

STUDENT HANDOUT

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This extract consist of:

CFR 49, Code of Federal Regulation

DOD Reg 4500.9R, Part II, Defense Transportation Regulation, Cargo Movement

Joint Hazard Classification System

MIL HDBK 138A, Container Inspection Handbook

NAVSEA OP 5, Vol. 1, Ammunition and Explosives Ashore Safety Regulations for
Handling, Storage, Production, Renovation and Shipping

TM 38-250, Preparing Hazardous Materials for Military Air Shipments

TM 55-607, Loading & Stowage of Military Ammunition Aboard Breakbulk
Merchant Ships

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INTRODUCTION

During receipt, issue, and transshipment operations, motor trucks, railcars, and vessels loaded with ammunition and hazardous materials will arrive and depart. You should receive documentation for the cargo loaded aboard incoming modes of transportation well in advance of the shipment's arrival. Upon receipt of advanced shipping documents, you should begin planning to determine the items that will be transshipped to other shipping activities or storage locations, transportation requirements for palletized loads or MILVANS, and types of material handling equipment and personnel requirements.

As military ammunition inspectors, your job will consist of numerous tasks associated with shipping and receiving operations. Keep in mind that at a port, there are not only vehicle requirements; there are also storage, quantity-distance and compatibility requirements, and inspection requirements for inbound and outbound, loaded and empty vehicles. You will also perform vessel (ship/boat/lighter) inspections, both on and off board. In order for you to accomplish your job, you must be aware of all of the tasks being performed around you. You must constantly be on the alert for safety violations, and ensure that all safety measures are emplaced and enforced.

In normal situations, there will be a Quality Assurance and Surveillance (QASAS) present who will oversee most of the operations in progress at a port. You will primarily assist the QASAS in accomplishing the surveillance role. If, in some unforeseen circumstance, a QASAS is unavailable, you must perform the task without his/her immediate guidance, advice, and/or supervision.

As you progress through this document, you may see things which are new to you. Do not let your questions go unanswered! If you are using this document as part of a class, ask your instructor for assistance. If you are using it in the field, call the number listed in the reference.

CHANGES AND NEW MATERIAL

1.0. FEDERAL REGULATIONS AND HAZMAT CLASSIFICATION

1.1. Adoption of International Regulations. The U.S. Department of Transportation (DOT) adopted the United Nations (UN) system of Hazardous Material (HAZMAT) regulations on 1 January 1991. This resulted in a number of changes which are of interest to the ammunition manager.

a. First, it discarded U.S.-specific packaging methods and adopted UN Performance Oriented Packaging (POP) methods which use a standard set of performance criteria to determine appropriate packaging for an item. POP further established HAZMAT classification standards, hazard communication (e.g. package marking, labeling, placarding and shipping documentation descriptions), and transportation/handling standards.

b. Code of Federal Regulations (CFR) 49 was amended to adopt the standards set out in international regulatory documents (e.g. International Maritime Dangerous Goods (IMDG), and the International Civil Aviation Organization (ICAO)) technical instruction.

c. The scheduled transition for domestic HAZMAT shipments within the continental U.S. (CONUS) is shown in Table 1. CONUS consists of all states within the U.S., the District of Columbia, the Commonwealths of Puerto Rico and the Northern Mariana Islands, the Virgin Islands, American Samoa, Guam, and any other territories or possessions of the U.S. designated by the Secretary of Transportation. Shipmasters may use their discretion in recognizing DOT's definition of CONUS. Pending full domestic adoption of the UN regulations, the Office of the Assistant Secretary of Defense (OASD) directed the Department of Defense (DOD) to voluntarily comply with the UN regulations. In doing so, DOD published its 4500.9-R series of regulations, of which Part 2 covers Cargo Movements. DOD also recognizes all associated civil HAZMAT movement regulations, including CFR 49, IMDG, ICAO Technical Instruction, and International Aviation Transport Association (IATA) Technical Instruction.

Airlift Mobility Command (AMC) recognizes DOT's definition, and outlined UN air shipment requirements in Air Force Joint Manual (AFJM) 24-204/Army Technical Manual (TM) 38-250 in April 1994.

e. Compliance is especially critical since commercial air carriers have adopted the UN regulations, even for CONUS shipments. Compliance will help prevent shipping frustrations, expedite implementation, and align DOD with international regulations.

f. Ammunition Shippers must be particularly aware of HAZMAT shipping regulations since ordnance commonly requires international shipment. A thorough background knowledge of current HAZMAT shipping regulations is essential to prevent cargo frustrations outside CONUS (OCONUS), and to ensure commonality with our allied and coalition partners.

Table 1. DOT and Military Effective Dates For Compliance with UN HAZMAT Regulations

Date	Requirement
1, JAN 91	Full compliance becomes mandatory for: -UN packaging Performance requirements -UN Marking for international shipments of HAZMAT according to specific modal provisions of the IMDG, ICAO Technical Instructions, and the IATA
1 OCT 91	Compliance with the revised classification and hazard communication requirements applying to new explosives becomes mandatory
1 DEC 91	Air Mobility Command (AMC) adopts the UN packaging Performance and Communication Requirements for all OCONUS shipments
1 OCT 92	Compliance with the revised hazard communication requirements for HAZMAT poisonous by inhalation (PIH) and for infectious substances becomes mandatory
1 JAN 93	Compliance with 1992-3 revised edition of the ICAO Technical Instructions becomes mandatory. Compliance with the 26th Amendment to the IMDG becomes mandatory. as well
1 OCT 93	Compliance becomes mandatory for: -the revised classification and hazard communication requirements becomes mandatory for all HAZMAT for which an earlier compliance date had not already been established; (e.g. new explosives, PIH, infectious substances). -the revised packaging requirements for PIH -revised modal requirements, including stowage compatibility and segregation within motor vehicles, rail cars, and freight containers
1 OCT 94	End date for manufacture of previously grandfathered DOT packaging and packaging markings which do not comply with UN POP specifications. All packaging produced and marked after this date must conform to the revised 49 CFR Parts 173 and 178. Additionally, conversion to the new placarding system is required for all materials other than PIH materials (for which conversion was mandated by 1 OCT 92.)
1 OCT 96	The transition period ends for use of packaging manufactured under the old 49 CFR 173 and 178 requirements. From 1 OCT 94 to 1 OCT 96, use of packaging manufactured and marked prior to 1 OCT 94 had been authorized in order to deplete stocks.
1 OCT 2001	Packages conforming to the requirements of 49 CFR in effect on 30 SEP 91 may no longer be transported or offered for transportation. Also, packages filled with HAZMAT prior to 1 OCT 91, or marked "Inhalation Hazard" if appropriate, or packages which have not been emptied or refilled on or after 1 OCT 91 may no longer be offered for transportation or transported.

1.2. Intermixing Old and New Requirements. During the remaining transitional period shown above, the DOT recommends that hazard communication requirements be consistent when practical; e.g., marking, labeling, placarding, and shipping paper descriptions should conform to either the old or the new requirements without intermixing communication elements. However, intermixing is permitted during the remaining periods for packaging, hazard communication and handling provisions, as follows:

a. A package conforming to the old DOT container specification requirements (e.g., a DOT 17E drum) may be marked and labeled for the hazardous material contained therein under the new package marking and labeling requirements of 49 CFR. In other words, old DOT specification packages containing HAZMAT may be marked and labeled in accordance with the new system.

b. Conversely, a package conforming to the new requirements of 49 CFR (e.g., UN 4G Box) may be marked and labeled for the HAZMAT contained therein under the old DOT package marking and labeling requirements.

c. If either shipping names or identification numbers are identical, a shipping paper may display the old shipping description even if the package is marked and labeled under the new shipping description.

d. Conversely, if either shipping names or identification numbers are identical, a shipping paper may display the new shipping description even if the package is marked and labeled under the old shipping description.

e. Use of UN (new) placards and stowage/segregation criteria are mandatory regardless of the above provisions.

1.3. Grandfather Provisions. This document will address both the old and new hazard communication and transportation description requirements. Such coverage is necessary because ammunition shippers will be encounter munitions packaged and marked under both the old and new classification systems, and numerous munitions may still be transported under pre-UN grandfather provisions.

Two grandfather provisions have been established. The first domestic grandfather provision applies to HAZMAT packaged prior to 1 OCT 91. It allows HAZMAT shippers to transport materials in containers packaged prior to 1 JAN 88 without performing POP tests or remarking the containers with the UN proper shipping name, UN number and UN hazard class. It does not apply to international and domestic commercial air shipments. The grandfather date applies to the date the item was physically packaged and not the manufactured date of the container. This provision applies to items which were physically packed and not to the packaging design. Under the grandfather provision, a shipper can remove the item from the package without voiding the grandfather as long as the package is released with the same degree as it was prior to being opened. The grandfather provisions were instituted in light of the cost involved in certifying, marking, and labeling packages in inventories such as ammunition, which may remain in storage many years, unlike most consumable items.

1.4. Metric System of Measurement. This document also includes metric conversion data to facilitate transition to the metric system of measurement and in conjunction with the addition of metric units to 49 CFR. Use of metric units is essential with adoption of the international modal regulations.

2.0. ORDNANCE CLASSIFICATION

2.1. General. This chapter describes the various methods of classifying ordnance for transportation and storage. Tables 1-2 through 1-10 are provided to explain some of the relationships among the classification elements and to give the reader quick reference to the requirements applicable to each class. All of these tables can be found in 49 CFR.

2.2. Hazard Classification and Divisions. Ordnance is classified by using a UN standard system consisting of hazard class/division and various compatibility groups. The two systems which make up the classification are defined below.

a. Nine hazard classes for hazardous materials have been established by the UN Committee of Experts on the Transport of Dangerous Goods. A hazard classification is based on the chemical and physical properties of material, and its reaction characteristics under various test conditions. Items or articles possessing more than one hazardous material or hazard are classified based on the highest hazard presented by the materials or combination of materials. 49 CFR provides a hierarchy of hazard assignments which are used when multiple hazards are contained in a given item. Some items possess subsidiary hazard designators. The hazard classes are listed in Table 2.

b. Class 1, which includes ammunition, explosive substances, and explosive articles, is further subdivided into six divisions based on the character and predominance of the associated hazards and of the potential for causing personnel casualties or property damage--not upon compatibility groupings or intended use. Explosive articles which differ in minor respects may be assigned to different divisions if their predominant hazards differ. These divisions are displayed in Table 3.

c. For ammunition and explosives in Hazard Class/Division 1.1 through 1.3, a numerical figure is displayed in parentheses to the left of hazard class/division designators. This figure indicates separation distance, in hundreds of feet, needed for protection from debris, fragments, and firebrand when distance alone is relied on for protection. The minimum separation distance is shown, for example, as "(04)1.2B". In this example, "(04)" indicates a minimum separation distance of 400 feet, "1.2" indicates the hazard class/division and "B" indicates the compatibility group, which we will now discuss.

Table 2. DOT/UN Hazard Classes

Class	Type of Hazardous Material
1	Ammunition and explosives, DOT classes A, B, and C; Blasting agents
2	Compressed gases, flammable and nonflammable; Poison gases (Poison A)
3	Flammable liquids
4	Flammable solids or substances
5	Oxidizing materials
6*	Poisonous substances (Poison B); Irritating materials; Etiological agents
7	Radioactive materials
8	Corrosive materials
9	Miscellaneous dangerous substances (other regulated materials)

* Include ammunition without explosive components which contain toxic chemical agents, and containers of toxic chemical agent in bulk. Formerly QD class 8. Also includes ordnance components with small quantities of explosive (e.g., squibs) where the compressed gas vessel are the predominant hazard and the explosive effects are self-contained within the package or article.

Table 3. Hazard Class 1 Division Designators and Types of Hazards

DIVISION DESIGNATOR	TYPE OF HAZARD	SUPERSEDED HAZARD (QD) CLASSES *
1	Mass detonating	7
2	Non-mass detonating - Fragment producing	3, 4, 5, and 6
3	Mass fire	2
4	Moderate fire, no blast	1
5	Very insensitive	---
6	Extremely insensitive	---

* This column shall not be used to convert suspended Q-D classes to DOD Class 1 Division, or assign a Class 1 Division number to an item not listed in this manual. Request this data from NAVSEASYS COM (SEA-665).

2.3. Relationship between UN and old DOT Hazard Classifications. Table 4 illustrates the relationship between UN Hazard Class 1 and the DOT hazard classes in use prior to 1 Jan 91.

Table 4. Hazard Classifications and Former DOT Class Names (Pre 1991)

Current Classification	Class Name Prior to 1 Jan 91
Division 1.1	Class A Explosives
Division 1.2	Class A or B Explosives
Division 1.3	Class B Explosives
Division 1.4	Class C Explosives
Division 1.5	Blasting Agents
Division 1.6	Not in existence prior to 1 Jan 91

NOTE: The hazard classification data for both the DOT and UN systems are listed in this document. For some items, the entries for the two classification systems do not match the current DOT guidelines shown in Table I-5. We recognize this problem and recommend that when such discrepancies occur, the UN transportation data should be used for the shipment.

2.4. Compatibility Groups. As mentioned, we cannot assume that simply because two types of Class 1 ammunition and explosives are in the same division, that they can be shipped or stored together. Instead, we must consult the third descriptor of the UN classification system for Class 1--the compatibility group. Compatibility groups determine storage and transportation compatibility (e.g. for motor and rail modes), while the class and division designators are used for determining segregation requirements for carriage by vessel. A compatibility group accompanies the hazard class to complete the hazard classification designation. Ammunition and explosives are assigned to a compatibility group when they can be stored and transported together without significantly increasing either the probability of an accident or, for a given quantity, the magnitude of the effects of such an accident. Considerations which are used in developing the compatibility groups include, but are not limited to:

- a. Chemical and physical properties.
- b. Design characteristics.
- c. Inner and outer packaging configuration.
- d. Hazard classification.
- e. Net explosive weight.
- f. Rate of deterioration.
- g. Sensitivity to initiation.
- h. Effects of Deflagration, Explosion, or Detonation.

A description of each of the compatibility group is shown in Table 5.

Table 5. Compatibility Groups of the U.N. Hazard Classification System

COMPATIBILITY GROUP	BEHAVIOR CHARACTERISTICS
A	Primary explosive substance. Examples are wet lead azide, wet lead styphnate, wet mercury fulminate, and wet tetracene; dry RDX and dry PETN.
B	Articles containing a primary explosive substance and not containing two or more effective protective features. Examples are detonators, blasting caps, small arms primers, and fuzes without two or more safing features.
C	Propellant explosive substances or other deflagrating explosive substances or articles containing such explosive substances. Examples are single-, double-triple-based, and composite propellants, rocket motors (solid propellant), and ammunition with inert projectiles.
D	Secondary detonating explosive substances or black powder or articles containing a secondary detonating explosive substance, in each case without means of initiation and without a propelling charge, or articles containing a primary explosive substance and containing two or more effective protective features.
E	Articles containing a secondary detonating explosive substance, without means of initiation, with a propelling charge (other than one containing flammable liquid hypergolic liquid). Examples are artillery ammunition, rockets, or guided missiles.
F	Articles 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 a propelling charge. Examples are items initiated by means of a bouchon firing device, grenades, sounding devices, and similar items having an in-line explosive train in the initiator.
G	Pyrotechnic substances or articles containing a pyrotechnic substance, or articles containing both an explosive substance and an 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). Examples are flares, signals, incendiary or illuminating ammunition, and other smoke or tear producing devices.
H	Articles containing both an explosive substance and white phosphorus. Examples are WP, PWP, or other ammunition containing pyrophoric material.
J	Articles containing both an explosive substance and flammable liquid or gel. Examples are liquid or gel filled incendiary ammunition, FAE devices, and flammable fueled missiles.
K	Articles containing both an explosive substance and a toxic chemical agent. Examples are artillery or mortar ammunition, fuzed and unfuzed grenades, rockets or bombs with a lethal or incapacitating chemical agent. Refer to table 2-10, note 6.
L	Explosive substances or articles containing an explosive substance and presenting a special risk (e.g., due to water-activation or presence of hypergolic liquids, phosphides or pyrophoric substances) needing isolation of each type. Examples are water-activated devices, prepackaged hypergolic liquid-fueled rocket engines, TPA (thickened TEA), and damaged or suspect ammunition of any group.

COMPATIBILITY GROUP	BEHAVIOR CHARACTERISTICS
N	Articles containing only extremely insensitive detonating substances (EIDS). Examples are bombs and warheads.
S	Substances or articles 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 firefighting or other emergency response efforts in the immediate vicinity of the package. Examples are thermal batteries, explosive switches or valves, and other ammunition items packaged to meet the criteria of this group.

2.5. Relationship between Class, Division and Compatibility Group. Table 6 shows the 35 U.N. classification codes for Class 1. The codes consist of the three parts of a classification including the Hazard Class, Division, and Compatibility Group.

Table 6. Classification Codes for Hazard Class 1, Ammunition and Explosives

Hazard division	Compatibility group													A-S
	A	B	C	D	E	F	G	H	J	K	L	N	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
1.1-1.6	1	3	4	4	3	4	4	2	3	2	3	1	1	35

3.0. Transportation of Ammunition and Explosives. Until 1993 when both domestic and international shipments of U.S. Government-owned assets will be required to reflect the United Nations (UN) hazard assets classification, marking, labeling, and communication requirements (except placarding, which becomes mandatory October 1, 1994), domestic shipments may be transported in accordance with the pre-December 31, 1991 regulations established by the Department of Transportation (DOT). The old DOT transportation data provided in this manual is provided for shipments traveling under grandfather provisions. Originators of new shipments of ammunition and explosives should refer to the new UN requirements. All hazardous material shipments packaged after January 1, 1988 must be marked with the UN markings when destined for overseas shipments. To minimize shipping costs, this shall be accomplished prior to shipment, instead of during storage. The following paragraphs describe the various DOT and UN requirements when transporting ammunition, explosives, and related hazardous materials.

3.1. Government Bill of Lading Description. Specific instructions for completing the Government Bill of Lading (GBL) are defined in the Defense Traffic Management Regulation (DTMR). NAVSUPINST 4600.70 (series). This document is currently being updated to reflect the latest regulations. The GBL accompanies the shipment and must be annotated with a description of the hazardous materials included in the shipment. As a minimum, the GBL must include:

- a. the name of the shipper.
- b. an emergency response telephone number (see NAVSEAINST 8020.13).
- c. a description of the hazardous material to be shipped, consisting of the following:
 - (1) proper shipping name of the item;
 - (2) the hazard class and division of the item (see paragraph 2-2);
 - (3) the UN identification number;
 - (4) the packing group prescribed for the material, preceded by the letters "PG".

(Most explosives are group II. The packing group can be obtained from the POP marking: X = I, Y = II, and Z = III. See 49 CFR 172.101);

- (5) the Net Explosive Weight (NEW) of the item being shipped, and;
- (6) the total quantity of material (e.g., 800 kilograms, or 50 liters) covered by the description.

d. any technical or chemical group descriptions required. This applies when the phrase "N.O.S." appears in the shipping name.

e. if shipment is being made under a DOT Exemption (DOT-E) (see paragraph 3.6.1), the notation "DOT-E" followed by the exemption number assigned.

f. if shipment is being made under a Certificate of Equivalency (COE) (see paragraph 3.6.2), the notation "Packaged in accordance with 49 CFR 173.7(a) by authority of CCN-(the applicable COE number)". A copy of the COE must be attached to the GBL.

g. if shipment is covered by a Competent Authority Approval (CAA) (see paragraph 3.6.3), the notation "Packaging authorized by authority of the United States of America, USA, CA - ZZZZZZ". These items require that the National Stock Number (NSN) also appear on the GBL and the outside of the package. Individual CAA's may specify additional shipping paper annotations. A copy of the CAA must be attached to the GBL.

h. if shipment is covered by a packaging and marking grandfather clause (see paragraph 4.2), the notation "Government-owned goods packaged prior to 1 January 1988".

The hazardous material description specified in subparagraph c. (1) through (4), above, must be shown in sequence with no additional information interspersed. For example: "Rocket Motor, 1.1C, UN 0280, PG II".

If necessary, any questions regarding the proper GBL Description shall be directed to the Commander, Naval Sea Systems Command (NAVSEASYS COM), (SEA-66T), Washington, DC 20362-5101, telephone AUTOVON 332-4059 or Commercial (703) 602-4059.

3.1.1. UN Identification Numbers/Proper Shipping Names. The UN has specified an identification number for each type of hazardous material. The UN identification number directly relates to the UN proper shipping name, class, division, and compatibility group of the material. UN identification numbers and UN proper shipping names for explosives are listed in 49 CFR 172.101, 172.62, the international modal regulations (e.g., ICAO, IMDG, IATA), and

chapter 2 of the UN publication, “Recommendations on the Transport of Dangerous Goods”. Some UN identification numbers cross reference to multiple proper shipping names (e.g., UN 0012, UN 0014, UN 0028, etc.). The shipping names provided in this manual reflect the most descriptive and primary shipping name assignments shown in 49 CFR 172.101. As a result, shipments of hazardous material from contractors and other military services may not be consistent with the Navy packaging markings and shipping paper descriptions in all cases. Shippers should refer to the hazardous material table in 49 CFR for alternate shipping name designations when discrepancies arise. Use of the alternate descriptions from 49 CFR is permissible. Package remarking and shipping paper descriptions need not be changed.

3.2. **Container Marking.** An external container marking is required by the DOT to identify the hazardous nature of the contents for transportation and emergency response purposes. Shipping activities are responsible for the marking of all containers. When preparing hazardous material for shipment, shippers shall inspect and ensure all hazardous material packaging contains the appropriate hazard marking and where required, the proper destination markings. An example of the correct position for marking and labels on a container is shown in figure 2-1. MIL-STD-129 provides the methods for standard marking of shipments by and for the Department of Defense (DOD). Standard marking of containers and unpacked items in storage is also addressed by MIL-STD-129. In addition, where the DOT has issued an exemption governing the shipment of an item, or a DOD Certificate of Equivalency (COE) pertains, the number of the exemption or the Certification Control Number (CCN) of the COE shall also appear on the exterior of the container; see paragraph 2-3.6.

3.3. **National Motor Freight Classification (NMFC)/ Uniform Freight Classification (UFC).** NMFC and UFC numbers, which must be annotated in a dedicated block on the GBL, are assigned to all shipments for tariff calculation purposes.

3.4. **Labels/Placards.** Each hazardous material shipment must be labeled and placarded in accordance with the requirements of 49 CFR 172 Subparts E and F, 172.400 and 172.500.

3.4.1. **Labeling.** Hazard labels are required to be printed or affixed to a surface other than the bottom of a package. They are required to be located on the same surface and as close as possible to the proper shipping name and UN identification number. When primary and subsidiary hazard labels are required they shall be affixed adjacent to one another. Packages over 64 cubic feet (1.8m³) require two labels displayed on at least two sides other than the bottom. All labels must be clearly visible and may not be obscured by markings, other labels, or attachments. Labeling of hazardous material packages is required for all shipments with the following exception: packages of military explosives shipped by or on behalf of the DOD when in freight container loads, car loads, or truck load shipments if loaded and unloaded by the shipper or DOD, are exempt from labeling requirements. Additionally, unitized or palletized breakbulk shipments by cargo ship under charter to DOD can be shipped with a single label per unit load. packages coming from production should possess labels in all cases since the life cycle of ordnance involves many logistical shipments, and because ultimate and secondary destinations are not always known. When the logistics flow of the material is unknown, however, the general labeling requirements shall be met.

3.4.2. Placards. Tables 1 and 2 of 49 CFR 172 Subpart F provide guidance for determining placarding requirements. For the purposes of transportation, each freight container, transport vehicle, or rail car containing hazardous material must be placarded on each side and each end with a placard. NAVSUP PUB 505/AFR 71-4/TM 38-250/MCO P4030.190/- placarding.

3.5. Firefighting Group. Ammunition and explosives are assigned to a commodity group which establishes firefighting procedures and distances to be maintained. See NAVSEA OP 2165 Volume 1 for commodity groupings and specific firefighting instructions applicable to each group. It should be noted, however, that firefighting groups are being phased out. Firefighting guidance and other emergency response procedures are provided in DOT P 5800.5, “Emergency Response Guide-book”.

3.6. Exemption / Shipping Authority..

3.6.1. DOT Exemptions In the past, shippers who wished to transport in interstate commerce hazardous material which did not comply with the DOT regulations published in 49 CFR, or if proposed shipments included materials not covered by existing regulations, the DOT issued an exemption for that shipment. These corresponding DOT exemption numbers are required to be marked on the outside of the shipping container; see paragraph 2-3.2. Copies and a dated listing of the most current DOT exemptions is presented in NAVSEA OP 2165 Volume 1, appendix E. It should be noted that many of the DOT exemptions previously approved by the DOT are being phased out, and replaced with regulatory changes or Competent Authority Approvals (CAA’s); see paragraph 3.6.3. Extensions of many current exemptions will not be renewed once their expiration date is reached.

3.6.2. Certificates of Equivalency (COE’s). Hazardous materials shipped by, for, or to the DOD, including commercial shipments prepared under U.S. contract, must be packaged in accordance with the regulations of 49 CFR 173 and 178. When packagings are not in accordance with the 49 CFR regulations, the DOD can certify that the packagings used are of equal or greater strength and efficiency. These certifications are issued as COE’s. COE’s, unlike CAA’s are only recognized for shipments traveling within CONUS and as specification packaging are phased out domestically, COE’s will play a less important role in hazardous material transportation. Each COE is identified by a Certification Control Number (CCN), which is preceded by the issuing service: “NA” for Navy, “AR” for Army, and “AF” for Air Force. A typical COE might be identified by the CCN “NA 92-504”.

3.6.3. Competent Authority Approval (CAA). A CAA is a written approval granted by the DOT that states that the Competent Authority has reviewed the explosive hazard classification or packaging; that it meets both domestic and UN standards, and that it is approved for transportation. The DOT is the only recognized Competent Authority for the U.S. A CAA may be required for explosive hazard classification (e.g., commercial air carriers require a hazard classification CAA prior to accepting Class 1 air eligible material for shipment; see ICAO Technical Instruction paragraph 1.3) or for packaging. CAA's which are issued for packaging authorize the use of containers which differ from those specified (e.g., aluminum instead of steel or wood), or containers which have been approved by different methods of POP testing. Packaging CAA's are also required for Class 1 explosives assigned the packing method E-103 in 49 CFR, and E-102, E-103, E-137, E-146, and E-149 in the international regulations, or when the net weight or volume of the packaged commodity exceeds 400 kilograms (882 lbs) for solids or 450 liters (119 gallons) for liquids. It will be equally as important to prepare CAA requests for affected items as to perform POP testing. Items which require CAA cannot be shipped overseas until the DOT (the U. S. Competent Authority) grants a CAA. The commodity classification along with the type of packaging determines whether a CAA is required. CAA's must be attached to the shipping papers.

3.6.4. Performance Oriented Packaging (POP) Test Marking. Under the UN system, all packaging containing hazardous materials must be certified to meet specific performance standards through performance testing. Containers meeting these standards are issued a standardized POP marking, which is required to be marked by the manufacturer or packager on the outside of the container. The marking presents the following information in the sequence presented:

- a. UN Packaging Symbol. Certifies that the package complies with UN requirements. The size of the circle shall be relative to the size of the packaging, and shall be readily visible. For metal receptacles, the capital letters "UN" may be applied in place of the symbol.
- b. Packaging Identification Code. Designates the type of packaging, the material of construction, and when appropriate, the category of packaging under 49 CFR 178.504 through 178.523.
- c. Packing Group and Gross Weight. Designates the packing group(s) for which the container design has been successfully tested:
 - (1) Code "X" for packages meeting packing groups I, II, and III tests.
 - (2) Code "Y" for packages meeting packing groups II and III tests.
 - (3) Code "Z" for packages meeting only packing group III tests.

The assignment of packing groups is described in the IMDG Code, ICAO Instructions, or the UN publication, "Recommendations on the Transport of Dangerous Goods". The majority of explosives fall under packing group II, Code "Y".

Accompanying the packing group designator is the maximum authorized gross weight (in kilograms) for which the container has been tested. For liquids, this number reflects specific gravity.

d. Descriptor. “S” indicates a packaging intended to contain solid or inner packaging. Most ammunition items are solids. In the case of liquids, the hydrostatic test pressure in kilopascals (kPa) rounded down to the nearest 10 kPa of which the package has successfully passed is used.

e. Year. Indicates the last two digits of the year during which the packaging was manufactured or packed.

f. State. Shown as “USA”.

g. Manufacturer/Certifying Authority. The name and address or symbol of the manufacturer or the approval authority. Symbols are required to be registered with the competent authority. Shown as “DOD”.

h. Certifying Authority. Represents the technical authority for the container design that authorized the package configuration. The authority is also responsible for signing the packaging document. Unless otherwise specified, the package certifying authority is the activity who approved the packaging drawing, specification, or special packaging instruction. NAVSUPINST 4030.50 (series) identifies UN POP certification symbols. This portion of the POP test marking is optional.

3.7. COAST GUARD (CG) Class. CG classification markings were established by the former 46 CFR 176 to classify hazardous materials for shipments by water. The Research and Special Programs Administration, DOT Docket HM-204A dated January 29, 1991, revokes 46 CFR 176 in its entirety. As a result, the Classification, Handling and Stowage Chart on which the CG stowage classification system was based, have been removed from the regulations. The stowage and transport of military explosives on vessels will be based on their UN class/divisions and compatibility groups rather than on their CG stowage classes.

3.8. Security risk Code (SRC). Each item of ammunition is assigned an SRC, which categorizes it for security purposes. The assigned SRC determines the extent of security measures which are required to be taken during storage and transport of the item. SRC’s are listed and explained in table 2-5.

3.9. Ex Number. EX-numbers are assigned by the Associate Administrator for Hazardous Material Safety, Department of Transportation (DOT), to identify an explosive which has been approved and properly classified. The EX-number is a six or seven digit designation, consisting of the year and month issued and a numerical sequence for tracking. Large quantities of comparable ammunition items with differing NALC’s, such as fuzes, may be assigned the same EX-number with alpha-suffix codes “a”, “b”, “c”, and so on. Shipping containers shall be marked with the EX-number, unless the Ex-number can be traced to a National Stock Number (NSN) through DOD-approved data file systems, such as the Joint Hazard Classification System (JHCS). In other words, if the packaging has the applicable NSN marking per MIL-STD-129, an EX marking is not required on the package.

3.10. Segregation During Transport. Hazardous materials may not be transported together by motor vehicle, ship, or rail unless appropriate segregation requirements are met. Tables 5 and 6 describe the compatibility criteria for shipping ammunition, explosives and hazardous materials of varying compatibility groups together in one conveyance in one conveyance are described in appendices G, H, and J of the yellow book.

3.10.1. Explosives and hazardous material stowed as breakbult cargo shall be separated according to the guidelines presented in 49 CFR 176.839c). Containerized explosives and hazardous materials stowed onboard container vessels, or on other types of vessels provided these cargo spaces are properly fitted for permanent stowage of freight containers during transport, shall be separated as described in 49 CFR 176.83(f).

3.10.2. Transportation Security Standards

Transportation security policy and standards for Arms, Ammunition, and Explosives (AA&E) are set forth in appendix B of AR 190-11. These standards have been established and are required in order to adequately protect such items during shipment. Minimum security provisions for commercial transportation of AA&E can be found in AR 55-355, chapter 33. On the basis of threat determination and evaluation of the movement itself, AA&E may be given additional protection, but not less than that required by the category assigned to the item. Specific guidance covering security standards for transportation of these items is located in chapter 7 of AR 190-11, pages 21-25.

CHAPTER 1

GENERAL REQUIREMENTS FOR SHIPMENTS AND PACKAGING

NOTES

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id materials may be filled with a Packing Group III solid material to a gross mass not exceeding the maximum gross mass marked on the intermediate bulk container, multiplied by 1.5.

[Amdt. 173-238, 59 FR 38064, July 26, 1994, as amended by Amdt. 173-243, 60 FR 40038, Aug. 4, 1995]

§173.40 General packaging requirements for poisonous materials required to be packaged in cylinders.

When this section is referenced in the packaging section for a hazardous material elsewhere in this part, the following requirements are applicable to cylinders used for that material:

(a) *Authorized cylinders.* A cylinder must conform to one of the specifications for cylinders in subpart C of part 178 of this subchapter, except that Specification 8, 8AL and 39 cylinders are not authorized.

(b) *Outage and pressure requirements.* The pressure of the hazardous material at 55° C (131° F) must not exceed the service pressure of the cylinder. Sufficient outage shall be provided so that the cylinder will not be liquid full at 55° C (131° F).

(c) *Closures.* Each cylinder must be closed with a plug or valve conforming to the following:

(1) Each plug or valve must have a tapered threaded connection directly to the cylinder and be capable of withstanding the test pressure of the cylinder;

(2) Each valve must be of the packless type with non-perforated diaphragm, except that for corrosive materials, a 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;

(3) Each valve outlet must be sealed by a threaded cap or threaded solid plug, and

(4) Cylinder, valves, plugs, outlet caps, luting and gaskets must be compatible with each other and with the lading.

(d) *Additional protection.* Additional protection requirements for thin-walled cylinders

and for cylinders equipped with valves are as follows:

(1) Each cylinder which has a wall thickness at any point of less than 2.03 mm (0.080 inch) and each cylinder which does not have fitted valve protection must be overpacked in a 4C1, 4D, 4F, 4G, 4H1 or 4H2 box. The box must conform to overpack provisions in § 173.25. Box and valve protection must be of sufficient strength to protect all parts of the cylinder and valve, if any, 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.

(2) Each cylinder equipped with a valve, if not overpacked in a box in accordance with paragraph (d)(1) of this section, must be equipped 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.

(e) *Interconnection.* Cylinders may not be interconnected.

[Amdt. 173-224, 55 FR 52616, Dec. 21, 1990]

Subpart C—Definitions, Classification and Packaging for Class 1

SOURCE: Amdt. 173-224, 55 FR 52617, Dec. 21, 1990, unless otherwise noted.

§173.50 Class 1—definitions.

(a) *Explosive.* For the purpose of this subchapter, an *explosive* means any substance or article, including a device, which is designed to function by explosion (i.e., an extremely rapid release of gas and heat) or which, by chemical reaction within itself, is able to function in a similar manner even if not designed to function by explosion, unless the substance or article is otherwise classed under the provision of this subchapter.

(b) Explosives in Class 1 are divided into six divisions as follows:

(1) *Division 1.1* consists of explosives that have a mass explosion hazard. A mass explosion is one which affects almost the entire load instantaneously.

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(2) *Division 1.2* consists of explosives that have a projection hazard but not a mass explosion hazard.

(3) *Division 1.3* consists of explosives that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard.

(4) *Division 1.4* consists of explosives 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.

(5) *Division 1.5*¹ 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 conditions of transport.

(6) *Division 1.6*² consists of extremely insensitive articles which do not have a mass explosive 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.

[Amdt. 173-224, 55 FR 52617 Dec. 21, 1990, as amended at 56 FR 66267, Dec. 20, 1991]

§173.51 Authorization to offer and transport explosives.

(a) Unless otherwise provided in this subpart, no person may offer for transportation or transport an explosive, unless it has been tested and classed and approved by the Associate Administrator for Hazardous Materials Safety (§ 173.56).

(b) Reports of explosives approved by the Department of Defense or the Department of Energy must be filed with, and receive acknowledgement in writing by, the Associate Administrator for Hazardous Materials Safe-

ty prior to such explosives being offered for transportation.

§173.52 Classification codes and compatibility groups of explosives.

(a) The classification code for an explosive, which is assigned by the Associate Administrator for Hazardous Materials Safety in accordance with this subpart, consists of the division number followed by the compatibility group letter. Compatibility group letters are used to specify the controls for the transportation, and storage related thereto, of explosives and to prevent an increase in hazard that might result if certain types of explosives were stored or transported together. Transportation compatibility requirements for carriers are prescribed in §§ 174.81, 175.78, 176.83 and 177.848 of this subchapter for transportation by rail, air, vessel, and public highway, respectively, and storage incidental thereto.

(b) Compatibility groups and classification codes for the various types of explosives are set forth in the following tables. Table 1 sets forth compatibility groups and classification codes for substances and articles described in the first column of Table 1. Table 2 shows the number of classification codes that are possible within each explosive division. Altogether, there are 35 possible classification codes for explosives.

¹The probability of transition from burning to detonation is greater when large quantities are transported in a vessel.

²The risk from articles of Division 1.6 is limited to the explosion of a single article.

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TABLE 1. CLASSIFICATION CODES

Description of substances or article to be classified	Compat- ibility group	Classi- fication code
Primary explosive substance.....	A	1.1A
Article containing a primary explosive substance and not containing two or more effective protective features. Some articles, such as detonators for blasting, detonator assemblies for blasting and primers, cap-type, are included, even though they do not contain primary explosives.	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 substance 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 gel 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 gel or hypergolic liquid) or without a 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 an 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 substance 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
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 hypergolic 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

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TABLE 2. SCHEME OF CLASSIFICATION OF EXPLOSIVES, COMBINATION OF HAZARD DIVISION WITH COMPATIBILITY GROUP

Hazard division	Compatibility group													
	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
1.6	1	3	4	4	3	4	4	2	3	2	3	1	1	35

[Amdt. 173-224, 55 FR 52617, Dec. 21, 1990, as amended by Amdt. 173-241, 59 FR 67492, Dec. 29, 1994]

§173.53 Provisions for using old classifications of explosives.

Where the classification system in effect prior to January 1, 1991, is referenced in State or local laws, ordinances or regulations not pertaining to the transportation of hazardous materials, the following table may be used to compare old and new hazard class names:

Current classification	Class name prior to Jan. 1, 1991
Division 1.1	Class A explosives.
Division 1.2	Class A or Class B explosives.
Division 1.3	Class B explosive.
Division 1.4	Class C explosives.
Division 1.5	Blasting agents.
Division 1.6	No applicable hazard class.

§173.54 Forbidden explosives.

Unless otherwise provided in this subchapter, the following explosives shall not be offered for transportation or transported:

- (a) An explosive that has not been approved in accordance with § 173.56 of this subpart.
- (b) An explosive mixture or device containing a chlorate and also containing:
 - (1) An ammonium salt, including a substituted ammonium or quaternary ammonium salt; or
 - (2) An acidic substance, including a salt of a weak base and a strong acid.
- (c) A leaking or damaged package of explosives.

(d) Propellants that are unstable, condemned or deteriorated.

(e) Nitroglycerin, Diethylene glycol dinitrate, or any other liquid explosives not specifically authorized by this subchapter.

(f) A loaded firearm (except as provided in 14 CFR 108.11).

(g) Fireworks that combine an explosive and a detonator.

(h) Fireworks containing yellow or white phosphorus.

(i) A toy torpedo, the maximum outside dimension of which exceeds 23 mm (0.906 inch), or a toy torpedo containing a mixture of potassium chlorate, black antimony (antimony sulfide), and sulfur, if the weight of the explosive material in the device exceeds 0.26 g (0.01 ounce).

(j) Explosives specifically forbidden in the § 172.101 Table of this subchapter.

(k) Explosives not meeting the acceptance criteria specified in § 173.57 of this subchapter.

(l) An explosive article with its means of initiation or ignition installed, unless approved in accordance with § 173.56.

[Amdt. 173-224, 55 FR 52617 Dec. 21, 1990, as amended at 56 FR 66267, Dec. 20, 1991; Amdt. 173-236, 58 FR 50236, Sept. 24, 1993]

§173.55 [Reserved]

§173.56 New explosives—definition and procedures for classification and approval.

(a) Definition of new explosive. For the purposes of this subchapter a *new explosive*

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means an explosive produced by a person who:

(1) Has not previously produced that explosive; or

(2) Has previously produced that explosive but has made a change in the formulation, design or process so as to alter any of the properties of the explosive. An explosive will not be considered a "new explosive" if an agency listed in paragraph (b) of this section has determined, and confirmed in writing to the Associate Administrator for Hazardous Materials Safety, that there are no significant differences in hazard characteristics from the explosive previously approved.

(b) Examination, classing and approval. Except as provided in paragraph (j) of this section, no person may offer a new explosive for transportation unless that person has specified to the examining agency the ranges of composition of ingredients and compounds, showing the intended manufacturing tolerances in the composition of substances or design of articles which will be allowed in that material or device, and unless it has been examined, classed and approved as follows:

(1) A new explosive must be examined and assigned a recommended shipping description, class, and classification code by a person approved by the Associate Administrator for Hazardous Materials Safety. The recommendation of class and classification code must be based on the tests and criteria prescribed in §§ 173.52, 173.57 and 173.58 of this subchapter. Each person requesting approval of a new explosive must submit a copy of the report of examination and assignment of recommended shipping description, class and classification code to the Associate Administrator for Hazardous Materials Safety for approval and must receive written approval and an EX-number from the Associate Administrator for Hazardous Materials Safety before offering that explosive for transportation.

(2) A new explosive made by or under the direction or supervision of a component of the DOD may be examined, classed, and concurred in by:

(i) U.S. Army Technical Center for Explosives Safety (SMCAC-EST), Naval Sea Systems Command (SEA-9934), or Air Force

Safety Agency (SEW), when approved by the Chairman, DOD Explosives Board, in accordance with the Department of Defense Explosives Hazard Classification Procedures (TB 700-2, dated December 1989); or

(ii) The agencies and procedures specified in paragraph (b)(1) of this section.

(3) A new explosive made by or under the direction or supervision of the Department of Energy (DOE) may be—

(i) Examined by the DOE in accordance with the Explosives Hazard Classification Procedures (TB 700-2, dated December, 1989), and must be classed and approved by DOE; or

(ii) Examined, classed, and approved in accordance with paragraph (b)(1) of this section.

(4) For a material shipped under the description of "ammonium nitrate-fuel oil mixture (ANFO)", the only test required for classification purposes is the Cap Sensitivity Test (Test Method 5(a), prescribed in the Explosive Test Manual). The test must be performed by an agency listed in paragraph (b)(1), (b)(2), or (b)(3) of this section, the manufacturer, or the shipper. A copy of the test report must be submitted to the Associate Administrator for Hazardous Materials Safety before the material is offered for transportation, and a copy of the test report must be retained by the shipper for as long as that material is shipped. At a minimum, the test report must contain the name and address of the person or organization conducting the test, date of the test, quantitative description of the mixture, including prill size and porosity, and a description of the test results.

(c) Filing DOD or DOE approval report. DOD or DOE must file a copy of each approval, accompanied by supporting laboratory data, with the Associate Administrator for Hazardous Materials Safety and receive acknowledgement in writing before offering the new explosive for transportation, unless the new explosive is:

(1) Being transported under paragraph (d) or (e) of this section; or

(2) Covered by a national security classification currently in effect.

(d) Transportation of explosive samples for examination. Notwithstanding the require-

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ments of paragraph (b) of this section with regard to the transportation of a new explosive that has not been approved, a person may offer a sample of a new explosive for transportation, by railroad, highway, or vessel from the place where it was produced to an agency identified in paragraph (b) of this section, for examination if—

(1) The new explosive has been assigned a tentative shipping description and class in writing by the testing agency;

(2) The new explosive is packaged as required by this part according to the tentative description and class assigned, unless otherwise specified in writing by the testing agency; and

(3) The package is labeled as required by this subchapter and the following is marked on the package:

(i) The words "SAMPLE FOR LABORATORY EXAMINATION";

(ii) The net weight of the new explosive; and

(iii) The tentative shipping name and identification number.

(e) Transportation of unapproved explosives for developmental testing. Notwithstanding the requirements of paragraph (b) of this section, the owner of a new explosive that has not been examined or approved may transport that new explosive from the place where it was produced to an explosives testing range if—

(1) It is not a primary (a 1.1A initiating) explosive or a forbidden explosive according to this subchapter;

(2) It is described as a Division 1.1 explosive (substance or article) and is packed, marked, labeled, described on shipping papers and is otherwise offered for transportation in conformance with the requirements of this subchapter applicable to Division 1.1;

(3) It is transported in a motor vehicle operated by the owner of the explosive; and

(4) It is accompanied by a person, in addition to the operator of the motor vehicle, who is qualified by training and experience to handle the explosive.

(f) Notwithstanding the requirements of paragraphs (b) and (d) of this section, the Associate Administrator for Hazardous Materials Safety may approve a new explosive on the

basis of an approval issued for the explosive by the competent authority of a foreign government, or when examination of the explosive by the a person approved by the Associate Administrator for Hazardous Materials Safety is impracticable, on the basis of reports of tests conducted by disinterested third parties, or may approve the transportation of an explosives sample for the purpose of examination by a person approved by the Associate Administrator for Hazardous Materials Safety.

(g) Notwithstanding the requirements of paragraph (b) of this section, an explosive may be transported under §§ 171.11, 171.12, 171.12a or § 176.11 of this subchapter without the approval of the Associate Administrator for Hazardous Materials Safety if the Associate Administrator for Hazardous Materials Safety has acknowledged, in writing, the acceptability of an approval issued by the competent authority of a foreign government pursuant to the provisions of the UN Recommendations, the ICAO Technical Instructions, the IMDG Code, or other national or international regulations based on the UN Recommendations. In such a case, a copy of the foreign competent authority approval, and a copy of the written acknowledgement of its acceptance must accompany each shipment of that explosive.

(h) The requirements of this section do not apply to cartridges, small arms which are:

(1) Not a forbidden explosive under § 173.54 of this subchapter;

(2) Ammunition for rifle, pistol, or shotgun;

(3) Ammunition with inert projectile or blank ammunition; and

(4) Ammunition not exceeding 50 caliber for rifle or pistol cartridges or 8 gauge for shotgun shells.

Cartridges, small arms meeting the criteria of this paragraph (h) may be assigned a classification code of 1.4S by the manufacturer.

(i) If experience or other data indicate that the hazard of a material or a device containing an explosive composition is greater or less than indicated according to the definition and criteria specified in §§ 173.50, 173.56, and 173.58 of this subchapter, the Associate Administrator for Hazardous Materials Safety

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may, following examination in accordance with paragraph (b) of this section, revise its classification or except the material or device from the requirements of this subchapter.

(j) Fireworks. Notwithstanding the requirements of paragraph (b) of this section, Division 1.3 and 1.4 fireworks may be classed and approved by the Associate Administrator for Hazardous Materials Safety without prior examination and offered for transportation if the following conditions are met:

(1) The fireworks are manufactured in accordance with the applicable requirements in APA Standard 87-1;

(2) A thermal stability test is conducted on the device by the BOE, the BOM, or the manufacturer. The test must be performed by maintaining the device, or a representative prototype of a large device such as a display shell, at a temperature of 75° C (167° F) for 48 consecutive hours. When a device contains more than one component, those components which could be in physical contact with each other in the finished device must be placed in contact with each other during the thermal stability test; and

(3) The manufacturer applies in writing to the Associate Administrator for Hazardous Materials Safety following the applicable requirements in APA Standard 87-1, and is notified in writing by the Associate Administrator for Hazardous Materials Safety that the fireworks have been classed, approved, and assigned an EX-number. Each application must be complete, including all relevant background data and copies of all applicable drawings, test results, and any other pertinent information on each device for which approval is being requested. The manufacturer must sign the application and certify that the device for which approval is requested conforms to APA Standard 87-1 and that the descriptions and technical information contained in the application are complete and accurate. If the application is denied, the manufacturer will be notified in writing of the reasons for the denial. The Associate Administrator for Hazardous Materials Safety may require that the fireworks be

examined by an agency listed in paragraph (b)(1) of this section.

[Amdt. 173-224, 55 FR 52617 Dec. 21, 1990, as amended at 56 FR 66267, Dec. 20, 1991; Amdt. 173-234, 58 FR 51532, Oct. 1, 1993; 62 FR 51560, Oct. 1, 1997]

§173.57 Acceptance criteria for new explosives.

(a) Unless otherwise excepted, an explosive substance must be subjected to the Drop Weight Impact Sensitivity Test (Test Method 3(a)(i)), the Friction Sensitivity Test (Test Method 3(b)(iii)), the Thermal Stability Test (Test Method 3(c)) at 75° C (167° F) and the Small-Scale Burning Test (Test Method 3(d)(i)), each as described in the Explosive Test Manual (UN Recommendations on the Transport of Dangerous Goods, Tests and Criteria, Part I, Second Edition (see § 171.7 of this subchapter). A substance is forbidden for transportation if any one of the following occurs:

(1) For a liquid, failure to pass the test criteria when tested in the Drop Weight Impact Sensitivity Test apparatus for liquids;

(2) For a solid, failure to pass the test criteria when tested in the Drop Weight Impact Sensitivity Test apparatus for solids;

(3) The substance has a friction sensitivity equal to or greater than that of dry pentaerythrite tetranitrate (PETN) when tested in the Friction Sensitivity Test;

(4) The substance fails to pass the test criteria specified in the Thermal Stability Test at 75° C (167° F); or

(5) Explosion occurs when tested in the Small-Scale Burning Test.

(b) An explosive article, packaged or unpackaged, or a packaged explosive substance must be subjected to the Thermal Stability Test for Articles and Packaged Articles (Test method 4(a)(i)) and the Twelve Meter Drop Test (Test Method 4(b)(ii)), when appropriate, in the Explosive Test Manual. An article or packaged substance is forbidden for transportation if evidence of thermal instability or excessive impact sensitivity is found in those tests according to the criteria and methods of assessing results prescribed therein.

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(c) Dynamite (explosive, blasting, type A) is forbidden for transportation if any of the following occurs:

(1) It does not have uniformly mixed with the absorbent material a satisfactory antacid in a quantity sufficient to have the acid neutralizing power of an amount of magnesium carbonate equal to one percent of the nitroglycerin or other liquid explosive ingredient;

(2) During the centrifuge test (Test Method D-2, in appendix D to this part) or the compression test (Test Method D-3 in appendix D to this part), a non-gelatin dynamite loses more than 3 percent by weight of the liquid explosive or a gelatin dynamite loses more than 10 percent by weight of the liquid explosive; or

(3) During the leakage test (Test Method D-1 in appendix D to this part), there is any loss of liquid.

[Amdt. 173-224, 55 FR 52617 Dec. 21, 1990, as amended at 58 FR 51532, Oct. 1, 1993]

§173.58 Assignment of class and division for new explosives.

(a) Division 1.1., 1.2., 1.3., and 1.4 explosives. In addition to the test prescribed in § 173.57 of this subchapter, a substance or article in these divisions must be subjected to Test Methods 6(a), 6(b), and 6(c), as described in the Explosive Test Manual, for assignment to an appropriate division. The criteria for assignment of class and division are as follows:

(1) Division 1.1 if the major hazard is mass explosion;

(2) Division 1.2 if the major hazard is dangerous projections;

(3) Division 1.3 if the major hazard is radiant heat or violent burning, or both, but there is no blast or projection hazard;

(4) Division 1.4 if there is a small hazard with no mass explosion and no projection of fragments of appreciable size or range;

(5) Division 1.4 Compatibility Group S (1.4S) if the hazardous effects are confined within the package or the blast and projection effects do not significantly hinder emergency response efforts; or

(6) Not in the explosive class if the substance or article does not have significant explosive hazard or if the effects of explosion are completely confined within the article.

(b) Division 1.5 explosive. Except for AN-FO, a substance that has been examined in accordance with the provisions § 173.57(a) of this subchapter, must be subjected to the following additional tests: Cap Sensitivity Test, Princess Incendiary Spark Test, DDT Test, and External Fire Test, each as described in the Explosive Test Manual. A material may not be classed as a Division 1.5 explosive if any of the following occurs:

(1) Detonation occurs in the Cap Sensitivity Test (Test Method 5(a));

(2) Detonation occurs in the DDT Test (Test Method 5(b)(ii));

(3) An explosion, evidenced by a loud noise and projection of fragments, occurs in the External Fire Test (Test Method 5(c), or

(4) Ignition or explosion occurs in the Princess Incendiary Spark Test (Test Method 5(d)).

(c) Division 1.6 explosive.

(1) In order to be classed as a 1.6 explosive, an article must pass all of the following tests, as prescribed in the Explosive Test Manual:

(i) The 1.6 Article External Fire Test;

(ii) The 1.6 Article Slow Cook-off Test;

(iii) The 1.6 Article Propagation Test; and

(iv) The 1.6 Article Bullet Impact Test.

(2) A substance intended for use as the explosive load in an article of Division 1.6 must be an extremely insensitive detonating substance (EIDS). In order to determine if a substance is an EIDS, it must be subjected to the tests in paragraphs (c)(2)(i) through (c)(2)(x) of this section, which are described in the Explosive Test Manual. The substance must be tested in the form (i.e., composition, granulation, density, etc.) in which it is to be used in the article. A substance is not an EIDS if it fails any of the following tests:

(i) The Drop Weight Impact Sensitivity Test;

(ii) The Friction Sensitivity Test;

(iii) The Thermal Sensitivity Test at 75° C (167° F);

(iv) The Small Scale Burning Test;

(v) The EIDS Cap Test;

(vi) The EIDS Gap Test;

(vii) The Susan Test;

(viii) The EIDS Bullet Impact Test;

(ix) The EIDS External Fire Test; and

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(x) The EIDS Slow Cook-off Test.

(d) The Associate Administrator for Hazardous Materials Safety may waive or modify certain test(s) identified in §§ 173.57 and 173.58 of this subchapter, or require additional testing, if appropriate. In addition, the Associate Administrator for Hazardous Materials Safety may limit the quantity of explosive in a device.

(e) Each explosive is assigned a compatibility group letter by the Associate Administrator for Hazardous Materials Safety based on the criteria prescribed in § 173.52(b) of this subchapter.

[Amdt. 173-224, 55 FR 52617 Dec. 21, 1990, as amended at 56 FR 66267, Dec. 20, 1991]

§173.59 Description of terms for explosives.

For the purpose of this subchapter, a description of the following terms is provided for information only. They must not be used for purposes of classification or to replace proper shipping names prescribed in § 172.101 of this subchapter.

Ammonium-nitrate-fuel oil mixture (AN-FO). A blasting explosive containing no essential ingredients other than prilled ammonium nitrate and fuel oil.

Ammunition. Generic term related mainly to articles of military application consisting of all types of bombs, grenades, rockets, mines, projectiles and other similar devices or contrivances.

Ammunition, illuminating, with or without burster, expelling charge or propelling charge. Ammunition designed to produce a single source of intense light for lighting up an area. The term includes illuminating cartridges, grenades and projectiles, and illuminating and target identification bombs. The term excludes the following articles which are listed separately: *cartridges, signal; signal devices; hand signals; distress flares, aerial and flares, surface.*

Ammunition, incendiary. Ammunition containing an incendiary substance which may be a solid, liquid or gel including white phosphorus. Except when the composition is an explosive *per se*, it also contains one or more of the following: a propelling charge with primer

and igniter charge, or a fuze with burster or expelling charge. The term includes: *Ammunition, incendiary*, liquid or gel, with burster, expelling charge or propelling charge; *Ammunition, incendiary* with or without burster, expelling charge or propelling charge; and *Ammunition, incendiary, white phosphorus*, with burster, expelling charge or propelling charge.

Ammunition, practice. Ammunition without a main bursting charge, containing a burster or expelling charge. Normally it also contains a fuze and propelling charge. The term excludes the following article which is listed separately: *Grenades, practice.*

Ammunition, proof. Ammunition containing pyrotechnic substance, used to test the performance or strength of new ammunition, weapon component or assemblies.

Ammunition, smoke. Ammunition containing a smoke-producing substance such as chlorosulphonic acid mixture (CSAM), titanium tetrachloride (FM), white phosphorus, or smoke-producing substance whose composition is based on hexachlorothannol (HC) or red phosphorus. Except when the substance is an explosive *per se*, the ammunition also contains one or more of the following: a propelling charge with primer and igniter charge, or a fuze with burster or expelling charge. The term includes: *Ammunition, smoke*, with or without burster, expelling charge or propelling charge; *Ammunition, smoke, white phosphorus* with burster, expelling charge or propelling charge.

Ammunition, tear-producing with burster, expelling charge or propelling charge. Ammunition containing tear-producing substance. It may also contain one or more of the following: a pyrotechnic substance, a propelling charge with primer and igniter charge, or a fuze with burster or expelling charge.

Ammunition, toxic. Ammunition containing toxic agent. It may also contain one or more of the following: a pyrotechnic substance, a propelling charge with primer and igniter charge, or a fuze with burster or expelling charge.

Articles, explosive, extremely insensitive (Articles, EEI). Articles that contain only extremely insensitive detonating substances and which demonstrate a negligible probab-

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ity of accidental initiation or propagation under normal conditions of transport and which have passed Test Series 7.

Articles, pyrophoric. Articles which contain a pyrophoric substance (capable of spontaneous ignition when exposed to air) and an explosive substance or component. The term excludes articles containing white phosphorus.

Articles, pyrotechnic for technical purposes. Articles which contain pyrotechnic substances and are used for technical purposes, such as heat generation, gas generation, theatrical effects, etc. The term excludes the following articles which are listed separately: all ammunition; *cartridges, signal; cutters, cable, explosive; fireworks; flares, aerial; flares, surface; release devices, explosives; rivets, explosive; signal devices, hand; signals, distress; signals, railway track, explosive; and signals, smoke.*

Black powder (gunpowder). Substance consisting of an intimate mixture of charcoal or other carbon and either potassium or sodium nitrate, and sulphur. It may be meal, granular, compressed, or pelletized.

Bombs. Explosive articles which are dropped from aircraft. They may contain a flammable liquid with bursting charge, a photo-flash composition or bursting charge. The term excludes *torpedoes (aerial)* and includes *bombs, photo-flash; bombs with bursting charge; bombs with flammable liquids, with bursting charge.*

Boosters. Articles consisting of a charge of detonating explosive without means of initiation. They are used to increase the initiating power of detonators or detonating cord.

Bursters, explosive. Articles consisting of a small charge of explosive to open projectiles or other ammunition in order to disperse their contents.

Cartridges, blank. Articles which consist of a cartridge case with a center or rim fire primer and a confined charge of smokeless or black powder, but no projectile. Used in training, saluting, or in starter pistols, etc.

Cartridges, flash. Articles consisting of a casing, a primer and flash powder, all assembled in one piece for firing.

Cartridges for weapons. (1) Fixed (assembled) or semi-fixed (partially assembled) ammunition designed to be fired from weapons. Each cartridge includes all the components necessary to function the weapon once. The name and description should be used for military small arms cartridges that cannot be described as cartridges, small arms. Separate loading ammunition is included under this name and description when the propelling charge and projectile are packed together (see also *Cartridges, blank*).

(2) Incendiary, smoke, toxic, and tear-producing cartridges are described under *ammunition, incendiary, etc.*

Cartridges for weapons, inert projectile. Ammunition consisting of a casing with propelling charge and a solid or empty projectile.

Cartridges, oil well. Articles consisting of a casing of thin fiber, metal or other material containing only propellant explosive. The term excludes charges, shaped, commercial.

Cartridges, power device. Articles designed to accomplish mechanical actions. They consist of a casing with a charge of deflagrating explosive and a means of ignition. The gaseous products of the deflagration produce inflation, linear or rotary motion; activate diaphragms, valves or switches, or project fastening devices or extinguishing agents.

Cartridges, signal. Articles designed to fire colored flares or other signals from signal pistols or devices.

Cartridges, small arms. Ammunition consisting of a cartridge case fitted with a center or rim fire primer and containing both a propelling charge and solid projectile(s). They are designed to be fired in weapons of caliber not larger than 19.1 mm. Shotgun cartridges of any caliber are included in this description. The term excludes: *Cartridges, small arms, blank, and some military small arms cartridges listed under Cartridges for weapons, inert projectile.*

Cases, cartridge, empty with primer. Articles consisting of a cartridge case made from metal, plastics or other non-flammable materials, in which only the explosive component is the primer.

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Cases, combustible, empty, without primer. Articles consisting of cartridge cases made partly or entirely from nitrocellulose.

Charges, bursting. Articles consisting of a charge of detonating explosive such as hexolite, octolite, or plastics-bonded explosive designed to produce effect by blast or fragmentation.

Charges, demolition. Articles consisting of a charge of detonating explosive in a casing of fiberboard, plastics, metal or other material. The term excludes articles identified as bombs, mines, etc.

Charges, depth. Articles consisting of a charge of detonating explosive contained in a drum or projectile. They are designed to detonate under water.

Charges, expelling. A charge of deflagrating explosive designed to eject the payload from the parent article without damage.

Charges, explosive, commercial without detonator. Articles consisting of a charge of detonating explosive without means of initiation, used for explosive welding, joining, forming, and other commercial processes.

Charges, propelling. Articles consisting of propellant charge in any physical form, with or without a casing, for use in cannon or for reducing drag for projectiles or as a component of rocket motors.

Charges, propelling for cannon. Articles consisting of a propellant charge in any physical form, with or without a casing, for use in a cannon.

Charges, shaped commercial, without detonator. Articles consisting of a casing containing a charge of detonating explosive with a cavity lined with rigid material, without means of initiation. They are designed to produce a powerful, penetrating jet effect.

Charges, shaped, flexible, linear. Articles consisting of a V-shaped core of a detonating explosive clad by a flexible metal sheath.

Charges, supplementary, explosive. Articles consisting of a small removable booster used in the cavity of a projectile between the fuze and the bursting charge.

Components, explosive train, n.o.s. Articles containing an explosive designed to transmit a detonation or deflagration within an explosive train.

Contrivance, water-activated with burster, expelling charge or propelling charge. Articles whose functioning depends of physico-chemical reaction of their contents with water.

Cord, detonating, flexible. Articles consisting of a core of detonating explosive enclosed in spun fabric with plastics or other covering.

Cord (fuse) detonating, metal clad. Articles consisting of a core of detonating explosive clad by a soft metal tube with or without protective covering. When the core contains a sufficiently small quantity of explosive, the words "mild effect" are added.

Cord igniter. Articles consisting of textile yarns covered with black powder or another fast-burning pyrotechnic composition and a flexible protective covering, or consisting of a core of black powder surrounded by a flexible woven fabric. It burns progressively along its length with an external flame and is used to transmit ignition from a device to a charge or primer.

Cutters, cable, explosive. Articles consisting of a knife-edged device which is driven by a small charge of deflagrating explosive into an anvil.

Detonator assemblies, non-electric, for blasting. Non-electric detonators assembled with and activated by such means as safety fuse, shock tube, flash tube, or detonating cord. They may be of instantaneous design or incorporate delay elements. Detonating relays incorporating detonating cord are included. Other detonating relays are included in Detonators, nonelectric.

Detonators. Articles consisting of a small metal or plastic tube containing explosives such as lead azide, PETN, or combinations of explosives. They are designed to start a detonation train. They may be constructed to detonate instantaneously, or may contain a delay element. They may contain no more than 10 g of total explosives weight, excluding ignition and delay charges, per unit. The term includes: detonators for ammunition; detonators for blasting, both electric and nonelectric; and detonating relays without flexible detonating cord.

Dynamite. A detonating explosive containing a liquid explosive ingredient (generally nitroglycerin, similar organic nitrate esters, or

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both) that is uniformly mixed with an absorbent material, such as wood pulp, and usually contains materials such as nitrocellulose, sodium and ammonium nitrate.

Entire load and total contents. The phrase means such a substantial portion of the material explodes that the practical hazard should be assessed by assuming simultaneous explosion of the whole of the explosive content of the load or package.

Explode. The term indicates those explosive effects capable of endangering life and property through blast, heat, and projection of missiles. It encompasses both deflagration and detonation.

Explosion of the total contents. The phrase is used in testing a single article or package or a small stack of articles or packages.

Explosive, blasting. Detonating explosive substances used in mining, construction, and similar tasks. Blasting explosives are assigned to one of five types. In addition to the ingredients listed below for each type, blasting explosives may also contain inert components, such as kieselguhr, and other minor ingredients, such as coloring agents and stabilizers.

Explosive, blasting, type A. Substances consisting of liquid organic nitrates, such as nitroglycerin, or a mixture of such ingredients with one or more of the following: nitrocellulose, ammonium nitrate or other inorganic nitrates, aromatic nitro-derivatives, or combustible materials, such as wood-meal and aluminum powder. Such explosives must be in powdery, gelatinous, plastic or elastic form. The term includes dynamite, blasting gelatine and gelatine dynamites.

Explosive, blasting, type B. Substances consisting of a mixture of ammonium nitrate or other inorganic nitrates with an explosive, such as trinitrotoluene, with or without other substances, such as wood-meal or aluminum powder, or a mixture of ammonium nitrate or other inorganic nitrates with other combustible substances which are not explosive ingredients. Such explosives may not contain nitroglycerin, similar liquid organic nitrates, or chlorates.

Explosive, blasting, type C. Substances consisting of a mixture of either potassium or so-

dium chlorate or potassium, sodium or ammonium perchlorate with organic nitro-derivatives or combustible materials, such as wood-meal or aluminum powder, or a hydrocarbon. Such explosives must not contain nitroglycerin or any similar liquid organic nitrate.

Explosive, blasting, type D. Substances consisting of a mixture of organic nitrate compounds and combustible materials, such as hydrocarbons and aluminum powder. Such explosives must not contain nitroglycerin, any similar liquid organic nitrate, chlorate or ammonium-nitrate. The term generally includes plastic explosives.

Explosive, blasting, type E. Substances consisting of water as an essential ingredient and high proportions of ammonium nitrate or other oxidizer, some or all of which are in solution. The other constituents may include nitro-derivatives, such as trinitrotoluene, hydrocarbons or aluminum powder. The term includes: explosives, emulsion; explosives, slurry; and explosives, watergel.

Explosive, deflagrating. A substance, e.g., propellant, which reacts by deflagration rather than detonation when ignited and used in its normal manner.

Explosive, detonating. A substance which reacts by detonation rather than deflagration when initiated and used in its normal manner.

Explosive, extremely insensitive detonating substance (EIDS). A substance which, although capable of sustaining a detonation, has demonstrated through tests that it is so insensitive that there is very little probability of accidental initiation.

Explosive, primary. Explosive substance which is manufactured with a view to producing a practical effect by explosion, is very sensitive to heat, impact, or friction, and even in very small quantities, detonates. The major primary explosives are mercury fulminate, lead azide, and lead styphnate.

Explosive, secondary. An explosive substance which is relatively insensitive (when compared to primary explosives) and is usually initiated by primary explosives with or without the aid of boosters or supplementary

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charges. Such an explosive may react as a deflagrating or as a detonating explosive.

Fireworks. Pyrotechnic articles designed for entertainment.

Flares. Articles containing pyrotechnic substances which are designed to illuminate, identify, signal, or warn. The term includes: flares, aerial and flares, surface.

Flash powder. Pyrotechnic substance which, when ignited, produces an intense light.

Fracturing devices, explosive, for oil wells, without detonators. Articles consisting of a charge of detonating explosive contained in a casing without the means of initiation. They are used to fracture the rock around a drill shaft to assist the flow of crude oil from the rock.

Fuse/Fuze. Although these two words have a common origin (French fusee, fusil) and are sometimes considered to be different spellings, it is useful to maintain the convention that fuse refers to a cord-like igniting device, whereas fuze refers to a device used in ammunition which incorporates mechanical, electrical, chemical, or hydrostatic components to initiate a train by deflagration or detonation.

Fuse, igniter. Articles consisting of a metal tube with a core of deflagrating explosives.

Fuse, instantaneous, non-detonating (Quickmatch). Article consisting of cotton yarns impregnated with fine black powder. It burns with an external flame and is used in ignition trains for fireworks, etc.

Fuse, safety. Article consisting of a core of fine-grained black powder surrounded by a flexible woven fabric with one or more protective outer coverings. When ignited, it burns at a predetermined rate without any explosive effect.

Fuzes. Articles designed to start a detonation or deflagration in ammunition. They incorporate mechanical, electrical, chemical, or hydrostatic components and generally protective features. The term includes: Fuzes, detonating; fuzes detonating with protective features; and fuzes igniting.

Grenades, hand or rifle. Articles which are designed to be thrown by hand or to be projected by rifle. The term includes: grenades, hand or rifle, with bursting charge; and gre-

nades, practice, hand or rifle. The term excludes: grenades, smoke.

Igniters. Articles containing one or more explosive substance used to start deflagration of an explosive train. They may be actuated chemically, electrically, or mechanically. The term excludes: cord, igniter; fuse, igniter; fuse, instantaneous, non-detonating; fuze, igniting; lighters, fuse, instantaneous, non-detonating; fuzes, igniting; lighters, fuse; primers, cap type; and primers, tubular.

Ignition, means of. A general term used in connection with the method employed to ignite a deflagrating train of explosive or pyrotechnic substances (for example: a primer for propelling charge, an igniter for a rocket motor or an igniting fuze).

Initiation, means of. (1) A device intended to cause the detonation of an explosive (for example: detonator, detonator for ammunition, or detonating fuze).

(2) The term *with its own means of initiation* means that the contrivance has its normal initiating device assembled to it and this device is considered to present a significant risk during transport but not one great enough to be unacceptable. The term does not apply, however, to a contrivance packed together with its means of initiation, provided the device is packaged so as to eliminate the risk of causing detonation of the contrivance in the event of functioning of the initiating device. The initiating device can even be assembled in the contrivance provided there are protective features ensuring that the device is very unlikely to cause detonation of the contrivance under conditions which are associated with transport.

(3) For the purposes of classification, any means of initiation without two effective protective features should be regarded as Compatibility Group B; an article with its own means of initiation, without two effective protective features, is Compatibility Group F. A means of initiation which itself possesses two effective protective features is Compatibility Group D, and an article with its own means of initiation which possesses two effective features is Compatibility Group D or E. A means of initiation, adjudged as having two effective protective features, must be approved by the

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Associate Administrator for Hazardous Materials Safety. A common and effective way of achieving the necessary degree of protection is to use a means of initiation which incorporates two or more independent safety features.

Jet perforating guns, charged, oil well, without detonator. Articles consisting of a steel tube or metallic strip, into which are inserted shaped charges connected by detonating cord, without means of initiation.

Lighters, fuse. Articles of various design actuated by friction, percussion, or electricity and used to ignite safety fuse.

Mass explosion. Explosion which affects almost the entire load virtually instantaneously.

Mines. Articles consisting normally of metal or composition receptacles and bursting charge. They are designed to be operated by the passage of ships, vehicles, or personnel. The term includes Bangalore torpedoes.

Powder cake (powder paste). Substance consisting of nitrocellulose impregnated with not more than 60 percent of nitroglycerin or other liquid organic nitrates or a mixture of these.

Powder, smokeless. Substance based on nitrocellulose used as propellant. The term includes propellants with a single base (nitrocellulose (NC) alone), those with a double base (such as NC and nitroglycerin (NG)) and those with a triple base (such as NC/NG/nitroguanidine). Cast pressed or bag-charges of smokeless powder are listed under *charges, propelling* and *charges, propelling for cannon*.

Primers, cap type. Articles consisting of a metal or plastic cap containing a small amount of primary explosive mixture that is readily ignited by impact. They serve as igniting elements in small arms cartridges and in percussion primers for propelling charges.

Primers, tubular. Articles consisting of a primer for ignition and an auxiliary charge of deflagrating explosive, such as black powder, used to ignite the propelling charge in a cartridge case for cannon, etc.

Projectiles. Articles, such as a shell or bullet, which are projected from a cannon or other artillery gun, rifle, or other small arm. They may be inert, with or without tracer, or may contain a burster, expelling charge or

bursting charge. The term includes: projectiles, inert, with tracer; projectiles, with burster or expelling charge; and projectiles, with bursting charge.

Propellant, liquid. Substances consisting of a deflagrating liquid explosive, used for propulsion.

Propellant, solid. Substances consisting of a deflagrating solid explosive, used for propulsion.

Propellants. Deflagrating explosives used for propulsion or for reducing the drag of projectiles.

Release devices, explosive. Articles consisting of a small charge of explosive with means of initiation. They sever rods or links to release equipment quickly.

Rocket motors. Articles consisting of a solid, liquid, or hypergolic propellant contained in a cylinder fitted with one or more nozzles. They are designed to propel a rocket or guided missile. The term includes: rocket motors; rocket motors with hypergolic liquids with or without an expelling charge; and rocket motors, liquid fuelled.

Rockets. Articles containing a rocket motor and a payload which may be an explosive warhead or other device. The term includes: guided missiles; rockets, line-throwing; rockets, liquid fuelled, with bursting charge; rockets, with bursting charge; rockets, with expelling charge; and rockets, with inert head.

Signals. Articles consisting of pyrotechnic substances designed to produce signals by means of sound, flame, or smoke or any combination thereof. The term includes: signal devices, hand; signals, distress ship; signals, railway track, explosive; signals, smoke.

Sounding devices, explosive. Articles consisting of a charge of detonating explosive. They are dropped from ships and function when they reach a predetermined depth or the sea bed.

Substance, explosive, very insensitive (Substance, EVI) N.O.S. Substances which present a mass explosive hazard but which are so insensitive that there is very little probability of initiation, or of transition from burning to detonation under normal conditions of transport and which have passed test series 5.

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Torpedoes. Articles containing an explosive or non-explosive propulsion system and designed to be propelled through water. They may contain an inert head or warhead. The term includes: torpedoes, liquid fuelled, with inert head; torpedoes, liquid fuelled, with or without bursting charge; and torpedoes, with bursting charge.

Tracers for ammunition. Sealed articles containing pyrotechnic substances, designed to reveal the trajectory of a projectile.

Warheads. Articles containing detonating explosives, designed to be fitted to a rocket, guided missile, or torpedo. They may contain a burster or expelling charge or bursting charge. The term includes: warhead rocket with bursting charge; and warheads, torpedo, with bursting charge.

[Amdt. 173-224, 55 FR 52617 Dec. 21, 1990, as amended at 56 FR 66267, Dec. 20, 1991; Amdt. 173-241, 59 FR 67492, Dec. 29, 1994]

§173.60 General packaging requirements for explosives.

(a) Unless otherwise provided in this subpart and in § 173.7(a), packaging used for Class 1 (explosives) materials must meet Packing Group II requirements. Each packaging used for an explosive must be capable of meeting the test requirements of subpart M of part 178 of this subchapter, at the specified level of performance, and the applicable general packaging requirements of paragraph (b) of this section.

(b) The general requirements for packaging of explosives are as follows:

(1) Nails, staples, and other closure devices, made of metal, having no protective covering may not penetrate to the inside of the outer packaging unless the inner packaging adequately protects the explosive against contact with the metal.

(2) The closure device of containers for liquid explosives must provide double protection against leakage, such as a screw cap secured in place with tape.

(3) Inner packagings, fittings, and cushioning materials, and the placing of explosive substances or articles in packages, must be such that the explosive substance is prevented from becoming loose in the outer packaging

during transportation. Metallic components of articles must be prevented from making contact with metal packagings. Articles containing explosive substances not enclosed in an outer casing must be separated from each other in order to prevent friction and impact. Padding, trays, partitioning in the inner or outer packaging, molded plastics or receptacles may be used for this purpose.

(4) When the packaging includes water that could freeze during transportation, a sufficient amount of anti-freeze, such as denatured ethyl alcohol, must be added to the water to prevent freezing. If the anti-freeze creates a fire hazard, it may not be used. When a percentage of water in the substance is specified, the combined weight of water and anti-freeze may be substituted.

(5) If an article is fitted with its own means of ignition or initiation, it must be effectively protected from accidental actuation during normal conditions of transportation.

(6) The entry of explosive substances into the recesses of double-seamed metal packagings must be prevented.

(7) The closure device of a metal drum must include a suitable gasket; if the closure device includes metal-to-metal screw-threads, the ingress of explosive substances into the threading must be prevented.

(8) Whenever loose explosive substances or the explosive substance of an uncased or partly cased article may come into contact with the inner surface of metal packagings (1A2, 1B2, 4A, 4B and metal receptacles), the metal packaging should be provided with an inner liner or coating.

(9) Packagings must be made of materials compatible with, and impermeable to, the explosives contained in the package, so that neither interaction between the explosives and the packaging materials, nor leakage, causes the explosive to become unsafe in transportation, or the hazard division or compatibility group to change (see § 173.24(e)(2)).

(10) An explosive article containing an electrical means of initiation that is sensitive to external electromagnetic radiation, must have its means of initiation effectively protected from electromagnetic radiation sources (for example, radar or radio transmitters)

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through either design of the packaging or of the article, or both.

(11) Plastic packagings may not be able to generate or accumulate sufficient static electricity to cause the packaged explosive substances or articles to initiate, ignite or inadvertently function. Metal packagings must be compatible with the explosive substance they contain.

(12) Explosive substances may not be packed in inner or outer packagings where the differences in internal and external pressures, due to thermal or other effects, could cause an explosion or rupture of the package.

(13) Packagings for water soluble substances must be water resistant. Packagings for desensitized or phlegmatized substances must be closed to prevent changes in concentration during transport. When containing less alcohol, water, or phlegmatizer than specified in its proper shipping description, the substance is a "forbidden" material.

[Amdt. 173-224, 55 FR 52617 Dec. 21, 1990, as amended at 56 FR 66267, Dec. 20, 1991; Amdt. 173-241, 59 FR 67492, Dec. 29, 1994; 62 FR 24719, May 6, 1997]

§173.61 Mixed packaging requirements.

(a) Unless specifically authorized in this subchapter, an explosive may not be packed in the same outside packaging with any other material, unless packaged by the DOD or DOE in accordance with § 173.7(a) of this subchapter.

(b) Hardware necessary for assembly of explosive articles at the point-of-use may be packed in the same outside packaging with the explosive articles. The hardware must be securely packed in a separate inside packaging. Sufficient cushioning materials must be used to ensure that all inside packagings are securely packed in the outside packaging.

(c) The following explosives may not be packed together with other Class 1 explosives: UN 0029, UN 0030, UN 0073, UN 0106, UN 0107, UN 0255, UN 0257, UN 0267, UN 0360, UN 0361, UN 0364, UN 0365, UN 0366, UN 0367, UN 0408, UN 0409, UN 0410, UN 0455, UN 0456, and NA 0350. These explosives may be mix-packed with each other in accordance

with the compatibility requirements prescribed in paragraph (e).

(d) Division 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.

(e) Except as prescribed in paragraphs (c) and (d) of this section, different explosives may be packed in one outside packaging in accordance with the following compatibility requirements:

(1) Explosives of the same compatibility group and same division number may be packed together.

(2) Explosives of the same compatibility group or authorized combination of compatibility group but different division number may be packed together, provided that the whole package is treated as though its entire contents were comprised of the lower division number. For example, a mixed package of Division 1.2 explosives (Class A explosive) and Division 1.4 explosives (Class C explosive), compatibility group D, must be treated as 1.2D explosives. However, when 1.5D explosives (blasting agents) are packed together with 1.2D explosives (Class A explosives), the whole package must be treated as 1.1D explosives.

(3) Explosives of compatibility group S may be packed with explosives of all other compatibility group except A and L.

(4) Explosives of compatibility group L shall only be packed with an identical explosive.

(5) Explosives articles of compatibility groups C, D, or E may be packed together and the entire package shall be treated as belonging to compatibility group E.

(6) Explosives articles of compatibility groups C, D, E, or N may be packed together and the entire package shall be treated as belonging to compatibility group D.

(7) Explosives substances of compatibility groups C and D may be packaged together and the entire package shall be treated as belonging to compatibility group D.

[Amdt. 173-224, 55 FR 52617 Dec. 21, 1990, as amended at 56 FR 66267, Dec. 20, 1991]

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§173.62 Specific packaging requirements for explosives.

(a) Except as provided in paragraph (e) of this section, when the § 172.101 Table specifies that an explosive must be packaged in accordance with this section, only non-bulk packagings which conform to the provisions of paragraphs (b), (c) and (d) of this section and the applicable requirements in §§ 173.60 and 173.61 may be used unless otherwise approved by the Associate Administrator. Intermediate bulk packagings may be used for explosives assigned to Packing Instruction 117 in paragraph (b) of this section. Intermediate bulk packagings must conform with the requirements of this subchapter.

(b) Explosives Table. The Explosives Table specifies the Packing Instructions assigned to each explosive. Explosives are identified in the first column in numerical sequence by their identification number (ID #), which is listed in column 4 of the § 172.101 Table, of this subchapter. The second column of the Explosives Table specifies the Packing Instruction (PI) which must be used for packaging the explosive. The Explosives Packing Method Table in paragraph (c) of this section defines the methods of packaging. The Packing Instructions are identified using a 3 digit designation. The Packing Instruction prefixed by the letters "US" is particular to the United States and not found in applicable international regulations.

Explosives Table—Continued

ID#	PI
UN0021.....	101
UN0027.....	113
UN0028.....	113
UN0029.....	131
UN0030.....	131
UN0033.....	130
UN0034.....	130
UN0035.....	130
UN0037.....	130
UN0038.....	130
UN0039.....	130
UN0042.....	132
UN0043.....	133
UN0044.....	133
UN0048.....	130
UN0049.....	135
UN0050.....	135
UN0054.....	135
UN0055.....	136
UN0056.....	130
UN0059.....	137
UN0060.....	132
UN0065.....	139
UN0066.....	140
UN0070.....	134
UN0072.....	112(a)
UN0073.....	133
UN0074.....	110(a) or 110(b)
UN0075.....	115
UN0076.....	112
UN0077.....	114(a) or 114(b)
UN0078.....	112
UN0079.....	112(b) or 112(c)
UN0081.....	116
UN0082.....	116 or 117
UN0083.....	116
UN0084.....	116
UN0092.....	135
UN0093.....	135
UN0094.....	113
UN0099.....	134
UN0101.....	140
UN0102.....	139
UN0103.....	140

Explosives Table

ID#	PI
UN0004.....	112
UN0005.....	130
UN0006.....	130
UN0007.....	130
UN0009.....	130
UN0010.....	130
UN0012.....	130
UN0014.....	130
UN0015.....	130
UN0016.....	130
UN0018.....	130
UN0019.....	130
UN0020.....	101

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Explosives Table—Continued	
ID#	PI
UN0104.....	139
UN0105.....	140
UN0106.....	141
UN0107.....	141
UN0110.....	141
UN0113.....	110(a) or 110(b)
UN0114.....	110(a) or 110(b)
UN0118.....	112
UN0121.....	142
UN0124.....	US1
UN0129.....	110(a) or 110(b)
UN0130.....	110(a) or 110(b)
UN0131.....	142
UN0132.....	114(b)
UN0133.....	112(a)
UN0135.....	110(a) or 110(b)
UN0136.....	130
UN0137.....	130
UN0138.....	130
UN0143.....	115
UN0144.....	115
UN0146.....	112
UN0147.....	112(b)
UN0150.....	112(a) or 112(b)
UN0151.....	112
UN0153.....	112(b) or 112(c)
UN0154.....	112
UN0155.....	112(b) or 112(c)
UN0159.....	111
UN0160.....	114(b)
UN0161.....	114(b)
UN0167.....	130
UN0168.....	130
UN0169.....	130
UN0171.....	130
UN0173.....	134
UN0174.....	134
UN0180.....	130
UN0181.....	130
UN0182.....	130
UN0183.....	130
UN0186.....	130
UN0190.....	101
UN0191.....	135

Explosives Table—Continued	
ID#	PI
UN0192.....	135
UN0193.....	135
UN0194.....	135
UN0195.....	135
UN0196.....	135
UN0197.....	135
UN0204.....	134
UN0207.....	112(b) or 112(c)
UN0208.....	112(b) or 112(c)
UN0209.....	112
UN0212.....	133
UN0213.....	112(b) or 112(c)
UN0214.....	112
UN0215.....	112
UN0216.....	112(b) or 112(c)
UN0217.....	112(b) or 112(c)
UN0218.....	112(b) or 112(c)
UN0219.....	112
UN0220.....	112
UN0221.....	130
UN0222.....	112(b) or 112(c)
UN0224.....	110(a) or 110(b)
UN0225.....	133
UN0226.....	112(a)
UN0234.....	114(a) or 114(b)
UN0235.....	114(a) or 114(b)
UN0236.....	114(a) or 114(b)
UN0237.....	138
UN0238.....	130
UN0240.....	130
UN0241.....	116 or 117
UN0242.....	130
UN0243.....	130
UN0244.....	130
UN0245.....	130
UN0246.....	130
UN0247.....	101
UN0248.....	144
UN0249.....	144
UN0250.....	101
UN0254.....	130
UN0255.....	131
UN0257.....	141
UN0266.....	112

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Explosives Table—Continued		Explosives Table—Continued	
ID#	PI	ID#	PI
UN0267.....	131	UN0323.....	134
UN0268.....	133	UN0324.....	130
UN0271.....	143	UN0325.....	142
UN0272.....	143	UN0326.....	130
UN0275.....	134	UN0327.....	130
UN0276.....	134	UN0328.....	130
UN0277.....	134	UN0329.....	130
UN0278.....	134	UN0330.....	130
UN0279.....	130	UN0331.....	116 or 117
UN0280.....	130	UN0332.....	116 or 117
UN0281.....	130	UN0333.....	135
UN0282.....	112	UN0334.....	135
UN0283.....	132	UN0335.....	135
UN0284.....	141	UN0336.....	135
UN0285.....	141	UN0337.....	135
UN0286.....	130	UN0338.....	130
UN0287.....	130	UN0339.....	130
UN0288.....	138	UN0340.....	112(a) or 112(b)
UN0289.....	139	UN0341.....	112(b)
UN0290.....	139	UN0342.....	114(a)
UN0291.....	130	UN0343.....	111
UN0292.....	141	UN0344.....	130
UN0293.....	141	UN0345.....	130
UN0294.....	130	UN0346.....	130
UN0295.....	130	UN0347.....	130
UN0296.....	134	UN0348.....	130
UN0297.....	130	UN0349.....	101
UN0299.....	130	UN0350.....	101
UN0300.....	130	UN0351.....	101
UN0301.....	130	UN0352.....	101
UN0303.....	130	UN0353.....	101
UN0305.....	113	UN0354.....	101
UN0306.....	133	UN0355.....	101
UN0312.....	135	UN0356.....	101
UN0313.....	135	UN0357.....	101
UN0314.....	142	UN0358.....	101
UN0315.....	142	UN0359.....	101
UN0316.....	141	UN0360.....	131
UN0317.....	141	UN0361.....	131
UN0318.....	141	UN0362.....	130
UN0319.....	133	UN0363.....	130
UN0320.....	133	UN0364.....	133
UN0321.....	130	UN0365.....	133
UN0322.....	101	UN0366.....	133

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Explosives Table—Continued	
ID#	PI
UN0367.....	141
UN0368.....	141
UN0369.....	130
UN0370.....	130
UN0371.....	130
UN0372.....	141
UN0373.....	135
UN0374.....	134
UN0375.....	134
UN0376.....	133
UN0377.....	133
UN0378.....	133
UN0379.....	136
UN0380.....	101
UN0381.....	134
UN0382.....	101
UN0383.....	101
UN0384.....	101
UN0385.....	112(b) or 112(c)
UN0386.....	112(b) or 112(c)
UN0387.....	112(b) or 112(c)
UN0388.....	112(b) or 112(c)
UN0389.....	112(b) or 112(c)
UN0390.....	112(b) or 112(c)
UN0391.....	112(a)
UN0392.....	112(b) or 112(c)
UN0393.....	112(b)
UN0394.....	112(a)
UN0395.....	101
UN0396.....	101
UN0397.....	101
UN0398.....	101
UN0399.....	101
UN0400.....	101
UN0401.....	112
UN0402.....	112(b) or 112(c)
UN0403.....	135
UN0404.....	135
UN0405.....	135
UN0406.....	114(b)
UN0407.....	114(b)
UN0408.....	141
UN0409.....	141
UN0410.....	141

Explosives Table—Continued	
ID#	PI
UN0411.....	112(b) or 112(c)
UN0412.....	130
UN0413.....	130
UN0414.....	130
UN0415.....	143
UN0417.....	130
UN0418.....	135
UN0419.....	135
UN0420.....	135
UN0421.....	135
UN0424.....	130
UN0425.....	130
UN0426.....	130
UN0427.....	130
UN0428.....	135
UN0429.....	135
UN0430.....	135
UN0431.....	135
UN0432.....	135
UN0433.....	111
UN0434.....	130
UN0435.....	130
UN0436.....	130
UN0437.....	130
UN0438.....	130
UN0439.....	137
UN0440.....	137
UN0441.....	137
UN0442.....	137
UN0443.....	137
UN0444.....	137
UN0445.....	137
UN0446.....	136
UN0447.....	136
UN0448.....	114(b)
UN0449.....	101
UN0450.....	101
UN0451.....	130
UN0452.....	141
UN0453.....	130
UN0454.....	142
UN0455.....	131
UN0456.....	131
UN0457.....	130

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Explosives Table—Continued	
ID#	PI
UN0458.....	130
UN0459.....	130
UN0460.....	130
UN0461.....	101
UN0462.....	101
UN0463.....	101
UN0464.....	101
UN0465.....	101
UN0466.....	101
UN0467.....	101
UN0468.....	101
UN0469.....	101
UN0470.....	101
UN0471.....	101
UN0472.....	101
UN0473.....	101
UN0474.....	101
UN0475.....	101
UN0476.....	101
UN0477.....	101
UN0478.....	101
UN0479.....	101
UN0480.....	101
UN0481.....	101
UN0482.....	101
UN0483.....	112(b) or 112(c)
UN0484.....	112(b) or 112(c)
UN0486.....	101
UN0487.....	135
UN0488.....	130
UN0489.....	112(b) or 112(c)
UN0490.....	112(b) or 112(c)
UN0491.....	143
UN0492.....	135
UN0493.....	135
UN0494.....	US1
UN0495.....	115
UN0496.....	112(b) or 112(c)
UN0497.....	115
UN0498.....	114(b)
UN0499.....	114(b)
UN0500.....	131
NA0124.....	US1
NA0276.....	134

Explosives Table—Continued	
ID#	PI
NA0323.....	134
NA0331.....	116 or 117
NA0337.....	135
NA0349.....	133
NA0494.....	US1

(c) Explosives Packing Instruction Table. Explosives must be packaged in accordance with the following table:

(1) The first column lists, in alphanumeric sequence, the packing methods prescribed for explosives in the Explosives Table of paragraph (b) of this section.

(2) The second column specifies the inner packagings that are required. If inner packagings are not required, a notation of "Not necessary" appears in the column. The term "Not necessary" means that a suitable inner packaging may be used but is not required.

(3) The third column specifies the intermediate packagings that are required. If intermediate packagings are not required, a notation of "Not necessary" appears in the column. The term "Not necessary" means that a suitable intermediate packaging may be used but is not required.

(4) The fourth column specifies the outer packagings which are required. If inner packagings and/or intermediate packagings are specified in the second and third columns, then the packaging specified in the fourth column must be used as the outer packaging of a combination packaging; otherwise it may be used as a single packaging.

(5) Packing Instruction 101 may be used for any explosive substance or article if an equivalent level of safety is shown to be maintained subject to the approval of the Associate Administrator for Hazardous Materials Safety.

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TABLE OF PACKING METHODS

Packing Instruction	inner packagings	Intermediate packagings	Outer packagings
101.....	This Packing Instruction may be used as an alternative to a specifically assigned packing method with the approval of the Associate Administrator for Hazardous Materials Safety prior to transportation. When this packing instruction is used, the following must be marked on the shipping documents: "Packaging approved by the competent authority of the United States of America (USA)".		
PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS: 1. Samples of new or existing explosive substances or articles may be transported as directed by the Associate Administrator for Hazardous Materials Safety for purposes including: testing, classification, research and development, quality control, or as a commercial sample. Explosive samples which are wetted or desensitized must be limited to 25 kg. Explosive samples which are not wetted or desensitized must be limited to 10 kg in small packages as specified by the Associate Administrator for Hazardous Materials Safety			
110(a)..... PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS: 1. The Intermediate packagings must be filled with water saturated material such as an anti-freeze solution or wetted cushioning 2. Outer packagings must be filled with water saturated material such as an anti-freeze solution or wetted cushioning. Outer packagings must be constructed and sealed to prevent evaporation of the wetting solution, except when 0224 is being carried dry	Bags..... plastics textile, plastic coated or lined rubber textile, rubberized textile	Bags..... plastics textile, plastic coated or lined rubber textile, rubberized Receptacles..... plastics metal	Drums. steel, removable head (1A2). plastics, removable head (1H2)
110(b)..... PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS For UN 0074, 0113, 0114, 0129, 0130, 0135 and 0224, the following conditions must be satisfied: a. inner packagings must not contain more than 50 g of explosive substance (quantity corresponding to dry substance); b. each inner packaging must be separated from other inner packagings by dividing partitions; and c. the outer packaging must not be partitioned with more than 25 compartments	Bags..... rubber, conductive plastics, conductive Receptacles..... metal wood rubber, conductive plastics, conductive	Dividing partitions..... metal wood plastics fibreboard	Boxes. natural wood, sift-proof wall (4C2). plywood (4D). reconstituted wood (4F).

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TABLE OF PACKING METHODS—Continued

Packing instruction	Inner packagings	Intermediate packagings	Outer packagings
<p>112(b) This packing instruction applies to dry solids other than powders.</p> <p>PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:</p> <ol style="list-style-type: none"> For UN 0004, 0076, 0078, 0154, 0216, 0219 and 0386, packagings must be lead free For UN 0209, bags, sift-proof (5H2) are recommended for flake or prilled TNT in the dry state and a maximum net mass of 30 kg. For UN 0222 and UN 0223, inner packagings are not required 	<p>Bags.....</p> <p>paper, Kraft paper, multiwall, water resistant plastics textile textile, rubberized plastics. woven plastics</p>	<p>Bags (for UN 0150 only).....</p> <p>plastics textile, plastic coated or lined.</p>	<p>Bags.</p> <p>woven plastics sift-proof (5H2/3). plastics, film (5H4). textile, sift-proof (5L2). textile, water resistant (5L3). paper, multiwall, water resistant (5M2).</p> <p>Boxes</p> <p>steel (4A). aluminium (4B). natural wood, ordinary (4C1). natural wood, sift proof (4C2). plywood (4D) reconstituted wood (4F). fibreboard (4G). plastics, expanded (4H1). plastics, solid (4H2).</p> <p>Drums</p> <p>steel, removable head (1A2). aluminium, removable head (1B2). fibre (1G). plastics, removable head (1H2).</p>
<p>112(c) This packing instruction applies to solid dry powders.</p> <p>PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:</p> <ol style="list-style-type: none"> For UN 0004, 0076, 0078, 0154, 0216, 0219 and 0386, packagings must be lead free For UN 0209, bags, sift-proof (5H2) are recommended for flake or prilled TNT in the dry state. Bags must not exceed a maximum net mass of 30 kg. Inner packagings are not required if drums are used as the outer packaging. At least one of the packagings must be sift-proof 	<p>Bags.....</p> <p>paper, multiwall, water resistant plastics woven plastics</p> <p>Receptacles.....</p> <p>fibreboard metal plastics wood</p>	<p>Bags.....</p> <p>paper, multiwall, water resistant with inner lining. plastics</p> <p>Receptacles.....</p> <p>metal plastics</p>	<p>Boxes.</p> <p>steel (4A). natural wood, ordinary (4C1). natural wood, sift proof (4C2). plywood (4D). reconstituted wood (4F). fibreboard (4G). plastics, solid (4H2).</p> <p>Drums.</p> <p>steel, removable head (1A2) aluminium, removable head (1B2). fibre (1G).</p>

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TABLE OF PACKING METHODS—Continued

Packing Instruction	Inner packagings	Intermediate packagings	Outer packagings
113..... PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS: 1. For UN 0094 and UN 0305, no more than 50 g of substance must be packed in an inner packaging 2. For UN 0027, inner packagings are not necessary when drums are used as the outer packaging 3. At least one of the packagings must be sift-proof 4. Sheets must only be used for UN 0028	Bags..... paper plastics textile, rubberized Receptacles..... fibreboard metal plastics wood Sheets..... paper, kraft paper, waxed	Not necessary	Boxes. steel (4A). natural wood, ordinary (4C1). natural wood, sift-proof walls (4C2). plywood (4D). reconstituted wood (4F). fibreboard (4G). plastics, solid (4H2). Drums steel, removable head (1A2). aluminium, removable head (1B2). fibre (1G).
114(a) This packing instruction applies to wetted solids. PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS: 1. For UN 0077, 0234, 0235 and 0236, packagings must be lead free 2. For UN 0342, inner packagings are not required when metal (1A2 or 1B2) or plastics (1H2) drums are used as outer packagings 3. Intermediate packagings are not required if leakproof removable head drums are used as the outer packaging	Bags..... plastics textile woven plastics Receptacles..... metal plastics	Bags..... plastics textile, plastic coated or lined Receptacles..... metal plastics	Boxes. steel (4A). natural wood, ordinary (4C1). natural wood, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fibreboard (4G). plastics, solid (4H2). Drums. steel, removable head (1A2). aluminium, removable head (1B2). plywood (1D). fibre (1G). plastics, removable head (1H2).

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TABLE OF PACKING METHODS—Continued

Packing instruction	Inner packagings	Intermediate packagings	Outer packagings
<p>114(b) This packing instruction applies to dry solids</p> <p>PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:</p> <ol style="list-style-type: none"> For UN 0077, 0132, 0234, 0235 and 0236, packagings must be lead free For UN 0160 and UN 0161, when metal drums (1A2 or 1B2) are used as the outer packaging, metal packagings must be so constructed that the risk of explosion, by reason of increased internal pressure from internal or external causes is prevented For UN 0160 and UN 0161, inner packagings are not required if drums are used as the outer packaging 	<p>Bags</p> <p>paper, kraft. plastics textile, sift-proof woven plastics, sift-proof</p> <p>Receptacles</p> <p>fibreboard metal paper plastics woven plastics, sift-proof</p>	<p>Not necessary</p> <p>natural wood, ordinary (4C1). natural wood, sift proof walls (4C2) plywood (4D). reconstituted wood (4F). fibreboard (4G).</p> <p>Drums. steel, removable head (1A2). aluminium, removable head (1B2). plywood (1D). fibre (1G). plastics, removable head (1H2).</p>	<p>Boxes.</p>
<p>115</p> <p>PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:</p> <ol style="list-style-type: none"> For liquid explosives, inner packagings must be surrounded with non-combustible absorbent cushioning material in sufficient quantity to absorb the entire liquid content. Metal receptacles should be cushioned from each other. The net mass of explosive per package may not exceed 30 kg when boxes are used as outer packaging. The net volume of explosive in each package other than boxes must not exceed 120 litres For UN 0075, 0143, 0495 and 0497 when boxes are used as the outer packaging, inner packagings must have taped screw cap closures and be not more than 5 litres capacity each. A composite packaging consisting of a plastic receptacle in a metal drum (6HA1) may be used in lieu of combination packagings. Liquid substances must not freeze at temperatures above -15° C (+ 5° F) For UN 0144, intermediate packagings are not necessary. 	<p>Receptacles</p> <p>metal plastics</p>	<p>Bags</p> <p>plastics in metal receptacles</p> <p>Drums</p> <p>metal</p>	<p>Boxes.</p> <p>natural wood, ordinary (4C1). natural wood, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fibreboard (4G).</p> <p>Drums. steel, removable head (1A2). aluminium, removable head (1B2). plywood (1D). fibre (1G).</p> <p>Specification MC-200 containers may be used for transport by motor vehicle.</p>

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TABLE OF PACKING METHODS—Continued

Packing Instruction	Inner packagings	Intermediate packagings	Outer packagings
116..... PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS: 1. For UN 0082, 0241, 0331 and 0332, inner packagings are not necessary if leakproof removable head drums are used as the outer packaging 2. For UN 0082, 0241, 0331 and 0332, inner packagings are not required when the explosive is contained in a material impervious to liquid 3. For UN 0081, inner packagings are not required when contained in rigid plastic which is impervious to nitric esters 4. For UN 0331, inner packagings are not required when bags (5H2), (5H3) or (5H4) are used as outer packagings 5. Bags (5H2 or 5H3) must be used only for UN 0082, 0241, 0331 and 0332 6. For UN 0081, bags must not be used as outer packagings	Bags..... paper, water and oil resistant plastics textile, plastic coated or lined woven plastics, sift-proof Receptacles..... fibreboard, water resistant. metal plastics wood, sift-proof Sheets..... paper, water resistant paper, waxed plastics	Not necessary	Bags. woven plastics (5H1/2/3). paper, multilwall, water resistant (5M2). plastics, film (5H4). textile, sift-proof (5L2). textile, water resistant (5L3). Boxes. steel (4A). aluminium (4B). wood, natural, ordinary (4C1). natural wood, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fibreboard (4G). plastics, solid (4H2). Drums. steel, removable head (1A2). aluminium, removable head (1B2). fibre (1G). plastics, removable head (1H2). Jerricans. steel, removable head (3A2). plastics, removable head (3H2).

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TABLE OF PACKING METHODS—Continued

Packing Instruction	Inner packagings	Intermediate packagings	Outer packagings
117 PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS: 1. This packing instruction may only be used for explosives of 0082 when they are mixtures of ammonium nitrate or other inorganic nitrates with other combustible substances which are not explosive ingredients. Such explosives must not contain nitroglycerin, similar liquid organic nitrates, liquid or solid nitrocarbons, or chlorates. 2. This packing instruction may only be used for explosives of UN 0241 which consist of water as an essential ingredient and high proportions of ammonium nitrate or other oxidizers, some or all of which are in solution. The other constituents may include hydrocarbons or aluminium powder, but must not include nitroderivatives such as trinitrotoluene. 3. Metal IBCs must not be used for UN 0082 and 0241. 4. Flexible IBCs may only be used for solids.	Not necessary	Not necessary	IBCs. metal (11A), (11B), (11N), (21A), (21B), (21N), (31A), (31B), (31N). flexible (13H2), (13H3), (13H4), (13L2), (13L3), (13L4), (13M2). rigid plastics (11H1), (11H2), (21H1), (21H2), (31H1), (31H2). composite (11HZ1), (11HZ2), (21HZ1), (21HZ2), (31HZ1), (31HZ2).

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TABLE OF PACKING METHODS—Continued

Packing Instruction	Inner packagings	Intermediate packagings	Outer packagings
<p>130.....</p> <p>PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:</p> <p>1. The following applies to UN 0006, 0009, 0010, 0015, 0016, 0018, 0019, 0034, 0035, 0038, 0039, 0048, 0056, 0137, 0138, 0168, 0169, 0171, 0181, 0182, 0183, 0186, 0221, 0238, 0243, 0244, 0245, 0246, 0254, 0280, 0281, 0286, 0287, 0297, 0299, 0300, 0301, 0303, 0321, 0328, 0329, 0344, 0345, 0346, 0347, 0362, 0363, 0370, 0412, 0424, 0425, 0434, 0435, 0436, 0437, 0438, 0451, 0459 and 0488. Large and robust explosives articles, normally intended for military use, without their means of initiation or with their means of initiation containing at least two effective protective features, may be carried unpackaged. When such articles have propelling charges or are self-propelled, their ignition systems must be protected against stimuli encountered during normal conditions of transport. A negative result in Test Series 4 on an unpackaged article indicates that the article can be considered for transport unpackaged. Such unpackaged articles may be fixed to cradles or contained in crates or other suitable handling devices.</p>	<p>Not necessary.....</p>	<p>Not necessary.....</p>	<p>Boxes.</p> <p>steel (4A).</p> <p>aluminium (4B).</p> <p>wood natural, ordinary (4C1).</p> <p>natural wood, sift proof walls (4C2).</p> <p>plywood (4D).</p> <p>reconstituted wood (4F).</p> <p>fibreboard (4G).</p> <p>plastics, expanded (4H1).</p> <p>plastics, solid (4H2).</p> <p>Drums.</p> <p>steel, removable head (1A2).</p> <p>aluminium, removable head (1B2).</p> <p>fibre (1G).</p> <p>plastics, removable head (1H2).</p>
<p>131.....</p> <p>PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:</p> <p>1. For UN 0029, 0267 and 0455, bags and reels may not be used as inner packagings</p> <p>2. For UN 0030, 0255 and 0456, inner packagings are not required when detonators are packed in pasteboard tubes, or when their leg wires are wound on spools with the caps either placed inside the spool or securely taped to the wire on the spool, so as to restrict freedom of movement of the caps and to protect them from impact forces</p> <p>3. For UN 0360, 0361 and 0500, detonators are not required to be attached to the safety fuse, metal-clad mild detonating cord, detonating cord, or shock tube. Inner packagings are not required if the packing configuration restricts freedom of movement of the caps and protects them from impact forces</p>	<p>Bags.....</p> <p>paper</p> <p>plastics</p> <p>Receptacles.....</p> <p>fibreboard</p> <p>metal</p> <p>plastics</p> <p>wood</p> <p>Reels.....</p>	<p>Not necessary.....</p>	<p>Boxes.</p> <p>steel (4A).</p> <p>aluminium (4B).</p> <p>wood, natural, ordinary (4C1).</p> <p>natural wood, sift proof walls (4C2).</p> <p>plywood (4D).</p> <p>reconstituted wood (4F).</p> <p>fibreboard (4G).</p> <p>Drums.</p> <p>steel, removable head (1A2).</p> <p>aluminium, removable head (1B2).</p> <p>fibre (1G).</p> <p>plastics, removable head (1H2).</p>

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TABLE OF PACKING METHODS—Continued

Packing Instruction	Inner packagings	Intermediate packagings	Outer packagings
132(a).....	Not necessary	Not necessary	Boxes. steel (4A). aluminium (4B). wood, natural, ordinary (4C1). wood, natural, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fibreboard (4G). plastics, solid (4H2).
132(b).....	Receptacles fibreboard metal plastics Sheets..... paper plastics	Not necessary	Boxes. steel (4A). aluminium (4B). wood, natural, ordinary (4C1). wood, natural, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fibreboard (4G). plastics, solid (4H2).
133..... PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS: 1. For UN 0043, 0212, 0225, 0268 and 0306 trays are not authorized as inner packagings 2. Intermediate packagings are only required when trays are used as inner packagings	Receptacles fibreboard metal plastics wood Trays, fitted with dividing partitions fibreboard plastics wood	Receptacles..... fibreboard metal plastics wood	Boxes. steel (4A). aluminium (4B). wood, natural, ordinary (4C1). wood, natural, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fibreboard (4G). plastics, solid (4H2).

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TABLE OF PACKING METHODS—Continued

Packing Instruction	Inner packagings	Intermediate packagings	Outer packagings
134.....	Bags..... water resistant Receptacles fibreboard metal plastics wood Sheets fibreboard, corrugated Tubes fibreboard	Not necessary	Boxes. steel (4A). aluminium (4B). wood, natural, ordinary (4C1). wood, natural, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fibreboard (4G). plastics, solid (4H2). Drums. steel, removable head (1A2). aluminium, removable head (1B2).
135.....	Bags..... paper plastics Receptacles fibreboard metal plastics wood Sheets paper plastics	Not necessary	Boxes. steel (4A). aluminium (4B). wood, natural, ordinary (4C1). wood, natural, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fibreboard (4G). plastics, expanded (4H1). plastics, solid (4H2). Drums. steel, removable head (1A2). aluminium, removable head (1B2). fibre (1G). plastics, removable head (1H2).

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TABLE OF PACKING METHODS—Continued

Packing Instruction	Inner packagings	Intermediate packagings	Outer packagings
136.....	Bags..... plastics textile Boxes..... fibreboard plastics wood Dividing partitions in the outer packagings.....	Not necessary	Boxes. steel (4A). aluminium (4B) wood, natural, ordinary (4C1). wood, natural, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fibreboard (4G). plastics, solid (4H2). Drums. steel, removable head (1A2). aluminium, removable head (1B2). fibre (1G). plastics, removable head (1H2).
137..... PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS: For UN 0059, 0439, 0440 and 0441, when the shaped charges are packed singly, the conical cavity must face downwards and the package marked "THIS SIDE UP". When the shaped charges are packed in pairs, the conical cavities must face inwards to minimize the jetting effect in the event of accidental initiation	Bags..... plastics Boxes..... fibreboard Tubes..... fibreboard metal plastics Dividing partitions in the outer packagings.	Not necessary	Boxes. steel (4A). aluminium (4B). wood, natural, ordinary (4C1). wood, natural, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fibreboard (4G).
138..... PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS: If the ends of the articles are sealed, inner packagings are not necessary	Bags..... plastics	Not necessary	Boxes. steel (4A). aluminium (4B). wood, natural, ordinary (4C1). wood, natural, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fibreboard (4G). plastics, solid (4H2). Drums. steel, removable head (1A2). aluminium, removable head (1B2).

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TABLE OF PACKING METHODS—Continued

Packing Instruction	Inner packagings	Intermediate packagings	Outer packagings
139..... PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS: 1. For UN 0065, 0102, 0104, 0289 and 0290, the ends of the detonating cord must be sealed, for example, by a plug firmly fixed so that the explosive cannot escape. The ends of CORD DETONATING flexible must be fastened securely 2. For UN 0065 and UN 0289, inner packagings are not required when they are fastened securely in coils	Bags..... plastics Receptacles..... fibreboard metal plastics wood Reels..... Sheets..... paper plastics	Not necessary	Boxes. steel (4A). aluminium (4B). wood, natural, ordinary (4C1). wood, natural, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fibreboard (4G). plastics, solid (4H2). Drums. steel, removable head (1A2). aluminium, removable head (1B2). plywood (1D). fibre (1G). plastics, removable head (1H2).
140..... PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS: 1. If the ends of UN 0105 are sealed, no inner packagings are required 2. For UN 0101, the packaging must be sift-proof except when the fuse is covered by a paper tube and both ends of the tube are covered with removable caps 3. For UN 0101, steel or aluminium boxes or drums must not be used	Bags..... plastics Reels..... Sheets..... paper, kraft plastics	Not necessary	Boxes. steel (4A). aluminium (4B). wood, natural, ordinary (4C1). wood, natural, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fibreboard (4G). plastics, solid (4H2). Drums. steel, removable head (1A2). aluminium, removable head (1B2). fibre (1G).

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Packing instruction	Inner packagings	Intermediate packagings	Outer packagings
141.....	Receptacles fibreboard metal plastics wood Trays, fitted with dividing partitions plastics wood Dividing partitions in the outer packagings.	Not necessary	Boxes. steel (4A). aluminium (4B). wood, natural, ordi- nary (4C1). wood, natural, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fibreboard (4G). plastics, solid (4H2). Drums. steel, removable head (1A2). aluminium, remov- able head (1B2). fibre (1G). plastics, removable head (1H2).
142.....	Bags paper plastics Receptacles fibreboard metal plastics wood Sheets paper Trays, fitted with dividing partitions plastics	Not necessary	Boxes. steel (4A). aluminium (4B). wood, natural, ordi- nary (4C1). wood, natural, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fibreboard (4G). plastics, solid (4H2). Drums. steel, removable head (1A2). aluminium, remov- able head (1B2). fibre (1G). plastics, removable head (1H2).

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TABLE OF PACKING METHODS—Continued

Packing Instruction	Inner packagings	Intermediate packagings	Outer packagings
143..... PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS: 1. For UN 0271, 0272, 0415 and 0491 when metal packagings are used, metal packagings must be so constructed that the risk of explosion, by reason of increase in internal pressure from internal or external causes is prevented 2. Composite packagings (6HH2) (plastic receptacle with outer solid box) may be used in lieu of combination packagings	Bag..... paper, kraft..... plastics textile textile, rubberized Receptacles..... fibreboard metal plastics Trays, fitted with dividing partitions plastics wood	Not necessary.....	Boxes. steel (4A). aluminum (4B). wood, natural, ordinary (4C1). wood, natural, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fibreboard (4G). plastics, solid (4H2). Drums. steel, removable head (1A2). aluminium, removable head (1B2). plywood (1D). fibre (1G). plastics, removable head (1H2).
144..... PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS: For UN 0248 and UN 0249, packagings must be protected against the ingress of water. When CONTRIVANCES, WATER ACTIVATED are transported unpackaged, they must be provided with at least two independent protective features which prevent the ingress of water	Receptacles..... fibreboard metal plastics Dividing partitions in the outer packagings.	Not necessary.....	Boxes. steel (4A). aluminum (4B). wood, natural, ordinary (4C1) with metal liner. plywood (4D) with metal liner. reconstituted wood (4F) with metal liner. plastics, expanded (4H1).

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TABLE OF PACKING METHODS—Continued

Packing Instruction	Inner packagings	Intermediate packagings	Outer packagings
US 1			
1. A jet perforating gun, charged, oil well may be transported under the following conditions:			
a. Initiation devices carried on the same motor vehicle or offshore supply vessel must be segregated; each kind from every other kind, and from any gun, tool or other supplies, unless approved in accordance with Sec. 173.56. Segregated initiation devices must be carried in a container having individual pockets for each such device or in a fully enclosed steel container lined with a non-sparking material. No more than two segregated initiation devices per gun may be carried on the same motor vehicle.			
b. Each shaped charge affixed to the gun may not contain more than 112 g (4 ounces) of explosives.			
c. Each shaped charge if not completely enclosed in glass or metal, must be fully protected by a metal cover after installation in the gun.			
d. A jet perforating gun classed as 1.1D or 1.4D may be transported by highway by private or contract carriers engaged in oil well operations.			
(i) A motor vehicle transporting a gun must have specially built racks or carrying cases designed and constructed so that the gun is securely held in place during transportation and is not subject to damage by contact, one to the other or any other article or material carried in the vehicle; and			
(ii) The assembled gun packed on the vehicle may not extend beyond the body of the motor vehicle.			
e. A jet perforating gun classed as 1.4D may be transported by a private offshore supply vessel only when the gun is carried in a motor vehicle as specified in paragraph (d) of this packing method or on offshore well tool pallets provided that:			
(i) All the conditions specified in paragraphs (a), (b), and (c) of this packing method are met;			
(ii) The total explosive contents do not exceed 90.8 kg (200 pounds) per tool pallet;			
(iii) Each cargo vessel compartment may contain up to 90.8 kg (200 pounds) of explosive content if the segregation requirements in Sec. 176.83(b)(3) of this subchapter are met; and			
(iv) When more than one vehicle or tool pallet is stowed "on deck" a minimum horizontal separation of 3 m (9.8 feet) must be provided.			

(d) Class 1 (explosive) materials owned by the Department of Defense and packaged prior to January 1, 1990, in accordance with the requirements of this subchapter in effect at that time, are excepted from the requirements of part 178 of this subchapter provided the packagings have maintained their integrity and the explosive material is declared as government-owned goods packaged prior to January 1, 1990.

[Amdt. 173-224, 55 FR 52617, Dec. 21, 1990, as amended at 56 FR 66267, Dec. 20, 1991; Amdt. 173-236, 58 FR 50236, Sept. 24, 1993; Amdt. 173-235, 58 FR 50502, Sept. 27, 1993; Amdt. 173-234, 58 FR 51532, Oct. 1, 1993; Amdt. 173-241, 59 FR 67492, 67506, Dec. 29, 1994; Amdt. 173-242, 60 FR 26806, May 18, 1995; Amdt. 173-246, 60 FR 49110, Sept. 21, 1995; 62 FR 24720, May 6, 1997; FR 62 45702, Aug. 28, 1997; 62 FR 51560, Oct. 1, 1997]

§173.63 Packaging exceptions.

(a) Cord, detonating (UN 0065), having an explosive content not exceeding 6.5 g (0.23 ounces) per 30 centimeter length (one linear foot) may be offered for transportation domestically and transported as Cord, detonating (UN 0289), Division 1.4 Compatibility Group D (1.4D) explosives, if the gross weight of all

packages containing Cord, detonating (UN 0065), does not exceed 45 kg (99 pounds) per:

- (1) Transport vehicle, freight container, or cargo-only aircraft;
- (2) Off-shore down-hole tool pallet carried on an off-shore supply vessel;
- (3) Cargo compartment of a cargo vessel; or
- (4) Passenger-carrying aircraft used to transport personnel to remote work sites, such as offshore drilling units.

(b) *Cartridges, small arms, and cartridges power devices.* (1) Cartridges, small arms, and cartridges power devices (which are used to project fastening devices) which have been classed as a Division 1.4S explosive may be re-classed, offered for transportation, and transported as ORM-D material when packaged in accordance with paragraph (b)(2) of this section; such transportation is excepted from the requirements of subparts E (Labeling) and F (Placarding) of part 172 of this subchapter. Cartridges, small arms, and cartridges power devices that may be shipped as ORM-D material is limited to:

- (i) Ammunition for rifle, pistol or shotgun;
- (ii) Ammunition with inert projectiles or blank ammunition;

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(iii) Ammunition having no tear gas, incendiary, or detonating explosive projectiles;

(iv) Ammunition not exceeding 12.7 mm (50 caliber or 0.5 inch) for rifle or pistol, cartridges or 8 gauge for shotshells; and

(v) Cartridges, power devices which are used to project fastening devices.

(2) Packaging for cartridges, small arms, and cartridges power devices as ORM-D material must be as follows:

(i) Ammunition must be packed in inside boxes, or in partitions which fit snugly in the outside packaging, or in metal clips;

(ii) Primers must be protected from accidental initiation;

(iii) Inside boxes, partitions or metal clips must be packed in securely-closed strong outside packagings;

(iv) Maximum gross weight is limited to 30 kg (66 pounds) per package; and

(v) Cartridges, power devices which are used to project fastening devices and 22 caliber rim-fire cartridges may be packaged loose in strong outside packagings.

(c)-(e) [Reserved]

(f) Detonators containing no more than 1 g explosive (excluding ignition and delay charges) that are electric blasting caps with leg wires 4 feet long or longer, delay connectors in plastic sheaths, or blasting caps with empty plastic tubing 12 feet long or longer may be packed as follows in which case they are excepted from the packaging requirements of § 173.62:

(1) No more than 50 detonators in one inner packaging;

(2) IME Standard 22 container or compartment is used as the outer packaging;

(3) No more than 1000 detonators in one outer packaging; and

(4) No material may be loaded on top of the IME Standard 22 container and no material may be loaded against the outside door of the IME Standard 22 compartment.

(g) Detonators that are classed as 1.4B or 1.4S and contain no more than 1 g of explosive (excluding ignition and delay charges) may be packed as follows in which case they are excepted from the packaging requirements of § 173.62:

(1) No more than 50 detonators in one inner packaging;

(2) IME Standard 22 container is used as the outer packaging;

(3) No more than 1000 detonators in one outer packaging; and

(4) Each inner packaging is marked "1.4B Detonators" or "1.4S Detonators", as appropriate.

[Amdt. 173-224, 55 FR 52617, Dec. 21, 1990, as amended at 56 FR 66268, Dec. 20, 1991; Amdt. 173-236, 58 FR 50536, Sept. 24, 1993; Amdt. 173-253, 61 FR 27175, May 30, 1996]

Subpart D—Definitions Classification, Packing Group Assignments and Exceptions for Hazardous Materials Other Than Class 1 and Class 7

SOURCE: Amdt. 173-224, 55 FR 52634 Dec. 21, 1990, unless otherwise noted.

§173.115 Class 2, Divisions 2.1, 2.2, and 2.3—Definitions.

(a) *Division 2.1 (Flammable gas)*. For the purpose of this subchapter, a *flammable gas* (Division 2.1) means any material which is a gas at 20° C (68° F) or less and 101.3 kPa (14.7 psi) of pressure (a material which has a boiling point of 20° C (68° F) or less at 101.3 kPa (14.7 psi)) which—

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

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

Except for aerosols, the limits specified in paragraphs (a)(1) and (a)(2) of this section shall be determined at 101.3 kPa (14.7 psi) of pressure and a temperature of 20° C (68° F) in accordance with ASTM E681-85, Standard Test Method for Concentration Limits of Flammability of Chemicals or other equivalent method approved by the Associate Administrator for Hazardous Materials Safety. The flammability of aerosols is determined by the tests specified in § 173.306(i) of this part.

(b) *Division 2.2 (non-flammable, nonpoisonous compressed gas-including compressed gas, liquefied gas, pressurized cryogenic gas, compressed gas in solution, asphyxiant gas*