and tightened to a torque as prescribed by the closure manufacturer, using a device that is capable of measuring torque.
  - Physically held in place by any means capable of preventing backoff or loosening of the closure by impact or vibration during transportation.
  - 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).
- Meet the following minimum thickness requirements:
  - 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.
  - 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.
  - 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.

A12.12.4.1. 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.

CLASS 9--MISCELLANEOUS HAZARDOUS MATERIAL

A13.1. General Requirements. This attachment contains information concerning the packaging and general handling instructions for Class 9 (Miscellaneous Hazardous Materials).

A13.2. Handling Instructions. 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.

A13.3. General Packaging Requirements for Class 9 and ORM-D. Generally, all inside containers for Class 9 and ORM-D packages must meet the requirements of A3.1 and this paragraph. 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.) 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. Package any Class 9 or ORM-D material that may cause a hazard in transportation due to its reaction with water in either an inner or outer waterproof packaging.
A13.3.1. Pack flammable liquids:
A13.3.1.1. In inside metal containers, each having a rated capacity of 1 L (1 quart) or less, packed in strong outside packagings.
A13.3.1.2. In inside containers, each having a rated capacity of .5 L (1 pint) or less, packed in strong outside packagings.
A13.3.1.3. In inside containers, each having a rated capacity of 4 L (1 gallon) or less, packed in strong outside packagings. These provisions only apply if the flash point of the material is 23 degrees C (73 degrees F) or higher.
A13.3.2. Package flammable solids, except for charcoal briquettes, in inside containers having a net weight of .5 kg (1 pound) each or less. Pack inside containers in strong outside packagings having a net weight of 11.3 kg (25 pounds) each or less. Charcoal briquettes may be shipped in packagings having a net weight of 30 kg (65 pounds) or less.
A13.3.3. Package flammable compressed gases:
A13.3.3.1. In inside containers, each having a water capacity of 118 ml, 7.22 cubic inches or less (4 fluid ounces or less.) Pack inside containers in strong outside packagings.
A13.3.3.2. In inside metal containers charged with a solution of materials and compressed gas or gases that are nonpoisonous, meeting all of the following:

- The capacity must not exceed 27.2 fluid ounces (50 cubic inches).
- The pressure in the container must not exceed 1242 kPa (180 psig) at 54 degrees C (130 degrees F). If the pressure is greater than 966 kPa (140 psig) at 130 degrees F (54 degrees C) but not over 160 psig (1104 kPa) at 54 degrees C (130 degrees F), a specification DOT 2P inside metal container must be used. If the pressure exceeds 1104 kPa (160 psig) at 54 degrees C (130 degrees F), an inside IP.7, IP.7A, or IP.7B metal container must be used. In any event, the metal container must be capable of withstanding, without bursting, a pressure of 1 1/2 times the equilibrium pressure of the contents at 54 degrees C (130 degrees F).
- The liquid content of the material and gas must not completely fill the container at 54 degrees C (130 degrees F).
- Pack the containers in strong outside packagings.
- Each completed container filled for shipment must have been heated until the pressure in the container is equivalent to the equilibrium pressure of the content at 54 degrees C (130 degrees F). There must not be evidence of leakage, distortion, or other defect to the containers.

A13.4. Ammonium Nitrate Fertilizers; Dibromodiflouromethane (Diflourodibromomethane); Environmentally Hazardous Substances, NOS; Hazardous Waste, NOS; Polycholorinated Biphenyls (PCB):
A13.4.1. **Handling Instructions.** Do not expose Dibromodiflouromethane to high temperature because, when it decomposes, toxic fumes are emitted. Store in a cool, ventilated area away from flame.
A13.4.2. **Packaging (Liquid):**
A13.4.2.1. Steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum, other than steel or aluminum (1N1 or 1N2) with inside glass, earthenware, plastic, or metal receptacles or pack in:
A13.4.2.2. Plywood drum (1D), fiber drum (1G), or plastic drum (1H1 or 1H2), with inside glass, earthenware, plastic, or metal receptacles.
A13.4.2.3. Wooden barrel (2C2), with inside glass, earthenware, plastic, or metal receptacles.

A13.4.2.4. Steel jerrican (3A1 or 3A2) or plastic jerrican (3H1 or 3H2), with inside glass, earthenware, plastic, or metal receptacles.
A13.4.2.5. Steel box (4A1 or 4A2) or aluminum box (4B1 or 4B2) with inside glass, earthenware, plastic, or metal receptacles.
A13.4.2.6. Natural wood box (4C1 or 4C2), plywood box (4D), or reconstituted wood box (4F), with inside glass, earthenware, plastic, or metal receptacles.
A13.4.2.7. Fiberboard box (4G) with inside glass, earthenware, plastic, or metal receptacles.
A13.4.2.8. Expanded plastic box (4H1) or solid plastic box (4H2) with inside glass, earthenware, plastic, or metal receptacles.
A13.4.2.9. Steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum, other than steel or aluminum (1N1 or 1N2).
A13.4.2.10. Plastic drum (1H1 or 1H2).
A13.4.2.11. Wooden barrel (2C1).
A13.4.2.12. Steel jerrican (3A1 or 3A2) or plastic jerrican (3H1 or 3H2).
A13.4.2.13. Single, composite package comprised of a plastic receptacle in steel, aluminum, fiber, or plastic drum (6HA1, 6HB1, 6HG1, or 6HH).
A13.4.2.14. Single, composite package comprised of a plastic receptacle in steel, aluminum, wooden, plywood, or fiberboard box (6HA2, 6HB2, 6HC, 6HD2, or 6HG2).
A13.4.2.15. Single, composite package comprised of glass, porcelain, or stoneware in steel, aluminum, or fiber drum (6PA1, 6PB1, or 6PG1).
A13.4.2.16. Single, composite package comprised of glass, porcelain, or stoneware, in steel, aluminum, wooden, or fiberboard box (6PA2, 6PB2, 6PC, or 6PG2).
A13.4.2.17. Single, composite package comprised of glass, porcelain, or stoneware in solid or expanded plastic packaging (6PH1 or 6PH2).
A13.4.2.18. Single, composite package comprised of a plastic receptacle in a plywood drum (6HD1).
A13.4.2.19. DOT specification cylinders as prescribed for any compressed gas, except DOT 8 (acetylene) and DOT 3HT.
A13.4.3. **Packaging (Solid):**
A13.4.3.1. Steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum, other than steel or aluminum (1N1 or 1N2) with inside glass, earthenware, plastic, or metal receptacles pack in:
A13.4.3.2. Plywood drum (1D), fiber drum (1G), or plastic drum (1H1 or 1H2), with inside glass, earthenware, plastic, or metal receptacles.
A13.4.3.3. Wooden barrel (2C2), with inside glass, earthenware, plastic, or metal receptacles.
A13.4.3.4. Steel jerrican (3A1 or 3A2) or plastic jerrican (3H1 or 3H2), with inside glass, earthenware, plastic, or metal receptacles.
A13.4.3.5. Steel box (4A1 or 4A2) or aluminum box (4B1 or 4B2) with inside glass, earthenware, plastic, or metal receptacles.
A13.4.3.6. Natural wood box (4C1 or 4C2), plywood box (4D), or reconstituted wood box (4F), with inside glass, earthenware, plastic, or metal receptacles.
A13.4.3.7. Fiberboard box (4G) with inside glass, earthenware, plastic, or metal receptacles.
A13.4.3.8. Solid plastic box (4H2) with inside glass, earthenware, plastic, or metal receptacles.
A13.4.3.9. Steel drum (1A1 or 1A2), aluminum drum (1B1 or 1B2), or metal drum, other than steel or aluminum (1N1 or 1N2).
A13.4.3.10. Plywood drum (1D).
A13.4.3.11. Plastic drum (1H1 or 1H2).
A13.4.3.12. Fiber drum (1G).
A13.4.3.13. Wooden barrel (2C1 or 2C2).
A13.4.3.14. Steel jerrican (3A1 or 3A2) or plastic jerrican (3H1 or 3H2).
A13.4.3.15. Steel box (4A1), steel box with liner (4A2), or aluminum box with liner (4B2).
A13.4.3.16. Natural wood box (4C1), natural wood box, sift-proof (4C2.) Plywood box (4D) or reconstituted wood box (4F).
A13.4.3.17. Fiberboard box (4G).
A13.4.3.18. Expanded plastic box (4H1) or solid plastic box (4H2).
A13.4.3.19. Bag, woven plastic (5H1, 5H2, or 5H3); bag, plastic film (5H4); bag, textile (5L1, 5L2, or 5L3); bag, paper, multiwall, water-resistant (5M2).

A13.4.3.20. Single, composite package comprised of a plastic receptacle in steel, aluminum, plywood, fiber, or plastic drum (6HA1, 6HB1, 6HD1, 6HG1, or 6HH1).
A13.4.3.21. Single, composite package comprised of a plastic receptacle in steel, aluminum, wood, plywood, or fiberboard box (6HA2, 6HB2, 6HC, 6HD2, or 6HG2).
A13.4.3.22. Single, composite package comprised of glass, porcelain, or stoneware in steel, aluminum, plywood, or fiber drum (6PA1, 6PB1, 6PD1, or 6PG1).
A13.4.3.23. Single, composite package comprised of glass, porcelain, or stoneware, in steel, aluminum, wooden, or fiberboard box (6PA2, 6PB2, 6PC, or 6PG2).
A13.4.3.24. Single, composite package comprised of glass, porcelain, or stoneware in expanded or solid plastic packaging (6PH1 or 6PH2).
A13.4.4. **Preventing Leakage.** 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 the POP requirements.

A13.5. Fueled, Motor Vehicles; and Self-Propelled Units. Find specific instructions for preparing items for air shipment in service technical manuals. Follow these instructions to ensure safety of the cargo aircraft from leakage of fluids during shipment. Shippers must comply with A13.6 for installed batteries. 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. Reference to the technical manual is not required on the Shipper's Declaration for Dangerous Goods, when the item is prepared according to this paragraph. See 3.4 and 3.7 for exceptions during tactical or contingency operations. The following fuel in tank requirements apply:
A13.5.1. Vehicles and self-propelled units must contain only the minimum quantity of fuel in tank consistent with operational requirements, not to exceed one half tank of fuel. Tanks must be securely closed.
A13.5.2. Engine-powered support equipment must be completely drained 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.
A13.5.3. Liquefied petroleum gas or compressed gas powered vehicles must have the gaseous fuel completely emptied from the pressurized vessel (fuel tank), lines, and regulator. Tanks must be securely closed. Purging is not required.
A13.5.4. Aircraft and helicopters must be prepared for air transportation according to the requirements of the respective aircraft's shipping manual. Remove all munitions and explosives, other than those installed as permanent-type aircraft equipment, according to the pertinent aircraft technical order and A5.3. Fasten batteries securely in the holder provided, with the terminals disconnected and 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. Transport fueled helicopters and aircraft with fuel in each tank not to exceed 150 gallons or three-fourths full, whichever amount is least. However, only one-half tank is authorized for fueled helicopters and aircraft loaded on the ramp area of cargo aircraft. Fuel leakage must not occur during shipment. No special venting is required other than to maintain a normal aircraft ventilation during flight. Vents must be sealed according to service technical directives.
A13.5.5. Fuel devices (carburetors, fuel pumps, filters, etc.) must be drained of fuel. All openings and lines must be capped or sealed according to applicable technical directives. Total content of fuel must not exceed 500 ml (17 ounces). Package devices in a strong outside container. These items are identified as "other regulated substances." Specification (POP) packaging is not required.
A13.5.6. Damaged or wrecked internal combustion engines must be drained as much as possible, and plugs, caps, and covers required by technical manuals must be installed over all openings.
A13.5.7. Aircraft engines that are inoperable must be completely drained and must comply with all other technical directives.

A13.6. Unfueled, Motor Vehicles, Self-Propelled Units, Including Internal Combustion Engine With Electric Storage Batteries (also includes wheelchairs).
A13.6.1. **Automobiles.** Automobiles, other self-propelled vehicles, engines, or other mechanical apparatus, equipped with electric storage batteries, wet. These items are exempt from specification packaging, labeling, and marking requirements, except PSNs when prepared according to this paragraph. The requirements of A13.5 apply for vehicles and support equipment with fuel in tank.
A13.6.1.1. Batteries installed in the vehicle or mechanical apparatus must be completely protected so that short circuits are prevented and so secured that leakage of battery fluid cannot occur. To secure the battery from short circuit, the terminal

posts must be completely protected from contact (i.e., taped, rubber boots, etc.). When prepared in this manner, it is not required to disconnect the battery or remove it from the equipment.
A13.6.1.2. When engines or mechanical apparatus are of such size or weight as to require skids, electric storage batteries, wet, may be securely fastened in the holder provided on the equipment. Protect the battery and terminals to prevent damage or short circuits. The batteries may also be completely boxed in containers of sound lumber. Filling holes must be upright. Boxes will be securely fastened to the skids upon which the engine (or mechanical apparatus) is mounted, to prevent accidental tipping, loosening, or leaking of acid.
A13.6.1.3. Batteries may be disconnected from the equipment, separately boxed in containers of sound lumber with filling holes upright, and blocked and braced inside vehicles (on floor, truck bed, etc.) to prevent accidental tipping, loosening, or leaking of acid.
A13.6.2. **Wheelchairs:**
A13.6.2.1. Wheelchairs equipped with nonspillable batteries may be transported provided the batteries are protected against short circuits and securely attached to the wheelchair or removed and boxed. Specifications packaging is not required.
A13.6.2.2. 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.
A13.6.2.3. These requirements apply to wheelchairs equipped with spillable batteries for carriage on aircraft in cargo compartments that cannot accommodate upright loading or storage of wheelchairs. Batteries must be removed and carried in strong outside containers that are leak tight, impervious to battery fluid, and rendered tilt-proof. Batteries must be protected against short circuit, secured upright in the outside container, and surrounded by absorbent cushioning material.
A13.6.3. **Aircraft and Helicopters.** Prepare unfueled (drained and purged) aircraft and helicopters according to the appropriate technical directive for military aircraft. 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. The requirements of A13.5.4 apply for installed components. Certification will be to this paragraph if the fuel tanks contain nonflammable fuel. For flammable fuel see A13.5.4.

A13.7. Unfueled, Motor Vehicles, Engine Powered Support Equipment, and Engine Internal Combustion (Without Installed Batteries). These items are void of hazardous material and are nonhazardous for transportation. A Shipper's Declaration for Dangerous Goods may be required (see attachment 17).
A13.7.1. All self-propelled ground vehicles, powered ground equipment, internal combustion engines (aircraft and ground power), with or without fuel tanks attached, are prepared for shipment and storage according to applicable technical directives. 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.
A13.7.2. All repairable fuel assemblies, fuel tanks, and cells are drained, purged, and sealed according to the applicable technical directive.
A13.7.3. All preserved and packed serviceable fuel assemblies, for example, carburetors, fuel pumps, filters, etc., must be drained and purged of all fuel. In addition, they must be sealed with proper caps, plugs, and covers according to the applicable technical directive. These items are not regulated by this manual.
A13.7.4. New engines or engines overhauled by a maintenance depot and containing no other hazard, are not regulated by this manual.

A13.8. Lithium Batteries and Cells:
A13.8.1. **General Requirements:**
A13.8.1.1. No cell may contain more than 12 g (0.42 ounces) of lithium or lithium alloy.
A13.8.1.2. Each cell and battery must be equipped with an effective means of preventing external short circuit.
A13.8.1.3. 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.
A13.8.1.4. 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.
A13.8.1.5. Cells and batteries must be subjected to the tests prescribed in 49 CFR 173.185(h).

A13.8.2. **Handling Instructions.** Do not use halon fire extinguishers to combat fires involving lithium-sulfur dioxide (Li-SO_2) batteries. Use water, CO_2, or approved Class-D (recommended) fire extinguisher.

A13.8.3. **Packaging Requirements.** Package lithium cells and batteries in performance oriented packaging that meets the PG II performance level as follows:

A13.8.3.1. In strong inner fiberboard containers limited to a maximum of 500 grams (17.6 ounces) of lithium per inner container. Pack inner containers in a removable head metal drum (1A2, 1B2) with a gas-tight gasket. Separate inner containers from each other and from the outer packaging by at least 25 mm (1 inch) of noncombustible cushioning material.

A13.8.3.2. Cells containing no more than 12 g (.42 ounces) of lithium metal which are hermetically sealed, and batteries constructed of such cells, are excepted from the tests in A13.8.1.5 and the outer metal drum requirement of A13.8.2.1, provided the tests as specified in 49 CFR 173.185(h)(3) have been successfully conducted. Army-procured lithium batteries are manufactured according to MIL-B-49430 and meet the test requirements of 49 CFR 173.185(h). 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. Package batteries that meet this requirement in a strong outer wooden box (4C1, 4C2, 4D, or 4F), fiberboard box (4G), or fiber drum (1G.)

A13.8.4. Non-Regulated Lithium Batteries. Lithium batteries are not regulated by this manual if they meet the following requirements:

- Each cell with a liquid cathode may contain no more than .5 g (.02 ounces) of lithium or lithium alloy, and each cell of a solid cathode may contain no more than 1.0 g (.04 ounces) of lithium or lithium alloy.
- Each battery with a solid cathode must contain a total quantity of no more than 2 g (.07 ounces) of lithium or lithium alloy, and each battery with a liquid cathode must contain a total quantity of no more than 1.0 g (.04 ounces) of lithium or lithium alloy.
- Each cell or battery containing a liquid cathode must be hermetically sealed.
- 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.
- If a liquid cathode battery contains more than .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.

A13.9. Carbon Dioxide, Solid (Dry Ice):

A13.9.1. **Handling Instructions.** Dry ice is cold and will damage human tissue on contact. Store in ventilated space. Never store in hermetically or tightly sealed containers. To minimize carbon dioxide concentration in an aircraft while on the ground, open the cargo and access doors 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 sublime and release carbon dioxide fumes. If the carbon dioxide concentration in the aircraft is over 0.5 percent, crew personnel 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. Crew personnel must be cautioned 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. **Dry Ice Limitations:**

- Do not carry dry ice in any upper deck compartment.
- Do not carry dry ice when troops are carried in the cargo compartment.
- Dry ice should be carried in the aft end of the cargo compartment.

A13.9.3.1. **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 A13.1.

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

Where:
V= Volume of aircraft
A= Air changes per hour
X= Maximum dry ice loading in pounds

Figure A13.1. Formula For Determining Dry Ice Limitations.

A13.9.3.2. **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 A13.2.

Aircraft	**Maximum Amount**	
Type	**in Pounds**	**Kilograms**
C-130	600	272
C-135	200	91
C-141B	3430 (See Note)	1555.5

Figure A13.2. Dry Ice Limitations When Aircraft is on Minimum Air Changes.

NOTE: 1,255 pounds (569 kg) with passengers.

A13.9.3.3. **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. Under these conditions 3, 644 pounds (1652.6 kilograms) of dry ice can be shipped on a C-141 aircraft. With unpressurized cargo compartment, the quantity of dry ice that can be transported is unlimited if the fumes are vented overboard the aircraft.

A13.9.3.4. **C-5 Aircraft.** Dry ice may be carried in the C-5A cargo compartment under the following aircraft operating conditions:

- During cruise (mach 0.5 and up) and altitudes up to 9144 m (30,000 feet), a safe load of dry ice is 2131.5 kg (4700 pounds.) During cruise (mach 0.6 and up) and altitudes above 9144 m (30,000 feet), a safe load is 1415 kg (3120 pounds.) The Environmental Control System (ECS) must be operated with "both" air-conditioning units on, a "Normal" flow setting on the flow control valve, and the "Intermediate" setting on the alternative air valve.
- During non-pressurized flight up to 3048 m (10,000 feet), a safe load is 2948 kg (6500 pounds.) The auxiliary vent valve must be open for this condition.
- During ground operations with one auxiliary power unit (air turbine motor at idle), a safe operating load is 1338 kg (2950 pounds). The auxiliary vent valve must be open for this condition.

A13.9.3.5. **KC-10 Aircraft.** Dry ice may be carried in the KC-10 cargo compartment under the following aircraft operating conditions:

- No environmental curtain (27 pallet all-cargo configuration.) A safe load of dry ice is 2,295 pounds with "both" air conditioning packs operating. This weight is reduced to 1,251 pounds when "one" air conditioning pack is operating. 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.
- Environmental curtain at station 615: A safe load of dry ice is 1,782 pounds with "both" air conditioning packs operating. This weight is reduced to 969 pounds when "one" air conditioning pack is operating.
- Environmental curtain at station 879: a safe load of dry ice is 1,204 pounds with "both" air conditioning packs operating. This weight is reduced to 653 pounds when "one" air conditioning pack is operating.

- 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.
- During cargo loading, the following procedures apply to minimize carbon dioxide concentration:
  - Ensure APU is running and "both" air conditioning packs are operating.
  - Open number 4 passenger service door for additional ventilation.
  - Open all air inlets in the aerial refueling operators station and close aerial refueling operators hatch.
  - Ensure environmental curtain is closed before flight.

A13.9.4. **Packaging Requirements.** Wrap in Kraft paper, secure with tape, and pack in fiberboard boxes. POP marked 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). 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). Magnetized materials for air shipment are identified as a PG III material. However, specification POP packaging is not required if the magnetized material has a magnetic field strength of less than 0.00525 gauss at 4.6m (15 feet). 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. Specification POP packaging is not required.

A13.11.2.2. Accompanying crew members. Package life-saving appliances containing small quantities of Class 1 (not to exceed 2.2 pounds N.E.W.) and other hazards in a strong fiberboard box or A-3 bag. Individual assigned kits may be handcarried by crew members. The requirements of A13.11.2.1 for inner packing and cushioning apply. When prepared and handcarried according to this paragraph, the marking and labeling requirements of Attachments 14 and 15 do not apply. Crew members must inform the Air Terminal Operations Center, when transporting life-saving appliances in this manner.

A13.12. 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.

A13.12.1. **Packaging Requirements.** Packaging must meet the general packaging requirements of A3.1. Specification POP packaging is not required. Package asbestos in:

A13.12.1.1. Rigid, leak tight packaging such as metal, plastic, or fiber drums.

A13.12.1.2. 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.

A13.12.1.3. Bags or other nonrigid packaging that are dust and sift-proof in strong outside fiberboard or wooden boxes.

A13.13. Oiled Material. Properly dry oiled material to prevent spontaneous heating, including carbon paper treated with oxidizable oil, oiled clothing, oil, impregnated or coated with 5 percent or less of animal or vegetable oil. Prepare this material for shipment according to A13.3 package as follows:
A13.13.1. When the nature of the material permits, it must be tightly rolled or coiled, and wrapped or sealed with heavy paper.
A13.13.2. Pack fabricated articles not suitable for rolling or coiling in sealed metal boxes or metal lined wooden boxes.

A13.14. Polystyrene Beads, Expandable, Evolving Flammable Vapors. Pack polystyrene beads or granules, expandable, impregnated with flammable gas or liquid as a blowing agent; and plastic molding materials in dough sheet or extruded rope form, in wood (4C1 or 4C2), plywood (4D), fiberboard (4G), or reconstituted wood (4F) boxes with sealed inner plastic liners. Plywood drums (1D) or fiber drums (1G) with sealed inner plastic liners or metal packaging (1A1, 1A2, 1B1, or 1B2) may also be used.

MARKING HAZARDOUS MATERIALS

A14.1. General Requirements. Mark hazardous materials according to MIL-STD-129 and this manual. Unless otherwise specified, mark all packages containing hazardous materials with the PSN and identification number shown in the alphabetical listing of items in table A4.1. Do not use abbreviations (except "w" (with), "w/o" (without), and "ORM" [other regulated material]).

A14.1.1. **United Nations (UN) Performance Oriented Packaging (POP) Markings.** POP markings are mandatory for packages of hazardous materials destined to an overseas location, or if the ultimate consignee is an overseas location. Activities originating hazardous materials shipments must consider the possibility that the material could be shipped overseas, and apply the POP mark accordingly. POP markings are strongly recommended for shipments where the ultimate consignee is a domestic activity, but are not yet mandatory. DOT and Federal or Military specification numbers are not required for domestic shipments unless POP markings do not appear on the container. A description of the codes and sequence of information contained in the POP marking are identified in figure A14.1.

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 box 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]). 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).

Figure A14.1. POP Markings Codes and Sequence of Instruction.

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 PG will be followed by the relative density, rounded off to the first decimal, 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 A3.1.2.
	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 POP 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 A14.1. Continued.

A14.1.1.1. **POP Marking of Combination Packaging.** Combination packages, with inner receptacles containing liquid hazardous material, must be marked to indicate that the inner receptacles meet the UN performance internal hydraulic pressure standard. The outer container must be marked "Air Eligible" to verify the inner containers meet the internal pressure requirement for air eligibility.

A14.1.1.2. **Overpacking POP Marked Packaging.** Inner packagings, which contain the prescribed UN POP markings, may be overpacked without further testing of the outer container. Mark the outer container "INNER PACKAGES COMPLY WITH PRESCRIBED SPECIFICATIONS." The overpack must also be marked according to A14.1.1.1, if it contains a liquid.

A14.1.1.3. **Grandfathered POP Items.** Containers packaged before January 1, 1990 may be shipped internationally by military air without the UN markings. Annotate the shipping papers with the words, "Government-owned goods packaged before January 1, 1990."

A14.1.2. **"THIS SIDE UP."** Pack all liquid hazardous materials in inside containers with filling holes up. Plainly mark the outside container "THIS SIDE UP" or "THIS END UP" on the cover or top to indicate the position of the inside containers. 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. In addition, two sides of a rectangular container and two equal distant points on the circumference of a cylindrical container must be stenciled with the word "UP," with an arrow pointing toward the top of the container. The length of the arrow must not be less than 2.54cm (1 inch) and the shaft not less than 1.3cm (1/2 inch) in width. The size of the arrow must be proportioned to the space available. Orientation labels may be used in place of stencil (see A15.1.8).

A14.1.3. **Hazardous Substance.** Mark all packages containing a hazardous substance with the letter "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:

- The name of the hazardous substance as shown in appendix A to 49 CFR, paragraph 172.101.
- The waste stream number.
- The letters "EPA" followed by the word "ignitability," "corrosivity," "reactivity," or "EP toxicity," as appropriate, or the corresponding "D" number, as appropriate.

A14.1.4. **Inhalation Hazard.** Mark each package containing any material that falls within the inhalation toxicity criteria specified in 49 CFR 173.133 "Inhalation Hazard." This requirement is applicable for containers having a capacity of 1 L (1.1 quarts) to 416.41 L (110 gallons).

A14.2. Marking Requirements Applicable to Class:

A14.2.1. **Class 1.** Mark packages of explosives containing liquids on the top with words "THIS SIDE UP."

A14.2.2. **Class 2.**

- For ethylene oxide prepared and certified according to A6.14.4, mark the top head of the drum "THIS END UP."
- Mark fire extinguishers prepared and certified according to A6.3.2.7 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.
- 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 and, 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).
- For nitric oxide prepared and certified according to A6.21 and the DOT 3A, 3AA, 3AL, or 3E1800 cylinders are overpacked, mark the outer wooden box "INSIDE CONTAINERS COMPLY WITH PRESCRIBED SPECIFICATIONS."
- For compressed gases in limited quantities prepared and certified according to A6.3, mark the outside packaging "INSIDE CONTAINERS COMPLY WITH PRESCRIBED SPECIFICATIONS" and "LIMITED QUANTITIES" or "LTD QTY."
- 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."

A14.2.3. **Class 3.** When shipping combustible liquids, mark the shipping container with the type of fuel and the flash point.

A14.2.4. **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."

A14.2.5. **Class 6.** Permanently mark outside plastic containers used for 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.

A14.2.6. **Class 7.** For limited quantities prepared and certified according to A11.11, the outside of the inner packaging or if there is no inner packaging, mark the outside of the packaging itself "Radioactive."

- Mark each package of radioactive materials over 50 kg (110 pounds) to show the gross weight.

- Mark each package of radioactive material that meets the requirements for type A or type B packaging on the outside of the package in letters at least 13mm (1/2 inch) high, with the words "TYPE A" or "TYPE B," as appropriate. Do not mark a package that does not meet these requirements. Mark each package of radioactive materials destined for overseas shipment "USA."

A14.2.7. **Class 8.** Mark the outer container of chemical kits prepared and certified according to A12.7 "CHEMICAL KITS" or "FIRST AID KITS" as applicable.

A14.2.8. **Class 9.** For wheelchairs prepared and certified to A13.6.2.3, mark the outer container containing the battery "THIS SIDE UP."

A14.2.9. **ORM Markings.** Plainly, durably, and legibly mark each package containing a material classified as "ORM-D" on at least one side or end with "ORM-D" or "ORM-D-AIR" immediately following or below the PSN. The ORM designation must be placed within a rectangle that is approximately 6.3 mm (1/4 inch) larger on each side than the ORM designation. An ORM designation is only authorized for domestic shipments.

A14.3. Marking Requirements Applicable to "Limited" and "Excepted" Quantities:

A14.3.1. **Limited Quantities.** Mark packages used for dangerous goods in limited quantities "Limited Quantities" or "LTD QTY."

A14.3.2. **Excepted Quantities.** Mark the air manifest with the words, "Dangerous Goods in Excepted Quantities."

LABELING HAZARDOUS MATERIALS

A15.1. General Requirements. Unless otherwise specified in this manual, packages containing hazardous materials must have the appropriate labels, as identified in table A4.1, applied to the outside container. When hazardous materials are palletized on a 463L pallet or warehouse skid, the label must be clearly visible. 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. Label hazardous materials that meet more than one hazard class for each hazard. When hazardous materials having different classes are packed in the same packaging or outside container, the outside container must be labeled as required for each material. Do not apply hazard labels to a package containing material which is not regulated. Do not use labels that are easily confused by their use, shape, and color, with the standard caution labels prescribed in the ICAO, IATA, or 49 CFR 172.411 through 172.450.

A15.1.1. Attach labels to the part of the package bearing the consignee's name and address.

A15.1.2. Do not place labels over any identifying data on the container.

A15.1.3. Include hazardous material class and division numbers, if applicable, (i.e., 1.1, 6.1, 8) in the bottom corner of the label that identifies the primary hazard. Labels that do not have the class or division number preprinted may be stamped or overprinted with the appropriate hazard class number in the bottom corner of the label. A label identifying any subsidiary risk (secondary hazard) must not show the class or division number. Obliterate this number (with the same color as the label) if already on the label.

A15.1.4. 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.

A15.1.5. Material classified as an infectious substance, that also meets the definition of a Class 2.3 poison or a radioactive material, must also be labeled with a "POISON GAS" label or "RADIOACTIVE" label as appropriate.

A15.1.6. Label empty packages according to A3.1.12.

A15.1.7. The "Cargo Aircraft Only" label is required on all shipments of dagger and theta cargo and packagings not permitted on passenger aircraft except according to chapter 3. The "Cargo Aircraft Only" label is not required on cargo shipped according to chapter 3 (see attachment 17 for certification.)

A15.1.8. Combination packagings or overpacks used to ship liquid hazardous material must have two Package Orientation (This Way Up) labels. Place the labels on opposite vertical sides to indicate the orientation of the inside containers. The lettering "THIS SIDE UP" or "THIS END UP" will also be included. Arrow stencils may be used in place of the orientation labels (see A14.1.2).

A15.1.9. Labels. It is the shipping activity's responsibility to establish procedures to locally fund for and procure hazardous material labels and commercial forms.

A15.2. General Requirements Applicable to Hazard Classes:

A15.2.1. **Class 2.**

- A toxic gas label may be used in place of a poison gas label required by table A4.1.
- 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, and the class number "2" would be used instead of Class "5.1." An "OXYGEN" label may be used in place of the "NONFLAMMABLE GAS" and "OXIDIZER" labels required in table A4.1.
- Recoil mechanisms or artillery gun mounts prepared and certified according to A6.7.3, 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.

A15.2.2. **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.

A15.2.3. **Class 7.**

- 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 three conditions: the radiation level at the surface of the package, the transport index, and the fissile characteristics of the package if appropriate. The proper category of label is determined according to table A15.1. Apply the highest category label required for any of the three 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 60 millirem per hour (mrem/h) which contains no fissile material must bear a radioactive yellow-III label (see table A15.1.)

Table A15.1. Radioactive Label Requirements. (See Note)

	A	B	C	D
RULE	**If The Transport Index (TI) is**	**and the Radiation Level (RL) Surface Is**	**or the Fissile Criteria Is**	**Then The Label Is**
1	N/A	0-0.5 mrem/h	fissile class I only, no fissile class II or III	white-I
2	0.1-1.0	0.6-50 mrem/h	fissile class I, fissile class II, with T.I.0.1-1.0, no fissile class III.	yellow-II
3	1.1-10	50.1-200 mrem/h	fissile class II, with T.I.1.1-10, fissile class III.	yellow-III

NOTE: The category of label must be shown in Key 16 of the Shipper's Declaration for Dangerous Goods and must also be applied to radioactive materials packages. Any package containing a "highway route controlled quantity" must be labeled as radioactive yellow-III.

- 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, packages containing:
- Label solid nitrates of uranium or thorium "RADIOACTIVE" and "OXIDIZER."
- Label nitric acid solution of radioactive material "RADIOACTIVE" and "CORROSIVE."
- 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:
  - **"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.
  - **"Activity."** Express units in appropriate curie units, i.e., curies (Ci), mullicuries (mCi), or microcuries (uCi). 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.
  - **"Transport Index."** See attachment 1. If an overpack is used to consolidate individual packages, determine this entry by adding together the transport indexes of the radioactive materials packages contained in the overpack. The transport index of the overpack must not exceed 3.0 for passenger-carrying aircraft shipments, or 10.0 for cargo only aircraft shipments.

A15.2.4. **Class 8.**

- Label chemical kits with the primary hazard label and any subsidiary risk labels applicable to each individual hazard within the kit.
- Batteries prepared and certified according to A12.5 must have a "Package Orientation" labels indicating the upright position (top) of the container.

A15.2.5. **Class 9.** A label is not required when shipments are prepared and certified according to A13.5 or A13.6.

A15.3. Limited and Excepted Quantities. Label each limited quantity package for each dangerous good contained in the package. However, each excepted quantities container only requires a completed "Dangerous Goods in Excepted Quantities" label attached to the container.

A15.4. Label Specifications:

- 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.
- 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.
- Use the color specifications detailed in 49 CFR 172.407(d), for the labels prescribed.
- A label conforming to specifications in the UN recommendations may be used in place of a corresponding label which conforms to the requirements of 49 CFR and this manual.

AREA PLACARDING

A16.1. General Requirements. Placard aircraft transporting any hazardous materials when parked according to table A16.1.

A16.2. Park aircraft transporting DoD Class 1.1, 1.2, and 1.3 explosives and Class 2.3 Hazard Zone A and B poison gas in a placarded area. Placarding is still required for these materials when parked in a designated restricted, posted, and traffic controlled parking or loading and unloading area.

A16.3. Park aircraft transporting hazardous materials other than those identified in A16.2 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. Use the placards specified in AFI 91-201, *Explosive Safety Standards*, instead of those specified in table A16.1 on Air Force installations.

A16.4. 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.

A16.5. Military hosts are responsible for placarding at military bases. 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. A description of the placards is shown in table A16.1.

A16.6. It is the shipping activity's responsibility to establish procedures to locally procure and fund for hazardous material placards.

Table A16.1. Placard Requirements. (see notes)

Area Placards Required for Parked 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	POISON GAS
4.3	DANGEROUS WHEN WET
6.1 (PG I, Inhalation hazard only)	POISON
7 (radioactive yellow-III label only)	RADIOACTIVE

Hazard Class or Division (1,000 pounds or more 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	ORGANIC PEROXIDE
6.1 (PG I or II, other than PG I inhalation hazard)	POISON
6.1 (PG III)	KEEP AWAY FROM FOOD
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. Placards complying with 49 CFR may be used.
3. EXPLOSIVE 1.2 placards are not required if the area contains both Class 1.1 and 1.2 explosives. Placard the area with EXPLOSIVE 1.1 placards.

CERTIFYING HAZARDOUS MATERIALS

A17.1. Shipper's Certification. Unless specifically exempted in this manual, a shipper's certification is required for all military air shipments of hazardous materials. Complete the certification form according to this attachment.

A17.1.1. **Forms Required.** Complete shipper's certification on the "Shipper's Declaration for Dangerous Goods" commercial form. Two styles of commercial forms may be used. One style is designed for computerized completion with the "Nature and Quantity of Dangerous Goods" section left open for continuous computer printing. The other style is designed in a columnar format for manual completion, with the "Nature and Quantity of Dangerous Goods" section blocked and formatted with headings specifying each key entry (figure A17.4). ***NOTE:*** Certifiers do not generate locally developed FORMS on computers, but may use automated products (spreadsheets, dbase, word-processing) when submitting required reports/documents.

A17.1.2. **Certification Authority.** Except as identified in this paragraph, certify on the Shipper's Declaration for Dangerous Goods to a packaging reference in this manual. Hazardous material may be certified to the ICAO Technical Instruction, IATA Dangerous Good Regulation, or Title 49 CFR under the following conditions:

- Comply with all requirements of the certifying document.
- Do not exceed the passenger quantity limitations of the certifying document (also see A17.1.5.) 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.
- Include handling instructions identified in this manual for specific proper shipping names on the certification form in the "Additional Handling Information" block.
- Include the packaging paragraph from this manual on the certification form in the "Additional Handling Information" block.
- Certify vehicles and support equipment to this manual.

A17.1.3. **Copies Required.** Complete and sign an original and at least one copy of the certification form. Attach the original certification form to the copy of the manifest that is placed on the aircraft. An original signature is required on the original Shipper's Declaration for Dangerous Goods. Attach a copy to the station file manifest. The original attached to the aircraft manifest and the copy attached to the station file manifest must have the vertical red hatch border. Additional copies may be placed in a waterproof envelope and attached to the number one piece of the shipment. Vertical red hatch border is not required for any additional copies.

A17.1.4. **Single Items With Multiple Hazards.** Only one Shipper's Declaration for Dangerous Goods is required when shipments involve a single item with multiple hazards. Certify to the highest hazard. All additional hazards will be identified by PSN, hazard class, and net quantity in "Additional Handling Information" (Key 19). Additionally, the same form may be used for one or more items with the same PSN and identical hazards.

A17.1.5. **Packages Containing Different Proper Shipping Names.** For packages containing items with different proper shipping names, prepare individual Shipper's Declarations for Dangerous Goods for each different PSN in the overpack. This is required for military airlift, regardless of the certification document used. Pieces of hazardous cargo with different proper shipping names, thus different Shipper's Declarations, cannot be shipped under the same transportation control number (TCN). General cargo and hazardous cargo may be shipped under the same TCN and only one original Shipper's Declaration for Dangerous Goods is required (see DoD 4500.32-R).

A17.1.6. **Not Enough Space In a Key.** 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 Declaration 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.

A17.1.7. **Classified Information.** If the information to be entered on the Shipper's Declaration is classified, follow the procedures outlined in A17.5.3.

A17.1.8. **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:

- Annotate all the information verbatim from the original Shipper's Declaration for Dangerous Goods.
- 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 1.17.4 to certify the Shipper's Declaration for Dangerous Goods is a true copy.

A17.1.9. **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 segment of transport. Include any information required by A17.1.2. For shipments that exceed the passenger quantity limitations of the ICAO, IATA, or 49 CFR, 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. 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. 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.

A17.1.10. **Exceptions for Chapter 3 Operations.** Except as specified below, prepare the Shipper's Declaration for Dangerous Goods according to this manual for tactical or contingency operations.

- **Key 1.** Show the address of the station where the cargo was certified and the telephone number of the certifier's assigned unit.
- **Key 2 and Key 9.** Show worldwide mobility.
- **Key 5.** Show the mobility transportation control number (TCN). Refer to DoD 4500.32-R, *Military Standard Transportation and Movement Procedures*, for completing TCN.
- **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.

A17.2. Certification Requirements for Specific Items:

A17.2.1. Competent Authority Approvals (CAA). If the shipment is packaged and transported under the authority of a CAA, cite the CAA number in Key 17. Mark the shipping papers, "PACKAGING AUTHORIZED BY COMPETENT AUTHORITY OF THE UNITED STATES OF AMERICA (USA)." A copy of the CAA must accompany the shipment.

A17.2.2. Engines Internal Combustion, Fuel Devices, and Other Equipment.

- For engines, internal combustion prepared according to A13.5, show the PSN, hazard class, and net quantities of flammable fuel (and any other additional hazards) in Key 19. Identify by name and quantity any non-hazardous fuel in vehicles or equipment tanks. Enter the flash point for flammable and non-hazardous fuel in Key 19. When an item is completely drained (but not purged) so that the quantity of fuel is below 500 ml (17 ounces), the shipper's estimate of the quantity of fuel remaining in the unit may be entered. Include the statement "non-hazardous battery installed" if applicable. Reference to the technical directive used to prepare the item for military air shipment is not required.
- Drained and purged repairable engines and fuel devices prepared according to A13.7.1 and A13.7.2 are not hazardous for transportation. A Shipper's Declaration for Dangerous Goods is required. Complete Keys 1 through 8, 17, and 19 through 22. Annotate "Drained and Purged" in Key 19. Items prepared according to A13.7.3 and A13.7.4 do not require a Shipper's Declaration for Dangerous Goods.
- Certification is not required for movement of wheelchairs with patients.

A17.2.3. **Life-Saving Appliances.** For life-saving appliances, Class 9, prepared according to A13.11, show the PSN, hazard class and net quantity of each hazard within the shipping containers in Key 19.

A17.2.4. **Bombs.** Bombs with flammable liquid prepared according to A5.16 must contain the following statement in Key 19: "Warning! This item contains ethylene oxide. If ethylene oxide odor or leakage is detected, the area must be kept well ventilated. Remove the item from transportation as soon as practical. Prolonged exposure to ethylene oxide fumes is hazardous to health."

A17.2.5. **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. Also, include one of the following statements for venting the unit:

- "Vent container to outside of aircraft."
- "Unit is empty and purged, and does not require venting."
- "Container is excepted from venting."

A17.2.6. **Excepted Quantities.** A Shipper's Declaration for Dangerous Goods is not required for excepted quantities prepared according to A19.2. The shipping papers (air manifest) must be annotated "Dangerous Goods in Excepted Quantities."

A17.3. Completing the Certification Form:

A17.3.1. **Manual and Mechanical Completion of the Certification Form.** The Shipper's Declaration for Dangerous Goods may be completed either manually (hand printed) or mechanically (typewriter, computer, etc.). The Shipper's

Declaration for Dangerous Goods may be completed by a combination of manual and mechanical means, as required, providing all entries are clear and legible. However, when possible, the Shipper's Declaration for Dangerous Goods should be completed entirely manually or entirely mechanically by the shipping activity. Incorrect punctuation or entries contacting column separating lines on the form is not justification for frustrating hazardous cargo.

A17.3.2. **Pen and Ink Changes.** Pen and ink changes may be made to any key. Except for Keys 2, 3, 8, 9, and 19, the certifying official must sign above the change. Key 2, 3, 8, 9, and 19 may be changed by someone other than the certifier without effecting the certification. Personnel making a change to these keys 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 Shipper's Declaration for Dangerous Goods is not clear and legible. If the Shipper's Declaration for Dangerous Goods 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.

A17.3.3. **Responsibility for Completion.** Except for Key 3, all entries must be made by the shipping activity. The excepted key may be completed by air freight terminal personnel. Also, air terminal personnel may enter "DOT-E 7573" on the Shipper's Declaration for Dangerous Goods form when contract commercial aircraft is used according to attachment 25.

A17.3.4. **Blank Keys.** Leave blank any key that does not require an entry (i.e., Key 15 when there is no subsidiary risk).

A17.4. Completing the Shipper's Declaration for Dangerous Goods. Figure A17.1 provides detailed instructions on accomplishing the certification form for nonradioactive shipments. Figure A17.2 provides guidance to determine if a Shipper's Declaration for Dangerous Goods is required for radioactive shipments. Figure A17.3 outlines certification requirements for radioactive shipments.

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 Codes (DODAAC) and/or the in-the-clear geographical location of the ultimate consignee (if known.)

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. Leave blank.

Key 7. Shipment Within Passenger Aircraft and Cargo Aircraft Limitations. If the shipment is acceptable for movement on both passenger and cargo aircraft, delete "Cargo Aircraft Only." If the shipment is allowed on cargo aircraft only, delete "Passengers and Cargo Aircraft."

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" since the shipment contains no radioactive material.

Key 11. Proper Shipping Name. Enter the PSN as it appears in table A4.1. Enter the following information, if applicable, in association with the basic description:

- The word "POISON" for a liquid or solid Class 6.1 PG I or II material if the PSN does not identify the material as a poison.
- For materials which are poisonous by inhalation, enter the words "POISON-INHALATION HAZARD" and "ZONE A", "ZONE B", "ZONE C", or "ZONE D" for gases, or "ZONE A" or "ZONE B" for liquids, as appropriate. If already identified, the word "POISON" need not be repeated. Enter "INHALATION HAZARD" and the appropriate zone.
- The word "Dangerous When Wet" when a material meets the definition of a dangerous when wet material.

Key 12. Class and Division. Enter the hazard class and division number given in column 3 of table A4-1. For Class 1 material, include the compatibility group letter and the inhabited building distance (if applicable). For a single item with more than hazard, enter the hazard class number of the item's highest or 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.

Key 15. Subsidiary Risk. When more than one hazard label is required, enter the subsidiary risk hazard class and division number corresponding to the subsidiary risk labels required. Do not enter the hazard class and division number of the primary hazard in this key. Only list the hazard class and division number of additional (subsidiary) labels required. If a "Cargo Aircraft Only" label is required, do not annotate it in this key.

Figure A17.1. Continued

Key 16. Quantity and Type of Packing. Enter:

- The number of packages (of same type and content) and their type of packaging (i.e., (1) fiberboard box, (2) metal drums, (4) cylinders). If applicable, enter the specifically named self-propelled vehicle and mechanical apparatus.
- The weight (pound, oz, gm, kg, etc.), volume (pint, quart, cc, liter, etc.), or measure of the actual hazardous material (per package). Do not include any nonhazardous content of the shipment. The net quantity must be entered in metric measurement units. The equivalent English unit of measure may be entered in parenthesis immediately following the metric unit. Show the quantity immediately following the number and type of package (i.e., 2 wooden boxes x 4.5 kg (10 pounds); 1 fiberboard box x 5 L(1.3 gallons)). For explosives, Class 1.1, 1.2, and 1.3, enter the "Net Explosive Weight (NEW)" in kilograms (pounds) per package or per pallet (i.e., 3 wooden boxes x 120 kg (264.6 pounds) NEW; 5 metal boxes x 200 kg (441 pounds) NEW). Unless otherwise required by status, either N/A or the NEW may be entered for Class 1.4, 1.5, 1.6 explosives. Italy and the United Kingdom require the NEW for all explosives entering their country. Annotate kilograms (pounds) in association with the NEW (abbreviations may be used).
- 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 "Compressed Gases, Limited Quantities, "A6.9 "Fire Extinguishers," and A6.11 "Cigarette Lighter or Other Similar Devices Charged with Fuel," other units of measure; (i.e., fluid ounces, gallons, or ounces) are specified and may be shown on this form.

Key 17. Packing Instructions. Enter the paragraph used to prepare the package for shipment.

- If the packaging has been approved by separate letter, message, or other instructions, cite that and the date of the letter or message, i.e., AFMC 24-204-92-09; COE NA-84-505; DOT-E 7052; etc.
- If a POP certified package is overpacked to meet air eligibility requirements, cite A3.1.10 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 POP configuration requirements.

Key 18. Authorization. Enter the special provision number from table A4.1 ONLY if it pertains to the packaging. When applicable, enter the words "Limited Quantity" or "LTD. QTY."

Key 19. Additional Handling Information. Enter:

- The PSN, hazard class, and net quantity of each additional hazard for items with multiple hazards.
- Handling instructions, when specified by a packaging paragraph.
- The name and quantity of non-hazardous fuel contained in tanks of vehicles or equipment. Include statement "non-hazardous battery installed" if applicable.
- The flash point in degrees Fahrenheit or centigrade when shipping flammable liquids or for any fuel identified in vehicle or equipment tanks. Show the letters "FP," the number, the degree symbol, and either "F" or "C" corresponding to the unit used. When known, enter the method of determining the flash point (i.e., Tag CC, Seta Flash, or Pensky-Martins).
- The packaging paragraph reference if required by A17.1.2.
- 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.

Key 20. Name/Title of Signatory. Enter the name and title of the official signing the form.

Key 21. Place and Date. Enter the place and date the material was certified (i.e., Kelly AFB, 1 Jan 90).

Key 22. Signature. The official who certifies that the shipment complies with the requirements of this instruction must sign the form in longhand.

Figure A17.1. Step-by step Instructions for Completing Shipper's Declaration for Dangerous Goods for NONRADIOACTIVE SHIPMENTS.

Step 1. Determine the radionuclide and type of package. Turn to A11.4. Find the radionuclide, its name, and the maximum radioactive quantity (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 is a limited quantity, a Shipper's Declaration for Dangerous Goods is not required, but you must comply with A11.11, A11.12, A11.13, or 11.14. 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 A17.3.

Figure A17.2. Determining Certification Requirements for Class 7.

Key 1. Shipper. Enter the address and telephone number where the hazardous material was certified.

Key 2. Consignee. Enter the six-digit DODAAC and/or the in-the-clear geographical location of the ultimate consignee (if known).

Key 3. Air Waybill Number. The aircraft manifest number to which the Shipper's Declaration 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 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 TCN.

Key 6. Optional Block. Leave blank.

Key 7. Shipment Within Passenger Aircraft and Cargo Aircraft Limitations. If the shipment is acceptable for movement on both passenger and cargo aircraft, delete "Cargo Aircraft Only." If the shipment is allowed on cargo aircraft only (dagger or theta coded items), delete "Passenger and Cargo Aircraft."

Figure A17.3. Continued.

Key 8. Airport of Departure. Enter the three-digit POE and/or the in-the-clear geographical location of the airport of departure.

Key 9. Airport of Destination. Enter the three-digit POD and/or the in-the-clear geographical location of the airport of destination.

Key 10. Shipment Type. Delete "Nonradioactive" since the shipment contains radioactive material.

Key 11. Proper Shipping Name. Enter the PSN as it appears in table A4.1, Alphabetical Listing of Items. Make sure the spelling is exact since some chemical names have similar spellings.

Key 12. Class and Division. Enter the hazard class and division number given in column 3 of table A4.1. For a single item with more than one hazard, enter the hazard class and division number of the item's highest hazard.

Key 13. UN, NA, or ID No. Enter the United Nations (UN) number given in column 4. Include the UN prefix and the number.

Key 14. Packing Group (PG). The PG does not apply.

Key 15. Subsidiary Risk. When more than one hazard label is required, enter the subsidiary risk hazard class and division number corresponding to the subsidiary risk labels required. Do not enter the hazard class and division number of the primary hazard in this key. Only list the hazard class and division number of additional (subsidiary) labels required. If a "Cargo Aircraft Only" label is required, do not annotate it in this key.

Key 16. Quantity and Type of Packing. 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 Ci, mCi, or uCi.

Key 17. Packing Instruction. Enter the following information in Key 17 (see figure A17.2, Steps 5 and 6, for assistance):

- Paragraph used to prepare the 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).
- The fissile class. If the package is exempt enter the words "Fissile Exempt."
- Maximum allowable number of packages for loading on one aircraft (for fissile class III shipments only).

Key 18. Authorization. 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.

Figure A17.3. Continued.

Key 19. Additional Handling Information. Enter:

- The PSN, hazard class, and net quantity of each additional hazard for items with multiple hazards.
- Handling instructions, when specified by a packaging paragraph.
- 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.

Key 20. Name/Title of Signatory. Enter the name and title of the official signing the form.

Key 21. Place and Date. Enter the place and date the material was certified (i.e., Kelly AFB, 1 Jan 90).

Key 22. Signature. The official who certifies that the shipment complies with the requirements of this instruction must sign the form in longhand.

Figure A17.3. Step-by-step Instructions for Completing the Shipper's Declaration for Dangerous Goods for RADIOACTIVE SHIPMENTS.

SHIPPER'S DECLARATION FOR DANGEROUS GOODS (Provide at least two copies to the airline.)

Shipper 1	Air Waybill No. 3 Page of Pages 4 Shipper's Reference Number (optional) 5
Consignee 2	6

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)* 7

PASSENGER AND CARGO AIRCRAFT	CARGO AIRCRAFT ONLY

Airport of Departure 8

Airport of Destination: 9

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 10

NATURE AND QUANTITY OF DANGEROUS GOODS *(see Subsections 6.6 and 8.1 of IATA Dangerous Goods Regulations)*

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
11	12	13	14	15	16	17	18

Additional Handling Information

19

24 hr. Emergency Contact Tel. No._____

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 20

Place and Date 21

Signature *(see warning above)* 22

Figure A17.4. Completed Samples of the Shipper's Declaration for Dangerous Goods.

SHIPPER'S DECLARATION FOR DANGEROUS GOODS (Provide at least two copies to the airline.)

Shipper 1	Air Waybill No. 3 Page of Pages 4 Shipper's Reference Number *(optional)* 5
Consignee 2	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)* 7

PASSENGER AND CARGO AIRCRAFT	CARGO AIRCRAFT ONLY

Airport of Departure 8

Airport of Destination: 9

Shipment type: *(delete non-applicable)* NON-RADIOACTIVE | RADIOACTIVE 10

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.

11,12,13,14,15//16//17//18

Additional Handling Information

19

24 hr. Emergency Contact Tel. No. _____

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 20

Place and Date 21

Signature *(see warning above)* 22

Figure A17.4. Completed Samples of the Shipper's Declaration for Dangerous Goods.

SHIPPER'S DECLARATION FOR DANGEROUS GOODS (Provide at least two copies to the airline.)

Shipper

ADDRESS AND TELEPHONE NUMBER

Air Waybill No. SKF1C21222

Page of Pages

Shipper's Reference Number (optional) FB20594911212XXX

Consignee

645 ABW
Wright Patterson AFB OH

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~~ | CARGO AIRCRAFT ONLY

Airport of Departure: Kelly AFB TX

Airport of Destination: Wright Patterson AFB OH

Shipment type: *(delete non-applicable)* ~~NON-RADIOACTIVE~~ | RADIOACTIVE

NATURE AND QUANTITY OF DANGEROUS GOODS *(see Subsections 6.6 and 8.1 of IATA Dangerous Goods Regulations)*

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
Radioactive Material N.O.S.	7	UN2982			137cs, Alkali Metal, solid, 2 type A packages X 10ci	A11.6.1, yellow III, Ti0.8	

Additional Handling Information

24 hr. Emergency Contact Tel. No. 1-800-424-8802

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: Sgt Michael Werneke

Place and Date: Kelly AFB TX 2 Jan 95

Signature *(see warning above)*

Figure A17.4. Completed Samples of the Shipper's Declaration for Dangerous Goods.

SHIPPER'S DECLARATION FOR DANGEROUS GOODS (Provide at least two copies to the airline.)

Shipper ADDRESS AND TELEPHONE NUMBER	Air Waybill No. Page 1 of 1 Pages Shipper's Reference Number NBO1710226193XXX *(optional)*
Consignee NBO171	

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 | ~~CARGO AIRCRAFT ONLY~~

Airport of Departure: NGV

Airport of Destination: Norfolk VA

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.

Engines, internal combustion,9,UN3166//1 Jeep//A13.5.1

Additional Handling Information
Fuel in tank
Gasoline,3,100L (25gal), FP -43°C (-45°F)
Batteries, wet, filled with acid, 8, 2.5L (5 pints)
24 hr Emergency Contact Tel. No. 1-800-851-8061

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 Duane Pfund, Foreman Place and Date Norfolk VA 2 Jan 95 Signature *(see warning above)*

Figure A17.4. Completed Samples of the Shipper's Declaration for Dangerous Goods.

A17.5. Processing the Certification Form. This paragraph provides instructions for processing the Shipper's Declaration for Dangerous Goods after the form has been completed, including what to do for classified material, and what to do if the package is a kit and contains more than one type of hazardous material. These instructions apply to both radioactive and nonradioactive shipments.

A17.5.1. The shipper is responsible for completing at least two copies of the Shipper's Declaration for Dangerous Goods (original and one copy) for each and every shipment regulated by this manual, unless it is stated that a Shipper's Declaration is not required. Although not mandatory, shippers are encouraged to include at least one additional copy in the packing envelope. The originating air terminal forwards the signed original to be attached to the air manifest, and retains a signed copy (reproduced, carbon, or "true" copy). The intransit station forwards the signed original that is attached to the air manifest to the AMC APOE or to the CONUS final destination, as appropriate. All copies shall have a red hatch border.

A17.5.2. If shipping a kit which contains more than one type of hazardous material, prepare the Shipper's Declaration for Dangerous Goods as follows:

- If the kit consists of only one container, prepare one Shipper's Declaration for Dangerous Goods (original plus at least one signed copy) identifying each hazard. All materials must be compatible.
- If the kit consists of more than one container with different hazardous materials, prepare a Shipper's Declaration for Dangerous Goods (original plus at least one signed copy) for each container. In Key 18, add the notation "contained in piece number ***" (replace "***" with the piece number which contains the hazardous materials.) Staple each set of copies together. Attach one set to the air manifest (originals) and retain one set (reproduced, carbon, or "true" copies) in the station file.

A17.5.3. If the information to be entered on the Shipper's Declaration for Dangerous Goods is classified, the following procedures apply:

- 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.
- The manifest that is placed 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.
- Complete the station file copy in detail except for the classified information. Enter the following statement in "Additional Handling Information" (Key 18): "See aircraft commander's copy of Shipper's Declaration for Dangerous Goods for complete information."

COMPATIBILITY

A18.1. 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 tables A18.1 and A18.2. Table A18.1 details segregation requirements for all hazardous materials. Table A18.2 specifies compatibility requirements for Class 1.

A18.2. Segregation Requirements for All Hazardous Materials. Table A18.1 indicates the explosives and other hazardous articles that must not be loaded, transported, or stored together. The absence of any hazard class or a blank space in the table indicates that no restrictions apply. The letter "X" at an intersection of horizontal and vertical columns indicates that these articles must not be loaded or stored together. For example, in table A18.1, Class 3 flammable liquids, must not be loaded, transported, or stored with Class 1.1. 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. Class 8 corrosive liquids must not be loaded above Class 4 (flammable solid) material or Class 5 (oxidizing) material. Only the primary hazard class or division are considered for compatibility, subsidiary-risk hazards are not considered. The "*" at an intersection of horizontal and vertical columns indicates that segregation among different Class 1 materials is identified in table A18.2. Be sure to check notes for compatibility.

A18.3. Segregation Requirements for Class 1 Materials.
A18.3.1. 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 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). Noncompatible explosives may be packed together when approved according to TB 700-2/NAVORDINST 8020.3/TO 11A-1-47/DSAR 8220.1, DoD Explosive Hazard Classification Procedures or 2.4.2.
A18.3.2. Specific Requirements For Using Table A18.2. Table A18.2 shows what Class 1 materials must not be loaded, transported, or stored together. A blank space in the table indicates that no restrictions apply. 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 1.4H. Be sure to check notes for compatibility.

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
1.1 and 1.2	1	*	*	*	*	*	X		X	X	X	X	X	X	X	X	X	X	X
1.3		*	*	*	*	*	X		X	X	X	X	X	X	X	X	X	X	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		X	X	0	0				X	0			0	0	0	0	0	0	0
2.2																			
2.3 Zone A		X	X	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
3		X	X	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		X	0	0						X		X
4.3		X	X				0		X	0	0						X		X
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	X				0												
8	4 5 6	X	X	0	0	0	0		X	0		0	X	X	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. Class 6.1 poisonous liquids (other than PG I, zone A) corrosive solids, ORM-D, Class 9, and hazardous materials in Excepted Quantities may be transported with each other and all other hazardous materials without compatibility restrictions.

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 0257 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.
7. Class 1.1 and 1.2 explosives may not be packed with the following explosives: UN 0333, UN 0334, UN 0335, UN 0336, and UN 0337.

A18.4. 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 A3.2.1.2. Compatibility groups and classification codes for the various types of explosives are identified in tables A18.3 and A18.4. Table A18.3 identifies compatibility groups and classification codes for substances and articles. Table A18.4 shows the number of potential classification codes within each explosive class. There are 35 possible classification codes for explosives.

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
Article containing both an explosive substance and flammable liquid or gel	J	1.1J 1.2J 1.3J

Table A18.3. Classification Codes Continued.

Description of Substances or Article to be Classified	Compatibility Group	Classification Code
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

Table A18.4. Scheme of Classification of Explosives Combination of Hazard Class With Compatibility Group.

Compatibility Group

Hazard Class	A	B	C	D	E	F	G	H	J	K	L	N	S	A-S
1.1	1.1A	1.1B	1.1C	1.1D	1.1E	1.1F	1.1G	—	1.1J	—	-1.1L	—	—	9
1.2	—	1.2B	1.2C	1.2D	1.2E	1.2F	1.2G	1.2H	1.2J	1.2K	1.2L	—	—	10
1.3	—	—	1.3C	—	—	1.3F	1.3G	1.3H	1.3J	1.3K	1.3L	—	—	7
1.4	—	1.4B	1.4C	1.4D	1.4E	1.4F	1.4G	—	—	—	—	—	1.4S	7
1.5	—	—	—	1.5D	—	—	—	—	—	—	—	—	—	1
1.6	—	—	—	—	—	—	—	—	—	—		1.6N	—	1
	1	3	4	4	3	4	4	2	3	2	3	1	1	35

A18.5. Compatibility for Chapter 3. This paragraph prescribes compatibility exceptions for tactical or contingency operations according to 3.6.1. Normally incompatible hazardous materials may be transported together when separated to the maximum extent possible. The following restrictions are mandatory:

- Explosives in compatibility groups A, J, K, and L can only be shipped with material in compatibility group S and Class 9.
- Fissile class III radioactive materials (Class 7) cannot be loaded, transported, or stored on the same aircraft with any other hazardous material.
- Class 1.1, 1.2, and 1.3 cannot be shipped with Class 2.3 poisonous gas, zone A.
- Class 1.1, 1.2, and 1.3 cannot be shipped with Class 6.1 poisonous liquids, PG I.
- Cyanides or cyanide mixtures (Class 6.1) cannot be loaded, transported, or stored with any corrosive Class 8 material.

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.

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:

- Class 1 material.
- Class 2, division 2.1 and 2.3; or division 2.2 material having a subsidiary risk.
- Material having a primary or subsidiary risk of Class 4 in PG I.
- Class 4.1 self-reactive material.
- Material having a primary or subsidiary risk of Class 5 in PG I.
- Material having a primary or subsidiary risk of Class 6.1, in PG I, by reason of inhalation toxicity.
- Class 6.2 material.
- Class 7 material.
- Material having a primary or secondary risk of Class 8 in PG I.
- Magnetized material (Class 9).
- Hazardous material contained within a device which 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.

A19.2.2. **Maximum Net Quantity for Excepted Quantities.** The maximum net quantity of hazardous material 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. Quantity Limits for Inner and Outer Packaging.

Class of Primary or Subsidiary Risk	Packing Group I Packagings		Packing Group II Packagings		Packing Group III Packagings	
	Inner	Outer	Inner	Outer	Inner	Outer
2.2	See (note 1) and (note 2)		See (note 1) and (note 2)		See (note 1) and (note 2)	
3	30 mL	300 mL	30 mL	500 mL	30 mL	1 L
4	Forbidden		30 g or	500 g or	30 g or	1 kg or
			30 mL	500 mL	30 mL	1 L
5 (note 3)	Forbidden		30 g or	500 g or	30 g or	1 kg or
			30 mL	500 mL	30 mL	1 L
6	1 g or	300 g or	1 g or	500 g or	30 g or	1 kg or
	1 mL	300 mL	1 mL	500 mL	30 mL	1 L
8	Forbidden		30 g or	500 g or	30 g or	1 kg or
			30 mL	500 mL	30 mL	1 L
9 (note 4)	Not Applicable		30 g or	500 g or	30 g or	1 kg or
			30 mL	500 mL	30 mL	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. For Class 5.2, PG II, the maximum total net quantity allowed in the outer packaging is 500 g or 250 ml.
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 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:

- 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.
- 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. **Testing.** 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.

- One drop flat on the bottom.
- One drop flat on the top.
- One drop flat on the long side.
- One drop flat on the short side.
- 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:

- One drop diagonally on chime or circumferential seam edge.
- 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 Technical Instructions or IATA Dangerous Goods Regulation. 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 POP requirements.

A19.3.1. **Dangerous Goods not Permitted in Limited Quantities:**

- Materials forbidden in table A4.1.
- Materials identified with a dagger (†) or theta (❑) in table A4.1.
- All materials in PG I.
- Class 1 and 7 materials.
- Class 2.3 and 6.2.
- Class 2.1 materials (other than aerosols).
- Refrigerated liquefied gases.
- Class 4.1 self-reactive substances.
- Class 4.2 or any material with a subsidiary risk of 4.2.
- Materials with UN numbers of 2794, 2795, or 3028.
- Class 9 materials except "ammonium nitrate fertilizers (UN 2071)" and "dibromodifuoromethane (UN 1941)."

A19.3.2. **Dangerous Goods Permitted in Limited Quantities:**

- Aerosols of Class 2.1 and 2.2.
- Gases of Class 2.2 without a subsidiary risk (excluding refrigerated liquefied gases).
- Class 3 (excluding PG I).
  Class 4.1 (excluding PG I and Class 4.1 self-reactive substances).
- Class 4.3 solids only (excluding PG I).
- Class 5.1 (excluding PG I).
- Class 5.2 only when contained in a "Polyester Resin Kit (ID 8017)," Chemical Kit (ID 8004)," or "First Aid Kit (ID 8004)" (excluding PG I).
- Class 6.1 (excluding PG I).
- Class 8 (excluding PG I, UN2794, UN2795 and UN3028).
- UN2071 and 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:

- 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 which is likely to affect safety during transport and there must be no leakage from the inner packagings.
- 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.

TABLE A19.2				
MAXIMUM QUANTITIES - CLASSES 2 - 9				
Class or Division	Packing Group	Physical State	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).

ABSORBENT CUSHIONING REQUIREMENTS

A20.1. Use absorbent cushioning material to package liquids in PG I and II. Absorbent cushioning material is not required for liquids in PG III. Cushioning materials suitable for this purpose are diatomaceous earth or untreated vermiculite (ASTM C516). Cushioning materials used must be satisfactory in all respects. It must not react adversely with the contents of the package and must be noncombustible. Do not use asbestos.

A20.2. Each package containing a liquid in PG I must include sufficient cushioning material to absorb the entire contents of the inner containers. 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. Determine the amount of vermiculite or diatomaceous earth required for overpacking and cushioning from table A20.1. 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. The amounts identified in table A20.1 are the minimum requirements. When POP test reports identify an amount larger than table A20.1, follow the amount identified in the POP test report.

A20.3. When exact quantities of cushioning materials are not found in table A20.1, make an approximation based on quantities listed.

A20.4. Absorbent cushioning material is not required for containers that have met the POP test requirements (including the hydrostatic pressure test) as a single packaging.

Table A20.1. Absorbent Material Requirements in Inches.

	A	B	C	D	E
RULE	**If quantity is**	**Then to ship use: Vermiculite, Type 1, Grade 3 (fine), or Type 1, Grade 4 (medium)**		**Diatomaceous Earth**	
		Centimeters (inches)		**Centimeters (inches)**	
		On sides	**On top and bottom**	**On sides**	**On top and bottom**
1	**.50 L (1 pt)**	**2.54 cm (1.0)**	**3.81 cm (1.5)**	**5.08 cm (2.0)**	**11.43 cm (4.5)**
2	**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	**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)**
4	**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)**
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)**
6	**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)**
7	**49.3 l (13 gals)**	**0.16 cm (4.0)**	**19.05 cm (7.5)**	**20.32 cm (8.0)**	**39.37 cm (15.5)**
8	**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)**

A20.5. Meet the requirements of A20.2 when overpacking is required because containers holding liquids do not meet the pressure requirements for air shipments. When overpacking individual packagings that already meet the requirements of

A20.2, use enough absorbent cushioning material to secure and position the packagings against damage. The cushioning material must completely fill any void space in the container.

A20.6. When absorbent cushioning material is required and 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 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.

A20.7. Personnel requiring assistance with cushioning material should contact the Air Force Packaging Evaluation Activity, 5215 Thurlow Street, Wright-Patterson AFB OH 45433-5540, (513) 257-4234 or DSN 787-4234.

INACCESSIBLE CONTAINERIZED LOADS

A21.1. Containerized Loads. Do not ship containerized loads of hazardous material that are not accessible to the aircrew during flight. The aircrew must have access to all hazardous materials in case of an in-flight incident. This attachment identifies exceptions to this requirement. All requirements of 1.11 apply. The following restrictions apply for transporting hazardous material in containerized loads that are not accessible:

A21.2. Underwater Construction Team. Recompression vans, support vans, and shelters (CONEX) used by the Underwater Construction Team may be shipped by military aircraft. Hazardous items inside these escorted containers have been identified to and approved for shipment by HQ AFMC/LGT.

A21.3. Tactical Shelters. The following items may be shipped aboard military aircraft in International Standardization Organization containers, ship and storage containers, and tactical shelters:

- Fire extinguishers secured in appropriate holders or brackets, or properly packaged according to this manual.
- 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 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 at or below 38 degrees C (100 degrees F). Installed batteries must be nonspillable type and secured upright.
- Items shipped under the PSN "life saving appliances" and packaged according to this manual.
- Air conditioners and environmental control units, magnetic material, radioactive material, and thermometers.

BRIEFING AGENCY REQUIREMENTS

A22.1. Briefing Agency. This attachment outlines the information that the briefing agency is required to provide to the aircraft commander (or designated representative) according to 1.12.

A22.2. Informational Requirements. The briefing agency must advise the aircraft commander (or designated representative) of:

- The PSN, hazard class, identification number, and PG prescribed in this manual for each hazardous material aboard the aircraft.
- The total quantity in weight or volume.
- The location of the hazardous item in the aircraft.
- 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.
- The requirement for escorts, couriers, and protective equipment.
- The number of passengers permitted aboard the aircraft.
- The procedures to use in an emergency.
- All cargo being carried under the terms of a DOT exemption, a DoD certification of equivalency (COE), a CAA, or a waiver.

A22.3. Notification Statements. The briefing agency must include the statements in A22.3.1 and A22.3.2 on the hazardous cargo manifest when transporting hazardous materials on aircraft. Apply these statements by programmed wording, rubber stamps, or typewriter.

A22.3.1. 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).

A22.3.2. Aircrew briefing certification statement: "I CERTIFY THAT I HAVE BEEN BRIEFED ACCORDING TO AFJMAN 24-204, PARAGRAPH 1.12, ON HAZARDOUS CARGO COVERED BY THIS MANIFEST. (Aircraft crewmember signature).

A22.3.3. After receiving the briefing, the aircraft commander (or designated representative) signs the cargo manifest. Return the signed copy, with the attached Shipper's Declaration for Dangerous Goods to the terminal record-keeping activity for retention. When crew changes occur, terminal personnel will brief the oncoming aircraft commander or designated representatives required by A22.2. The briefing must cover all hazardous materials (onload and throughload). 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. Keep the manifest, reflecting the certification for a hazardous cargo briefing, according to current files, maintenance, and disposition instructions.

DEVIATION AUTHORITY

A23.1. Deviations. This attachment identifies the circumstances in which a deviation to the requirements of this manual are authorized. These authorizations apply to deviations based on operational plans or necessity according to 2.1 and passenger movement according to 2.2.

A23.2. Deviations Based on Operational Plans or Necessity. Deviations from the requirements of this manual are authorized for a specific mission or operation when the deviation is:

- In conformance with an approved mobility or operational plan and the deviation has been coordinated with HQ AFMC/LGTP.
- On the basis of operational necessity determined by the shipper and approved by its MAJCOM under the following conditions:
- For recovery of downed aircraft.
- For emergency rescue operations.
- For movement of portable generators to support critical and key functions where power has been disrupted.
- 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. Channel airlift may be used if:
- Requested by the shipper and fully justified as operationally necessary.
- Validated by the shipper's MAJCOM.
- Coordinated by HQ Air Mobility Command (AMC) Tanker Airlift Control Center.
- For hazardous materials involved in intelligence or criminal investigations, qualified personnel of those agencies certify that all safety precautions have been taken to transport the materials safely.
- For hazardous materials required aboard the aircraft according to the applicable airworthiness requirements and operation. These items are considered part of the aircraft and are not regulated by this manual. Replacement items for such hazardous materials must be transported according to this manual.

A23.3. Passenger Deviations. Approval is granted only for exceptional cases. Separate passengers from the hazardous cargo. An aircrew member must provide surveillance to ensure passengers are safe and maintain a maximum distance from the hazardous cargo. Aircraft 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.
A23.3.1. 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 MATERIAL CODED DAGGER/THETA IS APPROVED. DEVIATION NUMBER:_____."
A23.3.2. Deviations are not required for:

- Guards.
- Couriers.
- Technical escorts responsible for cargo.
- Crew chiefs and maintenance personnel assigned to support the aircraft transporting the hazardous material.

PACKAGING EXCEPTIONS FOR TACTICAL, CONTINGENCY, OR EMERGENCY OPERATIONS

A24.1. Hazardous Materials. Hazardous materials removed from their required packaging, as authorized in 3.4, must meet the requirements of this attachment.

A24.2. Compliance with Technical Orders. Personnel must comply with all technical orders and technical publications to ensure correct storage of hazardous materials when they are removed from their packaging and stored in the racks or containers of tactical equipment or vehicles. Certify all hazardous materials, removed from their original packaging, on the Shipper's Declaration for Dangerous Goods according to this attachment.

A24.3. 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:

- Personnel will engage an enemy force immediately upon deplaning at the objective or will be airdropped.
- All efforts have been made to ensure individual hazardous materials are safe from accidental initiation (i.e., grenades in fiber containers, safety pins secured, etc.).
- All hazardous material other than small arms ammunition and nuclear, biological, and chemical (NBC) equipment are prepared for shipment according to this manual, consolidated in one central location on the aircraft as directed by the loadmaster, and distributed to personnel before landing.
- All small arms ammunition must remain in the individual carrier (for example, bandoleers, ammunition belts, pouches), and all weapons must remain clear until the aircraft has landed.
- All NBC equipment must remain in the individual carrier (for example, protective mask bag, mobility bag), and must accompany the individual at all times.
- The troop commander or team chief must brief the loadmaster concerning the individual issue of hazardous materials. A Shipper's Declaration for Dangerous Goods is not required.
- Personnel not immediately engaging the enemy force when deplaning, but will assume a tactical mission on arrival, may deploy with their basic load or individual issue of hazardous materials. However, these items, including small arms ammunition, must be collected by the troop commander 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. A Shipper's Declaration for Dangerous Goods is not required.
- Explosives and other hazardous materials must not be handled by personnel during flight operations.

A24.4. Waivers. Personnel requiring additional waivers to packaging requirements must follow the procedures in 2.4. POP requirements cannot be waived by DoD personnel. Compatibility waivers will be reviewed only for exceptional cases, and additional safety requirements will be identified. Apprise all aircrew personnel of the hazards involved.

USE OF COMMERCIAL AIRLIFT

A25.1. Commercial Airlift. Commercial airlift of military hazardous materials is authorized according to Department of Transportation Exemptions (DOT-E) 7573 and 9232 and this manual.

A25.1.1. **DOT-E 7573.** The DoD is authorized to transport hazardous materials via AMC commercial contract cargo aircraft under DOT-E 7573. A requirement of this exemption is that the hazardous material must be packed according to, or in excess of, the requirements of 49 CFR 100-199 and in compliance with this manual. Shipments with an ultimate consignee at an overseas address will not be accepted for shipment on contract airlift unless the item is packaged in a POP certified container, is POP-exempt, or is covered by a CAA. When hazardous materials are loaded aboard any commercial contract cargo aircraft operating under DOE-E 7573, Notify the pilot in command, in writing, that the exemption is being exercised. See Attachment 22 for the statements which must be included on the hazardous cargo manifest and used in the briefing provided to the pilot. When requirements dictate movement of passengers with hazardous materials on contract aircraft or through nonmilitary terminals, the material must be prepared according to 49 CFR 100-199.

A25.1.2. **DOT-E 9232.** DOT-E 9232 applies only under the following conditions:

- 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.
- During rapid deployment of US Armed Forces.
- The following special provisions also apply:
  - Include a summary of hazardous materials on the cargo manifest.
  - The troop commander must identify to the aircraft commander (or designated representative) in writing, any individual issue of hazardous materials that are included in rucksacks or field packs, which are not already included on the cargo manifest. Hazardous materials will be identified by PSN, hazardous class, net quantity, and PG.
  - Only load hazardous materials in the aircraft cargo compartment. Hazardous materials (including small arms ammunition) are not authorized in the passenger compartment.
  - Do not remove hazardous materials from required packaging and place in equipment or vehicle racks and containers.

SPECIAL CARGO REQUIREMENTS

A26.1. Requirements. This attachment identifies requirements for technical escorts and other extensive protective measures for extremely hazardous materials. The provisions of this attachment apply to shipments of Class 6.1, PG I, hazard zone A poisons; Class 2.3, hazard zone A and B poisons; Class 1, compatibility group K; Fissle Class III Radioactive Material; infectious substances (etiologic agent); and biological research material.

A26.2. Airlift Limitations. Airlift all shipments of Class 6.1, PG I, hazard zone A poisons and Class 2.3, hazard zone A and B poisons by a Special Assignment Airlift Mission (SAAM). Process SAAM requests, cargo clearance, and appropriate confirmations according to AFR 76-38/AR 59-8/OPNAVINST 4630.18E/MCO 4630.6D/DLAR 4540.9.

A26.3. Air Shipment Protection. When Class 6.1, PG I, hazard zone A poisons and Class 2.3, hazard zone A and B poisons are shipped by air, the consignor is required to furnish:

- Complete protective clothing and equipment for all aircrew members.
- 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.

A26.4. 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:

- The aircraft commander in matters of flight operations and safety.
- The base installation commander in matters affecting the safety and mission of the command.

A26.5. Aircraft Parking. Pack aircraft containing these materials as cargo in an isolated area under security precautions.

A26.6. Aircrew Jettison Criteria:

A26.6.1. For cargo consisting of Class 6.1, PG I, hazard zone A poisons; Class 2.3, hazard zone A and B poisons; infectious substances; biological agents; or radioactive material (other than excepted quantities), the jettison criteria are as follows:

- Must not be jettisoned over land.
- 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.

A26.6.2. 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.

A26.6.3. 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.

A26.7. Shipping Documents for Infectious Substances (Etiologic Agents). All shipments of infectious substances (etiologic agents) must be accompanied by an etiologic agent and plant quarantine material shipment record. This record must be prepared by the consignor (shipper).

- 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.
- 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 which is in compliance with agreements between DoD and the Department of Health and Human Services; and also between DoD and the Department of Agriculture.
- On all shipments (except diagnostic specimens) escorted or not escorted, the agency receiving the shipment is responsible for forwarding the report indicated above within 2 hours of receipt.

CARRIAGE OF HAZARDOUS MATERIALS BY PASSENGERS

A27.1. Hazardous Materials. As identified in 2.3, passengers must not carry hazardous materials on military aircraft. The exceptions listed in this attachment are not subject to any other requirements of this manual (nonregulated) when carried by a crewmember or passenger.

A27.2. Authorized Material:

- 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).
- Oxygen, or any hazardous material used for the generation of oxygen, carried for medical use by a passenger according to 14 CFR 121.574 or 135.114.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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 personnel use, excluding ammunition with explosive or incendiary projectiles. Allowances for more than one passenger must not be combined into one or more packages.
- 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.
- 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.
- 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.
- Heat producing articles such as underwater torches (diving lamps) and soldering irons may be in carry-on baggage.

HAZARDOUS MATERIALS INITIAL AND REFRESHER TRAINING

A28.1. Training Courses. This attachment identifies the hazardous material training courses required by chapter 1, section B.

A28.2. Initial Training Courses. Preparers (certifiers) must satisfactorily complete one of the following initial courses as required by 1.17.4.3.

- Technical Transportation of Hazardous Materials (AMMO-L-17, Resident or AMMO-L-17OS On Site), US Army Defense Ammunition Center and School, Savanna IL 61074-9639.
- 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 Materials (L3AZR2T000 005, Resident or L4AZT2T000 005, On Site), Lackland AFB TX 78236-5427.
- Transportation of Hazardous Materials (A-822-0012), Navy Supply Course School, Athens, GA 30606-5520.
- Installation Traffic Management of Hazardous Materials (Initial) (DACS AMMO-77) (Resident), US Army Defense Ammunition Center and School, Savanna IL 61074-9639.

A28.3. Refresher Training Courses. The following courses meet the formal 24-month refresher training requirement of 1.17.4.4.

- General Transportation of Hazardous Materials (AMMO-L-16, Resident or AMMO-L-160S, On Site), US Army Defense Ammunition Center and School, Savanna IL 61074-9639.
- 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.
- Airlift of Hazardous Materials (Refresher) (L6AZS2T000 001, Local training approved by the Air Force), Lackland AFB TX 78236-5427.
- Transportation of Hazardous Materials Recertification (A-822-001), Navy Supply Course School, Athens GA 30606-5520.

TABLE OF EQUIVALENTS

A29.1. Temperature Conversion. Use figure A29.1 to convert temperatures between celsius and fahrenheit.

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)

Figure A29.1. Temperature Conversion Formulae.

A29.2. Metrics. Figure A29.2 provides a list of metric prefixes.

Deci	0.1
Centi	0.01
Milli	0.001
Micro	0.000001
Nano	0.000000001
Pico	0.000000000001
Deca	10
Hecto	100
Kilo	1,000
Mega	1,000,000
Gica	1,000,000,000
Tera	1,000,000,000,000

Figure A29.2. Metric Prefixes.

A29.3. Miscellaneous Conversions. Figure A29.3 provides a list of general miscellaneous conversions for use with this manual.

PRESSURE:	
1 pound per square inch	6.895 kilopascal
1 kilopascal	0.145 pound per square inch
WEIGHT:	
1 dram	27.343 grains, 1.77 grams, 0.0039.pounds
1 grain	0.0648 grams, 64.80 milligrams, 0.0001428 pounds
1 milligram	0.016 grains
1 gram	15.432 grains, 0.03527 ounces, 0.0022 pounds avoidupois
1 kilogram	2.205 pounds avoirdupois, 35.274 ounces
LENGTH:	
1 centimeter	0.3937 inches
1 meter	3.28 feet, 39.37 inches

Figure A29.3. Miscellaneous Conversions Continued.

VOLUME:	
1 fluid dram	3.697 milliliters, 0.226 cubic inches
1 liter	1.057 quarts, 61.025 cubic inches, 33.815 fluid ounces
1 cubic foot	28.32 liters, 7.481 gallons, 1728 cubic inches
1 cubic meter	1000 liters, 35.31 cubic feet, 264.2 gallons

Figure A29.3. Miscellaneous Conversions.

A29.4. NET QUANTITY OF GAS CONVERSION FORMULAE. Use figure A29.4 to determine the net hazard of a compressed gas by converting PSI of a cylinder into pounds. Use figure A29.5 to determine the molecular weight or specific gravity required to complete the formula.

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

Figure A29.4. Net Quantity of Gas Conversion Formulae.

NOTE: Use Formula (1) for calculation using the specific gravity value. Use Formula (2) for calculation using the molecular weight value.

A29.5. PROPERTIES OF COMMON GASES. Figure A29.5 is a list of the molecular weight and specific gravity of common gases.

GAS	SYMBOL	WEIGHT	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	SO2	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

Figure A29.5. Properties of Common Gases.