

DEPARTMENT OF TRANSPORTATION**Pipeline and Hazardous Materials Safety Administration**

49 CFR Parts 171, 172, 173, 175, 176, 177, and 178

[Docket Nos. PHMSA–2012–0027 (HM–215L)]

RIN 2137–AE87

Hazardous Materials: Harmonization with International Standards (RRR)

AGENCY: Pipeline and Hazardous Materials Safety Administration (PHMSA), DOT.

ACTION: Final rule.

SUMMARY: PHMSA is amending the Hazardous Materials Regulations to maintain alignment with international standards by incorporating various amendments, including changes to proper shipping names, hazard classes, packing groups, special provisions, packaging authorizations, air transport quantity limitations, and vessel stowage requirements. These revisions are necessary to harmonize the Hazardous Materials Regulations (HMR) with recent changes made to the International Maritime Dangerous Goods (IMDG) Code, the International Civil Aviation Organization's Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO Technical Instructions), and the United Nations Recommendations on the Transport of Dangerous Goods—Model Regulations (UN Model Regulations) and address a petition for rulemaking.

DATES: *Effective Date:* January 1, 2013.

Voluntary compliance date: PHMSA is authorizing voluntary compliance beginning January 1, 2013.

Delayed compliance date: Unless otherwise specified, compliance with the amendments adopted in this final rule is required beginning January 1, 2014.

Incorporation by reference date: The incorporation by reference of certain publications listed in this rule is approved by the Director of the Federal Register as of January 1, 2013.

FOR FURTHER INFORMATION CONTACT: Vincent Babich or Shane Kelley, International Standards, telephone (202) 366–8553, Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, 1200 New Jersey Avenue SE., 2nd Floor, Washington, DC 20590–0001.

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I. Executive Summary

In this final rule, PHMSA is amending the Hazardous Materials Regulations (HMR; 49 CFR Parts 171–180) to incorporate changes adopted in the IMDG Code, the ICAO Technical Instructions, and the UN Model Regulations, effective January 1, 2013. These changes ensure the domestic hazard classification, hazard communication and packaging requirements are consistent with those employed throughout the world.

Federal law and policy strongly favor the harmonization of domestic and international standards for hazardous materials transportation. The Federal hazardous materials transportation law (Federal hazmat law; 49 U.S.C. 5101 *et seq.*) directs PHMSA to participate in relevant international standard-setting bodies and encourages alignment of the HMR with international transport standards to the extent practicable while recognizing that deviations may at times be necessary to be consistent with the public interest (see 49 U.S.C. 5120). Harmonization facilitates international trade by minimizing the costs and other burdens of complying with multiple or inconsistent safety requirements for transportation of hazardous materials. Harmonization has also become increasingly important as the volume of hazardous materials transported in international commerce grows. Safety is often enhanced by creating a uniform framework for compliance. PHMSA actively participates in relevant international standard-setting bodies and promotes the adoption of standards consistent with the high safety standards set by the HMR.

The foreign trade of chemicals is a large segment of the United States economy. In 2000, U.S. foreign trade in chemicals totaled \$154 billion and generated a \$6 billion positive trade balance. The consistency of regulations reduces regulatory compliance costs and helps to avoid costly frustrations of international shipments. PHMSA's

continued leadership in maintaining consistency with international regulations enhances the hazardous materials safety program and assists in maintaining a favorable trade balance.

II. Background

PHMSA published a notice of proposed rulemaking (NPRM) under Docket HM–215L (77 FR 49167, August 15, 2012) to incorporate various amendments to harmonize the HMR with recent changes to the UN Model Regulations, the IMDG Code, and the ICAO Technical Instructions. When considering alignment of the HMR with international standards, we review and evaluate each amendment on its own merit, on the basis of its overall impact on transportation safety, and on the basis of the economic implications associated with its adoption into the HMR. Our goal is to harmonize without diminishing the level of safety currently provided by the HMR or imposing undue burdens on the regulated community.

Based on this review and evaluation, in this final rule, PHMSA is amending the HMR to incorporate changes from the 17th Revised Edition of the UN Model Regulations, Amendment 36–12 to the IMDG Code, and the 2013–2014 ICAO Technical Instructions, which become effective January 1, 2013 (The IMDG Code is effective January 1, 2013; however, the previous amendment may continue to be used until January 1, 2014). Notable amendments to the HMR in this final rule include the following:

- Update references to international regulations including the ICAO Technical Instructions, the International Convention for the Safety of Life at Sea, the IMDG Code, the UN Model Regulations, the UN Manual of Tests and Criteria the Canadian Transportation of Dangerous Goods Regulations and various technical standards.

- Add, revise, or remove certain proper shipping names, hazard classes, packing groups, special provisions, packaging authorizations, bulk packaging requirements, and passenger and cargo aircraft maximum quantity limits from the Hazardous Materials Table (HMT).

- Adopt new HMT entries for chemical under pressure and specify acceptable bulk and non-bulk packagings, filling limits and appropriate segregation requirements.

- Adopt an exception for the transport of aircraft batteries aboard passenger aircraft in excess of the quantity limits specified in column 9A of the HMT.

- Revise the vessel stowage provisions in column 10 of the § 172.101 Hazardous Materials Table (HMT).
- Adopt minimum size requirements for the “UN” or “NA” markings specified in § 172.301.
- Adopt changes throughout Part 173 (packaging requirements) to: (1) authorize the use of wood as a material of package construction for certain explosives; (2) authorize the use of metals other than steel or aluminum for drums and boxes; and (3) where appropriate, permit the use of non-removable head drums in those instances where removable head drums are otherwise authorized.
- Adopt a new packaging definition, operational controls, performance-oriented standards, and testing requirements for Flexible Bulk Containers (FBCs).

III. Comment Discussion

In response to PHMSA's August 15, 2012 NPRM (77 FR 49167), PHMSA received comments from the following organizations and individuals:

- 3M Company (3M)
- Airline Pilots Association, International (ALPA)
- Caterpillar Inc. (Caterpillar)
- Chemically Speaking LLC (Chemically Speaking)
- Council on Safe Transport of Hazardous Articles (COSTHA)
- Dangerous Goods Advisory Council (DGAC)
- Dow Chemical Company (Dow)
- Fuel Cell & Hydrogen Energy Association (FCHEA)
- Healthcare Waste Institute (HWI)
- Horizon Lines (Horizon)
- International Vessel Operators Dangerous Goods Association (IVODGA)
- Jamie Lee Guzman
- Mercotac Inc.
- Nora
- Nucon International Inc. (Nucon)
- PRBA-The Rechargeable Battery Association (PRBA)
- Saft America (Saft)
- Sporting Arms and Ammunition Manufacturing Institute (SAAMI)
- Stericycle, Inc. (Stericycle)
- United Airlines (United)
- United Parcel Service (UPS)
- VaporLok Products, LLC (Vaporlok)
- Veolia ES Technical Solutions, L.L.C. (Veolia)

Below is a listing of major amendments to the international transportation regulations that we proposed for adoption into the HMR, a brief synopsis of the comments we received regarding those proposals and PHMSA's position regarding the comments. Additional comments are

addressed in the section-by-section analysis section.

Incorporation by Reference

In the NPRM, PHMSA proposed to incorporate by reference the latest editions of various international transport standards including the 2013–2014 ICAO Technical Instructions, Amendment 36–12 of the IMDG Code, the 17th Revised Edition of the UN Model Regulations, and the Canadian Transportation of Dangerous Goods Regulations to include Amendments 8, 9, and 10. Finally, PHMSA proposed the incorporation by reference of new and updated standards published by the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). PHMSA received general support from the commenters on the principle of harmonizing the U.S. regulations with international transport and technical standards. We did not receive any comments that opposed our proposals to incorporate these standards and will adopt them in this final rule.

Chemical Under Pressure

In the NPRM, PHMSA proposed to amend the HMT to include individual entries for chemical under pressure and incorporate other safety requirements including, but not limited to, quantity and filling limits and packaging and segregation requirements. PHMSA received one comment on this proposal from 3M in support of the proposals to add entries for chemical under pressure. 3M requested we authorize the use of non-refillable cylinders larger than 1.25 liters containing flammable gas consistent with the UN Model Regulations. PHMSA's intent regarding the chemical under pressure entry was to comprehensively align the requirements of this entry with international standards. In this final rule we are revising the packaging requirements for chemical under pressure to authorize the use of non-refillable cylinders larger than 1.25 liters for chemical under pressure.

Aircraft Batteries

In the NPRM, PHMSA proposed to revise the HMR to permit the transport of wet cell aircraft batteries and lithium ion aircraft batteries aboard passenger aircraft in excess of the quantity limited specified in column 9A of the HMR. PHMSA received comments from Saft and PRBA in support of these proposed amendments because these changes would further harmonize the HMR with the ICAO Technical Instructions. Both Saft and PRBA cite a requirement in the “FAA Modernization and Reform Act of

2012” (§ 828, Pub. L. 112–95; 126 Stat. 133 (Feb 14, 2012)) (FAA Modernization and Reform Act of 2012) that states the Secretary of Transportation, including a designee of the Secretary, may not issue or enforce any regulation or other requirement regarding the transportation by aircraft of lithium metal cells or batteries or lithium ion cells or batteries, whether transported separately or packed with or contained in equipment, if the requirement is more stringent than the requirements of the ICAO Technical Instructions, and state that the NPRM proposal would be more restrictive than requirements in the ICAO Technical Instructions. The commenters noted that as proposed in the NPRM, the exception would only apply when an air carrier was transporting its own replacement items, whereas the 2013–2014 ICAO Technical Instructions does not impose this restriction. In this final rule PHMSA has revised this exception to ensure full alignment with the ICAO Technical Instructions and FAA Modernization and Reform Act of 2012 statutory requirements.

Vessel Stowage Requirements

In the NPRM, we proposed to revise the vessel stowage location requirements for explosives and reduce the number of explosive stowage categories from 15 to 5 in column (10A) of the HMT. IVODGA and SAAMI supported the proposed assignment of vessel stowage requirements for certain small arms cartridges consistent with the IMDG Code.

Size Requirements for “UN” or “NA” Markings

The HMR details the general marking requirements for non-bulk packages in § 172.301 including the proper shipping name, the “UN” or “NA” number technical names as applicable and the consignee or consignor's name and address. In the NPRM, we proposed to adopt minimum size requirements for the “UN” or “NA” markings and provide a one year transition period. This action was consistent with recent changes adopted in the UN Model Regulations, the IMDG Code and the ICAO Technical Instructions.

PHMSA received comments from the DGAC, Dow, HWI, Stericycle, and Veolia. DGAC and Dow requested an effective date of no earlier than January 1, 2017 for this requirement to allow for the depletion of finished products and labels and preprinted packaging stock. Veolia suggested the character size limit should only apply to international hazardous materials shipments. HWI and Stericycle note that the proposed

change would impose an unnecessary economic burden since they employ reusable packaging permanently marked with the UN number or pre-printed shipping labels that may not meet proposed minimum size marking. In response to these comments, we will delay the effective date of this requirement until January 1, 2017 and permit packages permanently marked prior to this date to remain in use until the end of their useful life. This will minimize the economic impact of this requirement and provide a suitable period to permit the depletion of preprinted packages.

Flexible Bulk Containers

In the NPRM, PHMSA proposed to adopt a new packaging definition, operational controls, performance-oriented standards, and testing requirements for Flexible Bulk Containers (FBCs). The proposed FBC requirements are modeled after the FBC requirements adopted into the 17th revised edition of the UN model Regulations. IVODGA and DGAC support the introduction of FBCs and since we received no adverse comments to these proposals, we will adopt these requirements as proposed.

Amendments Proposed in the NPRM But Not Adopted in the Final Rule

In this section, PHMSA discusses changes not adopted in the final rule as a result of comments in response to the August 15, 2012 Notice of Proposed Rulemaking (NPRM).

Used Medical Devices

The UN Model Regulations have been amended to exempt medical devices or equipment potentially contaminated with or containing infectious substances which are drained of free liquids from all other requirements of the UN Model Regulations. In the August 15, 2012 NPRM, PHMSA proposed to amend § 173.134, "Class 6, Division 6.2-Definitions and Exceptions" to adopt additional exemptions for medical devices and equipment. PHMSA received one comment from COSTHA opposing our adoption of these changes to the HMR. COSTHA noted that the ICAO Dangerous Goods Panel (DGP) has reviewed and has chosen not to adopt the provisions for transportation by aircraft. COSTHA also noted that changes to the HMR before ICAO has adopted the change would lead to confusion and disharmony. COSTHA further noted that papers will be presented to both the UN and ICAO in an attempt to alter the current exceptions for used medical devices.

The HMR has long standing provisions for the transport of potentially contaminated medical devices, some tied to provisions in 29 CFR, concerning the domestic shipment of such goods. Pending further UN changes and consultation with the Centers for Disease Control, PHMSA will not adopt the proposed changes to § 173.134 in this final rule.

Fuel in Machinery

Prior to the publication of the 17th Revised Edition of the UN Model Regulations, the transport of large amounts of fuel in machinery was not specifically addressed in international transport regulations. In the most recent biennium of the UNSCOE, some experts expressed concerns about the transport of large amounts of fuel in machinery. This concern led the international community to adopt in the 17th Revised Edition of the UN Model Regulations a special provision associated with fuel-related Class 3 entries.

Special Provision 363, as adopted in the UN Model Regulations, requires an article that contains fuel in excess of the limited quantity authorized amount and is ineligible to be described as Dangerous Goods in Machinery or Apparatus, UN3363, to conform to several general provisions to avoid being subject to the remainder of the HMR. In the August 15, 2012 NPRM, PHMSA proposed the addition of SP 363 for transportation by vessel to various Class 3 fuels modeled on the corresponding special provision adopted in the UN Model Regulations. PHMSA received three comments (Caterpillar, DGAC, & IVODGA) concerning our proposed adoption of special provision 363.

Both DGAC and Caterpillar were opposed to PHMSA's adoption of special provision 363. Caterpillar stated that PHMSA's proposed addition of special provision 363 was not based on sufficient data demonstrating the revision would improve transport safety. Caterpillar also stated that the change would introduce conflicting requirements and regulatory uncertainty and would be excessively burdensome. DGAC stated that the adoption of special provision 363 would introduce conflicting requirements and regulatory uncertainty, and highlighted a proposal they will present to the UN to clarify special provision 363.

Caterpillar noted that the proposal in the August 15, 2012 NPRM does not demonstrate through data obtained via scientific methodology any connection between the proposed revision and enhanced reductions in risks to people and the environment for all affected

shipments. Caterpillar and DGAC noted that the adoption of the changes proposed in the NPRM creates conflicting requirements under the HMR for shipments of generators and machinery.

Caterpillar also commented that proposed special provision 363 is excessively burdensome and would result in millions of dollars of expenditures for unnecessary transport related costs that would ultimately raise the consumer price of affected shipments.

IVODGA supported the adoption of special provision 363, stating concern that many fuel storage components within such machinery may not meet UN Performance Oriented Packaging or bulk tank specifications. IVODGA recommended PHMSA adopt special provision 363 as proposed to help prevent frustrated shipments at ports of discharge and loading in the United States.

PHMSA will not adopt special provision 363 in this final rule. This decision not to adopt special provision 363 is based on several factors. The first was a lack of concrete safety or incident data that indicated a need for increased regulation of domestic shipments of machinery and equipment containing fuel in amounts over the authorized limited quantity amount for that particular fuel. Also PHMSA believes that to adopt this special provision would require a review of existing requirements for UN3166, and possibly UN3366 that has yet to take place. PHMSA would like to note that even though we are not adopting special provision 363, shippers offering hazardous materials in accordance with Subpart C of Part 171 may utilize the IMDG Code, including special provision 363, if all or part of the movement is by vessel. PHMSA would also like to note that a shipper utilizing the IMDG Code to offer cargo to a vessel for transport must still comply with special provision 363 under the IMDG Code. PHMSA will likely revisit the need to incorporate special provision 363 after a determination is made at the UN on pending papers concerning the implementation of this special provision.

Requirements for Salvage Pressure Receptacles

The 17th Revised Edition of the UN Model Regulations adopted guidelines for Competent Authorities to use when issuing approvals for salvage pressure receptacles. These revisions are found in Chapter 1.2, 4.1, 5.4, and 6.2 of the UN Model Regulations. Specifically, these requirements address the

packaging, hazard communication, and safe transport of salvage pressure receptacles, also known as salvage cylinders in the United States.

The HMR currently address the packaging, hazard communication, and safe transport of salvage cylinders in § 173.3(d) and do not require approval of the Associate Administrator to do so. Accordingly, PHMSA did not propose adopting this provision in the August 15, 2012, NPRM. During the comment period, PHMSA was alerted that Chemically Speaking has filed a petition (P-1596) that requests PHMSA amend the HMR to add Class 4 and Class 5 hazardous materials to the hazard classes authorized in salvage cylinders. While this petition has merit, we did not receive it in time to address in this rulemaking. We will consider this petition in a future rulemaking.

Additional Clarification on the Requirements for Lithium Batteries

On August 15, 2012, PHMSA published an NPRM associated with this rulemaking (RIN 2137-AE87, 77 FR 49168). In the NPRM, no specific amendments were proposed regarding the requirements for the air transportation and handling of lithium batteries. However, in that NPRM, PHMSA did propose the incorporation by reference of the 2013–2014 Edition of the ICAO Technical Instructions which covers the air transportation of lithium batteries. This final rule adopts that provision and will incorporate the 2013–2014 Edition of the ICAO Technical Instructions by reference. Upon adoption of this provision, for purposes of the HMR a shipment of lithium batteries would be permitted to be transported by air in accordance with the 2013–2014 Edition of the ICAO Technical Instructions (with the exception of primary lithium batteries and cells aboard passenger carrying aircraft and unapproved prototype lithium batteries and cells aboard passenger carrying aircraft) or the applicable requirements currently specified in the HMR (see §§ 171.24(d)(1)(ii), and 171.24(d)(1)(iii)). Incorporation by reference of the 2013–2014 Edition of the ICAO Technical Instructions will allow shippers and carriers to choose which method of compliance is appropriate to the specific shipment. This Final Rule (RIN 2137-AE87; PHMSA–2012–0027) does not have any bearing on regulatory decisions associated with Docket HM–224F, (RIN 2137-AE44; PHMSA–2009–0095). PHMSA is requesting additional comment on various issues related to the air transportation and handling of lithium batteries in a separate Notice,

under the Docket for that rulemaking (RIN AE44; PHMSA–2009–0095).

IV. Section-By-Section Review

The following is a section-by-section review of the amendments adopted in this final rule:

Part 171

Section 171.7

Section 171.7 provides a listing of all standards incorporated by reference into the HMR. For this rulemaking, we evaluated updated international consensus standards pertaining to proper shipping names, hazard classes, packing groups, special provisions, packaging authorizations, air transport quantity limitations, and vessel stowage requirements and determined that the revised standards provide an enhanced level of safety without imposing significant compliance burdens. These standards have a well-established and documented safety history; their adoption will maintain the high safety standard currently achieved under the HMR. Therefore, we are adding and revising the incorporation by reference materials under the following organizations:

The *International Civil Aviation Organization (ICAO)* Technical Instructions for the Safe Transport of Dangerous Goods by Air, 2011–2012 Edition is revised to incorporate the 2013–2014 Edition.

The *International Convention for the Safety of Life at Sea (SOLAS)* Amendments 2002, Chapter II–2/ Regulation 19, Consolidated Edition 2004 is revised to incorporate the 2009 Consolidated Edition.

The *International Electrotechnical Commission (IEC)* Fuel cell technologies—Part 6–1: Micro fuel cell power systems—Safety, IEC/PAS 62282–6–1:2006(E), First Edition 2006–02, with Corrigendum 1, First Edition 2007–04 is removed and replaced with Fuel cell technologies—Part 6–100: Micro fuel cell power systems—Safety, IEC 62282–6–100:2010, Edition 1.0, March 2010 and Amendment 1 to IEC 62282–6–100, October 12, 2012. FCHEA requested we incorporate the recently approved Amendment 1 to the International Electrotechnical Commission standard for micro-fuel cell cartridges as well as a request for a slight alteration in the way we reference the document. In this final rule we will incorporate by reference amendment 1 to the IEC international standard and change the wording used to reference the document.

The *International Maritime Organization (IMO)* International

Maritime Dangerous Goods Code, 2010 Edition, Incorporating Amendment 35–10, English Edition, Volumes 1 and 2 is revised to incorporate the 2012 Edition, Amendment 36–12.

The *International Organization for Standardization (ISO)* entries for “ISO 10156:1996, Gases and Gas Mixtures—Determination of fire potential and oxidizing ability for the selection of cylinder valve outlets, Second edition, February 1996 (E)” and “ISO 10156–2:2005, Gas cylinders—Gases and gas mixtures—Part 2: Determination of oxidizing ability of toxic and corrosive gases and gas mixtures, First edition, August 2005, (E)” are removed and replaced with an entry for “ISO 10156:2010: Gases and gas mixtures—Determination of fire potential and oxidizing ability for the selection of cylinder valve outlets, Third edition, March 2010.”

The entry “ISO 4126–1: Safety valves—Part 1: General requirements, December 15, 1991, First edition” is revised to the entry “ISO 4126–1:2004(E): Safety devices for protection against excessive pressure—Part 1: Safety valves, Second edition 2004–02–15.” The entry “ISO 11117, Gas cylinders—Valve protection caps and valve guards for industrial and medical gas cylinders—Design, construction and tests, First edition, August 1998, (E)” is revised to the entry “ISO 11117:2008(E): Gas cylinders—Valve protection caps and valve guards—Design, construction and tests, Second edition, 2008–09–01.” The entry “ISO 11117:2008/Cor.1:2009(E): Gas cylinders—Valve protection caps and valve guards—Design, construction and tests, Technical Corrigendum 1, 2009–05–01” is added.

The entries “ISO 4126–7:2004(E): Safety devices for protection against excessive pressure—Part 7: Common data, First Edition 2004–02–15,” “ISO 4126–7:2004/Cor.1:2006(E): Safety devices for protection against excessive pressure—Part 7: Common data, Technical Corrigendum 1, 2006–11–01,” and “ISO 13340:2001(E) Transportable gas cylinders—Cylinder valves for non-refillable cylinders—Specification and prototype testing, First edition, 2004–04–01” are added.

The *Transport Canada* entry, Transportation of Dangerous Goods Regulations, including Clear Language Amendments 1 through 7 is revised to include Amendments 8, 9 and 10.

The *United Nations* Recommendations on the Transport of Dangerous Goods—Model Regulations, 16th Revised Edition (2009), Volumes I and II, is revised to incorporate the 17th

Revised Edition (2011), Volumes I and II.

The United Nations

Recommendations on the Transport of Dangerous Goods—Manual of Tests and Criteria, Fifth Revised Edition (2009), is revised to incorporate Amendment 1 (2011). One commenter (DGAC) requested that we do not require compliance with the lithium battery testing requirements contained in Amendment 1 for lithium cells and batteries manufactured before January 1, 2014. Since PHMSA has specified a delayed compliance date of January 1, 2014 for this final rule, compliance with Amendment 1 will only be required for lithium cells and batteries manufactured on or after January 1, 2014.

In addition to the revisions and additions above, PHMSA is restructuring § 171.7 to comply with National Archives and Records Administration requirements for centralized IBR section formatting. This change is not intended to remove or change any IBR materials previously incorporated by reference, with the exception of those references mentioned above.

Section 171.8

This section defines terms generally used throughout the HMR that have broad or multi-modal applicability. PHMSA is adding the following defined terms:

Aircraft battery: This term means a battery designed in accordance with a recognized aircraft battery design standard (e.g. FAA technical standard order) that is capable of meeting all aircraft airworthiness requirements and operating regulations.

Currently the HMR does not define aircraft battery. The recent amendment of special provision A51 in the ICAO TI require PHMSA to define this term to ensure appropriate application of this special provision.

Flexible Bulk Container (FBC): This term means a flexible container with a capacity not exceeding 15 cubic meters and includes liners and attached handling devices and service equipment.

Currently the HMR do not prescribe requirements for the transport of FBCs. In this final rule, PHMSA is adopting various transportation and manufacturing requirements for FBCs. Prior to adoption of such standards, the term “Flexible Bulk Container” must be defined. Therefore we are adopting the above definition of an FBC based on the definition for FBC adopted in the IMDG Code and 17th Revised Edition of the UN Model Regulations.

Part 172

Section 172.101

Section 172.101 provides instructions for using the Hazardous Materials Table (HMT) and the HMT itself. In this final rule, PHMSA is revising the instructional text that precedes the HMT.

Paragraph (c) of § 172.101 describes the information indicated in column 2 of the HMT. Column 2 lists the hazardous materials descriptions and proper shipping names of materials designated as hazardous materials. Paragraph (c)(10) of § 172.101 prescribes how mixtures or solutions not identified specifically by name are described.

PHMSA is revising § 172.101(c)(10) to incorporate language adopted in the 17th Revised Edition of the UN Model Regulations that states mixtures and solutions must meet the definition of one or more hazard classes to be classified as a hazardous material. This change will clarify that for a mixture or solution composed of one or more components that are classified as a hazardous material, the resulting mixture or solution must meet the definition of one or more hazard classes to be classified as a hazardous material.

Paragraph (k) of § 172.101 explains the purpose of column (10) of the HMT and prescribes the vessel stowage and segregation requirements for specific entries in the HMT. Column (10) is divided into two columns: column (10A) [Vessel stowage] specifies the authorized stowage locations on board cargo and passenger vessels and column (10B) [Other provisions] specifies special stowage and segregation provisions.

We are modifying these instructions by revising the vessel stowage location requirements for explosives and reducing the number of explosive stowage categories from 15 to 5. Specifically, the explosive stowage categories 6 through 15 will be eliminated and stowage categories 1 through 5 will be modified. Changes to the explosive stowage categories are necessary because, as part of this final rule, PHMSA is removing magazine stowage Types “A,” “C,” and special stowage from Part 176 with the consolidation of authorized explosive stowage categories. The authorized explosive stowage categories will be replaced with a new term of art “Closed cargo transport units for Class 1 (explosives).” Included in this definition are freight containers or transport vehicles that are structurally serviceable in accordance with § 176.172, portable magazines conforming to § 176.137, and small

vessel compartments (i.e., mast lockers and deck house). These changes will require Class 1 materials to be shipped in closed cargo transport units as defined above when stowed on deck.

Hazardous Materials Table (HMT)

In this final rule, PHMSA is amending the HMT. Readers should review all changes for a complete understanding of the amendments. For purposes of the Government Printing Office’s typesetting procedures, changes to the HMT appear under three sections of the Table, “remove,” “add,” and “revise.” Certain entries in the HMT, such as those with revisions to the proper shipping names, appear as a “remove” and “add.” Amendments to the HMT include the following:

New HMT Entries.

UN3497 Krill meal

This new HMT entry is created because krill meal has a chemical composition that is significantly different from that of fish meal. It contains a natural stabilizing substance (ethoxyquin) and the fat content of krill meal is higher than that of fish meal. The UN numbers established for fish meal are restricted to maximum fat contents, which makes these UN numbers not applicable to krill meal.

UN3498 Iodine monochloride, liquid

This new HMT entry is a result of the division of the proper shipping name Iodine monochloride into two authorized proper shipping names; one for the liquid state of the commodity and another for the solid state. Solid shipments of Iodine monochloride remain assigned to UN1792.

UN3499 Capacitor, electric double layer (with an energy storage capacity greater than 0.3 Wh)

This new HMT entry covers capacitors with an energy storage capacity greater than 0.3 Wh. Capacitors are assigned as a Class 9 miscellaneous hazardous material and measures required to prevent short circuit are provided in special provision 361.

UN3500 Chemical under pressure, n.o.s.

UN3501 Chemical under pressure, flammable, n.o.s.

UN3502 Chemical under pressure, toxic, n.o.s.

UN3503 Chemical under pressure, corrosive, n.o.s.

UN3504 Chemical under pressure, flammable, toxic, n.o.s.

UN3505 Chemical under pressure, flammable, corrosive, n.o.s.

The “Chemical under pressure. n.o.s.” HMT entries are added to address shipments of liquids or solids (e.g.,

adhesives, coatings, and cleaners) combined with a gas or gas mixtures utilized to expel the contents from pressure vessels. The primary hazard class for these shipments is determined by the hazard presented by the propellant and any subsidiary risk is determined by the properties of the liquid or solid under pressure. Toxic gases are not permitted as propellants.

UN3506 Mercury contained in manufactured articles

This new entry was created to separately address manufactured articles containing mercury. The international community provided an exception from regulation for instruments and articles containing not more than 1 kg of mercury, when transported by means other than aircraft. PHMSA is unable to adopt a comparable exception as the reportable quantity for mercury is 0.454 kg (1.00 lbs.), but is revising the current exception authorized in § 173.164(e) for shipments containing less than 0.454 kg (1.00 pound) to include transportation by vessel.

UN1950 Aerosols, corrosive, Packing Group II or III (each not exceeding 1 L capacity).

This new entry was inadvertently removed from the HMT due to an incorrect amendatory instruction in a September 13, 2011 final rule (76 FR 56304; HM-244D). The entry is being placed back into the HMT.

Removed HMT Entries

UN3492 Toxic by inhalation liquid, corrosive, flammable, n.o.s. with an inhalation toxicity lower than or equal to 200 ml/m3 and saturated vapor concentration greater than or equal to 500 LC50

UN3493 Toxic by inhalation liquid, corrosive, flammable, n.o.s. with an inhalation toxicity lower than or equal to 1000 ml/m3 and saturated vapor concentration greater than or equal to 10 LC50

These entries are removed from the HMT due to their similarity to UN3488 and UN3489 respectively. The sole difference between these entries is the order of subsidiary risks, which does not affect the classification and transport conditions applied to shipments of these substances. As a result, PHMSA is removing identification numbers UN3492 and UN3493 to avoid confusing shippers in determining which identification numbers to use.

Amendments to the Column (1) Symbols

Section 172.101(b) describes column (1) of the HMT and the associated symbols that may be indicated in the column. In accordance with § 172.101(b), the symbol “G” identifies proper shipping names for which one or more technical names of the hazardous material must be entered in parentheses in association with the basic description on a shipping paper. In this final rule, PHMSA is adding a “G” to column (1) for “UN1707, Thallium compounds, n.o.s.” The addition of a “G” to this entry will provide notification of the technical name of this toxic material and thus aid emergency responders with providing an appropriate response.

Amendments to the Column (2) Hazardous Materials Descriptions and Proper Shipping Names

Section 172.101(c) describes column (2) of the HMT and the requirements for hazardous materials descriptions and proper shipping names. Among other requirements, in accordance with § 172.101(c)(1), proper shipping names indicated in column (2) of the HMT may be used in the singular or the plural form interchangeably. Regardless, in this final rule, PHMSA is revising several entries in the HMT to remove the plural ending letter “s” to provide continuity with the internationally accepted proper shipping names. Specifically, PHMSA is removing the letter “s” from: UN1107, Amyl chlorides; UN1111, Amyl mercaptans; UN1113, Amyl nitrites; and, UN2347, Butyl Mercaptans.

Generally the physical state (solid or liquid) appears before the hazard characteristics (toxic, flammable, etc.) in the sequence of wording used in proper shipping names specified in column (2) of the HMT. In some instances, the hazard characteristics are indicated before the physical state. In this final rule, PHMSA is revising several proper shipping names to indicate the physical state before the hazard characteristics for consistency in formatting.

Current proper shipping names:

UN No.	Proper shipping name
3276	Nitriles, toxic, liquid, n.o.s.
3278	Organophosphorus compound, toxic, liquid, n.o.s.
3282	Organometallic compound, toxic, liquid, n.o.s.
3439	Nitriles, toxic, solid, n.o.s.
3464	Organophosphorus compound, toxic, solid, n.o.s.

UN No.	Proper shipping name
3467	Organometallic compound, toxic, solid, n.o.s.

Revised proper shipping names:

UN No.	Proper shipping name
3276	Nitriles, liquid, toxic, n.o.s.
3278	Organophosphorus compound, liquid, toxic, n.o.s.
3282	Organometallic compound, liquid, toxic, n.o.s.
3439	Nitriles, solid, toxic, n.o.s.
3464	Organophosphorus compound, solid, toxic, n.o.s.
3467	Organometallic compound, solid, toxic, n.o.s.

A new proper shipping name “Cartridges for tools, blank” is assigned to identification number UN0014. This proper shipping name more appropriately describes industrial blank cartridges currently described as “UN0323, Cartridges, power device” or “ORM-D or ORM-D-AIR, Cartridges, power device (used to project fastening devices).” In the NPRM, PHMSA proposed to remove the “ORM-D” entry for “Cartridges, power device (used to project fastening devices)” because the proper shipping name for such articles is now “Cartridges for tools, blank” under identification number UN0014. Subsequent changes were proposed to § 173.63 and the § 172.102(c)(1) special provision 347 to replace any references to “ORM-D or ORM-D-AIR, Cartridges, power device (used to project fastening devices)” with the new description “UN0014, Cartridges for tools, blank (used to project fastening devices).” Additionally, such articles are not subject to the UN Test Series 6(d) previously required under special provision 347. The description “UN0323, Cartridges, power device” will remain subject to special provision 347.

PHMSA received one comment from SAAMI noting that the proposed domestic only entry for Cartridges for tools, blank (used to project fastening devices) was unnecessary and should be deleted. SAAMI also asked for the retention of the ORM-D entry for Cartridges, power device until the end of the transition period for its use. SAAMI raised concerns over packaging manufactured and marked to meet current HMR requirements. SAAMI stated that existing packaging inventory will be depleted during 2013, but industry will not be ready to stop using

the old markings for ORM–D “Cartridges, power device” on January 1, 2013, and that HM–215K provided a deadline of December 31, 2013 to accomplish this transition. PHMSA agrees and is retaining the entry Cartridges power device (*used to project fastening devices*) and will not be adopting a domestic only entry for Cartridges for tools, blank.

The proper shipping name for “UN1305, Vinyltrichlorosilane, stabilized” is amended by removing the term “stabilized” for consistency with the Dangerous Goods Lists of the various international standards and the HMT of the HMR. The revised proper shipping name for UN1305 is “Vinyltrichlorosilane.”

The 17th Revised Edition of the UN Model Regulations amended the qualifying text (text in italics) for UN Nos. 3381–3390 and UN Nos. 3488–3491. The changes to these entries’ qualifying or modifying text in italics would change the wording from “with an inhalation toxicity lower than or equal to” to “with an LC50 lower than or equal to.” This terminology change better identifies the criteria used to determine the proper classification of these substances.

Amendments to the Column (4) Identification Numbers

Section 172.101(e) describes Column (4) of the HMT and the designation of the identification number to each proper shipping name. With the addition of a separate identification number (UN3506) for the description “Mercury contained in manufactured articles,” PHMSA is removing the description that is currently assigned to “UN2809, Mercury.”

Amendments to the Column (6) Label(s)

Section 172.101(g) describes Column (6) of the HMT and the labels required (primary and subsidiary) for specific entries in the HMT. Data presented to the UN Committee of Experts on the Transport of Dangerous Goods (UNCOE) in this last biennium indicated a need for the addition of subsidiary risk of Division 6.1 (toxic) to be assigned to “UN2809, Mercury” and to the new entry “UN3506, Mercury contained in manufactured articles.” We note that for air transport, Special provision A191 provides relief from the labeling and documentation requirements of this new subsidiary risk.

In addition to the changes above, data was also presented to the UNCOE that indicated the need for a subsidiary risk

of Division 6.1 (toxic) to be assigned to UN2381 Dimethyl disulfide.

PHMSA is making appropriate amendments to the HMT to account for these revisions to the UN Model Regulations.

Amendments to the Column (7) Special Provisions

Section 172.101(h) describes Column (7) of the HMT and the § 172.102(c) Special provisions assigned to specific entries in the HMT. The particular modifications to the entries in the HMT are discussed below. See *Section 172.102 special provisions* for a detailed discussion of the additions, revisions, and deletions to the special provisions addressed in this final rule.

Several HMT entries are revised to include special provision B120. Special provision B120 indicates that the material, when offered in conformance with the applicable requirements of Part 178 and general packaging requirements in Part 173, may be offered for transportation in a Flexible Bulk Container. See *Section 172.102 special provisions* for a detailed discussion of special provision B120.

In this final rule, special provision B120 is assigned to the following entries:

Proper shipping name	UN No.
Naphthalene, crude or Naphthalene, refined	UN1334
Sulfur (domestic and international entries)	UN1350
Calcium nitrate	UN1454
Magnesium nitrate	UN1474
Potassium nitrate	UN1486
Sodium nitrate	UN1498
Sodium nitrate and potassium nitrate mixtures	UN1499
Ammonium nitrate, with not more than 0.2% total combustible material, including any organic substance, calculated as carbon to the exclusion of any other added substance	UN1942
Ammonium nitrate based fertilizer	UN2067
Paraformaldehyde	UN2213
Environmentally hazardous substance, solid, n.o.s	UN3077
Sodium perborate monohydrate	UN3377
Sodium carbonate peroxyhydrate	UN3378

New special provision 222 is added to the ORM–D entries for Cartridges, small arms, and Cartridges power device (*used to project fastening devices*). See *Section 172.102 Special provisions* for a detailed discussion of the addition of special provision 222.

The entry for UN1008 Boron trifluoride is assigned new special provision 238. See *Section 172.102 Special provisions* for a detailed discussion of the addition of special provision 238.

Special provision A51 is added to authorize the transport of aircraft batteries consistent with the provisions

of the 2013–2014 ICAO Technical Instructions.

The portable tank code assigned to “UN 1203, Gasoline” was inadvertently changed from T4 to T8 in a rulemaking under Docket Number PHMSA–2009–0151 (HM–218F) [76 FR 43510]. As this was an inadvertent, but consequential change, PHMSA is amending the entry for Gasoline to indicate T4 as the appropriate portable tank code.

With the addition of a Division 6.1 (toxic) subsidiary risk to “UN2381, Dimethyl disulfide,” the portable tank codes and portable tank provisions are revised as follows:

T4 is replaced by T7

TP1 is replaced by TP2, TP13, and TP39

See *Section 172.102 Special provisions* for a detailed discussion of our addition of special provision TP39.

Review of the “Guiding Principles for the Development of the UN Model Regulations (Guiding Principles)” indicates that in some cases, the portable tank instructions for the transport of Division 4.3 liquid materials are not consistent with the Guiding Principles, and, in other instances, relevant portable tank special provisions were missing or incorrectly assigned. The following are revisions with deletions indicated by a

strikethrough and additions or replacements shown in bold font.

UN No	PSN	Class	SR	PG	T	TP
2965	Boron Trifluoride Dimethyl Etherate	4.3	3 8	I	T10	TP2 TP7 TP13
3129	Water-reactive Liquid, Corrosive n.o.s.	4.3	8	I	T14	TP2 TP7 TP13
3129	Water-reactive Liquid, Corrosive n.o.s.	4.3	8	II	T11	TP2 TP7
3129	Water-reactive Liquid, Corrosive n.o.s.	4.3	8	III	T7	TP1 TP2 TP7
3148	Water-reactive Liquid, n.o.s.	4.3		I	T9 T13	TP2 TP7 TP41
3148	Water-reactive Liquid, n.o.s.	4.3		II	T7	TP2 TP7
3148	Water-reactive Liquid, n.o.s.	4.3		III	T7	TP1 TP2 TP7

See Section 172.102 *Special provisions* for a detailed discussion of the addition of special provision TP41.

Special provisions A100 and A103 are revised to clarify that the weight (mass) limitations specified are net and not gross amounts for secondary lithium batteries. See Section 172.102 *Special provisions* for a detailed discussion of the revision of special provisions A100 and A103.

Special provision A191 is added to note that regardless of the Division 6.1 (toxic) subsidiary risk indicated in the HMT, the toxic subsidiary risk label and an indication of the subsidiary risk on the shipping paper are not required for manufactured articles containing less than 5 kg (11 pounds) of mercury. This special provision is assigned to the entry “UN3506, Mercury contained in manufactured articles.”

Special provision A200 is added to require that certain articles may not be transported by passengers or crewmembers, on their person or in their baggage and are to be shipped as cargo when transported via aircraft. Under certain circumstances, the articles affected by this special provision may be excepted from the requirements of the HMR. When these articles are not subject to the regulations, there is the potential for them to be inappropriately carried aboard an aircraft. In response to this safety concern, the ICAO Technical Instructions were revised to clarify that

when transported by aircraft, these articles, regardless of whether they are otherwise excepted from the regulations, must be transported as cargo and may not be carried onboard an aircraft by passengers or crewmembers in carry-on baggage, checked baggage, or on their person unless specifically excepted by § 175.10, “Exceptions for Passengers, Crewmembers, and Air Operators.” Consistent with the revised ICAO Technical Instructions requirement, PHMSA is adopting the special provision restricting these items from being carried aboard an aircraft by passengers and crewmembers.

This special provision is assigned to the following entries: “UN3166, Engines, internal combustion *or* Engines, fuel cell, *flammable gas powered*”; “UN3166, Engines, internal combustion *or* Engines, fuel cell, *flammable liquid powered*”; “UN3166, Vehicle, *flammable gas powered or* Vehicle, fuel cell, *flammable gas powered*”; “UN3166, Vehicle, *flammable liquid powered or* Vehicle, fuel cell, *flammable liquid powered*”; “UN0503, Air bag inflators *or* Air bag modules *or* Seat-belt pretensioners”; and “UN3268, Air bag inflators *or* Air bag modules *or* Seat-belt pretensioners.”

Special provision W10 is assigned to “UN3486, Calcium hypochlorite mixture, dry, corrosive *with more than 10% but not more than 39% available chlorine*” and to “UN2208, Calcium

hypochlorite mixtures, dry, *with more than 10 percent but not more than 39 percent available chlorine.*” Special provision W10 indicates that, when offered for transportation by vessel, these entries may not be offered in large packagings. See Section 172.102 *Special provisions* for a detailed discussion of the addition of special provision W10.

Amendments to the Column (8a) Packaging Exceptions

Column 8A contains exceptions from some of the requirements of this subchapter. The referenced exceptions are in addition to those specified in subpart A of part 173 and elsewhere in this subchapter. A “None” in this column means no packaging exceptions are authorized, except as may be provided by special provisions in Column 7. PHMSA received one comment from SAAMI noting that PHMSA, unlike the UN Model Regulations, IMDG Code and the European Road and Rail Regulations (ADR), did not propose a limited quantity exception for UN 0055 “Cases, cartridge, empty with primer” as a limited quantity. This was an inadvertent omission and PHMSA is adding 63 to column 8a of the HMT for the UN 0055 entry.

Amendments to the Column (9) Quantity Limitations

Section 172.101(j) describes Column (9) of the HMT and the quantity

limitations for specific entries in the HMT. Furthermore, Columns (9A) and (9B) specify the maximum quantities that may be offered for transportation in one package by passenger-carrying aircraft or passenger-carrying rail car (Column (9A)) or by cargo-only aircraft (Column (9B)). Unless otherwise indicated the quantity limitations shown in column (9) of the HMT are net. PHMSA is removing the gross weight indicator in columns (9A) (if authorized previously) and (9B) for the following battery entries. The quantity limit for these entries should be based on the weight of the battery or batteries and not the weight of the battery or batteries plus the packaging (i.e., the package).

UN3028 Batteries, dry, containing potassium hydroxide solid, *electric, storage*

UN2794 Batteries, wet, filled with acid, *electric storage*

UN2795 Batteries, wet, filled with alkali, *electric storage*

UN3468 Hydrogen in a metal hydride storage system *or* Hydrogen in a metal hydride storage system contained in equipment *or* Hydrogen in a metal hydride storage system packed with equipment

UN3090 Lithium battery

UN3091 Lithium batteries packed with equipment

PHMSA is revising column (9A) to forbid several entries previously authorized for shipment on passenger-carrying aircraft or passenger-carrying rail to harmonize with changes to the ICAO Technical Instructions. The following entries would now be forbidden on passenger-carrying aircraft or passenger-carrying rail.

UN1196 Ethyltrichlorosilane

UN1250 Methyltrichlorosilane

UN1298 Trimethylchlorosilane

UN1305 Vinyltrichlorosilane

UN2985 Chlorosilanes, flammable, corrosive, n.o.s.

UN3361 Chlorosilanes, toxic, corrosive, n.o.s.

UN3362 Chlorosilanes, toxic, corrosive, flammable, n.o.s.

Quantity limits of 450 L for "UN3334, Aviation regulated liquid, n.o.s." and 400 kg for "UN3335, Aviation regulated solid, n.o.s." are added for both columns (9A) and (9B). Previously, there was no limit to the amount

authorized to be shipped in one package. These new quantity limits are consistent with authorized quantity limits found in the ICAO Technical Instructions.

Amendments to the Column (10) Vessel Stowage Requirements.

Vessel Stowage Location (10A)

Section 172.101(k) explains the purpose of column (10) of the HMT and prescribes the vessel stowage and segregation requirements for specific entries in the HMT. Column (10) is divided into two columns: column (10A) [Vessel stowage] specifies the authorized stowage locations on board cargo and passenger vessels and column (10B) [Other provisions] specifies special stowage and segregation provisions.

One commenter (SAAMI) noted that limited quantity shipments are assigned the least restrictive stowage category and are excepted from additional stowage provisions in 3.4.3 of the IMDG Code and requested that PHMSA do the same. PHMSA agrees and is amending § 172.101(k) to ensure that shipments offered as limited quantities are allocated to stowage category A, and to note that such shipments are excepted from the other stowage provisions indicated by codes in column 10B of the HMT for the material being offered for transport as a limited quantity. PHMSA is simplifying the number of vessel stowage locations for shipments of Class 1 explosive materials to harmonize with recently adopted vessel explosive stowage categories in the IMDG Code. Currently, there are 15 possible stowage location codes available for assignment to column (10A) for explosive shipments. Recent changes in the IMDG Code have reduced the number of available explosive stowage location codes to five. This consolidation of codes was accomplished to reduce the complexity of the regulations without compromising safety.

The International Maritime Organization (IMO) determined that the term "magazine" was no longer necessary and the magazine concept could be incorporated into a broader definition for closed cargo transport units for Class 1 (explosives) material. In general, a magazine used to store and transport explosives is equivalent to a

closed cargo transport unit with a wooden floor. A magazine type A has additional wooden walls, or walls covered with wooden pallets, and is currently only assigned to 7 entries in the HMT. A magazine type C is currently defined by a minimum distance to the ship's side of 2.4 m (8 feet). Requirements to load Class 1 closed cargo transport units a minimum distance of 2.4 m (8 feet) from the ship's side wall remove the need for specific stowage category references to magazine stowage type C. The IMO, taking into account the properties of various classes and divisions of explosives, has determined that only 1.4S, 1.4G, 1.4D, and 1.4C explosives are acceptable on passenger ships. PHMSA agrees and has removed the majority of Class 1 stowage location codes and revised the remaining codes. The codes for each Class 1 entry are grouped by stowage code (01, 02, 03, 04, or 05) as follows:

Explosive Stowage Category

01—means the material may be stowed "on deck" in closed cargo transport units or "under deck" on a cargo vessel (up to 12 passengers) and on a passenger vessel

02—means the material may be stowed "on deck" in closed cargo transport units or "under deck" on a cargo vessel (up to 12 passengers) and "on deck" in closed cargo transport units or "under deck" in closed cargo transport units on a passenger vessel

03—means the material may be stowed "on deck" in closed cargo transport units or "under deck" on a cargo vessel (up to 12 passengers) but the material is prohibited on a passenger vessel

04—means the material may be stowed "on deck" in closed cargo transport units or "under deck" in closed cargo transports on a cargo vessel (up to 12 passengers) but the material is prohibited on a passenger vessel

05—means the material may be stowed "on deck" in closed cargo transport units on a cargo vessel (up to 12 passengers) but the material is prohibited on a passenger vessel

Taking into account the properties of various classes and divisions of explosives, the IMO determined new stowage category assignments as follows:

Division	Stowage category	Division	Stowage category	Division	Stowage category
1.1A	05	1.1F	05	1.1L	05
1.1B	05	1.2F	05	1.2L	05
1.2B	05	1.3F	05	1.3L	05
1.4B	05	1.4F	05	1.6N	03
1.1C	04	1.1G	03	1.4S	01
1.2C	04	1.2G	03		
1.3C	04	1.3G	03		
1.4C	02	1.4G	02		
1.1D	04	1.2H	05		
1.2D	04	1.3H	05		
1.4D	02	1.1J	05		
1.5D	03	1.2J	05		
1.1E	04	1.3J	05		
1.2E	04	1.2K	05		
1.4E	03	1.3K	05		

PHMSA agrees with the assignments and, in particular, agrees that only 1.4S, 1.4G, 1.4D, and 1.4C explosives are acceptable on passenger ships. Column (10A) in the HMT is revised to read Stowage Category 01 for the following proper shipping names and corresponding identification numbers:

Proper shipping name	Un No.	Proper shipping name	Un No.
Articles, explosive, n.o.s.	UN0349	Fuse, safety	UN0105
Articles, pyrotechnic for technical purposes	UN0432	Fuzes, detonating	UN0367
Cartridges, power device	UN0323	Fuzes, igniting	UN0368
Cartridges, signal	UN0405	Grenades, practice, hand or rifle	UN0110
Cartridges for weapons, blank or Cartridges for tools, blank.	UN0014	Igniters	UN0454
Cartridges for weapons, inert projectile or Cartridges, small arms.	UN0012	Lighters, fuse	UN0131
Cases, cartridge, empty with primer	UN0055	Primers, cap type	UN0044
Charges, bursting, plastics bonded	UN0460	Primers, tubular	UN0376
Charges, explosive, commercial without detonator	UN0445	Projectiles, inert with tracer	UN0345
Charges, shaped, without detonator	UN0441	Release devices, explosive	UN0173
Components, explosive train, n.o.s.	UN0384	Rivets, explosive	UN0174
Cutters, cable, explosive	UN0070	Signal devices, hand	UN0373
Detonator assemblies, non-electric, for blasting	UN0500	Signals, distress, ship	UN0506
Detonators for ammunition	UN0366	Signals, railway track, explosive	UN0193
Detonators, electric for blasting	UN0456	Signals, smoke	UN0507
Detonators, non-electric for blasting	UN0455	Substances, explosive, n.o.s.	UN0481
Fireworks	UN0337	Toy Caps	NA0337
Flares, aerial	UN0404		

Column (10A) in the HMT is revised to read Stowage Category 02 for the following proper shipping names and corresponding identification numbers:

Proper shipping name	UN No.	Proper shipping name	UN No.
5-Mercaptotetrazol-1-acetic acid	UN0448	Flares, aerial	UN0403
Air bag inflators, or Air bag modules, or Seat-belt pretensioners.	UN0503	Fuse, igniter tubular metal clad	UN0103
Ammunition, illuminating with or without burster, expelling charge or propelling charge.	UN0297	Fuzes, detonating, with protective features	UN0410
Ammunition, incendiary with or without burster, expelling charge or propelling charge.	UN0300	Fuzes, igniting	UN0317
Ammunition, practice	UN0362	Grenades practice, hand or rifle	UN0452
Ammunition, proof	UN0363	Igniters	UN0325
Ammunition, smoke with or without burster, expelling charge or propelling charge.	UN0303	Jet perforating guns, charged oil well, with detonator	NA0494
Ammunition, tear-producing with burster, expelling charge or propelling charge.	UN0301	Jet perforating guns, charged, oil well, without detonator	UN0494
Articles, explosive, n.o.s.	UN0351	Powder, smokeless	UN0509
Articles, explosive, n.o.s.	UN0352	Primers, tubular	UN0320
Articles, explosive, n.o.s.	UN0353	Projectiles, inert, with tracer	UN0425
Articles, explosive, n.o.s.	UN0354	Projectiles, with burster or expelling charge	UN0347
Articles, pyrotechnic for technical purposes	UN0431	Projectiles, with burster or expelling charge	UN0435
Cartridges for weapons, blank or Cartridges, small arms, blank.	UN0338	Projectiles, with bursting charge	UN0344
Cartridges for weapons, inert projectile or Cartridges, small arms.	UN0339	Propellant, solid	UN0501
Cartridges, oil well	UN0278	Rockets, line-throwing	UN0453
Cartridges, power device	UN0276	Rockets, with expelling charge	UN0438
Cartridges, signal	UN0312	Rockets, with inert head	UN0502
Cases, cartridges, empty with primer	UN0379	Signal devices, hand	UN0191
Cases, combustible, empty, without primer	UN0446	Signals, distress, ship	UN0505

Proper shipping name	UN No.	Proper shipping name	UN No.
Charges, bursting, plastics bonded	UN0459	Signals, railway track, explosive	UN0493
Charges, explosive, commercial <i>without detonator</i>	UN0444	Signals, smoke	UN0197
Charges, propelling	UN0491	Substances, explosive, n.o.s.	UN0479
Charges, shaped, flexible, linear	UN0237	Substances, explosive, n.o.s.	UN0480
Charges, shaped, <i>without detonator</i>	UN0440	Substances, explosive, n.o.s.	UN0485
Cord, detonating, <i>flexible</i>	UN0289	Tetrazol-1-acetic acid	UN0407
Cord, detonating, mild effect or Fuse, detonating, mild effect <i>metal clad</i>	UN0104	Tracers for ammunition	UN0306
Cord, igniter	UN0066	Warheads, rocket <i>with burster or expelling charge</i>	UN0370
Fireworks	UN0336	.....	.....

Column (10A) in the HMT is revised to read Stowage Category 03 for the following proper shipping names and corresponding identification numbers:

Proper shipping name	UN No.	Proper shipping name	UN No.
Ammonium nitrate-fuel oil mixture <i>containing only prilled ammonium nitrate and fuel oil</i>	NA0331	Flares, aerial	UN0421
Ammunition, illuminating <i>with or without burster, expelling charge or propelling charge</i>	UN0171	Flares, surface	UN0092
Ammunition, illuminating <i>with or without burster, expelling charge or propelling charge</i>	UN0254	Flares, surface	UN0418
Ammunition, incendiary <i>with or without burster, expelling charge, or propelling charge</i>	UN0009	Flares, surface	UN0419
Ammunition, incendiary <i>with or without burster, expelling charge, or propelling charge</i>	UN0010	Flash powder	UN0094
Ammunition, practice	UN0488	Flash powder	UN0305
Ammunition, smoke <i>with or without burster, expelling charge or propelling charge</i>	UN0015	Fuse, non-detonating <i>instantaneous or quickmatch</i>	UN0101
Ammunition, smoke <i>with or without burster, expelling charge or propelling charge</i>	UN0016	Fuzes, igniting	UN0316
Ammunition, tear-producing <i>with burster, expelling charge or propelling charge</i>	UN0018	Grenades, practice, <i>hand or rifle</i>	UN0318
Ammunition, tear-producing <i>with burster, expelling charge or propelling charge</i>	UN0019	Grenades, practice, <i>hand or rifle</i>	UN0372
Articles, explosive, extremely insensitive or Articles, EEI	UN0486	Igniters	UN0121
Articles, explosive, n.o.s.	UN0471	Igniters	UN0314
Articles, pyrotechnic <i>for technical purposes</i>	UN0428	Igniters	UN0315
Articles, pyrotechnic <i>for technical purposes</i>	UN0429	Primers, tubular	UN0319
Articles, pyrotechnic <i>for technical purposes</i>	UN0430	Projectiles, <i>inert, with tracer</i>	UN0424
Bombs, photo-flash	UN0039	Projectiles, <i>with burster or expelling charge</i>	UN0434
Bombs, photo-flash	UN0299	Rockets, line-throwing	UN0238
Cartridges for weapons, <i>with bursting charge</i>	UN0412	Rockets, line-throwing	UN0240
Cartridges, flash	UN0049	Signals, distress, <i>ship</i>	UN0194
Cartridges, flash	UN0050	Signals, distress, <i>ship</i>	UN0195
Cartridges, signal	UN0054	Signals, railway track, explosive	UN0192
Explosive, blasting, type B or Agent blasting, Type B	UN0331	Signals, railway track, explosive	UN0492
Explosive, blasting, type E or Agent blasting, Type E	UN0332	Signals, smoke	UN0196
Fireworks	UN0333	Signals, smoke	UN0313
Fireworks	UN0334	Signals, smoke	UN0487
Fireworks	UN0335	Substances, explosive, n.o.s.	UN0476
Flares, aerial	UN0093	Substances, explosive, n.o.s.	UN0478
Flares, aerial	UN0420	Substances, explosive, very insensitive, n.o.s. or Substances, EVI, n.o.s.	UN0482
		Tracers for ammunition	UN0212

Column (10A) in the HMT is revised to read Stowage Category 04 for the following proper shipping names and corresponding identification numbers:

Proper shipping name	UN No.	Proper shipping name	UN No.
1H-Tetrazole	UN0504	Hexolite, or Hexotol <i>dry or wetted with less than 15 percent water, by mass</i>	UN0118
1-Hydroxybenzotriazole, anhydrous, <i>dry or wetted with less than 20 percent water, by mass</i>	UN0508	Hexotonal	UN0393
5-Nitrobenzotriazol	UN0385	Jet perforating guns, charged <i>oil well, with detonator</i>	NA0124

Proper shipping name	UN No.	Proper shipping name	UN No.
Ammonium nitrate, with more than 0.2 percent combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance.	UN0222	Jet perforating guns, charged oil well, without detonator ...	UN0124
Ammonium perchlorate	UN0402	Mannitol hexanitrate, wetted or Nitromannite, wetted with not less than 40 percent water, or mixture of alcohol and water, by mass.	UN0133
Ammonium picrate, dry or wetted with less than 10 percent water, by mass.	UN0004	Mines with bursting charge	UN0137
Articles, explosive, n.o.s.	UN0462	Mines with bursting charge	UN0138
Articles, explosive, n.o.s.	UN0463	Nitro urea	UN0147
Articles, explosive, n.o.s.	UN0464	Nitrocellulose, dry or wetted with less than 25 percent water (or alcohol), by mass.	UN0340
Articles, explosive, n.o.s.	UN0466	Nitrocellulose, plasticized with not less than 18 percent plasticizing substance, by mass.	UN0343
Articles, explosive, n.o.s.	UN0467	Nitrocellulose, unmodified or plasticized with less than 18 percent plasticizing substance, by mass.	UN0341
Articles, explosive, n.o.s.	UN0468	Nitrocellulose, wetted with not less than 25 percent alcohol, by mass.	UN0342
Articles, explosive, n.o.s.	UN0470	Nitroglycerin, desensitized with not less than 40 percent non-volatile water insoluble phlegmatizer, by mass.	UN0143
Black powder or Gunpowder, granular or as a meal	UN0027	Nitroglycerin, solution in alcohol, with more than 1 percent but not more than 10 percent nitroglycerin.	UN0144
Black powder, compressed or Gunpowder, compressed or Black powder, in pellets or Gunpowder, in pellets.	UN0028	Nitroguanidine or Picrite, dry or wetted with less than 20 percent water, by mass.	UN0282
Bombs, photo-flash	UN0038	Nitrostarch, dry or wetted with less than 20 percent water, by mass.	UN0146
Bombs, with bursting charge	UN0034	Nitrotriazolone or NTO	UN0490
Bombs, with bursting charge	UN0035	Octolite or Octol, dry or wetted with less than 15 percent water, by mass.	UN0266
Boosters, without detonator	UN0042	Octonal	UN0496
Boosters, without detonator	UN0283	Pentaerythrite tetranitrate or Pentaerythritol tetranitrate or PETN, with not less than 7 percent wax by mass.	UN0411
Bursters, explosive	UN0043	Pentaerythrite tetranitrate, wetted or Pentaerythritol tetranitrate, wetted, or PETN, wetted with not less than 25 percent water, by mass, or Pentaerythrite tetranitrate, or Pentaerythritol tetranitrate or PETN, desensitized with not less than 15 percent phlegmatizer by mass.	UN0150
Cartridges for weapons, blank	UN0326	Pentolite, dry or wetted with less than 15 percent water, by mass.	UN0151
Cartridges for weapons, blank	UN0413	Powder cake, wetted or Powder paste, wetted with not less than 17 percent alcohol by mass.	UN0433
Cartridges for weapons, blank or Cartridges, small arms, blank.	UN0327	Powder cake, wetted or Powder paste, wetted with not less than 25 percent water, by mass.	UN0159
Cartridges for weapons, inert projectile	UN0328	Powder, smokeless	UN0160
Cartridges for weapons, inert projectile or Cartridges, small arms.	UN0417	Powder, smokeless	UN0161
Cartridges for weapons, with bursting charge	UN0006	Projectiles, with burster or expelling charge	UN0346
Cartridges for weapons, with bursting charge	UN0321	Projectiles, with bursting charge	UN0168
Cartridges, oil well	UN0277	Projectiles, with bursting charge	UN0169
Cartridges, power device	UN0275	Propellant, liquid	UN0495
Cartridges, power device	UN0381	Propellant, liquid	UN0497
Cases, combustible, empty, without primer	UN0447	Propellant, solid	UN0498
Charges, bursting, plastics bonded	UN0457	Propellant, solid	UN0499
Charges, bursting, plastics bonded	UN0458	RDX and HMX mixtures, wetted with not less than 15 percent water by mass or RDX and HMX mixtures, desensitized with not less than 10 percent phlegmatizer by mass.	UN0391
Charges, demolition	UN0048	Rocket motors	UN0186
Charges, depth	UN0056	Rocket motors	UN0280
Charges, explosive, commercial without detonator	UN0442	Rocket motors	UN0281
Charges, explosive, commercial without detonator	UN0443	Rockets, with bursting charge	UN0181
Charges, propelling	UN0271	Rockets, with bursting charge	UN0182
Charges, propelling	UN0272	Rockets, with expelling charge	UN0436
Charges, propelling	UN0272	Rockets, with expelling charge	UN0437
Charges, propelling	UN0415	Rockets, with inert head	UN0183
Charges, propelling, for cannon	UN0242	Sodium dinitro-o-cresolate, dry or wetted with less than 15 percent water, by mass.	UN0234
Charges, propelling, for cannon	UN0279	Sodium picramate, dry or wetted with less than 20 percent water, by mass.	UN0235
Charges, propelling, for cannon	UN0414	Sounding devices, explosive	UN0374
Charges, shaped, flexible, linear	UN0288	Sounding devices, explosive	UN0375

Proper shipping name	UN No.	Proper shipping name	UN No.
Charges, shaped, <i>without detonator</i>	UN0059	Substances, explosive, n.o.s.	UN0474
Charges, shaped, <i>without detonator</i>	UN0439	Substances, explosive, n.o.s.	UN0475
Charges, supplementary explosive	UN0060	Substances, explosive, n.o.s.	UN0477
Cord detonating or Fuse detonating <i>metal clad</i>	UN0102	Tetranitroaniline	UN0207
Cord, detonating or Fuse, detonating <i>metal clad</i>	UN0290	Torpedoes <i>with bursting charge</i>	UN0329
Cord, detonating, <i>flexible</i>	UN0065	Torpedoes <i>with bursting charge</i>	UN0451
Cyclotetramethylenetetranitramine, desensitized or Octogen, desensitized or HMX, desensitized.	UN0484	Trinitroaniline or Picramide	UN0153
Cyclotetramethylenetetranitramine, wetted or HMX, wetted or Octogen, wetted <i>with not less than 15 percent water, by mass.</i>	UN0226	Trinitroanisole	UN0213
Cyclotrimethylenetrinitramine, desensitized or Cyclonite, desensitized or Hexogen, desensitized or RDX, desensitized.	UN0483	Trinitrobenzene, <i>dry or wetted with less than 30 percent water, by mass.</i>	UN0214
Cyclotrimethylenetrinitramine, wetted or Cyclonite, wetted or Hexogen, wetted or RDX, wetted <i>with not less than 15 percent water by mass.</i>	UN0072	Trinitrobenzenesulfonic acid	UN0386
Deflagrating metal salts of aromatic nitroderivatives, n.o.s.	UN0132	Trinitrobenzoic acid, <i>dry or wetted with less than 30 percent water, by mass.</i>	UN0215
Diethyleneglycol dinitrate, desensitized <i>with not less than 25 percent non-volatile water-insoluble phlegmatizer, by mass.</i>	UN0075	Trinitrochlorobenzene or Picryl chloride	UN0155
Dinitroglycoluril or Dingu	UN0489	Trinitrofluorenone	UN0387
Dinitrophenol, <i>dry or wetted with less than 15 percent water, by mass.</i>	UN0076	Trinitro-m-cresol	UN0216
Dinitrophenolates <i>alkali metals, dry or wetted with less than 15 percent water, by mass.</i>	UN0077	Trinitronaphthalene	UN0217
Dinitroresorcinol, <i>dry or wetted with less than 15 percent water, by mass.</i>	UN0078	Trinitrophenetole	UN0218
Dinitrosobenzene	UN0406	Trinitrophenol or Picric acid, <i>dry or wetted with less than 30 percent water, by mass.</i>	UN0154
Dipicryl sulfide, <i>dry or wetted with less than 10 percent water, by mass.</i>	UN0401	Trinitrophenylmethylnitramine or Tetryl	UN0208
Explosive, blasting, type A	UN0081	Trinitroresorcinol or Styphnic acid, <i>dry or wetted with less than 20 percent water, or mixture of alcohol and water, by mass.</i>	UN0219
Explosive, blasting, type B	UN0082	Trinitroresorcinol, wetted or Styphnic acid, wetted <i>with not less than 20 percent water, or mixture of alcohol and water by mass.</i>	UN0394
Explosive, blasting, type C	UN0083	Trinitrotoluene and Trinitrobenzene mixtures or TNT and trinitrobenzene mixtures or TNT and hexanitrostilbene mixtures or Trinitrotoluene and hexanitrostilbene mixtures.	UN0388
Explosive, blasting, type D	UN0084	Trinitrotoluene mixtures containing Trinitrobenzene and Hexanitrostilbene or TNT mixtures containing trinitrobenzene and hexanitrostilbene.	UN0389
Explosive, blasting, type E	UN0241	Trinitrotoluene or TNT, <i>dry or wetted with less than 30 percent water, by mass.</i>	UN0209
Fracturing devices, explosive, <i>without detonators for oil wells.</i>	UN0099	Tritonal	UN0390
Fuzes, detonating, <i>with protective features</i>	UN0408	Urea nitrate, <i>dry or wetted with less than 20 percent water, by mass.</i>	UN0220
Fuzes, detonating, <i>with protective features</i>	UN0409	Warheads, rocket <i>with bursting charge</i>	UN0286
Grenades, <i>hand or rifle, with bursting charge</i>	UN0284	Warheads, rocket <i>with bursting charge</i>	UN0287
Grenades, <i>hand or rifle, with bursting charge</i>	UN0285	Warheads, torpedo <i>with bursting charge</i>	UN0221
Hexanitrodiphenylamine or Dipicrylamine or Hexyl	UN0079	Zirconium picramate, <i>dry or wetted with less than 20 percent water, by mass.</i>	UN0236
Hexanitrostilbene	UN0392		

Column (10A) in the HMT is revised to read Stowage Category 05 for the following proper shipping names and corresponding identification numbers:

Proper shipping name	UN No.	Proper shipping name	UN No.
Ammunition smoke, white phosphorus with burster, expelling charge, or propelling charge.	UN0245	Diazodinitrophenol, wetted with not less than 40 percent water or mixture of alcohol and water, by mass.	UN0074
Ammunition, incendiary liquid or gel, with burster, expelling charge or propelling charge.	UN0247	Fuzes, detonating	UN0106
Ammunition, incendiary, white phosphorus, with burster, expelling charge or propelling charge.	UN0243	Fuzes, detonating	UN0107

Proper shipping name	UN No.	Proper shipping name	UN No.
Ammunition, incendiary, white phosphorus, with burster, expelling charge or propelling charge.	UN0244	Fuzes, detonating	UN0257
Ammunition, smoke, white phosphorus with burster, expelling charge, or propelling charge.	UN0246	Grenades, hand or rifle, with bursting charge	UN0292
Ammunition, toxic with burster, expelling charge, or propelling charge.	UN0020	Grenades, hand or rifle, with bursting charge	UN0293
Ammunition, toxic with burster, expelling charge, or propelling charge.	UN0021	Guanyl nitrosaminoguanylidene hydrazine, wetted with not less than 30 percent water, by mass.	UN0113
Articles, explosive, n.o.s.	UN0350	Guanyl nitrosaminoguanyltetrazene, wetted or Tetrazene, wetted with not less than 30 percent water or mixture of alcohol and water, by mass.	UN0114
Articles, explosive, n.o.s.	UN0355	Lead azide, wetted with not less than 20 percent water or mixture of alcohol and water, by mass.	UN0129
Articles, explosive, n.o.s.	UN0356	Lead styphnate, wetted or Lead trinitroresorcinate, wetted with not less than 20 percent water or mixture of alcohol and water, by mass.	UN0130
Articles, explosive, n.o.s.	UN0465	Mercury fulminate, wetted with not less than 20 percent water, or mixture of alcohol and water, by mass.	UN0135
Articles, explosive, n.o.s.	UN0469	Mines with bursting charge	UN0136
Articles, explosive, n.o.s.	UN0472	Mines with bursting charge	UN0294
Articles, pyrophoric	UN0380	Primers, cap type	UN0377
Barium azide, dry or wetted with less than 50 percent water, by mass.	UN0224	Primers, cap type	UN0378
Bombs with flammable liquid, with bursting charge	UN0399	Projectiles, with burster or expelling charge	UN0426
Bombs with flammable liquid, with bursting charge	UN0400	Projectiles, with burster or expelling charge	UN0427
Bombs, photo-flash	UN0037	Projectiles, with bursting charge	UN0167
Bombs, with bursting charge	UN0033	Projectiles, with bursting charge	UN0324
Bombs, with bursting charge	UN0291	Rocket motors with hypergolic liquids with or without an expelling charge.	UN0250
Boosters with detonator	UN0225	Rocket motors with hypergolic liquids with or without an expelling charge.	UN0322
Boosters with detonator	UN0268	Rocket motors, liquid fueled	UN0395
Cartridges for weapons, with bursting charge	UN0005	Rocket motors, liquid fueled	UN0396
Cartridges for weapons, with bursting charge	UN0007	Rockets, liquid fueled with bursting charge	UN0397
Cartridges for weapons, with bursting charge	UN0348	Rockets, liquid fueled with bursting charge	UN0398
Components, explosive train, n.o.s.	UN0382	Rockets, with bursting charge	UN0180
Components, explosive train, n.o.s.	UN0383	Rockets, with bursting charge	UN0295
Components, explosive train, n.o.s.	UN0461	Samples, explosive, other than initiating explosives	UN0190
Contrivances, water-activated, with burster, expelling charge or propelling charge.	UN0248	Sounding devices, explosive	UN0204
Contrivances, water-activated, with burster, expelling charge or propelling charge.	UN0249	Sounding devices, explosive	UN0296
Detonator assemblies, non-electric for blasting	UN0360	Substances, explosive, n.o.s.	UN0357
Detonator assemblies, non-electric, for blasting	UN0361	Substances, explosive, n.o.s.	UN0358
Detonators for ammunition	UN0073	Substances, explosive, n.o.s.	UN0359
Detonators for ammunition	UN0364	Substances, explosive, n.o.s.	UN0473
Detonators for ammunition	UN0365	Torpedoes with bursting charge	UN0330
Detonators, electric, for blasting	UN0030	Torpedoes, liquid fueled, with inert head	UN0450
Detonators, electric, for blasting	UN0255	Torpedoes, liquid fueled, with or without bursting charge ..	UN0449
Detonators, non-electric, for blasting	UN0029	Warheads, rocket with burster or expelling charge	UN0371
Detonators, non-electric, for blasting	UN0267	Warheads, rocket with bursting charge	UN0369

Vessel Stowage Codes (10B)

Section 172.101(k) describes Column (10) of the HMT and the vessel stowage requirements for specific entries in the HMT. Furthermore, column (10B) [Other provisions] specifies codes for stowage requirements for specific hazardous materials. The meaning of each code in Column (10B) is set forth in § 176.84 of this subchapter.

Vessel shipments of Class 1 explosives are currently required to be stored away from all sources of heat

including steam pipes, heating coils, sparks, and flame in accordance with § 176.116(a). In addition to this general provision in § 176.116, several vessel stowage codes in column (10B) make reference to shading or stowing away from heat. To harmonize with the IMDG Code, reduce the number of redundant vessel stowage codes, and incorporate the addition of a new definition for protected from sources of heat (see Section 176.2 of this final rule for definition) PHMSA is deleting vessel stowage codes 50 and 48 and replacing

all references to these codes with stowage code 25. See *Section 176.84* for a detailed discussion of our revision to stowage code 25.

The following proper shipping names and corresponding identification numbers will have stowage code 48 replaced with stowage code 25 in Column (10B) in the HMT. If the commodity is currently assigned both stowage code 48 and 25 in Column (10B) in the HMT stowage code 48 will be deleted and stowage code 25 will remain.

Proper shipping name	UN No.	Proper shipping name	UN No.
Aerosols, <i>poison, Packing Group III (each not exceeding 1 L capacity).</i>		Calcium hypochlorite mixture, dry, corrosive with more than 10% but not more than 39% available chlorine.	UN3486
Aerosols, <i>poison, Packing Group III (each not exceeding 1 L capacity).</i>	UN1950	Calcium hypochlorite mixtures, dry, with more than 10 percent but not more than 39 percent available chlorine.	UN2208
Aerosols, <i>flammable, (each not exceeding 1 L capacity)</i>	UN1950	Copra	UN1363
Aerosols, <i>flammable, n.o.s. (engine starting fluid) (each not exceeding 1 L capacity).</i>	UN1950	Dichlorophenyl isocyanates	UN2250
Aerosols, <i>non-flammable, (each not exceeding 1 L capacity).</i>	UN1950	Dicyclohexylammonium nitrite	UN2687
Aerosols, <i>poison, (each not exceeding 1 L capacity)</i>	UN1950	Gallium	UN2803
Ammonium nitrate based fertilizer	UN2067	Hypochlorites, inorganic, n.o.s	UN3212
Ammonium nitrate emulsion or Ammonium nitrate suspension or Ammonium nitrate gel, intermediate for blasting explosives.	UN3375	Isocyanates, toxic, flammable, n.o.s. or Isocyanate solutions, toxic, flammable, n.o.s., flash point not less than 23 degrees C but not more than 61 degrees C and boiling point less than 300 degrees C.	UN3080
Ammonium nitrate, with not more than 0.2% total combustible material, including any organic substance, calculated as carbon to the exclusion of any other added substance.	UN1942	Isocyanates, toxic, n.o.s. or Isocyanate solutions, toxic, n.o.s., flash point more than 61 degrees C and boiling point less than 300 degrees C.	UN2206
Batteries, nickel-metal hydride <i>see</i> Batteries, dry, sealed, n.o.s. for nickel-metal hydride batteries transported by modes other than vessel.	UN3496	Isocyanatobenzotrifluorides	UN2285
Benzyl dimethylamine	UN2619	Lithium hypochlorite, dry or Lithium hypochlorite mixture ...	UN1471
5-tert-Butyl-2,4,6-trinitro-m-xylene or Musk xylene	UN2956	Methacrylonitrile, stabilized	UN3079
Calcium hypochlorite, dry, corrosive or Calcium hypochlorite mixtures, dry, corrosive with more than 39% available chlorine (8.8% available oxygen).	UN3485	Phosphorous acid	UN2834
Calcium hypochlorite, dry or Calcium hypochlorite mixtures dry with more than 39 percent available chlorine (8.8 percent available oxygen).	UN1748	Propylene chlorohydrins	UN2611
Calcium hypochlorite, hydrated, corrosive or Calcium hypochlorite, hydrated mixture, corrosive with not less than 5.5% but not more than 16% water.	UN3487	Sodium carbonate peroxyhydrate	UN3378
Calcium hypochlorite, hydrated or Calcium hypochlorite, hydrated mixtures, with not less than 5.5 percent but not more than 16 percent water.	UN2880	Sodium perborate monohydrate	UN3377

The following proper shipping names and corresponding identification numbers will have stowage code 19 replaced with stowage code 25 in

Column (10B) in the HMT if stowage code 25 is not currently listed in Column (10B). If the proper shipping name already is currently assigned both

stowage code 19 and 25, stowage code 19 will be deleted.

Proper shipping name	UN No.	Proper shipping name	UN No.
Copra	UN1363	Plastic molding compound <i>in dough, sheet or extruded rope form evolving flammable vapor.</i>	UN3314
Polymeric beads, expandable <i>evolving flammable vapor</i>	UN2211	Sulfur	NA1350
Sulfur	UN1350		

We are also assigning stowage code 25 to every Class 1 explosive table entry to indicate these materials must be protected from sources of heat in accordance with the new definition of "protected from sources of heat" in § 176.2. See *Section 176.84* for a detailed discussion of our revision to stowage code 25 and § 176.2 for the definition of "protected from sources of heat."

Stowage code 50 is currently not assigned to any HMT entries and is being deleted.

PHMSA is revising stowage code 128 to account for a citation change in the IMDG Code. The new text of stowage code 128 is "stow in accordance with the IMDG Code, Sub-section 7.6.2.7.2 (incorporated by reference; see § 171.7 of this subchapter)."

PHMSA is deleting stowage codes 7E, 8E, and 20E. The reduction in the

number of vessel stowage categories in column (10A) makes these codes unnecessary and any applicable stowage requirements are covered by the requirements of the applied code in column (10A).

The following proper shipping names and corresponding identification numbers will have stowage code 7E removed from column (10B) of the HMT.

Proper shipping name	UN No.	Proper shipping name	UN No.
Ammunition, smoke <i>with or without burster, expelling charge or propelling charge.</i>	UN0303	Ammunition, tear-producing <i>with burster, expelling charge or propelling charge.</i>	UN0301

The following proper shipping names and corresponding identification numbers will have stowage code 8E removed from column (10B) of the HMT.

Proper shipping name	UN No.	Proper shipping name	UN No.
Ammunition smoke, white phosphorus with burster, expelling charge, or propelling charge.	UN0245	Articles, explosive, n.o.s.	UN0354
Ammunition, smoke, white phosphorus with burster, expelling charge, or propelling charge.	UN0246	Articles, explosive, n.o.s.	UN0355
Ammunition, smoke with or without burster, expelling charge or propelling charge.	UN0015	Articles, explosive, n.o.s.	UN0356
Ammunition, smoke with or without burster, expelling charge or propelling charge.	UN0016	Articles, pyrophoric	UN0380
Ammunition, smoke with or without burster, expelling charge or propelling charge.	UN0303	Contrivances, water-activated, with burster, expelling charge or propelling charge.	UN0248
Ammunition, tear-producing with burster, expelling charge or propelling charge.	UN0018	Contrivances, water-activated, with burster, expelling charge or propelling charge.	UN0249
Ammunition, tear-producing with burster, expelling charge or propelling charge.	UN0019	Rocket motors with hypergolic liquids with or without an expelling charge.	UN0250
Ammunition, tear-producing with burster, expelling charge or propelling charge.	UN0301	Rocket motors with hypergolic liquids with or without an expelling charge.	UN0322
Ammunition, toxic with burster, expelling charge, or propelling charge.	UN0020	Substances, explosive, n.o.s.	UN0357
Ammunition, toxic with burster, expelling charge, or propelling charge.	UN0021	Substances, explosive, n.o.s.	UN0358
		Substances, explosive, n.o.s.	UN0359

The following proper shipping names and corresponding identification numbers will have stowage code 20E removed from column (10B) of the HMT.

Proper shipping name	UN No.	Proper shipping name	UN No.
Ammunition, smoke with or without burster, expelling charge or propelling charge.	UN0015	Ammunition, tear-producing with burster, expelling charge or propelling charge.	UN0018
Ammunition, smoke with or without burster, expelling charge or propelling charge.	UN0016	Ammunition, tear-producing with burster, expelling charge or propelling charge.	UN0019

During review of the explosive stowage codes it was noted that stowage code 1E was assigned to UN0504 1H-Tetrazole and UN0502 Rockets, with inert head. Stowage code 1E was removed in a final rule published on June 21 2001, under Docket Number RSPA-2000-7702 (HM-215D) [66 FR 33316] entitled, "Harmonization with the United Nations Recommendations, International Maritime Dangerous Goods Code, and International Civil Aviation Organization's Technical Instructions" and, in this final rule, PHMSA is amending the listings for these two entries by removing these two codes whose requirements have been captured by other vessel stowage provisions.

Section 172.102 Special Provisions

Section 172.102 lists special provisions applicable to the transportation of specific hazardous materials. Special provisions contain packaging requirements, prohibitions, and exceptions applicable to particular quantities or forms of hazardous materials. PHMSA is revising § 172.102, Special provisions as follows:

Special Provision 47

Special provision 47 provides classification exceptions for mixtures of solids and flammable liquids. In this final rule, PHMSA is revising special provision 47 to clarify that the requirement that each packaging must correspond with a design type that has passed a leakproofness test at the Packing Group II level applies only to single packagings.

Special Provision 48

Special provision 48 provides classification exceptions for mixtures of solids and toxic liquids. In this final rule, PHMSA is revising special provision 48 to clarify that the requirement that each packaging must correspond with a design type that has passed a leakproofness test at the Packing Group II level applies only to single packagings.

Special Provision 49

Special provision 49 provides classification exceptions for mixtures of solids and corrosive liquids. In this final rule, PHMSA is revising special

provision 49 to clarify that the requirement that each packaging must correspond with a design type that has passed a leakproofness test at the Packing Group II level applies only to single packagings.

Special Provision 101

In a NPRM published in the *Federal Register* on August 31, 2006 (71 FR 51895), we proposed to remove § 172.102(c)(1), Special provision 101. In the NPRM, we stated that with the introduction of the letter "G" in Column (1), which requires the n.o.s. and generic proper shipping names to be supplemented with the technical name of the hazardous material, special provision 101 became obsolete. Consequently, because we did not receive public comment, the amendment was adopted as proposed in a final rule published in the **Federal Register** on December 29, 2006 (71 FR 78596).

Consequences of the removal of § 172.102(c)(1) Special provision 101 in 2006 may have resulted in noncompliance for certain Department of Defense (DOD) explosive shipments.

DOD recently asserted the current provisions in §§ 171.8 and 172.203(k) of the HMR do not permit technical names to be indicated in such a manner as former special provision 101 required. For example, a DOD explosive shipment approved under the generic description “Articles, explosive, n.o.s.” was previously assigned special provision 101 in column 7 of the § 172.101 Hazardous Materials Table that required the name of the particular substance or article to be specified as the technical name for the substance or article (e.g., “Fuze, Grenade, M219A2”) in association with the basic description. Therefore, PHMSA is reinstating special provision 101 for the following HMT entries:

UN0349 Articles, explosive, n.o.s.
 UN0350 Articles, explosive, n.o.s.
 UN0351 Articles, explosive, n.o.s.
 UN0352 Articles, explosive, n.o.s.
 UN0353 Articles, explosive, n.o.s.
 UN0354 Articles, explosive, n.o.s.
 UN0355 Articles, explosive, n.o.s.
 UN0356 Articles, explosive, n.o.s.
 UN0462 Articles, explosive, n.o.s.
 UN0463 Articles, explosive, n.o.s.
 UN0464 Articles, explosive, n.o.s.
 UN0465 Articles, explosive, n.o.s.
 UN0466 Articles, explosive, n.o.s.
 UN0467 Articles, explosive, n.o.s.
 UN0468 Articles, explosive, n.o.s.
 UN0469 Articles, explosive, n.o.s.
 UN0470 Articles, explosive, n.o.s.
 UN0471 Articles, explosive, n.o.s.
 UN0472 Articles, explosive, n.o.s.
 UN0382 Components, explosive train, n.o.s.
 UN0383 Components, explosive train, n.o.s.
 UN0384 Components, explosive train, n.o.s.
 UN0461 Components, explosive train, n.o.s.
 UN0357 Substances, explosive, n.o.s.
 UN0358 Substances, explosive, n.o.s.
 UN0359 Substances, explosive, n.o.s.
 UN0473 Substances, explosive, n.o.s.
 UN0474 Substances, explosive, n.o.s.
 UN0475 Substances, explosive, n.o.s.
 UN0476 Substances, explosive, n.o.s.
 UN0477 Substances, explosive, n.o.s.
 UN0478 Substances, explosive, n.o.s.
 UN0479 Substances, explosive, n.o.s.
 UN0480 Substances, explosive, n.o.s.
 UN0481 Substances, explosive, n.o.s.
 UN0485 Substances, explosive, n.o.s.
 UN0482 Substances, explosive, very insensitive, n.o.s. or Substances, EVI, n.o.s.

Special Provision 118

Special provision 118 states that materials listing this special provision may not be transported under the provisions of Division 4.1 unless specifically authorized by the Associate

Administrator. In the UN Model Regulations the corresponding special provision, SP 272, contained a note that the special provision referred to UN0143. This special provision in the UN Model Regulations has been revised to indicate that the special provision applies to both UN0143 and UN0150, as appropriate. To maintain consistency with the UN Model Regulations, PHMSA is adopting this editorial note and revising special provision 118 by adding the language “(see UN0143 or UN0150 as appropriate)” following the existing text.

Special Provision 134

Special provision 134 is revised to note that this provision also applies to equipment powered by wet batteries or sodium batteries that are transported with these batteries installed.

Special Provision 155

Special provision 155 states that Fish meal or fish scrap may not be transported if the temperature at the time of loading either exceeds 35 °C (95 °F), or exceeds 5 °C (9 °F) above the ambient temperature, whichever is higher.

PHMSA is revising special provision 155 by adding a reference to the new proper shipping name “krill meal.” Krill meal possesses similar self-heating hazard characteristics to fish meal and scrap; therefore, application of this special provision is appropriate. This addition clarifies that special provision 155 applies to fish meal and fish scrap as well as krill meal.

Special Provision 222

Special provision 222 is added to indicate that shipments of 1.4S materials reclassified as ORM-D are not eligible to be offered for transportation by aircraft. Special provision 222 is added to the ORM-D entries for Cartridges, small arms, Cartridges, power device (*used to project fastening devices*).

Special Provision 237

Special provision 237 specifies that “Batteries, dry, containing potassium hydroxide solid, *electric storage*” must be prepared and packaged in accordance with the requirements of § 173.159(a), (b), and (c) and that for transportation by aircraft, the provisions of § 173.159(b)(2) are applicable.

PHMSA is adding an additional sentence to special provision 237 clarifying the applicability of the provision. Specifically language is added to state that the entry for “Batteries, dry, containing potassium hydroxide solid, *electric storage*” may

only be used for the transport of non-activated batteries that contain dry potassium hydroxide and that are intended to be activated prior to use by the addition of an appropriate amount of water to the individual cells.

Special Provision 238

Special provision 238 is added to address the shipment of neutron radiation detectors. Neutron detection is a key component used in nuclear arms interdiction in addition to other applications such as nuclear reactor monitoring, neutron-based cancer treatments, neutron spallation, nondestructive testing and health physics applications. Most neutron radiation detectors contain boron trifluoride gas, UN1008, which is currently forbidden by passenger and cargo aircraft as noted in Columns (9A) and (9B) of the HMT. Currently, neutron radiation detectors that contain this gas can only be transported by air under a special permit.

ICAO recently adopted a special provision specifically addressing neutron radiation detectors. The recently adopted special provision A190 permits, under certain conditions the transportation by cargo aircraft of neutron radiation detectors containing boron trifluoride. These conditions include quantity of gas limitations, and construction and packaging specifications. The special provision also provides that under certain conditions these neutron radiation detectors containing not more than 1 gram of boron trifluoride gas are not otherwise subject to the ICAO Technical Instructions.

PHMSA granted a special permit, for the transportation by all modes, of certain neutron radiation detectors containing boron trifluoride gas. The limitations set forth in Special Provision A190 of the ICAO Technical Instructions do not exceed any limitations of the special permit and, therefore, PHMSA is adopting and applying them to all modes of transportation except passenger-carrying aircraft by incorporating them into § 172.102(c)(1), Special provision 238. Specifically, the special provision provides packaging requirements (including pressure limitations), quantities permitted, and package construction requirements for radiation detectors containing non-pressurized boron trifluoride gas in excess of 1 gram. The special provision also provides additional exceptions from the HMR based on the transport mode and other conditions. The special provision will be applicable to the entry “UN1008, Boron trifluoride” in the HMT. PHMSA

believes the adoption of this special provision provides an adequate level of safety for the transportation of these items, while providing flexibility in the need to obtain a special permit.

Special Provision 338

A new special provision 338 is added to clarify that when lithium cells or batteries are contained in the fuel cell system, the item must be described under this entry and the entry "Lithium batteries, contained in equipment." This special provision is applied to UN3473 "Fuel cell cartridges or Fuel cell cartridges contained in equipment or Fuel cell cartridges packed with equipment, *containing flammable liquids*"; UN3476 "Fuel cell cartridges or Fuel cell cartridges contained in equipment or Fuel cell cartridges packed with equipment, *containing water-reactive substances*"; UN3477 "Fuel cell cartridges or Fuel cell cartridges contained in equipment or Fuel cell cartridges packed with equipment, *containing corrosive substances*"; UN3478 "Fuel cell cartridges or Fuel cell cartridges contained in equipment or Fuel cell cartridges packed with equipment, *containing liquefied flammable gas*"; and UN3479 "Fuel cell cartridges or Fuel cell cartridges contained in equipment or Fuel cell cartridges packed with equipment, *containing hydrogen in metal hydride*."

Special Provision 360

New special provision 360 is added and assigned to UN3091, "Lithium batteries, contained in equipment" to clarify that vehicles powered only by lithium batteries must be assigned to identification number UN3071, "Battery powered vehicle."

Special Provision 361

New special provision 361 is added to clarify that certain capacitors with limited energy storage capability are excepted from the HMR. Specifically, the special provision states that capacitors with an energy storage capacity of 0.3 Wh or less are not subject to the HMR. Furthermore this special provision defines energy storage capacity as the energy held by a capacitor, as calculated using the nominal voltage and capacitance.

Section 173.176 provides that capacitors not installed in equipment must be transported in an uncharged state and capacitors installed in equipment must be transported in either an uncharged state or protected against short circuit. Certain types of capacitors such as asymmetrical capacitors are designed to maintain a terminal voltage.

This special provision also clarifies that the entry UN3499 does not apply to these capacitors. This special provision is applied to the new HMT entry UN3499, "Capacitor, *electric double layer (with an energy storage capacity greater than 0.3 Wh)*."

Veolia expressed concern that while manufacturers will have control over the charge state of a capacitor when it is offered for transportation, when these same capacitors are being offered for transportation for recycling or disposal, the recycling or disposal facility may not be aware of or have control over their charge state. Veolia further asserted that this special provision only applies to electric double layer capacitors with an energy storage capacity of greater than 0.3 Wh, and there are other types of capacitors that have a potential to store a significant amount of energy that may pose a risk during transportation. The 0.3 Wh threshold for electric double layer capacitors is the threshold determined by the UNSCOE below which a capacitor would not pose a significant risk in transportation. PHMSA is aware that there are additional emerging capacitor technologies that are under review by the UNSCOE for possible inclusion in the dangerous goods list.

In this final rule PHMSA is only addressing the adoption of the special provision consistent with the amendment to the UN Model regulations. PHMSA has published an advance notice of proposed rulemaking (ANPRM) under Docket HM-253 (77 FR 39662, July 5, 2012) requesting public comment and input concerning the transportation of hazardous materials for recycling or disposal.

Special Provision 362

New special provision 362 specifies when a material can be considered a chemical under pressure. Specifically, the special provision states that classification of these materials is to be based on hazard characteristics of the components in the propellant, the liquid, or the solid forms. Further, this special provision details the appropriate primary and subsidiary hazard classes to be assigned to chemical under pressure. Special provision 362 is assigned to the following HMT entries: UN3500, Chemical under pressure, n.o.s.; UN3501, Chemical under pressure, flammable, n.o.s.; UN3503, Chemical under pressure, corrosive, n.o.s.; UN3502, Chemical under pressure, toxic n.o.s.; UN3504, Chemical under pressure, flammable, toxic, n.o.s.; and UN3505, Chemical under pressure, flammable, corrosive, n.o.s.

Special Provision 365

With the adoption of a new HMT entry "UN3506 Mercury contained in manufactured articles" in the 17th Revised Edition of the UN Model Regulations to address manufactured articles containing mercury, PHMSA is adding new special provision 365 stating that manufactured instruments and articles containing mercury should reference UN3506. This special provision is applied to UN2809 Mercury.

Special Provision A51

PHMSA is adding a new special provision A51 to authorize the transport by passenger aircraft of wet cell aircraft batteries with a mass up to 100 kg net and lithium ion aircraft batteries in packages containing a single aircraft battery with a net mass not exceeding 35 kg. The August 15, 2012 NPRM proposed to authorize the transport of aircraft batteries into Part 175 that provides exceptions from certain regulations for air carrier operator equipment and items of replacement, as well as for items used to provide customer service aboard an aircraft. PRBA and Saft noted the NPRM proposed to authorize the transport of aircraft batteries in a way that is not fully consistent with the 2013–2014 ICAO Technical Instructions, which do not limit the use of this exception to a particular aircraft operator's aircraft batteries. PRBA notes that such an action would frustrate the intent of Congress when it passed the FAA Modernization and Reform Act of 2012. In this final rule we are incorporating this authorization into a special provision consistent with the 2013–2014 ICAO Technical Instructions.

Special Provision A60

Special Provision A60 permits UN2014, Hydrogen peroxide, aqueous solution, to be transported in excepted quantities provided a comparative fire test between packages containing the solution and identical packages containing water demonstrated no difference in the burning rate. The likelihood of finding discernible differences with more accurate test equipment used today is much greater than it would have been with equipment used when the test requirements were first developed. This more sensitive equipment often detects negligible differences between the two test subjects and, therefore, precludes transport of these small devices under the special provision. To address the issue, the ICAO Dangerous Goods Panel

(DGP) adopted a proposal to allow small differences in burning rates.

In this final rule we are harmonizing with the ICAO Technical Instructions with regard to the comparative fire test for Hydrogen peroxide, aqueous solution. Special provision A60 is revised accordingly.

Special Provision A100

Special Provision A100 states that primary (non-rechargeable) lithium batteries and cells are forbidden for transport aboard passenger-carrying aircraft and secondary (rechargeable) lithium batteries and cells are authorized aboard passenger-carrying aircraft in packages that do not exceed a gross weight of 5 kg.

Special provision A100 is revised to clarify the weight limitations for secondary lithium batteries are net and not gross quantities. There are some combinations of authorized battery packagings that contribute significantly towards the gross weight of the finished package. The intent of this change is to indicate that the quantity limits for secondary lithium battery shipments aboard passenger-carrying aircraft are to be based on the actual weight of the batteries in each individual package and not the weight of the completed package.

Special Provision A103

Special Provision A103 specifies that lithium batteries contained in equipment is authorized aboard passenger carrying aircraft if the gross weight of the inner package of secondary lithium batteries or cells packed with the equipment does not exceed 5 kg (11 pounds).

Special provision A103 is revised to clarify the weight limitations are net and not gross quantities. There are some combinations of authorized battery packagings that contribute significantly towards the gross weight of the finished package. The intent of this change is to indicate that the quantity limits for secondary lithium battery shipments aboard passenger carry aircraft are to be based on the actual weight of the

batteries in each individual package and not the weight of the completed package.

Special Provision A189

We are adding a new special provision, A189, which is assigned to the HMT entry “UN2209, Formaldehyde solutions, with not less than 25 percent formaldehyde” indicating how Formaldehyde solutions with more than 25% are to be classified. It was suggested at the ICAO DGP that the entry for “UN2209, Formaldehyde solution with not less than 25% formaldehyde” implied that concentrations of less than 25% formaldehyde were not regulated. To clarify these requirements, the ICAO adopted a new special provision detailing how differing percentage of formaldehyde solutions are regulated.

We are adding language detailing how differing percentages of Formaldehyde solutions are to be regulated in the new special provision A189. This special provision is applied to UN3334, Aviation regulated liquid, n.o.s. and NA3082, Other regulated substances, liquid, n.o.s.

Special Provision A191

In the NPRM, PHMSA proposed a new special provision, A192, noting that regardless of the Division 6.1 (toxic) subsidiary indicated in the HMT, the poison subsidiary hazard label and an indication of this subsidiary hazard on the shipping paper are not required for manufactured articles containing less than 0.45 kg (1 pound) of mercury. This provision aligns with the decision of the UN Sub-Committee to ensure that transport of such articles, particularly by air, is not impeded due to mercury’s revised classification.

PHMSA received one comment from UPS noting that this special provision was assigned A191 by ICAO and not A192 as assigned by PHMSA. UPS also noted that ICAO provided an exception from display of the subsidiary “Toxic” label and the identification of subsidiary risk for up to 5 kg (11 pounds) of mercury, PHMSA proposed an

exception for no more than 0.454 kg (1 LB). UPS sees no reason for this lack of alignment, but foresees unnecessary challenges arising from such inconsistency. Therefore, UPS urges PHMSA to align directly with the 5 kg limit in the ICAO text. PHMSA is assigning special provision A191 to this entry for continuity with the international regulations. PHMSA agrees with UPS regarding the amount of mercury that may be present in manufactured articles to utilize the exception from communicating the subsidiary hazard, and is changing that amount to 5 kg (11 pounds).

Special Provision A200

As previously discussed, new special provision, A200, is added stating the entries assigned this special provision must be transported as cargo when transported by aircraft and cannot be carried onboard an aircraft by passengers or crewmembers either in or as carry-on baggage, checked baggage, or on their person unless specifically excepted by § 175.10, “Exceptions for Passengers, Crewmembers, and Air Operators.” This special provision is assigned to articles and will be applied to: UN3166, Engines, internal combustion or Engines, fuel cell, flammable gas powered; UN3166, Engines, internal combustion, or Engines, fuel cell, flammable liquid powered; UN3166, Vehicle, flammable gas powered or Vehicle, fuel cell, flammable liquid powered; UN3166, Vehicle, flammable liquid powered or Vehicle, fuel cell, flammable liquid powered; UN0503, Air bag inflators, or Air bag modules, or Seat-belt pretensioners; and, UN3268, Air bag inflators, or Air bag modules, or Seat-belt pretensioners.

Special Provision B120

Special provision B120 is added to specify the use of FBCs conforming to the requirements in Subpart R and Subpart S of part 178 of this subchapter are permitted. The special provision is applicable to the following entries:

Proper shipping name	UN No.
Ammonium nitrate based fertilizer	UN2067
Ammonium nitrate, with not more than 0.2% total combustible material, including any organic substance, calculated as carbon to the exclusion of any other added substance.	UN1942
Calcium nitrate	UN1454
Environmentally hazardous substance, solid, n.o.s	UN3077
Magnesium nitrate	UN1474
Naphthalene, crude or Naphthalene, refined	UN1334
Paraformaldehyde	UN2213
Potassium nitrate	UN1486
Sodium carbonate peroxyhydrate	UN3378
Sodium nitrate	UN1498
Sodium nitrate and potassium nitrate mixtures	UN1499

Proper shipping name	UN No.
Sodium perborate monohydrate	UN3377
Sulfur (domestic and international entries)	UN1350

FBCs must conform to the performance-oriented construction standards and testing criteria in new subparts R and S of part 178. In addition, shipments of FBCs must be prepared and otherwise conform to the general requirements for bulk packages in subpart B of part 173 and the new § 173.37.

IBC Codes

In a final rule published in the **Federal Register** on January 19, 2011 (76 FR 3308; HM-215K), the Table 1 (IBC Codes) in paragraph (c)(4) were editorially revised to remove UN Specifications 31A, 31B and 31N from IBC Codes IB4 through IB8. The revision was consistent with amendments to international standards that removed the specifications from the indicated codes in the table because IBC Codes IB4 through IB8 are assigned to solids, whereas, UN Specifications 31A, 31B, and 31N are authorized for transportation of liquids in IBC Codes IB1 through IB3 and are assigned to liquid materials only. In the January 19, 2011 final rule, PHMSA inadvertently failed to also remove the remaining liquid IBC specifications (31H1, 31H2, 31HZ1, and 31HZ2) from IBC Codes IB4 through IB8. Therefore, PHMSA is editorially correcting the IBC Code Table in § 172.102(c)(4).

Special Provision TP39

Special provision, TP39, is added and assigned to HMT entry “UN2381, Dimethyl disulfide.” This special provision indicates that portable tank instruction T4 may continue to be applied until December 31, 2018. This provides more time for portable tank transporters to transition their current fleets.

Special Provision TP40

Special provision TP40 is added and assigned to HMT entries “UN3500, Chemical under pressure, n.o.s.; UN3501, Chemical under pressure, flammable, n.o.s.; UN3503, Chemical under pressure, corrosive, n.o.s., UN3503; UN3502, Chemical under pressure, toxic n.o.s.; UN3504, Chemical under pressure, flammable, toxic, n.o.s.; and UN3505, Chemical under pressure, flammable, corrosive, n.o.s.” The special provision indicates that the portable tanks must not be transported when connected with spray application equipment. This provides an additional

measure preventing inadvertent release of hazardous materials in transport.

Special Provision TP41

Special provision TP41 is added and assigned to HMT entries “UN3148, Water-reactive liquid, n.o.s.,” indicating that the portable tank instruction T9 may continue to be applied until December 31, 2018.

Special Provision T50

Special provision T50 is revised to note that this provision is applicable to chemicals under pressure as well as liquefied compressed gases. Special provision T50 would be assigned to HMT entries “UN3500, Chemical under pressure, n.o.s.; UN3501, Chemical under pressure, flammable, n.o.s.; UN3503, Chemical under pressure, corrosive, n.o.s., UN3503; UN3502, Chemical under pressure, toxic n.o.s.; UN3504, Chemical under pressure, flammable, toxic, n.o.s.; and UN3505, Chemical under pressure, flammable, corrosive, n.o.s.”

Special Provision W10

Special provision W10 is added and assigned to HMT entries “UN3486 Calcium hypochlorite mixture, dry, corrosive *with more than 10% but not more than 39% available chlorine*” and to “UN2208 Calcium hypochlorite mixtures, dry, *with more than 10 percent but not more than 39 percent available chlorine*” indicating that when offered for transportation by vessel, the use of large packagings is prohibited. This provision is adopted to align with a recent IMO change forbidding these commodities from being transported by vessel in large packages.

PHMSA received two comments (DGAC & IVODGA) on our proposal to adopt new special provision W10. IVODGA supported placing W10 in column 7 of the HMT in order for the UN2208 & UN3486 entries to harmonize with the IMDG Code. DGAC recommended against placing W10 in column 7 of the HMT for the UN2208 & UN3486 entries. DGAC also requested that PHMSA elaborate as to why this change is needed on a safety basis. The IMO Sub-Committee on Dangerous Goods, Solid Cargoes and Containers (DSC) at their 14th session; decided not to assign LP02 to UN3486 to be consistent with the assignment of packing authorizations for UN2208, a material exhibiting similar

characteristics. To remain harmonized with the IMDG Code PHMSA will be adopting W10 as proposed in the August 15, 2012 NPRM.

Section 172.202

Section 172.202 establishes requirements for shipping descriptions on shipping papers. As part of these shipping paper requirements, in many situations a net or gross quantity of the hazardous materials transported must be included. At the 23rd meeting of the ICAO DGP, the issue of notation of quantities on shipping documents was raised. Specifically, it was noted that some confusion exists as to whether or not the net quantity or a gross mass is required on the shipping documents on particular shipments, such as limited quantities. At this meeting an amendment to the ICAO Technical Instructions was adopted to clarify what quantities (i.e. net or gross quantity) were required on the transport document for packages containing limited quantities when different hazardous materials are packed together in the same outer packaging.

PHMSA is adopting a similar provision to the one addressed by the ICAO DGP discussed above. Specifically, PHMSA is adding a new paragraph (a)(6)(vii) stating that for shipments containing hazardous materials in limited quantities with a “30 kg gross” limit in Column (9A) or (9B) of the § 172.101 Hazardous Materials Table and different hazardous materials packed together in the same outer packaging, the net quantity of each hazardous material followed by the gross mass of the completed package must be shown on the shipping paper.

This clarification addresses a transport scenario currently not addressed in the HMR thus alleviating confusion regarding the shipping paper requirements of such shipments. Furthermore, this harmonizes the HMR with the ICAO Technical Instructions and avoids shipping paper discrepancies for international shipments.

Section 172.203

This section details additional description requirements that are required for certain shipments of hazardous materials. PHMSA is amending paragraph (i)(3) to cross reference the IBR § 171.7.

Section 172.301

This section details the general marking requirements for non-bulk packagings. Specifically, this section states what information (proper shipping name and identification number, technical names, consignee's or consignor's name, etc.) must be displayed on the outside of non-bulk packages. While the HMR requires that an identification number, preceded by "UN" or "NA" as appropriate, be marked on the outside of a non-bulk packaging a specific size of this marking is not specified.

In this final rule, PHMSA is adding specific size requirements for the "UN" or "NA" markings. These markings must be marked in characters at least 12 mm (0.47 inches) high, however, packages with a maximum capacity of 30 liters (7.92 gallons), 30 kg (66 pounds), or cylinders with a maximum water capacity of 60 liters (16 gallons) must be marked with characters at least 6 mm (0.2 inches) high and packages having a maximum capacity 5 liters (1.32 gallons) or 5 kg (11 pounds) or less must be marked in a size appropriate for the size of the package.

PHMSA is adopting this minimum size marking for the "UN" or "NA" markings to align with newly adopted requirements in the 17th Revised Edition of the UN Model Regulations. PHMSA recognizes the importance of establishing a minimum size requirement for the internationally recognized "UN" identification number marking system. Without a minimum size requirement for hazard communication, shippers may mark packages in a format that makes it difficult for first responders to identify the commodity associated with a particular package.

In response to the NPRM, PHMSA received several comments concerning this proposed requirement. DGAC and Dow suggested extending the compliance date for this provision to January 1, 2017 to allow companies time to make the transition, and for the depletion of both finished product and prepackaged inventory that do not meet the requirements of the proposal.

Veolia noted that their company's proprietary software produces markings that would not be in compliance with the proposed size limitations and that they would incur a cost to reprogram their system if the proposal is maintained. They further contended that in 20 years of displaying the marking they are unaware of any instances of the markings being questioned as being too small or illegible. Veolia requested that the

minimum size requirement apply to international shipments only.

Stericycle and the HWI requested an exception to this marking requirement for dedicated carriers of regulated medical waste. These commenters stated that the proposed change would impose a significant cost on the industry. They requested an exception for the continued use of existing containers used to transport regulated medical waste and permanently marked with the applicable "UN" number.

PHMSA accepts that many packages are currently marked in a manner that may not in all cases meet the new minimum size standards. In response to the comments raised to the NPRM we will provide, for domestic transportation, a transition period to continue using non-bulk packagings displaying "UN" or "NA" number markings in accordance with the requirements in effect on October 1, 2011 (i.e., no minimum size), until January 1, 2017.

PHMSA maintains that there is benefit to harmonization in this case, and having a single standard outweighs the cost incurred by a company to revise its software and systems to produce compliant markings. The transition period for the continued use of the current markings in domestic transportation provides an opportunity for companies to revise their marking systems and maintain compliance. PHMSA is sympathetic to the assertion that the containers used to transport regulated medical waste are often permanently stamped with the "UN" number and the containers often have very long useful lives. Therefore PHMSA is also including an exception that allows packages that are permanently marked with the UN number (e.g., by embossing or through a heat stamp process) and are manufactured prior to January 1, 2017 to continue in service for the life of the container.

DGAC noted that while an inch conversion was provided in the preamble there is no inch conversion noted in the regulations text. This was an oversight and has been corrected in this final rule.

COSTHA questioned if the minimum size of the "UN" number markings should be dictated by the maximum capacity of the outer package or the inner packagings. COSTHA proposed an example package consisting of 2 inner packagings of 4 L each. Maximum capacity is defined in § 171.8 as "the maximum inner volume of receptacles or packagings." A package containing 2 inner packagings with a maximum capacity of 4 L each would have a

maximum capacity of 8 L, and thus would require a 6 mm minimum UN number marking.

It was also noted that the UNSCOE, at its 39th session, provided an exception from minimum marking size requirements for cylinders of 60 liters water capacity or less. PHMSA agrees that cylinder markings have historically been allowed provisions that would allow for smaller UN number markings than other non-bulk packages and is providing an exception for cylinders of 60 liters water capacity or less consistent with the recent UNSCOE exception.

Therefore, with the aforementioned transition period, exceptions, and note, PHMSA is specifying a marking size consistent with package marking sizes adopted in the 17th Revised Edition of the UN Model Regulations.

Section 172.312

Section 172.312 details the specific marking requirements for liquid hazardous materials in non-bulk packagings. Paragraph (a) of this section describes scenarios when package orientation arrows must be displayed on the outside of a package. Provided certain criteria are met, paragraph (c) excepts certain shipments from the requirements of paragraph (a) and thus, the requirement to display the package orientation arrows on the package. Currently § 173.312(c)(3) states that when offered or intended for transportation by aircraft, packages containing flammable liquids in inner packagings of 120 mL (4 fluid oz.) or less prepared in accordance with § 173.150(b) or (c) of this subchapter when packed with sufficient absorption material between the inner and outer packagings to completely absorb the liquid contents are not required to display the package orientation arrows on the outside of the package. The ICAO TI have been amended to extend this exception to the package orientation markings to all liquid hazardous materials in inner packagings of 120 mL (4 fluid oz.) when packed with sufficient absorption material between the inner and outer packagings to completely absorb the liquid contents. PHMSA is adopting this change, consistent with the amendment made to the ICAO TI to extend the exception for the display of the package orientation arrows to all liquid hazardous materials in inner packagings of 120 mL (4 fluid oz.) when packed with sufficient absorption material between the inner and outer packagings to completely absorb the liquid contents.

Section 172.407

This section provides label specifications. PHMSA is amending paragraph (f) to include a cross reference to the IBR § 171.7.

Section 172.604

Section 172.604 prescribes emergency response telephone number requirements. Paragraph (d) of this section provides a listing of materials that are excepted from the requirement to provide an emergency response telephone number on a shipping document.

PHMSA is adding "Krill Meal, PGIII" to the list of materials excepted from the emergency response telephone number requirements. Krill meal poses similar hazards to fish scrap and meal; therefore, we are providing Krill meal with the same exception from the emergency response telephone number requirements as fish scrap and meal.

Part 173

Part 173 of the HMR describes the general requirements for shipments and packagings of hazardous materials. Consistent with amendments adopted by the UN Model Regulations, PHMSA is adopting changes throughout the Part 173 packaging requirements to authorize more flexibility when choosing packages for hazardous materials. Specifically PHMSA is authorizing the use of the following packaging types and materials:

The specific packaging requirements for Class 1 explosive materials are specified in § 173.62. In this final rule PHMSA is revising § 173.62 to authorize wood as an appropriate material used to construct receptacles, inner and outer intermediate packagings, and intermediate packagings/dividing partitions for certain explosives. Furthermore, PHMSA is authorizing the use of metals other than steel or aluminum in specification packagings, specifically drums (1N1 or 1N2) and boxes (4N), as appropriate. This authorization does not include chlorosilanes under § 173.206 because of corrosion concerns. Otherwise, it authorizes the use of closed head drums where open head drums are generally permitted. PHMSA believes these amendments provide greater flexibility in packaging while maintaining an equivalent level of safety.

Consistent with amendments adopted by the ICAO Technical Instructions, PHMSA is adopting changes in various sections on Part 173 where certain articles, items, and materials are excepted from the requirements of the subchapter. There is a potential for

these excepted articles, items, and materials to be inappropriately carried aboard an aircraft by passengers or crewmembers. The changes will address this concern by clarifying that certain excepted articles, items and materials, identified by ICAO as posing a safety risk, must be transported as cargo and cannot be carried onboard an aircraft by passengers or crewmembers as carry-on baggage, checked baggage, or on their person unless specifically excepted by § 175.10, "Exceptions for Passengers, Crewmembers, and Air Operators." The amended sections include §§ 173.159a, 173.162, 173.164, 173.175, 173.219, and 173.306. For UN3166 and UN3268, Special Provision A200 is created to communicate this requirement and a reference to special provision A200 is placed in column 7 of the HMT for these entries. In response to the NPRM, COSTHA and Mercotac, suggested changes to regulatory text language to eliminate confusion that these items may only be able to be transported as cargo. PHMSA has revised the language in §§ 173.159a, 173.162, 173.175, 173.219, and 173.306 to be consistent with the language in special provision A200 that these excepted articles, items and materials must be transported as cargo and cannot be carried onboard an aircraft by passengers or crewmembers as carry-on baggage, checked baggage, or on their person unless specifically excepted by § 175.10.

PHMSA received one comment from the FCHEA requesting that we amend § 175.10(a)(19) to allow fuel cell cartridges containing flammable gas in division 2.1 and fuel cells containing water reactive materials in division 4.3 in checked passenger baggage. PHMSA did not propose changes to the provisions allowing for the checking limited types of fuel cells in the NPRM, and consider this request to be outside the scope of this rulemaking.

Section 173.4b

This section specifies exceptions for materials packaged in de minimus quantities. In the NPRM, PHMSA proposed and is subsequently adopting in this final rule, an exception in § 175.10(a)(22) to permit non-infectious specimens packaged in accordance with § 173.4b(b) to be carried aboard an aircraft by passengers and crewmembers in checked or carry-on baggage or on their person. In the NPRM we inadvertently neglected to revise the language in § 173.4b(b)(8) to recognize this exception. In this final rule, PHMSA is revising § 173.4b(b)(8) to reference the adopted exception in § 175.10(a)(22).

Section 173.12

This section specifies the exceptions for shipment of waste materials including the requirements for waste packages known as "lab packs." A lab pack, although not specifically defined in § 171.8, is considered a large outer packaging containing small inner packagings that are filled with various compatible laboratory hazardous wastes. Paragraph (b) of this section specifies the authorized inner and outer packagings for lab packs.

In this final rule, PHMSA is revising paragraph (b)(2)(ii)(a) of this section by adding 1N2 metal drums to the permitted outer packagings currently authorized for a lab pack.

Section 173.21

Section 173.21 prescribes materials and packages forbidden for transport. In this final rule, PHMSA is correcting the IMDG Code section reference to control temperature requirements in § 173.21(f)(3)(ii) from 7.7 to 7.3.7.

Section 173.37

Currently, the HMR does not include a section that prescribes general requirements for packaging hazardous materials in Flexible Bulk Containers (FBCs). In this final rule, PHMSA is adding such requirements in new § 173.37 in a similar format to the general requirements for other bulk and large packagings (e.g., portable tanks, IBCs, etc.) in subpart B of part 173. This section includes, but is not limited to, requirements addressing the initial use and reuse of FBCs, capacity requirements and general transport conditions. Consistent with the use and reuse requirements of other large and bulk packagings, the general requirements in part 173 complement the construction and manufacture specifications for such bulk packagings in part 178 of the HMR.

PHMSA is authorizing the reuse of FBCs. The FBC must be given a visual examination prior to reuse. Furthermore, the general requirements for FBCs specify that FBCs must be transported in a conveyance with rigid sides and ends that extend at least two-thirds the height of the FBC, must not be offered for transportation in freight containers, and may not exceed 15 cubic meters in capacity.

Section 173.50

Section 173.50 provides definitions for the various divisions of Class 1 (explosives) referenced in Subpart C of Part 173. Paragraph (b) of this section notes that Class 1 (explosives) are divided into six divisions. Division 1.6 is described as an explosive consisting

“of extremely insensitive articles that do not have a mass explosive hazard. This division is comprised of articles that contain only extremely insensitive detonating substances and that demonstrate a negligible probability of accidental initiation or propagation.”

In this final rule, PHMSA is removing the word “detonating” from this definition to align with the revised definition provided in the 17th Revised Edition of the UN Model Regulations.

Section 173.56

Section 173.56 prescribes the definition of new explosives and provides explosive (Class 1) classification and approval requirements. Paragraph (h) of § 173.56 states that small arms ammunition, within certain parameters is not subject to the approval requirements of the rest of § 173.56.

PHMSA received a comment from SAAMI requesting that PHMSA amend § 173.56 to except Cases, cartridge, empty with primer and Cartridges for tools, blank from the approval requirements of § 173.56. SAAMI noted that for Cartridges for tools, blank the switch from UN 0323 to UN 0014 could necessitate new EX approvals for products which are essentially identical to those already exempted. SAAMI noted that Cases, cartridge, empty with primer refers to small arms cartridges with no bullet or propellant but with a primer, just an empty primed case. SAAMI stated that Cases, cartridge, empty with primer of 50 caliber or less clearly meet the intent and equivalent level of safety to products already referenced in 173.56(h).

PHMSA is amending § 173.56(h) to ensure Cartridges for tools, blank that meet the conditions of that paragraph are excepted from the requirements of the rest of this section. PHMSA believes this to be a natural extension of the intent of the exception in § 173.56(h) as well as a necessary domestic change that is a direct result of international rulemaking.

PHMSA will not be adding Cases, cartridge, empty with primer to § 173.56(h). PHMSA believes Cases, cartridge, empty with primer to be materially different from those articles currently authorized for the exception in § 173.56(h). The proposed addition of Cases, cartridge, empty with primer to § 173.56(h) is also not a direct result of international rulemaking and this rulemaking vehicle is not suited for such a proposal.

Section 173.59

Section 173.59 provides definitions of explosive terms related to the transport

and classification of explosives used throughout subpart C of part 173. These definitions are intended for information only and are not to be used for purposes of classification or to replace proper shipping names prescribed in § 172.101. In the UN Model Regulations, Appendix B to Chapter 3 contains a similar list of explosive definitions which are also intended for information only and are not to be used for purposes of hazard classification.

In April 2010, the United States and the United Kingdom submitted a formal document regarding proposed modifications to the UN test series 7 for consideration by the UN Subcommittee of Experts on the Transport of Dangerous Goods. Test series 7 is used to classify explosives into the appropriate class.¹ This paper sought to modify the test series 7 to more accurately address the classification of Division 1.6. Specifically, Division 1.6 is for extremely insensitive detonating articles and the proposed changes in the US/UK paper are designed to ensure that the probability of accidental initiation or propagation of an article attaining this division remains negligible.

In the 17th Revised Edition of the UN Model Regulations, the proposals presented in the US/UK paper regarding the UN test series 7 were adopted. Among the adopted proposals was the addition of various explosive specific definitions referencing the modifications to the UN test series 7. In this final rule, we are revising the various definitions prescribed in § 173.59. Specifically, we revised the definition for “Articles, explosive, extremely insensitive (Articles, EEI)” by removing the word “detonating” and adding the words “tools” after “starter pistols” in the definition for “Cartridges, blank.” We also replaced the definition for “Explosive, extremely insensitive detonating substances (EIDS)” with a new definition for “Explosive, extremely insensitive substances (EIS).” Lastly, we added a definition for “Auxiliary explosive component, isolated.” The addition of and revisions to these definitions provide consistency with international regulations and clarity when utilizing the UN test series 7 for explosive classification.

PHMSA received one comment from SAAMI that requested we revise the

¹ The scientific data regarding the adoption of these modifications are presented in working paper ST/SG/AC.10/C.3/2010/40 entitled “Proposed modifications to Test Series 7.” This paper can be viewed at the following URL: <http://www.unece.org/fileadmin/DAM/trans/doc/2010/ac10c3/ST-SG-AC10-C3-2010-40e.pdf>.

proposed definition of Cartridges, blank. The definition proposed by SAAMI was “Cartridges, blank. Articles that consist of a cartridge case with a center or rim fire primer, with or without a confined charge of smokeless or black powder, but with no projectile. Used in training, saluting, or in starter pistols, tools, etc.” SAAMI’s proposal would remove the requirement for Cartridges, blank to contain a confined charge of smokeless powder. This SAAMI proposed definition is not consistent with the UN adopted definition for Cartridges, blank. Additionally adopting the definition proposed by SAAMI may conflict with the standing definition for Cases, cartridge empty with, primer. For the aforementioned reasons, PHMSA is adopting the definition as proposed in the August 15, 2012 NPRM.

Section 173.62

Section 173.62 prescribes the specific packaging requirements for explosives. These packaging requirements stipulate the permitted inner, intermediate, and outer packagings as well as any specific additional packaging information. These packaging requirements are generally aligned with the requirements stipulated in the UN Model Regulations.

In this final rule, PHMSA is revising various packaging provisions in the “Table of Packing Methods” in this section to align with changes adopted in the 17th Revised Edition of the UN Model Regulations. The revisions to the authorized packaging methods provide greater flexibility when packaging explosives while retaining an appropriate level of safety. These changes include, but are not limited to, permitting various explosives to be transported in closed head drums in addition to the already permitted removable head drums and adding the option to utilize wooden inner and intermediate packagings in various packaging provisions.

Section 173.63

Section 173.63 provides packaging exceptions for specific types of low hazard explosive materials including certain detonators, small arms ammunition and detonating cord. PHMSA received one comment from SAAMI requesting that PHMSA clarify its intent to allow these articles to display either the ground limited quantity mark or the air limited quantity mark regardless of the mode of transport.

In this final rule PHMSA is clarifying the language in § 173.63(b)(2) to clearly state that a limited quantity of 1.4S material may be marked with either the surface or the air limited quantity

marking regardless of mode of transport. However, PHMSA also notes that in October of 2012 the ICAO Dangerous Goods Panel Working Group of the Whole (DGP-WG/12) considered, but did not adopt, a proposal to authorize limited quantities of certain 1.4S articles. DGP-WG/12 did note that packages bearing the limited quantity marking of other modes could still be accepted for air transport provided all additional requirements of the ICAO Technical Instructions were met. As a result of the DGP-WG/12 decision PHMSA and FAA believe retaining the option to display the air limited quantity marking by all modes may result in confusion and potentially frustrate shipments of packages that display the air limited quantity marking in air transit.

As a result of the recent DGP-WG/12 decision PHMSA and FAA plan to consider removing the authorization to display the air limited quantity marking for limited quantity materials packaged in accordance with § 173.63(b)(2) in a future rulemaking, as such a change was not proposed in the NPRM to this final rule.

PHMSA received one comment from SAAMI requesting that the recent UN assignment of limited quantity packaging authorizations to Cases, cartridges, empty with primer (UN0055) be extended to this commodity in the HMR. PHMSA agrees and has made the relevant text changes to § 173.63. SAAMI also commented that the ORM-D entries removed from the table should be left until the expiration of the transitional period for their use. PHMSA agrees and has inserted those proper shipping names back into § 173.63.

Section 173.115

Section 173.115 prescribes the definitions for Class 2 materials. Paragraph (k) of this section specifies how the oxidizing ability of certain Division 2.2 gases is determined. Currently, the HMR references ISO standards that include test and calculations used to determine the oxidizing ability of certain Division 2.2 gases. The UN Model Regulations and the ICAO Technical Instructions replace references to ISO standards 10156:1996 and 10156-2:2005 with the updated version ISO 10156:2010.

Based on its technical review, PHMSA believes the updated standard provides an adequate level of safety and is referencing the standard in this section and adding it to the list of IBR materials in § 171.7.

Section 173.121

Section 173.121 prescribes the requirements for selection of packing groups for Class 3 flammable liquids. Paragraph (b) of this section describes the criteria for inclusion of viscous Class 3 materials in Packing Group III.

ICAO adopted requirements in the Technical Instructions that increased the quantity of viscous Class 3 flammable liquids permitted reclassification from Packing Group II to Packing Group III from 30 L (7.9 gal) per package to 100 L (26.42 gal) per package when offered for transport by cargo aircraft.

In this final rule, PHMSA is expanding the per package amounts of viscous Class 3 material meeting the requirements in § 173.121(b). The increase will facilitate multi-modal transportation by permitting shipments offered by highway, rail, and cargo-carrying aircraft to utilize the same 100 L criteria.

Section 173.134

Provisions contained in the UN Model Regulations, Chapter 2.6, Class 6—Toxic and Infectious Substances, relating to the transportation of medical devices and equipment, have been amended to except medical equipment which has been drained of free liquid from the requirements of the UN Model Regulations. In addition, except for medical devices or equipment being transported for disposal, or medical devices or equipment contaminated with or suspected of contamination with a Category A infectious substance, the UN Model Regulations have been amended to exempt medical devices or equipment potentially contaminated with or containing infectious substances which are being transported for disinfection, cleaning, sterilization, repair or equipment evaluation from all other requirements of the UN Model Regulations, provided they meet certain packaging requirements.

PHMSA is amending § 173.134, “Class 6, Division 6.2—Definitions and Exceptions” by adopting the additional exemptions for medical devices and equipment.

Section 173.158

Section 173.158 prescribes packaging requirements for nitric acid mixtures of varying concentrations. PHMSA is revising the list of outer packagings permitted for nitric acid mixtures of varying concentrations.

Specifically, PHMSA is revising paragraph (d)(2) by adding 1N2, 4A, 4B and 4N packagings to the list of authorized outer packagings of

combination packages for Nitric acid of 90 percent or greater concentration, when offered for transportation or transported by rail, highway, or water, in addition to the packaging options currently authorized.

PHMSA is also revising paragraph (e) of this section pertaining to nitric acid of less than 90 percent concentration, when offered for transportation or transported by rail, highway, or water. Specifically, this paragraph is revised to permit packagings of specification 4A, 4B, or 4N metal boxes for certain nitric acid concentrations.

Further, PHMSA is revising paragraphs (f)(3), (g) and (h) by adding specification 1N2, 4A, 4B and 4N packagings to the list of authorized outer packagings of combination packagings for Nitric acid of the following concentrations; (1) Nitric acid of 70 percent or less concentration, when offered for transportation or transported by rail, highway, or water; (2) Nitric acid of more than 70 percent concentration, when offered for transportation or transported by cargo aircraft only; and (3) Nitric acid of less than 70 percent concentration, when offered for transportation in cargo aircraft only.

The addition of these packaging options will increase flexibility for shippers when determining the appropriate packaging for nitric acid mixtures, in addition to the packaging options currently authorized.

Section 173.159a

Section 173.159a provides exceptions for non-spillable batteries. Paragraph (d) of this section excepts non-spillable batteries from the requirements of the HMR provided certain criteria, including specific packaging requirements and the absence of free-flowing liquid in the battery, are met.

In this final rule, PHMSA is clarifying paragraph (d) of this section by adding a new subparagraph (d)(3) stating that “for transport by aircraft, must be transported as cargo and may not be carried onboard an aircraft by passengers or crewmembers in carry-on baggage, checked baggage, or on their person unless specifically excepted by § 175.10.” This clarification will align the HMR with the previously discussed changes made to the ICAO TI with regard to the air transport of non-spillable batteries that are excepted from the HMR.

Section 173.160

Section 173.160 prescribes packaging requirements for “Bombs, smoke, non-explosive” when shipped without ignition devices. PHMSA is revising the

list of packagings permitted for “Bombs, smoke, non-explosive” shipped without ignition devices. Specifically, PHMSA is adding the authorization to use metal (4A, 4B, and 4N), fiberboard (4G) or solid plastic (4H2) boxes, or metal (1A2, 1B2, and 1N2), plastic (1H2), plywood (1D), or fiber (1G) drums.

Section 173.162

Section 173.162 prescribes the packaging requirements for “UN2803, Gallium.” PHMSA is revising paragraph (a)(1), to permit both open and closed steel, metal, other than steel and aluminum drums (1A1, 1N1, 1N2, 1H1, 3A2 or 3H2) in addition to the packaging options currently authorized.

Further, PHMSA is revising paragraph (a)(2), to permit metal, other than steel or aluminum (4N) boxes; metal, other than steel or aluminum drums (1N1, 1N2); and plastic drums (1H1 or 1H2) in addition to the packaging options currently authorized.

In addition, PHMSA is clarifying paragraph (c) by stating that “for transport by aircraft, must be transported as cargo and may not be carried onboard an aircraft by passengers or crewmembers in carry-on baggage, checked baggage, or on their person unless specifically excepted by § 175.10.” This clarification will align the HMR with the previously discussed changes adopted in the ICAO Technical Instructions regarding the air transport of gallium otherwise excepted from the HMR.

Section 173.164

Section 173.164 prescribes the packaging requirements for Mercury (metallic and articles containing mercury). In this final rule, PHMSA is revising paragraph (a)(1), to permit steel drums; metal, other than steel and aluminum drums (1A1, 1N1, 1N2) and metal, other than steel or aluminum boxes (4N), in addition to the packaging options currently authorized in paragraphs (a), (b) and (c).

Paragraph (f) is added to provide an exception to the requirements of the HMR for vessel transport of manufactured articles or instruments containing less than 0.45 kg (1.0 pound) of mercury. This exception is inserted to mirror an existing IMDG Code provision and harmonize the requirements for vessel shipments of mercury contained in manufactured articles as much as possible.

In addition, PHMSA is clarifying paragraphs (a)(5), (b), and (c)(2) of this section by adding the phrase “when transported as cargo.” This clarification will align the HMR with the previously discussed changes adopted in the ICAO

Technical Instructions regarding the air transport of manufactured articles containing mercury otherwise excepted from the HMR.

Section 173.165

Section 173.165 prescribes the transport and packaging requirements for polyester resin kits. PHMSA is revising § 173.165 to better align the packaging and other requirements for UN3269, Polyester resin kits with the various international modal standards. These amendments correct inconsistencies adopted in a final rule published in the **Federal Register** on January 19, 2011 (76 FR 3308; HM–215K).

Section 173.175

Section 173.175 prescribes the transport and packaging requirements for permeation devices. Currently, permeation devices containing hazardous materials that are used for calibrating air quality monitoring devices are not subject to the HMR provided they meet specific requirements that include packaging, quantity limitations, testing, and transport controls.

PHMSA is adding a new paragraph (g) stating that “for transport by aircraft, must be transported as cargo and may not be carried onboard an aircraft by passengers or crewmembers in carry-on baggage, checked baggage, or on their person unless specifically excepted by § 175.10.” This clarification aligns the HMR with changes adopted in the ICAO Technical Instructions regarding the air transport of permeation devices that are otherwise excepted from the HMR.

Section 173.176

Electric double layer capacitors are devices that store but do not produce electrical energy. They contribute to increased fuel efficiency in many alternative energy solutions such as hybrid vehicles. Some double layer capacitors contain flammable liquid absorbed in a solid with small amounts present as free liquid while others use a liquid electrolyte. Currently, the HMR do not contain specific requirements to address the transport of electric double layer capacitors.

New Section 173.176 addresses electric double layer capacitors, prescribing the testing, marking, safety, and packaging requirements for electric double layer capacitors with an energy storage capacity greater than 0.3 Wh. PHMSA is incorporating these requirements consistent with the 17th Revised Edition of the UN Model Regulations. These amendments address potential electrical and other hazards

arising from the release of hazardous materials during the transportation of these articles.

Section 173.181

Section 173.181 prescribes the non-bulk packaging requirements applicable to pyrophoric liquids. Paragraph (b) of this section specifies the specification boxes authorized to package these substances. PHMSA is revising paragraph (b) by adding packaging authorizations for steel boxes (4A), aluminum boxes (4B), metal boxes, other than steel or aluminum (4N), or fiberboard boxes (4G); steel drums (1A1 or 1A2), aluminum drums (1B1 or 1B2), metal drums, other than steel or aluminum (1N1 or 1N2), plywood drums (1D), or fiber drums (1G); or steel jerricans (3A1 or 3A2) or aluminum jerricans (3B1 or 3B2).

Section 173.183

Section 173.183 prescribes the packaging requirements for nitrocellulose base film. To provide greater flexibility in packaging selection, PHMSA is adding other metal drums (4A2), aluminum jerricans (3B2), and steel, aluminum or other metal (4A, 4B, 4N) boxes, to the list of authorized packagings.

Section 173.184

Section 173.184 provides the definition and packaging requirements for highway or rail fusees. To provide greater flexibility in packaging selection, steel (1A2), aluminum (1B2) or other metal (1N2) drums; steel (3A2) or aluminum (3B2) jerricans; and steel (4A), aluminum (4B) or other metal (4N) boxes are added to the list of authorized packagings.

Section 173.186

Section 173.186 provides definitions and packaging requirements for various types of matches. To provide greater flexibility in packaging selection, PHMSA is adding packaging options to the list permitted for strike-anywhere matches specified in paragraph (f) of this section. Specifically steel drums (1A1 or 1A2), aluminum drums (1B1 or 1B2), other metal drums (1N1, 1N2), steel jerricans (3A1, 3A2), aluminum jerricans (3B1, 3B2), steel (4A), aluminum (4N) and other metal (4N) boxes are added to the list of authorized packagings.

Section 173.187

Section 173.187 prescribes the packaging requirements for pyrophoric solids, metals or alloys, n.o.s. To provide greater flexibility in packaging selection, PHMSA is adding packaging

options to the list permitted for pyrophoric solids, metals or alloys, n.o.s. specified in paragraph (a) and (d) of this section. Specifically, steel, aluminum or other metal boxes (4A, 4B or 4N) are added to the list of authorized packagings in paragraph (a). In addition, steel, aluminum or other metal drums (1A1, 1A2, 1B1, 1B2, 1N1 or 1N2) are added to the list of authorized packagings in paragraph (d).

Section 173.188

Section 173.187 prescribes the packaging requirements for white and yellow phosphorus. To provide greater flexibility in packaging selection, steel, aluminum or other metal boxes (4A, 4B or 4N) are added to the list of authorized packagings in paragraph (a)(1). In addition, PHMSA is adding steel, aluminum or other metal drums (1A1, 1B1 or 1N1) not over 250 L (66 gallons) capacity each and steel, aluminum or other metal drums (1A2, 1B2, or 1N2) not over 115 L (30 gallons) capacity each, to the list of authorized packagings in paragraph (a)(2).

Section 173.189

Section 173.189 prescribes the packaging and transport requirements for batteries containing sodium or cells containing sodium. To provide greater flexibility in packaging selection, PHMSA is adding 1N2, 4A, 4B, 4N, 4H1, 3A2, 3B3 and 3H2 outer packagings to the list of authorized outer packagings in paragraph (b).

Section 173.193

Section 173.193 prescribes the packaging requirements for bromoacetone, methyl bromide, chloropicrin and methyl bromide or methyl chloride mixtures. To provide greater flexibility in packaging selection, metal boxes (4A, 4B or 4N) are added to the list of authorized outer packagings in paragraph (a).

Section 173.194

Section 173.194 prescribes the packaging requirements for gas identification sets. To provide greater flexibility in packaging selection, metal boxes (4A, 4B or 4N) are added to the list of authorized outer packagings in paragraphs (b)(1) and (b)(2).

Section 173.196

Section 173.196 prescribes the packaging requirements for Category A infectious substances. To provide greater flexibility in packaging selection, PHMSA is adding drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G); boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2); or jerricans (3A1, 3A2, 3B1,

3B2, 3H1, 3H2) as examples of the types of authorized "rigid outer packaging" referenced in paragraph (a)(3).

Section 173.199

Section 173.199 prescribes the packaging requirements for category B infectious substances. Paragraph (d) of this section provides the requirements for refrigerated or frozen specimens in ice, dry ice or liquid nitrogen. These provisions include the requirement to secure secondary packages.

Consistent with an editorial amendment to Packing Instruction P650 in the 17th Revised Edition of the UN Model Regulations, PHMSA is removing the language "position after the ice or dry ice has dissipated" from the requirements to secure secondary packages.

Section 173.201

Section 173.201 prescribes the authorized non-bulk packagings for liquid hazardous materials in packing group I. To provide greater flexibility in packaging selection, PHMSA is adding "Metal box other than steel or aluminum: 4N" to authorized outer packagings of combination packagings listed in paragraph (b) of this section.

Section 173.202

Section 173.202 prescribes the authorized non-bulk packagings for liquid hazardous materials in packing group II. To provide greater flexibility in packaging selection, PHMSA is adding "Metal box other than steel or aluminum: 4N" to the authorized outer packagings of combination packagings indicated in paragraph (b).

Section 173.203

Section 173.203 prescribes the authorized non-bulk packagings for liquid hazardous materials in packing group III. To provide greater flexibility in packaging selection, PHMSA is adding "Metal box other than steel or aluminum: 4N" to the authorized outer packagings of combination packagings indicated in paragraph (b).

Section 173.211

Section 173.211 prescribes the authorized non-bulk packagings for hazardous materials in packing group I. To provide greater flexibility in packaging selection, PHMSA is adding "Metal box other than steel or aluminum: 4N" to the authorized outer packagings of combination packagings indicated in paragraph (b) and the single packagings authorized in paragraph (c).

Section 173.212

Section 173.212 prescribes the authorized non-bulk packagings for hazardous materials in packing group II. To provide greater flexibility in packaging selection, PHMSA is adding "Metal box other than steel or aluminum: 4N" to authorized outer packagings of combination packagings indicated in paragraph (b). Further, we are adding "Metal box other than steel or aluminum: 4N" and "Metal box other than steel or aluminum with liner: 4N" to authorized single packagings permitted in paragraph (c) of this section.

Section 173.213

Section 173.213 prescribes the authorized non-bulk packagings for hazardous materials in packing group III. To provide greater flexibility in packaging selection, PHMSA is adding "Metal box other than steel or aluminum: 4N" to the authorized outer packagings of combination packagings indicated in paragraph (b). Further, we are adding "Metal box other than steel or aluminum: 4N" and "Metal box other than steel or aluminum with liner: 4N" to the single packagings authorized in paragraph (c).

Section 173.219

Section 173.219 prescribes the transport conditions and packaging requirements for life saving appliances. Paragraph (b) of this section provides a list of hazardous materials that a life-saving appliance is permitted to contain as well as other transport requirements. Currently, the transport conditions specified in paragraph (b)(1) of this section specify that Division 2.2 compressed gases, including oxygen are permitted; however, oxygen generators are not. In this final rule, PHMSA is broadening the materials permitted in life-saving appliances by modifying paragraph (b)(1) to include liquefied gases as well.

Paragraph (c) of this section prescribes the packaging requirements and exceptions provided for life saving appliances. Subsequent changes are proposed to paragraph (c)(1) of this section to reflect this inclusion of liquefied gases discussed previously. Furthermore, paragraph (c)(5) currently states that, for other than transportation by aircraft, life-saving appliances containing no hazardous materials other than carbon dioxide with a capacity not exceeding 100 cm³ are not subject to the provisions of this subchapter provided they are overpacked in rigid outer packagings with a maximum gross mass of 40 kg. In this final rule, PHMSA is

revising the exception in (c)(5) by replacing the language “carbon dioxide” with “cylinders of Division 2.2 compressed or liquefied gases with no subsidiary risk,” and the quantity limit “100 cm³” with “120 mL, installed solely for the purpose of activating the appliance.”

In addition, we are further clarifying paragraph (c)(5) of this section by adding the statement, “For transportation by aircraft, such appliances must be transported as cargo and may not be carried onboard an aircraft by passengers or crewmembers in carry-on baggage, checked baggage, or on their person unless specifically excepted by § 175.10.” This clarification aligns the HMR with the recently adopted changes in the ICAO Technical Instructions regarding the air transport of life saving appliances that would otherwise be excepted from the HMR.

Section 173.220

Section 173.220 prescribes packaging requirements for internal combustion engines, self-propelled vehicles, mechanical equipment containing internal combustion engines, battery-powered equipment or machinery, fuel cell-powered equipment or machinery. In this rule PHMSA is amending paragraph (d) to cross reference the IBR § 171.7.

Section 173.221

Section 173.221 prescribes the non-bulk packaging requirements for Polymeric beads (or granules), expandable, *evolving flammable vapor* and Plastic molding compound *in dough, sheet or extruded rope form, evolving flammable vapor*. PHMSA is adding the following packaging authorizations: metal (4A, 4B, or 4N), and plastic (4H1 or 4H2) drums, and 1N1, 1N2 drums in vapor tight metal or plastic jerricans (3A1, 3A2, 3B1, 3B2, 3H1, or 3H2). PHMSA is also adding a paragraph to the section that reference the reader to a newly created § 176.907 for cargo transport and hazard communication marking requirements for shipments of Polymeric beads expandable, *evolving flammable vapor* and Plastic molding compound *in dough, sheet or extruded rope form, evolving flammable vapor* when transported by vessel. These changes address the safety hazard presented by shipments of polymeric beads or plastic molding compounds off-gassing flammable vapors during vessel transport. See *Section 176.907* for a detailed discussion of our addition of these vessel cargo transport requirements.

Section 173.225

Section 173.225 prescribes the packaging requirements and other provisions for organic peroxides. Packaging requirements for organic peroxides are very specific and include requirements for the concentration by mass permitted, diluents percentage, water mass, temperature controls and organic peroxide specific packing methods.

Paragraph (c) of this section contains and describes the organic peroxide table and how specific organic peroxides are to be transported. In addition, paragraph (e) contains a separate table that prescribes the packaging requirements for organic peroxides packaged in IBCs. As self-insulating hazardous materials, organic peroxides can pose different risks when transported in larger quantities. Thus, a separate table unique to the transport of these substances in IBCs is contained in the HMR. The “Organic Peroxide IBC Table” includes maximum quantities permitted to be packaged and any temperature and emergency controls.

The organic peroxides tables in paragraphs (c) and (e) specify by technical name those organic peroxides that are authorized for transportation and not subject to the approval provisions of § 173.128. An organic peroxide identified by technical name is authorized for transportation only if it conforms to all applicable provisions of these tables. In this final rule, we are amending the Organic Peroxides Tables in § 173.225 by adding new entries and revising current entries to account for new organic peroxides and formulations that are commercially available.

The following entries are added in the § 173.225(c) organic peroxides table:

UN3106, “[3R-(3R,5aS,6S,8aS,9R,10R,12S,12aR**)]-Decahydro-10-methoxy-3,6,9-trimethyl-3,12-epoxy-12H-pyrano[4,3-j]-1,2-benzodioxepin”

UN3110, “3,6,9-Triethyl-3,6,9-trimethyl-1,4,7-triperoxonane”

UN3119, “Di-(3,5,5-trimethylhexanoyl) peroxide”

The following current entries in the § 173.225(c) organic peroxides table are amended:

UN3115, “Diisopropyl peroxydicarbonate”

UN3115, “Di-(3,5,5-trimethylhexanoyl) peroxide”

The following entries are added to the § 173.225(e) Organic Peroxide IBC Table:

UN3119 “Diisobutyl peroxide, not more than 28% as a stable dispersion in water”

UN3119, “Diisobutyl peroxide, not more than 42% as a stable dispersion in water”

The following entries are amended in the § 173.225(e) Organic Peroxide IBC Table:

UN3119 “Di-(3,5,5-trimethylhexanoyl) peroxide, not more than 38% in diluent type A”

UN3119 “1,1,3,3-Tetramethylbutyl peroxyneodecanoate, not more than 52%, stable dispersion, in water”

Section 173.226

Section 173.226 prescribes the packaging requirements for Materials poisonous by inhalation, Division 6.1, Packing Group I, Hazard Zone A. Specifically, this section authorizes the transport of Materials poisonous by inhalation, Division 6.1, Packing Group I, Hazard Zone A in specification cylinders, specification drums packaged further in specification drums and combination packages. PHMSA is revising the requirements of paragraph (c) by adding an authorization to package such materials in “Metal box other than steel or aluminum: 4N” drums. In addition, PHMSA is correcting an editorial error by replacing the incorrect wording “Expanded plastic box: 4H2” with the correct wording “Expanded plastic box: 4H1.”

Section 173.230

Section 173.230 prescribes the transport requirements for fuel cell cartridges containing hazardous material. Paragraph (e) of this section prescribes the packaging requirements for fuel cell cartridges containing hazardous material. Furthermore, paragraph (e)(2)(ii) notes that “Fuel cell cartridges contained in equipment must be protected against short circuits and the entire fuel cell system must be protected from unintentional activation. The equipment must be securely cushioned in the outer packaging.” As currently stated in the HMR, this requirement may imply that only fuel cell cartridges contained in equipment, not the fuel cell system, would have to be protected against short circuits. This is not the intent of this requirement. Therefore, PHMSA is clarifying that the entire fuel cell system must be protected against short circuits and unintentional activation.

Section 173.240

Section 173.240 prescribes the bulk packagings authorized for certain low hazard solid materials. As discussed previously, PHMSA is adopting flexible bulk container provisions throughout the HMR.

In this section, PHMSA is adding paragraph (f) that authorizes the use of FBCs for certain low hazard solid materials. Specifically, paragraph (f) permits the use of FBCs if B120 is indicated in Column (7) of the specific entry in § 172.101 HMT and the FBC conforms to the requirements in subparts R and S of part 178 of the HMR. Furthermore, paragraph (f) notes that FBCs may not be used for Packing Group I or II hazardous materials. Only select low hazard solid materials are authorized for transport in FBCs. The use of FBCs for the transportation of an HMT entry not assigned special provision B120 is prohibited.

Section 173.301b

Section 173.301b provides additional general requirements for shipment of UN pressure receptacles. Recent international adoption of this standard leads PHMSA to incorporate by reference ISO 13340:2001(E) Transportable gas cylinders—Cylinder valves for non-refillable cylinders—Specification and prototype testing, First edition, 2004–04–01, and require all non-refillable UN pressure receptacle valves to be in compliance with this standard.

Section 173.306

Section 173.306 prescribes the exceptions for limited quantities of compressed gases including aerosols. Paragraph (a) of this section prescribes the general requirements for limited quantities of compressed gases while paragraph (j) specifically addresses aerosols and receptacles small, containing gas, with a capacity of less than 50 mL.

In this final rule, we are revising paragraph (j) to note that aerosols conforming to this paragraph, when offered for transportation by air, must be transported as cargo and may not be carried onboard an aircraft by passengers or crewmembers in carry-on baggage, checked baggage, or on their person unless specifically excepted by § 175.10. This clarification aligns the HMR with the previously discussed changes adopted in the ICAO Technical Instructions regarding the air transport of aerosols that are otherwise excepted from the HMR.

Section 173.313

Section 173.313 contains instructions for UN portable tanks and the table for liquefied compressed gases. The UN Portable Tank Table for Liquefied Compressed Gases is referenced in § 172.102(c)(7)(iii) of the HMR for portable tanks used to transport liquefied compressed gases.

Chemical manufacturers throughout the world are currently supplying pressurized products contained and transported in gas cylinders. The products are liquids or solids such as adhesives, coatings and cleaners combined with a gas or gas mixtures in pressure receptacles under sufficient pressure to expel the contents. These mixtures are typically expelled from the pressurized receptacles as foams, streams or thick sprays. Under the current HMR these types of products are classified as liquefied gases and transported in accordance with the applicable sections for the liquefied gases in which they are classified. A typical product however is a combination of a propellant (gas phase) and a liquid or solid component, and therefore the term liquefied gas does not correctly reflect the contents. As they are not filled in aerosol dispensers and as the receptacles used exceed the volume limitations for aerosols, they may not be transported as aerosols. The United Nations Sub-Committee of experts on the Transportation of Dangerous goods agreed to create new entries (UN numbers) for these products to address their unique characteristics and corresponding regulations to address the safe transport of such materials.

In this final rule, we are adopting entries in the HMT for various chemicals under pressure and the corresponding packaging provisions. We are modifying § 173.313 to include the packaging requirements for chemicals under pressure transported in portable tanks. Specifically, we are revising the section title, introductory text, and table name to reflect that chemicals under pressure are addressed in this section. We are also adding table entries for identification numbers UN3500, UN3501, UN3502, UN3503, UN3504 and UN3505. Lastly, we are correcting the maximum filling density for UN3220.

The addition of packaging requirements specific to chemicals under pressure will ensure that an appropriate level of safety is achieved for these unique materials. PHMSA participated in, and concurs with, the discussions and decisions regarding the packagings selected for these materials. The packagings adopted by the UN, ICAO and IMO provide an appropriate level of safety for these materials and, thus, PHMSA is adopting similar packagings in the HMR. Furthermore, aligning with international packaging standards facilitates the movement of these materials both domestically and internationally.

Section 173.316

Section 173.316 provides the requirements for cryogenic liquids contained in cylinders. Specifically, the HMR requires each cylinder containing cryogenic liquids be equipped with one or more pressure relief devices.

PHMSA is revising § 173.316, “Cryogenic Liquids in Cylinders” to include a requirement consistent with the UN Model Regulations that all pressure relief device inlets must under maximum filling conditions be situated in the vapor space of the closed cryogenic receptacle and the devices must be so arranged as to ensure that the escaping vapor is discharged unobstructed.

This requirement will enhance safety by assisting in the proper function of the pressure release devices. Further, it will prevent unsafe conditions in transport if the liquid form of the gas were released through the pressure release device. For instance, if the gas released is a Division 2.1 (flammable) gas or a Division 2.3 (poisonous) gas, it will reduce the opportunity for the released liquid form of the gas to create an asphyxiant environment through the rapid displacement of the normal concentration of oxygen in the breathable atmosphere. Finally, it will reduce the potential of released cryogenic oxygen in liquid form to create an oxygen enriched atmosphere that may explosively combust.

Section 173.318

Section 173.318 provides the requirements for cryogenic liquids contained in cargo tanks. Specifically, the HMR requires each cargo tank containing cryogenic liquids be equipped with one or more pressure relief devices.

PHMSA is revising § 173.318, “Cryogenic Liquids in Cargo Tanks” to include a requirement consistent with the UN Model Regulations that all pressure relief device inlets must under maximum filling conditions be situated in the vapor space of the closed cryogenic receptacle and the devices be so arranged as to ensure that the escaping vapor is discharged unobstructed.

This requirement will enhance safety by assisting in the proper function of the pressure release devices. Further, it will prevent unsafe conditions in transport if the liquid form of the gas were released through the pressure release device. For instance, if the gas released is a Division 2.1 (flammable) gas or a Division 2.3 (poisonous) gas, it would reduce the opportunity for the released liquid form of the gas to create an asphyxiant

environment through the rapid displacement of the normal concentration of oxygen in the breathable atmosphere. Finally it will reduce the chance of released cryogenic oxygen in liquid form creating an oxygen enriched atmosphere that may explosively combust.

Section 173.335

Section 173.335 is created to provide packaging requirements for new HMT entries "Chemical under pressure n.o.s." Specifically, PHMSA is adopting transport requirements, filling limits, minimum service pressure, and periodic inspection requirements for cylinders utilized for shipments of chemical under pressure n.o.s.

Cylinders used to ship chemical under pressure n.o.s. must be authorized UN or DOT cylinders for the propellant and otherwise conform to the applicable requirements of subpart G of part 173. 3M noted in their comments to the August 15, 2012 NPRM that while PHMSA created a section that included filling limits for cylinders containing chemical under pressure, we did not increase the water capacity for non-refillable UN pressure receptacles filled with chemical under pressure classed as flammable or toxic. In § 173.301b non-refillable cylinders containing a flammable or a toxic gas are limited to 1.25 liters. The UN authorizes non-refillable cylinders with a capacity up to 50 liters when it contains a chemical under pressure. In this final rule we will revise §§ 173.301b and 173.302a to increase the maximum allowable water capacity for non-refillable cylinders containing chemical under pressure to 50 liters (3050 in3).

Section 173.340

Section 173.340 prescribes the packaging requirements for NA1693, tear gas devices. PHMSA is revising the packaging requirements in paragraphs (c) and (d) by authorizing the use of 4A, 4B, or 4N metal boxes, and 1B2, 1N2, or 1H2 drums.

Part 175

Section 175.8

Section 175.8 provides exceptions from certain regulations for air carrier operator equipment and items of replacement. ICAO amended the Technical Instructions applicable to exceptions from certain regulations for air carrier operator equipment and items of replacement, and to better reflect items that may be sold as part of duty free services. PHMSA is revising paragraph (b)(2) of this section to add portable electronic devices containing

lithium batteries to the list of items permitted aboard an aircraft for use or sale on that specific aircraft.

Section 175.10

Section 175.10 specifies the conditions for which passengers, crew members, or an operator may carry hazardous materials aboard an aircraft. Consistent with revisions to the ICAO Technical Instructions, in this final rule, PHMSA is revising paragraph (a)(14), the conditions under which electrically powered heat-producing articles may be carried aboard an aircraft. The requirement that the heat-producing component, or the energy source, must be removed to prevent unintentional functioning during transport is being revised to permit the removal of another component, such as a fuse, to prevent unintentional functioning during transport. In addition the paragraph is being revised to specify procedures for protecting any removed battery from short circuit during transport. PHMSA is also adding paragraphs (a)(20), (a)(21), (a)(22), (a)(23), and (a)(24) to specify conditions under which permeation devices for calibrating air quality monitoring equipment, internal combustion or fuel cell engines, non-infectious specimens, insulated packagings containing refrigerated liquid nitrogen, and small compressed gas cartridges fitted into devices, respectively, may be carried aboard an aircraft.

PHMSA received one comment from the FCHEA requesting that we amend § 175.10(a)(19) to allow fuel cell cartridges containing flammable gas in Division 2.1 and fuel cells containing water reactive materials in Division 4.3 in checked passenger baggage. PHMSA did not propose changes to the provisions allowing for the checking of limited types of fuel cells in the NPRM, and consider this request to be outside the scope of this rulemaking.

PRBA noted in their comments to the NPRM that the 2013–2014 ICAO Technical Instructions contain a provision that authorizes passengers to carry portable medical electronic devices aboard passenger aircraft with lithium metal batteries containing up to 8 grams of lithium metal. While this amendment should be added to the HMR it was not included in the August 15, 2012 NPRM and the public has not been provided notice of any intent to add a new exception for lithium battery-containing portable medical devices in § 175.10 or afforded the opportunity to provide us with written data, views, or arguments to aid our decision. As the FAA Modernization and Reform Act of 2012 requires harmonization in this

instance, we will propose to adopt this exception in a future rulemaking.

Part 176

Section 176.2

Section 176.2 provides definitions of terms specifically as they pertain to Part 176. In this final rule, PHMSA is adopting various revisions to the vessel stowage and segregation requirements specified in Part 176. As part of these changes certain terminology must be defined.

The term "Closed cargo transport unit for Class 1" is defined by the IMDG Code as a freight container or transport vehicle that fully encloses the contents by permanent structures and can be secured to the ship's structure and are, except for the carriage of division 1.4 explosives, structurally serviceable (see § 176.172). Portable magazines conforming to § 176.137 are also considered closed cargo transport units for Class 1. Small compartments such as deck houses and mast lockers are included. Cargo transport units with fabric sides or tops are not closed cargo transport units. The floor of any closed cargo transport unit must either be constructed of wood, close-boarded or so arranged that goods are stowed on sparred gratings, wooden pallets or dunnage. The IMO adopted this new definition for "closed cargo transport unit for Class 1" to define the characteristics required for cargo transport units carrying explosives by vessel.

A new definition for "potential or possible sources of ignition" was adopted by the IMO for incorporation in the next published IMDG Code. The term "Potential or possible sources of ignition" as defined in the IMDG Code "means but is not limited to, open fires, machinery exhausts, galley uptakes, electrical outlets and electrical equipment including those on refrigerated or heated cargo transport units unless they are of certified safe type." The text "means but is not limited to" indicates that the list of potential or possible sources of ignition is not all inclusive; as it is impossible to identify in a definition all potential or possible sources of ignition that may exist on a variety of vessels with various engineering designs and stowage configurations. PHMSA is adopting a definition for "Potential or possible sources of ignition" that replaces "of certified safe type" with "designed to operate in a hazardous environment." This change is due to some ambiguity as to what is considered a certified safe type of refrigerated or heated cargo transport unit. Adoption of this

definition will provide guidance to vessel stowage planners in determining safe stowage locations for cargo on board vessels.

The term "Protected from sources of heat" as defined by the IMDG Code means "that packages and cargo transport units must be stowed at least 2.4 m from heated ship structures, where the surface temperature is liable to exceed 131 °F (55 °C). Examples of heated structures are steam pipes, heating coils, top or side walls of heated fuel and cargo tanks, and bulkheads of machinery spaces. In addition, packages not loaded inside a cargo transport unit and stowed on deck must be shaded from direct sunlight. The surface of a cargo transport unit can heat rapidly when in direct sunlight in nearly windless conditions and the cargo may also become heated. Depending on the nature of the goods in the cargo transport unit and the planned voyage precautions must be taken to ensure that exposure to direct sunlight is reduced". This definition was adopted by the IMO for inclusion in the next IMDG Code to provide a list of possible sources of heat a cargo transport unit might encounter during vessel transport. This definition also includes requirements for break bulk packages stowed on deck that are required to be protected from sources of heat by means of a stowage provision or a general stowage requirement found in Part 176.

PHMSA received one comment from IVODGA concerning the proposed definition of "protected from sources of heat." IVODGA suggested that at the end of the new definition for "protected from sources of heat" we include that "* * * containers should not be stowed in the upper most tier position when this is required, which does not include tank units that have protective insulation shields" since the new definition seems to bridge the older *shade from radiant heat* and other heat related factors onboard vessels. PHMSA does not see the need to be more specific and restrictive than the internationally accepted definition calls for and is maintaining the definition of protected from sources of heat as proposed in the NPRM.

Therefore, in this final rule, PHMSA is adding definitions in this section for the terms, "Closed cargo transport unit for Class 1," "Potential or possible sources of ignition" and "Protected from sources of heat" with additional text clarifying that a portable magazine conforming to § 176.137 is also considered "closed cargo transport unit for Class 1."

Section 176.63

Section 176.63 prescribes supplementary requirements with respect to the stowage of specific hazardous materials in addition to those authorized in the HMT in § 172.101. This section sets forth the basic physical requirements for the authorized vessel stowage locations.

One commenter (SAAMI) noted that limited quantity shipments are assigned the least restrictive stowage category and are excepted from additional stowage provisions in 3.4.3 of the IMDG Code and requested that PHMSA do the same. PHMSA agrees and is revising paragraph (a) of this section to allocate stowage category A to hazardous materials offered as limited quantities, and to except these shipments from the other stowage provisions assigned in column 10B of the HMT for shipments of limited quantities.

PHMSA is also revising paragraph (b) of this section by replacing the phrase "shade from radiant heat" with the phrase "protected from sources of heat." This revision of terminology is necessary to incorporate other changes to the vessel stowage codes in Column 10 B of the HMT.

PHMSA is also revising paragraph (e) of this section to remove references to magazine stowage type A and C, as the definition of "closed cargo transport unit for Class 1" was added to § 176.2 references to magazine stowage type A and C are no longer needed in this section.

Paragraph (e) also contains an exception for empty packages containing residue (excluding Class 2.3 empty packages containing residue and waste aerosols), including IBCs and large packages to be stowed on deck, or under deck if in a mechanically ventilated cargo space. This exception will apply regardless of the stowage provisions indicated in § 172.101(k). PHMSA believes the reduced hazard present in empty packages containing residue combined with the mechanically ventilated cargo space warrants a relaxation of stowage requirements for shipments of empty packages (excluding Class 2.3 and waste aerosols) that otherwise would require on deck stowage.

Section 176.76

Section 176.76 specifies the requirements for transport vehicles, freight containers, and portable tanks containing hazardous materials transported via vessel.

In this final rule, PHMSA is adding a new paragraph (a)(11) requiring that banding or securing straps used to

secure packages must not be over tightened to cause damage or deformation of the packages or the securing points within the freight container or transport vehicle. PHMSA is adopting this change to harmonize cargo securement requirements in the HMR with recently adopted changes in the IMDG Code. This requirement is intended to prevent undue stress and potential damage to packages and tie down points during transport.

PHMSA had originally proposed to replace the existing paragraph (a)(9) with this regulatory text, but received one comment from IVODGA noting that the provisions of (a)(9) concerning security devices is still necessary, and a request to maintain the current text of (a)(9) and simply insert a new paragraph with the proposed text. PHMSA agrees and is maintaining the current paragraph (a)(9). IVODGA also requested that the following text be included at the end of the newly proposed paragraph of our proposed text: "* * * or transport vehicle. The Maximum Securing Load on internal container lashing, securing or anchor points shall not be exceeded." PHMSA believes that inserting IVODGA's proposal would be very difficult to enforce, as anchor points in containers are not marked with maximum securing loads. Additionally PHMSA believes that the language proposed in the NPRM accounts for IVODGA's concerns as deformation of the securing points is indicative of exceeding the securing points capabilities.

PHMSA received an additional comment from IVODGA requesting we amend § 176.76 to require transport equipment with refrigerated or heating units used for the transport of hazardous materials of Division 2.1, Class 3, or those capable of releasing flammable vapors during transport to be equipped with explosion proof electrical fittings. PHMSA has determined that such an amendment is beyond the scope of the proposals presented in the August 15, 2012 NPRM and therefore will not be addressed in this final rule.

Section 176.83

Section 176.83 prescribes the general vessel segregation requirements. Paragraph (m) of this section specifies additional segregation requirements for certain groups of hazardous materials. Paragraph (m)(2) of this section prescribes segregation requirements for materials shipped under n.o.s. entries. Furthermore, paragraph (m)(3) discusses materials that fall outside the defining criteria for hazardous materials, but display chemical properties similar to

hazardous materials listed in segregation groups.

In this final rule, PHMSA is revising paragraph (m)(2) to clarify that the offeror of hazardous materials is responsible for deciding if allocation of a segregation group is appropriate. We are also revising paragraph (m)(3) to clarify that the offer of hazardous materials for transportation or the person packing the cargo transport unit is responsible for identifying a relevant segregation group and applying the segregation requirements for that segregation group. These revisions will replace the current term “shipper,” which is not defined in § 171.8, with the terms “offeror” and “person who offers” which are defined terms in § 171.8.

Section 176.84

Section 176.84 prescribes the meanings and requirements for numbered or alpha-numeric stowage provisions for vessel shipments listed in column 10B of the § 172.101 Hazardous Materials Table. The provisions in § 176.84 are broken down into general stowage provisions whose meanings are defined in the “table of provisions” in paragraph (b), and the stowage provisions applicable to vessel shipments of Class 1 explosives defined in the table to paragraph (c)(2).

PHMSA is revising stowage provisions 25 and 128 and deleting stowage provisions 19, 48, and 50 from the table in paragraph (b). Stowage provision 25 is revised from “Shade from radiant heat” to read “Protected from sources of heat.” Stowage provision 128 is revised from “Stow in accordance with the IMDG Code, Subsection 7.1.10.3 (incorporated by reference; see § 171.7 of this subchapter)” to read “Stow in accordance with the IMDG Code, Subsection 7.6.2.7.2 (incorporated by reference; see § 171.7 of this subchapter).” Deleted stowage provision 19 previously read “Protect from sparks and open flames.” Deleted stowage provision 48 previously read “Stow “away from” sources of heat”. Deleted stowage provision 50 previously read “Stow “away from” sources of heat where temperatures in excess of 55 °C (131 °F) for a period of 24 hours or more will be encountered.”

The current stowage provision table in paragraph (b) contains three listings requiring shipments to be either shaded or stowed away from sources of heat. The addition of a standard definition for “protected from sources of heat” to the list of definitions in § 176.2 has rendered stowage provisions 19, 48, and 50 redundant and all HMT listings previously assigned stowage provisions

19 or 48 have been assigned the revised stowage provision 25. Furthermore, no listings in the current HMR are assigned stowage provision 50; therefore, we are deleting it and all references to it. The change to stowage provision 128 will account for a citation change in the newest edition of the IMDG Code.

In this final rule, PHMSA is revising explosive stowage provision 26E and deleting explosive stowage provisions 7E, 8E, and 20E from the table in paragraph (c)(2). Deleted explosive stowage provision 7E previously read “Stowage category “04” for projectiles or cartridges for guns, cannons or mortars; Stowage category “08” for other types.” Deleted explosive stowage provision 8E previously read “When under deck, special stowage is required.” Deleted explosive stowage provision 20E previously read “Stowage category “03” for projectiles or cartridges for guns, cannons or mortars; Stowage category “07” for other types; magazines must be of steel construction that prevents leakage.” Changes to explosive stowage provisions 7E, 8E, and 20E are necessary to account for revisions to the stowage category definitions proposed in § 172.101(k). Additionally, as a result of the removal of stowage provisions 10 and 13 from § 172.101(k), PHMSA is revising explosive stowage provision 26E in § 176.84. Please see section 172.101 for explosive stowage codes associated with HMT entries previously assigned these explosive stowage provisions and a list of entries these provisions have been removed from.

Section 176.116

Section 176.116 prescribes the general stowage conditions for Class 1 explosive materials. Paragraph (a) of this section prescribes explosive stowage requirements, which take into account heat and sources of ignition. Paragraph (f) of this section prescribes explosives stowage requirements for under deck storage. PHMSA is revising paragraph (a) to clarify the general stowage conditions for Class 1 materials on board vessels and deleting and reserving paragraph (f).

PHMSA is revising paragraph (a)(1) to require explosive materials to be stowed in a cool part of the ship, to be kept as cool as practicable while on board, and to be stowed as far away as practicable from any potential source of heat or ignition. This change is due to the inclusion of a definition for “potential source of heat or ignition” in § 176.2. A new paragraph (a)(2) is added requiring Class 1 materials to be stowed away from the side of a ship’s side at a distance at least equal to one eighth of

the beam of the vessel or 2.4 m (8 feet), whichever is less. PHMSA received one comment (IVODGA) requesting an exception for materials within Class 1 of low or relatively low hazard within division 1.4 through 1.6 and the allowance to transport these in all positions available on-deck. In 7.1.4.4.3 of the IMDG goods of division 1.4 are excepted from the requirement to be stowed away from the side of a ship. Another comment by Horizon also noted that 1.4 cargos should be excluded from this requirement. PHMSA agrees to provide such an exception for goods of division 1.4, but sees no need to extend the exception beyond what is authorized by the international standard.

This minimum distance for explosive shipment stowage from the ship’s side is adopted to harmonize with a recent change in the IMDG Code and provides an increased level of safety by ensuring explosive shipments are not stowed adjacent to the ships internal structure.

Paragraph (f) previously indicated general stowage provisions for HMT explosive entries stowed under deck and assigned stowage category 09 or 10. The removal of stowage category 09 and 10 make these provisions no longer applicable.

Section 176.128

Section 176.128 defines the varying levels of containment for explosives identified as magazine stowage types “A”, “C,” and “Special Stowage.” The IMO has determined that a distinction between closed cargo transport units and magazines is no longer necessary. PHMSA concurs with the IMO on this issue and is deleting § 176.128 and reserving it for future use. With the addition of a definition for “closed cargo transport unit for Class 1,” and the requirement for all explosive shipments to be stored at a distance at least equal to one eighth of the beam of the vessel or 2.4 m (8 feet), whichever is less, specific requirements for type A, C, and special magazine stowage are now unnecessary. Note that portable magazines remain authorized by § 176.137 and the definition of “closed cargo transport unit for Class 1.”

Section 176.130

Section 176.130 prescribes requirements for magazine stowage type A. The IMO determined that a distinction between closed cargo transport units and magazines is no longer necessary. PHMSA concurs with the IMO on this issue and is deleting § 176.130 and reserving it for future use. In general, a magazine is equivalent to a closed cargo transport unit with a

wooden floor. Properly packaged and transported packages in a closed cargo transport unit will adequately address safety concerns presented by commodities previously required to be transported in magazine stowage type A.

Section 176.133

Section 176.133 prescribes requirements for magazine stowage type C. The IMO has determined that all explosive shipments must be stored at a distance at least equal to one eighth of the beam of the vessel or 2.4 m (8 feet), whichever is less, thus making the provisions for magazine stowage type C unnecessary. PHMSA concurs with the IMO on this issue and is deleting § 176.133 and reserving it for future use.

Section 176.134

Section 176.134 prescribes requirements for vehicles carrying Class 1 materials requiring magazine stowage. The removal of magazine stowage definitions and provisions make this section unnecessary. Therefore, PHMSA is deleting this section and reserving it for future use.

Section 176.136

Section 176.136 prescribes requirements for special stowage of Class 1 materials. Changes to vessel stowage location codes in § 172.101(k) and the assignment of vessel stowage codes requiring on deck stowage for entries previously authorized as special stowage make this section unnecessary. Therefore, PHMSA is deleting this section and reserving it for future use.

Section 176.138

Section 176.138 prescribes general requirements for on deck stowage. Paragraph (b) provides general requirements for on deck stowage of explosives. In this final rule, PHMSA is revising this section to require explosives to not be stowed within 6 m (20 feet) of the newly defined term “any potential sources of heat or ignition.” This change is adopted to incorporate a newly defined term in § 176.2. PHMSA received one comment from IVODGA requesting an editorial clarification to separate the proposed language into “from any source of heat and any possible sources of ignition” and is making the requested change.

Section 176.144

Section 176.144 prescribes segregation requirements for Class 1 materials transported by vessel. Paragraph (d) allows materials requiring ordinary stowage (non-magazine stowage) to be stowed in the same magazine as materials requiring

magazine stowage. PHMSA is revising paragraph (d) to state that if part of a shipment requires non-metallic lining of closed cargo transport units, Class 1 materials requiring ordinary stowage (stowage not requiring non-metallic lining of closed cargo transport units) may be stowed in the same closed cargo transport unit provided there are no exposed parts of any ferrous metal or aluminum alloy, unless separated by a partition. The removal of sections and requirements for magazine stowage necessitates the change in this section.

During the review of the NPRM PHMSA noted that Table 176.144(a) includes a reference to explosives requiring special stowage in Note: 1. This final rule removes the special stowage section in the HMR. Therefore, PHMSA is removing the reference to special stowage in Note 1 of Table 176.144(a).

Section 176.146

Section 176.146 prescribes segregation requirements for Class 1 materials and non-hazardous goods transported by vessel. Paragraph (a) currently states that Class 1 material need not be segregated from non-hazardous materials except as provided in paragraphs (b) and (c). Paragraph (b) then goes on to state that certain cargo (mail, baggage, and personal effects) may not be stowed in the same compartment as, or in compartments immediately above or below, Class 1 (explosive) materials other than those in compatibility group S. Paragraph (c) states that where Class 1 (explosive) materials are stowed against an intervening bulkhead, any mail on the other side of the bulkhead must be stowed away from it.

In this final rule, PHMSA is revising paragraphs (a) and (b) and deleting and reserving paragraph (c). Specifically, we are revising paragraph (a) to remove a reference to the removed paragraph (c). We are also revising paragraph (b) to read “readily combustible materials may not be stowed in the same compartment or hold as Class 1 (explosive) materials other than those in compatibility group S.” This change incorporates the adoption by IMO of the defined term “readily combustible material” in 176.2. In this final rule, PHMSA is removing and reserving paragraph (c) as the vast majority of mail is now sent by air and not vessel. A specific requirement for stowage of mail away from the intervening bulkhead between it and Class 1 materials is deemed unnecessary.

Section 176.170

Section 176.170 prescribes requirements for shipments of Class 1 materials in freight containers by vessel. Paragraph (a) states that when Class 1 materials are stowed in a freight container, the freight container, for the purposes of this subpart, may be regarded as a magazine but not as a separate compartment. Paragraph (c) states that freight containers used to transport Class 1 (explosive) materials for which magazine stowage type A is required must have a floor consisting of tightly fitted wooden boards, plywood or equivalent non-metallic material, and a non-metallic lining.

PHMSA is amending paragraph (a) and deleting and reserving paragraph (c). Paragraph (a) is revised to state that when Class 1 materials are stowed in a freight container, the freight container, for the purposes of this subpart G of Part 176, may be regarded as a closed transport unit for Class 1 or a magazine but not a separate compartment. This change is being made to incorporate the definition of “closed cargo transport unit for Class 1” and the removal of magazine stowage A, C, and Special Stowage. Paragraph (c) references freight containers used to transport Class 1 (explosive) materials for which magazine stowage type A is required. The removal of a definition for and requirements for magazine stowage type A make this paragraph unnecessary.

Section 176.200

Section 176.200 prescribes general stowage requirements for Class 2 materials transported by vessel. Paragraph (c) of this section prescribes the orientation and outer packaging requirements for cylinders transported by vessel.

PHMSA is revising paragraph (c) to clarify that cylinders offered for transport by vessel in a vertical position must be stowed in either a block and cribbed or boxed-in with suitable sound lumber. PHMSA is also replacing the word movement with shifting in the requirement for the crib or box bracing to prevent any movement. These revisions are to harmonize with vessel transportation requirements incorporated in the IMDG Code and clarify that cylinders stored in a vertical position must be adequately blocked and braced using sound lumber.

Section 176.210

Section 176.210 prescribes on deck stowage requirements for cylinders transported by vessel. This section currently requires cylinders of Class 2 materials being transported by vessel to

be protected from radiant heat, including the direct rays of the sun, by structural erections or awnings.

In this final rule, PHMSA is revising this section by replacing “protected from radiant heat, including the direct rays of the sun, by structural erections or awnings” with the newly defined term “protected from sources of heat.”

Section 176.230

Section 176.230 prescribes stowage requirements for Division 2.1 materials transported by vessel. Currently the HMR requires Division 2.1 materials transported in Specification 106A or 110A multi-unit car tanks must be stowed on deck only, and must be shaded from radiant heat.

In this final rule, PHMSA is replacing the phrase “shaded from radiant heat” with the newly defined “protected from sources of heat.”

Section 176.305

Section 176.305 prescribes stowage requirements for Class 3 materials transported by vessel. Paragraph (a) states that Class 3 flammable or combustible liquids must be kept as cool as reasonably practicable and be stowed away from all sources of heat and ignition.

In this final rule, PHMSA is revising paragraph (a) to read “a Class 3 (flammable) or combustible liquid must be kept as cool as reasonably practicable, protected from sources of heat, and away from potential sources of ignition.” These changes incorporate the definitions of “protected from sources of heat” and “potential or possible sources of ignition.”

Section 176.400

Section 176.400 prescribes stowage requirements for Division 1.5, Class 4 (flammable solids) and Class 5 materials transported by vessel. Paragraph (a) requires Class 4 (flammable solid) material and Division 5.2 (organic peroxide) materials to be kept as cool as reasonably practicable and be stowed away from all sources of heat and ignition.

PHMSA is revising paragraph (a) to read “Class 4 (flammable solid) material and Division 5.2 (organic peroxide) material must be kept as cool as reasonably practicable, protected from sources of heat, and away from potential sources of ignition.” These changes incorporate the definitions of “protected from sources of heat” and “potential or possible sources of ignition.”

Paragraph (b) of this section requires Division 5.2 (organic peroxide) material to be stowed away from living quarters or access to them. Division 5.2 (organic

peroxide) substances not requiring temperature control should be protected from radiant heat, which includes direct rays of the sun, and stowed in a cool, well-ventilated area.

PHMSA is amending paragraph (b) to replace “should be protected from radiant heat, which includes direct rays of the sun, and stowed in a cool, well-ventilated area” with “must be protected from sources of heat, including radiant heat and strong sunlight, and must be stowed in a cool, well-ventilated area.” These changes are being made to incorporate the definitions of “protected from sources of heat” harmonize with the IMDG Code, and to emphasize that protecting shipments of organic peroxides not requiring temperature control from sources of heat is a requirement and not optional.

Section 176.600

Section 176.600 prescribes detailed requirements for Division 2.3 (Poisonous Gas) and Division 6.1 (Poisonous) materials transported by vessel. Paragraph (d) of this section requires each package of Division 2.3 (poisonous gas) material or Division 6.1 (poison) material that also bears a FLAMMABLE LIQUID or FLAMMABLE GAS label must be stowed in a mechanically ventilated space, kept as cool as reasonably practicable, and be stowed away from all sources of heat and ignition.

PHMSA is revising paragraph (d) to replace “stowed away from all sources of heat and ignition” with “protected from sources of heat and stowed away from potential sources of ignition.” These changes incorporate the definitions of “protected from sources of heat” and “potential or possible sources of ignition.”

PHMSA received one comment from Horizon requesting that the mechanically ventilated space and protected from sources of ignition stowage requirements be applied only to 2.3 materials and 6.1 materials that are toxic by inhalation. The proposal in the NPRM was done solely to change the terminology based on the adoption of new international definitions for “protected from sources of heat” and “potential or possible sources of ignition.” No changes to the actual commodities that require such segregation were proposed or will be implemented in this rulemaking.

Section 176.907

Section 176.907 is created to incorporate cargo transport requirements for shipments of UN2211, Polymeric Beads, Expandable *evolving*

flammable vapor and UN3314, Plastics Molding Compound *in dough, sheet or extruded rope form, evolving flammable vapor*. Several cases of damage to cargo transport units were presented to the IMO with the root cause being identified as the release of flammable pentane gas during transportation of shipments UN2211 and UN3314. To address the concerns presented by off gassing of flammable vapors which lead to a rise in pressure that may damage cargo transport units, the IMO instituted measures to ensure an adequate exchange of air within the cargo transport unit is provided. PHMSA is harmonizing with the recent changes to the IMDG and addressing safety concerns presented by the off gassing of flammable vapors from shipments of UN2211 and UN3314 by requiring that when UN2211 or UN3314 are transported by vessel, the cargo transport unit must provide an adequate exchange of air. This adequate exchange of air may be accomplished by using a ventilated container, an open-top container, or a container in one door off operation. As an alternative to these methods of air exchange, shippers may transport these cargos under temperature control in refrigerated cargo transport units. Exceptions to the cargo transport unit providing an adequate exchange of air requirement are provided for shipments packed in hermetically sealed packagings or IBCs which conform to the packing group II performance level for liquid dangerous goods in which the total pressure in the package (i.e., the vapor pressure of the liquid plus the partial pressure of air or other inert gasses less 100 kPa (15 psia)) with a filling temperature of 55° C (131° F) does not exceed two-thirds of the marked test pressure. Cargo transport units containing shipments of UN2211 or UN3314 must be marked with a warning mark including the words “CAUTION—MAY CONTAIN FLAMMABLE VAPOR” or “CAUTION—MAY CONTAIN FLAMMABLE VAPOUR” with lettering not less than 25 mm high. This mark must be affixed at each access point in a location where it will be easily seen by persons prior to opening or entering the cargo transport unit and must remain on the cargo transport unit until the cargo transport unit has been completely ventilated to remove any hazardous concentration of vapor or gas, the immediate vicinity of the cargo transport unit is clear of any source of ignition, and the goods have been unloaded.

PHMSA received one comment from IVODGA requesting a further exception

for shipments that do not meet the ventilation requirements or the packaging requirements of the proposed section. IVODGA asked PHMSA to allow freight containers or transport vehicles containing these shipments not meeting the conditions of the proposed 176.907 to be allowed to be transported on vessel using on-deck stowage and stowed away from sources of potential ignition. PHMSA does not see a need to allow for less protective stowage provisions than the IMDG Code provides for these commodities. While the suggested stowage location and provisions proposed by IVODGA do represent a certain degree of caution; the adopted and harmonized requirements provide additional protection from the potential offgassing of pentane from these commodities; and thus PHMSA is adopting the changes as proposed in the NPRM.

Part 178

Section 178.71

Section 178.71 prescribes specifications for UN pressure receptacles. In this final rule PHMSA is incorporating by reference ISO 13340:2001(E) Transportable gas cylinders—Cylinder valves for non-refillable cylinders—Specification and prototype testing, First edition, 2004–04–01. Non-refillable pressure receptacles must comply with cylinder valve requirements from ISO 13340. ISO 13340 was incorrectly proposed for addition to § 178.274(i) in the NPRM. PHMSA is correcting this proposal by incorporating this standard into the correct sections and requiring non-refillable pressure receptacles to comply with cylinder valve requirements in ISO 13340.

Section 178.512

Section 178.512 prescribes the standards, packaging identification codes, and construction requirements for steel and aluminum boxes (4A and 4B boxes). To incorporate the authorization for use of 4N boxes (metal other than steel or aluminum), the title of the section is revised to “Standards for steel, aluminum or other metal boxes.” Section 178.512 is also revised to include the authorized packaging identification code, 4N, for other metal boxes, and expand the construction requirements of the section to include these packagings. Subsequent changes are made throughout the section to address the inclusion of 4N other metal boxes.

Section 178.603

Section 178.603 prescribes the drop test requirements for non-bulk packagings in the HMR. Section 178.603 provides that a drop test must be conducted for the qualification of all packaging design types, and further provides that exceptions for the number of steel and aluminum packaging samples used for conducting the drop test are subject to the approval of the Associate Administrator. Currently, paragraph (a) of this section contains a table that outlines specific types of packagings and the corresponding number of samples that should be tested and the drop orientation of those samples. In this final rule, PHMSA is revising this table by including “other metal boxes” to the listed packagings. To incorporate the authorization for use of 4N boxes (metal other than steel or aluminum), § 178.603 is revised to require the drop test for other metal (4N) boxes, and authorize exceptions, subject to the approval of the Associate Administrator, for the number of samples used for conducting the drop test of these packagings.

Section 178.705

Section 178.705 prescribes standards for metal IBCs. Paragraph (a)(3) indicates that IBC specifications 31A, 31B, and 31N are authorized for both liquids and solids. PHMSA is revising this sentence editorially by removing the authorization to package solids in specification 31 IBCs as the specification is only assigned to liquid substances. This editorial change is consistent with the § 172.102 IBC Code Table revisions in paragraph (c)(4) and other IBC standards (e.g., § 178.707(a)(5)) prescribed in subpart N of part 178.

Section 178.910

Section 178.910 prescribes the marking requirements for specification Large Packaging design types. Paragraph (a)(1) of this describes the size specifications and format of the marking requirements. In this final rule, PHMSA is clarifying these requirements by indicating that for large packages manufactured after January 1, 2014 the minimum marking size must be 12 mm in height.

Furthermore, paragraph (b) of this section is now reserved. However, we are adding a paragraph (b) indicating that for all Large Packages manufactured, repaired or remanufactured after January 1, 2015 the large package must be marked with the symbol applicable to a Large Package designed for stacking or not

designed for stacking, as appropriate. This language will be accompanied by an example of such a mark.

Section 178.980

Section 178.980 prescribes the procedures for conducting the stacking test for qualification of all Large Packaging design types. Paragraph (e)(1) describes the criterion a metal or rigid plastic Large Packaging must meet to be considered as successfully passing the stacking test. While paragraph (e) addresses metal or rigid plastic Large Packagings, the criterion that a fiberboard or wooden Large Packaging must meet to be considered as successfully passing the stacking test is omitted.

Therefore, in this final rule, we are correcting this omission, by adding a new paragraph (e)(2) that addresses the criterion for fiberboard or wooden Large Packagings to pass the test and redesignating the following paragraphs accordingly.

Subpart R

Currently, the HMR do not contain specifications for FBCs. In this final rule, PHMSA is adopting the specification, construction, and testing requirements for FBCs. On February 2, 2010, PHMSA published a final rule in the **Federal Register** under Docket Number PHMSA–2006–25736 (HM–231) [75 FR 4699] entitled “Hazardous Materials; Miscellaneous Packaging Amendments.” In HM–231, specification and testing requirements were adopted for Large Packagings. The specification and testing requirements for FBCs are modeled on the regulatory structure adopted for Large Packagings in HM–231. Thus, new subpart R of part 178 entitled “Subpart R—Flexible Bulk Container Standards” is added.

Section 178.1000

PHMSA is adopting new § 178.1000 entitled “Purpose and scope.” This section prescribes the packaging designs to which Subpart R applies and the location in the HMR where terms used in the subpart are defined.

Section 178.1005

In this final rule, PHMSA is adding new § 178.1005 entitled “Flexible Bulk Container Identification Code.” This section provides the identification code (i.e. BK3) assigned to FBCs.

Section 178.1010

In this final rule, PHMSA is adding new § 178.1010 entitled “Marking of Flexible Bulk Containers.” This section prescribes the markings the manufacturer of an FBC must mark on

a package to indicate the FBC meets the specification. The marking requirements for FBCs are based on the current marking requirements for IBCs prescribed in § 178.703.

Section 178.1015

In this final rule, PHMSA is adding new § 178.1015 entitled “General Flexible Bulk Container Standards.” This section prescribes the general packaging integrity requirements an FBC design must meet.

Section 178.1020

In this final rule, PHMSA is adding new § 178.1020 entitled “Period of use for transportation of hazardous materials in Flexible Bulk Containers.” This section prescribes the length of time an FBC may be used to package hazardous materials. Specifically, this section states that an FBC used to package hazardous materials may remain in service not to exceed two years from the date of manufacture.

Subpart S

Currently, the HMR do not prescribe testing criteria for FBCs. PHMSA is adopting testing protocol for FBCs. On February 2, 2010, PHMSA published a final rule in the **Federal Register** under Docket Number PHMSA–2006–25736 (HM–231) [75 FR 4699] entitled “Hazardous Materials; Miscellaneous Packaging Amendments.” In HM–231, specification and testing requirements were adopted for Large Packagings. The test protocol proposed in this final rule for FBCs are modeled on the regulatory structure adopted for Large Packagings in HM–231. Thus, new subpart S of part 178 entitled “Subpart S—Testing of Flexible Bulk Container Standards” is added.

Section 178.1030

In this final rule, PHMSA is adopting § 178.1030 entitled “Purpose and scope.” This section prescribes the applicability to which the Subpart S tests apply.

Section 178.1035

In this final rule, PHMSA is adopting § 178.1035 entitled “General requirements.” This section prescribes the general packaging requirements for FBCs and addresses the following topics: FBC-related definitions; defining responsibility for compliance with specification requirements; design qualification testing; periodic design testing; proof of compliance; and record retention.

Section 178.1040

In this final rule, PHMSA is adopting test preparation requirements for FBCs in new § 178.1040 entitled “Preparation of Flexible Bulk Containers for Testing.” This section specifies the general test preparation requirements applicable to all tests an FBC is required to successfully pass.

Section 178.1045

In this final rule, PHMSA is adopting requirements for drop tests conducted on FBCs. A drop test is used to measure a packaging’s ability to withstand falls from specific heights and is used to determine if a package is suitable to transport hazardous materials. Thus, PHMSA is adding a new § 178.1045 entitled “Drop test.” This section prescribes the preparation of test samples, test methods authorized, drop heights, and criteria for passing the drop test.

Section 178.1050

In this final rule, PHMSA is adopting requirements for top lift tests conducted on FBCs. A top lift test measures a package’s ability to be moved mechanically by lifting the package by its top end and is used to determine if a package is suitable to transport hazardous materials. Thus, PHMSA is adding new § 178.1050 entitled “Top lift test.” This section prescribes requirements for the preparation of test samples, test methods authorized, and criteria for passing the top lift test.

Section 178.1055

In this final rule, PHMSA is adopting requirements for stacking tests conducted on FBCs. A stacking test is used to measure a packaging’s ability to withstand other packages placed on top of it and is used to determine if a package is suitable to transport hazardous materials. Thus, PHMSA is adding new § 178.1055 entitled “Stacking test.” This section prescribes requirements for the preparation of test samples, test methods authorized, and criteria for passing the stacking test.

Section 178.1060

In this final rule, PHMSA is adopting requirements for topple tests conducted on FBCs. A topple test is used to measure a packaging’s ability to withstand tipping of the package and is used to determine if a package is suitable to transport hazardous materials. Thus, PHMSA is adding new § 178.1060 entitled “Topple test.” This section prescribes the preparation of test samples, test methods authorized, topple height, and criteria for passing the topple test.

Section 178.1065

In this final rule, PHMSA adopting requirements for righting tests conducted on FBCs. A righting test is used to measure a packaging’s ability to withstand lifting from a lying position at a given rate of speed and is used to determine if a package is suitable to transport hazardous materials. Thus, PHMSA is adding new § 178.1065 entitled “Righting test.” This section prescribes the preparation of test samples, test methods authorized, and criteria for passing the righting test.

Section 178.1070

In this final rule, PHMSA is adopting requirements for tear tests conducted on FBCs. A tear test is used to measure a packaging’s ability to withstand shearing and tearing that may be encountered during transportation, such as loading and unloading, and is used to determine if a package is suitable to transport hazardous materials. Thus, PHMSA is adding new § 178.1070 entitled “Tear test.” This section prescribes the preparation of test samples, test methods authorized, and criteria for passing the tear test.

V. Regulatory Analyses and Notices

A. Statutory/Legal Authority for This Rulemaking

This final rule is published under the following statutory authorities:

1. 49 U.S.C. 5103(b) authorizes the Secretary of Transportation to prescribe regulations for the safe transportation, including security, of hazardous materials in intrastate, interstate, and foreign commerce. This final rule amends regulations to maintain alignment with international standards by incorporating various amendments, including changes to proper shipping names, hazard classes, packing groups, special provisions, packaging authorizations, air transport quantity limitations and vessel stowage requirements. To this end, this final rule amends the HMR to more fully align with the biennial updates of the UN Model Regulations, the IMDG Code, and the ICAO Technical Instructions.

Harmonization serves to facilitate international commerce; at the same time, harmonization promotes the safety of people, property, and the environment by reducing the potential for confusion and misunderstanding that could result if shippers and transporters were required to comply with two or more conflicting sets of regulatory requirements. While the intent of this rulemaking is to align the HMR with international standards, we review and consider each amendment

on its own merit based on its overall impact on transportation safety and the economic implications associated with its adoption into the HMR. Our goal is to harmonize without sacrificing the current HMR level of safety and without imposing undue burdens on the regulated community. Thus, as explained in the corresponding sections above, we are not harmonizing with certain specific provisions of the UN Model Regulations, the IMDG Code, and the ICAO Technical Instructions. Moreover, we are maintaining a number of current exceptions for domestic transportation that should minimize the compliance burden on the regulated community. Additionally, the following external agencies were consulted in the development of this rule:

U.S. Coast Guard
U.S. Department of Agriculture (USDA)
U.S. Department of Energy
U.S. Department of Interior
U.S. Department of Justice

2. 49 U.S.C. 5120(b) authorizes the Secretary of Transportation to ensure that, to the extent practicable, regulations governing the transportation of hazardous materials in commerce are consistent with standards adopted by international authorities. This final rule is amending the HMR to maintain alignment with international standards by incorporating various amendments to facilitate the transport of hazardous material in international commerce. To this end, as discussed in detail above, PHMSA is incorporating changes into the HMR based on the 17th Revised Edition of the UN Model Regulations, Amendment 36–12 to the IMDG Code, and the 2013–2014 ICAO Technical Instructions, which become effective January 1, 2013. The large volume of hazardous materials transported in international commerce warrants the harmonization of domestic and international requirements to the greatest extent possible.

B. Executive Orders 12866 and 13563 and DOT Regulatory Policies and Procedures

This final rule is not considered a significant regulatory action under section 3(f) of Executive Order 12866 (“Regulatory Planning and Review”) and, therefore, was not reviewed by the Office of Management and Budget. This final rule is not considered a significant rule under the Regulatory Policies and Procedures of the Department of Transportation (44 FR 11034). Additionally, E.O. 13563 (“Improving Regulation and Regulatory Review”) supplements and reaffirms E.O. 12866, stressing that, to the extent permitted by

law, an agency rulemaking action must be based on benefits that justify its costs, impose the least burden, consider cumulative burdens, maximize benefits, use performance objectives, and assess available alternatives.

Economic Benefits to Harmonization. In this final rule, PHMSA is incorporating by reference the most recent versions of various international hazardous materials standards, including the 2013–2014 ICAO Technical Instructions, Amendment 36–12 to the IMDG Code, and the 17th Revised Edition of the UN Model Regulations. Additionally, PHMSA is updating its incorporation by reference of the Canadian Transportation of Dangerous Goods Regulations to include Amendment 8 (SOR/2011–239) October 27, 2011; Amendment 9 (SOR/2011–60) March 3, 2011; and Amendment 10 (SOR/2011–210) September 30, 2011. Lastly, PHMSA is adopting updated International Standards Organization (ISO) standards.

The primary benefit of harmonizing the U.S. Hazardous Materials Regulations (HMR) with the international hazardous materials standards noted previously is that it will reduce the regulatory compliance costs faced by U.S. companies. Without harmonization, these companies will be forced to comply with dual systems of regulations, and as a result will incur higher compliance costs than would be encountered under a single regulatory scheme. The benefit of harmonization attributable to this rulemaking is the difference in regulatory compliance costs faced by companies operating under a single regulatory framework instead of multiple regulatory frameworks.

If the U.S. regulations were not harmonized with the international standards mentioned above, we estimate that it would cost U.S. companies an additional \$62 million per year to comply with both the HMR and the international standards. Harmonizing the HMR with the international standards, however, will avert these \$62 million in additional costs, and these averted costs are therefore considered the primary benefit attributable to this rulemaking.

The \$62 million estimate is based on the assumption that in the absence of harmonization both exporters and importers would have to adhere to two separate hazard communication systems, one used for the transportation of materials within the United States and one used for the transportation of materials outside the United States. Exporters would directly incur four different cost elements and would have

to pay for (1) dual labels and safety data sheets, (2) additional training, (3) additional management activities, and (4) additional packaging costs. Foreign producers who ship products to the United States would also incur these four cost elements, and we assume that the foreign producers would pass half of those incurred costs on to U.S. consumers in the form of higher prices.

To develop the \$62 million estimate, we estimated the average hazard communication cost per dollar of hazardous materials produced in the United States and then multiplied that cost figure by an estimate of the value of U.S. imports and exports of hazardous materials. In other words, in the absence of harmonization, we assume that companies involved with U.S. foreign trade would have to pay for additional hazard communication requirements for international movements; these companies would have to comply with the HMR communication requirements during domestic legs of the movement and with international standards during legs of the movement outside of the United States.

A proxy for hazard communication costs was obtained from a recent Occupational Safety and Health Administration study looking at the costs for industry to comply with the revised Hazard Communication Standard.² The study estimated the total compliance cost to be \$201 million per year based on four cost elements: revisions to labels and safety data sheets, additional training, additional management activities, and printing of color packaging. The first three cost elements are relevant for our purposes and totaled \$177 million.

To put the \$177 million hazard communication cost estimate on a per unit basis, we divided the \$177 million by an estimate of the total value of hazardous materials produced in the United States in 2010. The total value of hazardous materials produced in the United States was estimated to be \$151 billion. To derive this \$151 billion estimate, we summed relevant product values reported in the Census Bureau’s Annual Survey of Manufactures: Value of Product Shipments, and then multiplied the result by 12.4 percent—the percentage of shipment values reported to be hazardous products (this parameter was obtained from Table 10 in the Census Bureau’s 2007 Commodity Flow Survey for Hazardous Materials). The resulting hazard communication cost per dollar of hazardous materials

² <http://www.osha.gov/dsg/hazcom/hazcom-faq.html>.

output was estimated to be \$0.001 (or \$177 million + \$151 billion).

We were not able to identify any comprehensive source on hazardous materials imports and exports and therefore developed estimates for these figures using quarterly trade data from the Bureau of Economic Analysis³ and data on the transportation of hazardous materials from the Census Bureau's 2007 Commodity Flow Survey. The quarterly trade data on the value of imports and exports—for fuels and lubricants, chemicals, and medicinal/dental/pharmaceutical products—were summed to produce a single annual trade value for 2010 for industries that produce hazardous materials. Before aggregating the import and export values, we reduced the import values by half to take into account the assumption mentioned previously that foreign producers would be able to pass on only half of the additional hazard communication costs to U.S. consumers. Total annual trade for industries that produce hazardous materials was computed to be just over \$498 billion in 2010.

We then multiplied this \$498 billion trade figure by 12.4 percent, the percentage of output in these industries reported to be hazardous products; this parameter was obtained from Table 10 in the 2007 Commodity Flow Survey for Hazardous Materials. The resulting estimate indicates that approximately \$62 billion worth of hazardous materials were involved in international trade with the United States in 2010.

Multiplying the hazard communication cost per dollar of hazardous material output (\$0.001) by the value of hazardous materials involved in international trade (\$62 billion) results in a hazard communication cost estimate of approximately \$62 million per year that companies would have to pay to comply with different regulatory requirements applicable to international movements. Harmonizing the HMR with international standards will make these \$62 million in hazard communications costs unnecessary, and therefore is the main benefit attributable to this rulemaking.

Cost of Harmonization. The potential costs of this rulemaking include private sector compliance costs and any costs that can be attributed to a possible reduction in public safety as a result of harmonizing the HMR with international standards. We expect that both of these costs will be negligible. Estimates suggest that private sector

compliance costs associated with complying with the different amendments in the final rule will be minimal. In terms of costs due to any reduction in public safety as a result of harmonizing the HMR with international standards, PHMSA believes that none of the proposed revisions to the HMR have material safety impacts. We therefore assume that the gross social costs of this NPRM are effectively zero.

Net Benefit. Based on the discussions of benefits and costs provided above the estimated net benefit associated with the international harmonization final rule (2137-AE87) is nearly \$62 million.

C. Executive Order 13132

This final rule has been analyzed in accordance with the principles and criteria contained in Executive Order 13132 (“Federalism”). This final rule preempts State, local, and Indian tribe requirements but does not impose any regulation that has substantial direct effects on the States, the relationship between the national government and the States, or the distribution of power and responsibilities among the various levels of government. Therefore, the consultation and funding requirements of Executive Order 13132 do not apply.

The Federal hazardous material transportation law, 49 U.S.C. 5101–5128, contains an express preemption provision (49 U.S.C. 5125(b)) that preempts State, local, and Indian tribe requirements on certain covered subjects, as follows:

- (1) The designation, description, and classification of hazardous material;
- (2) The packing, repacking, handling, labeling, marking, and placarding of hazardous material;
- (3) The preparation, execution, and use of shipping documents related to hazardous material and requirements related to the number, contents, and placement of those documents;
- (4) The written notification, recording, and reporting of the unintentional release in transportation of hazardous material; and
- (5) The design, manufacture, fabrication, inspection, marking, maintenance, recondition, repair, or testing of a packaging or container represented, marked, certified, or sold as qualified for use in transporting hazardous material in commerce.

This final rule addresses covered subject items (1), (2), (3), (4) and (5) above and preempts State, local, and Indian tribe requirements not meeting the “substantively the same” standard. This final rule is necessary to incorporate changes adopted in international standards, effective

January 1, 2013. If this final rule was not adopted, U.S. companies, including numerous small entities competing in foreign markets, will be at an economic disadvantage. These companies will be forced to comply with a dual system of regulations. The changes in this final rule are intended to avoid this result. Federal hazardous materials transportation law provides at 49 U.S.C. 5125(b)(2) that, if DOT issues a regulation concerning any of the covered subjects, DOT must determine and publish in the Federal Register the effective date of Federal preemption. The effective date may not be earlier than the 90th day following the date of issuance of the final rule and not later than two years after the date of issuance. The effective date of Federal preemption is 90 days from publication of this final rule.

D. Executive Order 13175

This final rule was analyzed in accordance with the principles and criteria contained in Executive Order 13175 (“Consultation and Coordination with Indian Tribal Governments”). Because this final rule does not have tribal implications and, does not impose substantial direct compliance costs the funding and consultation requirements of Executive Order 13175 do not apply.

E. Regulatory Flexibility Act, Executive Order 13272, and DOT Procedures and Policies

The Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*) requires an agency to review regulations to assess their impact on small entities, unless the agency determines that a rule is not expected to have a significant impact on a substantial number of small entities. This final rule facilitates the transportation of hazardous materials in international commerce by providing consistency with international standards. This final rule applies to offerors and carriers of hazardous materials, some of whom are small entities, such as chemical manufacturers, users and suppliers, packaging manufacturers, distributors, and training companies. As discussed above, under *Executive Order 12866*, the majority of amendments in this final rule should result in cost savings and ease the regulatory compliance burden for shippers engaged in domestic and international commerce, including trans-border shipments within North America.

Many companies will realize economic benefits as a result of these amendments. Additionally, the changes effected by this final rule will relieve U.S. companies, including small entities

³ http://www.bea.gov/international/detailed_trade_data.htm.

competing in foreign markets, from the burden of complying with a dual system of regulations. Therefore, we certify that these amendments will not have a significant economic impact on a substantial number of small entities.

This final rule has been developed in accordance with Executive Order 13272 ("Proper Consideration of Small Entities in Agency Rulemaking") and DOT's procedures and policies to promote compliance with the Regulatory Flexibility Act to ensure that potential impacts of draft rules on small entities are properly considered.

F. Paperwork Reduction Act

PHMSA currently has approved information collections under Office of Management and Budget (OMB) Control Number 2137-0018, "Inspection and Testing of Portable Tanks and Intermediate Bulk Containers," and OMB Control Number 2137-0572, "Testing Requirements for Non-Bulk Packages." This final rule may result in an increase in the annual burden and costs of both OMB Control Numbers due to the proposed amendments to allow the use of metals other than steel or aluminum for drums and boxes as well as the proposed new Flexible Bulk Container package authorization, which will require package manufacturers to document and maintain package test results, should they elect to manufacture Flexible Bulk Containers or of metals other than steel or aluminum for drums and boxes.

Under the Paperwork Reduction Act of 1995, no person is required to respond to an information collection unless it has been approved by OMB and displays a valid OMB control number. Section 1320.8(d), title 5, Code of Federal Regulations requires that PHMSA provide interested members of the public and affected agencies an opportunity to comment on information and recordkeeping requests.

This notice identifies revised information collection requests that PHMSA will submit to OMB for approval based on the requirements in this final rule. PHMSA has developed burden estimates to reflect changes in this final rule, and estimates the information collection and recordkeeping burden in this rule to be as follows:

OMB Control No.: 2137-0018.

Annual Increase in Number of Respondents: 25.

Annual Increase in Annual Number of Responses: 50.

Annual Increase in Annual Burden Hours: 200.

Annual Increase in Annual Burden Costs: \$5,000.

50 estimated responses at \$25 per hour and four hours per response.

OMB Control No.: 2137-0572.

Annual Increase in Number of Respondents: 100.

Annual Increase in Annual Number of Responses: 300.

Annual Increase in Annual Burden Hours: 600.

Annual Increase in Annual Burden Costs: \$15,000.

300 Annual responses at \$25 per hour and 2 hours per response.

PHMSA will submit the revised information collection and recordkeeping requirements to OMB for approval.

G. Regulation Identifier Number (RIN)

A regulation identifier number (RIN) is assigned to each regulatory action listed in the Unified Agenda of Federal Regulations. The Regulatory Information Service Center generally publishes the Unified Agenda in April and October of each year. The RIN contained in the heading of this document can be used to cross-reference this action with the Unified Agenda.

H. Unfunded Mandates Reform Act

This final rule does not impose unfunded mandates under the Unfunded Mandates Reform Act of 1995. It does not result in costs of \$141.3 million or more, adjusted for inflation, to either State, local, or tribal governments, in the aggregate, or to the private sector in any one year, and is the least burdensome alternative that achieves the objective of the rule.

I. Environmental Assessment

The National Environmental Policy Act, 42 U.S.C. 4321-4375, requires that federal agencies consider the consequences of major Federal actions and prepare a detailed statement on actions significantly affecting the quality of the human environment. The Council on Environmental Quality (CEQ) regulations require federal agencies to conduct an environmental review considering: (1) The need for the action; (2) alternatives to the action; (3) probable environmental impacts of the action and alternatives; and (4) the agencies and persons consulted during the consideration process (40 CFR 1508.9(b)).

Description of Action

Docket No. PHMSA-2012-0027 (HM-215L), Final Rule. The transportation of hazardous materials in commerce is subject to the HMR, issued under authority of Federal hazardous materials transportation law, codified at 49 U.S.C. 5001 et seq. To facilitate the safe and

efficient transportation of hazardous materials in international commerce, the HMR provides that both domestic and international shipments of hazardous materials may be offered for transportation and transported under provisions of the international regulations.

Purpose and Need

In this final rule, PHMSA is amending the HMR to maintain alignment with international standards by incorporating various amendments, including changes to proper shipping names, hazard classes, packing groups, special provisions, packaging authorizations, air transport quantity limitations, and vessel stowage requirements. These revisions are necessary to harmonize and align the HMR with recent amendments adopted in the UN Model Regulations, IMDG Code, and the ICAO Technical Instructions. The amendments in this final rule are intended to facilitate the safe and efficient transportation of hazardous materials in international commerce, provide clarity designed to encourage and increase regulatory compliance, and improve the efficacy of emergency response in the event a hazardous materials incident occurs.

Alternatives

In developing this rule, we considered three alternatives:

(1) Do nothing.

(2) Adopt the international standards in their entirety.

(3) Adopt most of the international standards, with certain modifications based on safety or economic considerations.

Alternative 1

Because our goal is to facilitate uniformity, compliance, commerce and safety in the transportation of hazardous materials, we rejected this alternative.

Alternative 2

By adopting the international standards in their entirety, PHMSA could potentially adopt provisions that, in our view, do not provide an adequate level of transportation safety and environmental safety and protection. Further, because we provide for domestic exceptions and extended compliance periods to minimize the potential economic impact of any revisions on the regulated community, this alternative was also rejected.

Alternative 3

Consistency between U.S. and international regulations helps to assure the safety of international hazardous

materials transportation and the environment through better understanding of the regulations, an increased level of compliance, the smooth flow of hazardous materials from their points of origin to their points of destination, and effective emergency response in the event of a hazardous materials incident. Under Alternative 3, we would harmonize the HMR with international standards to the extent consistent with U.S. safety, economic, and environmental protection goals.

Alternative 3 is the only alternative that addresses, in all respects, the purpose of this regulatory action, which is to facilitate the safe and efficient transportation of hazardous materials in international commerce and the protection of the environment. These actions will provide the greatest possible harmonization with international requirements without posing an undue increased cost burden on the regulated community. For these reasons, alternative 3 is our selected alternative.

Analysis of Environmental Impacts

Hazardous materials are transported by aircraft, vessel, rail, and highway. The potential for environmental damage or contamination exists when packages of hazardous materials are involved in accidents or en route incidents resulting from cargo shifts, valve failures, package failures, or loading, unloading, or handling problems. The ecosystems that could be affected by a release include air, water, soil, and ecological resources (for example, wildlife habitats). The adverse environmental impacts associated with releases of most hazardous materials are short-term impacts that can be greatly reduced or eliminated through prompt clean-up of the accident scene. Most hazardous materials are not transported in quantities sufficient to cause significant, long-term environmental damage if they are released.

The hazardous material regulatory system is a risk-management system that is prevention-oriented and focused on identifying hazards and reducing the probability and quantity of a hazardous material release. Amending the HMR to maintain alignment with international standards enhances the safe transportation of hazardous materials in domestic and international commerce. When considering the adoption of international standards under the HMR, we review and consider each amendment on its own merit and assess the likely impact on transportation safety and the environment. It is our conclusion that the provisions in this

final rule will not have either a substantial positive or adverse effect on the environment. In this final rule PHMSA is adopting the following noteworthy amendments to the HMR:

Chemicals under pressure.

Manufacturers in the United Kingdom, the United States, Australia, Canada, and other countries are supplying pressurized products contained and transported in gas cylinders. The products are liquids or solids such as adhesives, coatings and cleaners combined with a gas or gas mixtures in pressure receptacles under sufficient pressure to expel the contents. These mixtures are typically expelled from the pressurized cylinders as foams, streams or thick sprays. Currently the HMR does not comprehensively address chemicals under pressure. Because of the substantial packaging integrity inherent in pressure vessel designs, PHMSA believes the chemical under pressure amendments in this rule will result in a positive environmental impact.

Flexible Bulk Containers (FBCs).

Incorporate a new packaging definition, operational controls, performance-oriented standards, and testing requirements for Flexible Bulk Containers (FBCs). FBCs are flexible bulk packages with a capacity over the currently authorized maximum volumetric capacity for flexible IBCs, but not exceeding 15 cubic meters. FBCs provide shippers the opportunity to utilize a reusable flexible packaging for bulk shipments of certain authorized low-hazard commodities, all of which are currently authorized in non-specification bulk bins. Because of the inherent integrity of a specification packaging design when compared to a non-specification packaging design, PHMSA believes the amendments in this final rule authorizing the construction and use of FBCs will result in a net positive environmental impact due to a possible decrease in the unintentional release of hazardous material.

Packaging Authorizations. Part 173 of the HMR prescribes the general requirements for shipment preparation and packaging selection for hazardous materials. Consistent with amendments adopted in the various international standards, we are amending multiple Part 173 packaging sections by authorizing additional packaging specifications used to package hazardous materials. These amendments include, but are not limited to, the authorization to use wood as a material of package construction for certain explosives, the authorization to use metals other than steel or aluminum for boxes and drums for certain hazardous

materials, and the incorporation of authorizations and specifications of FBCs. Because of the substantial integrity in the newly authorized packaging specifications, PHMSA believes the amendments in this final rule will result in a positive environmental impact. Higher integrity packaging designs prevent the unintentional release of hazardous materials when transported in commerce.

Vessel Stowage Requirements. The requirements for vessel stowage are described and specified in § 172.101(k) and HMT entries are assigned appropriate vessel stowage codes and stowage special provisions in column 10 of the HMT. We are clarifying these instructions by revising the vessel stowage location requirements for explosives and reducing the number of explosive stowage categories from 15 to 5 in column 10A of the HMT. Specifically, explosive stowage categories 6 through 15 are eliminated, and stowage categories 1 through 5 are retained and modified. We are also adopting modifications to the vessel stowage provisions indicated in column 10B of the HMT. In order to harmonize with the IMDG Code, PHMSA is incorporating the addition of a new definition for protected from sources of heat and potential or possible sources of ignition (see Section 176.2 of this final rule for definitions), and subsequently revise and delete various vessel stowage provisions.

The amendments adopted in this final rule consolidate the number of vessel stowage codes for explosives, resulting in greater clarity in the HMR and reducing the potential for unintentional release of hazardous materials. PHMSA believes these changes will have a positive impact on the environment.

Conclusion

In the NPRM PHMSA sought public comments on our environmental assessment. No comments were received. In this final rule, PHMSA is amending the HMR in response to revisions adopted in the various international standards. Through this integrated and cooperative approach, we believe we can be most successful in reducing incidents, enhancing public safety, and protecting the environment. The amendments are intended to update, clarify, or provide relief from certain existing regulatory requirements and to provide greater flexibility in packaging selection suitable for the transportation of hazardous materials. PHMSA believes the net environmental impact of this rule will be somewhat positive. Additionally, we believe there

will be little or no adverse environmental impact associated with the amendments adopted in this rule. We conclude that there are no significant environmental impacts associated with this rule.

J. Privacy Act

Anyone is able to search the electronic form of all comments received into any of our dockets by the name of the individual submitting the comments (or signing the comment, if submitted on behalf of an association, business, labor union, etc.). You may review DOT's complete Privacy Act Statement in the **Federal Register** published on April 11, 2000 (Volume 65, Number 70; Pages 19477–78) which may be viewed at <http://www.gpo.gov/fdsys/pkg/FR-2000-04-11/pdf/00-8505.pdf>.

K. Executive Order 13609 and International Trade Analysis

Under E.O. 13609, agencies must consider whether the impacts associated with significant variations between domestic and international regulatory approaches are unnecessary or may impair the ability of American business to export and compete internationally. In meeting shared challenges involving health, safety, labor, security, environmental, and other issues, international regulatory cooperation can identify approaches that are at least as protective as those that are or would be adopted in the absence of such cooperation. International regulatory cooperation can also reduce, eliminate, or prevent unnecessary differences in regulatory requirements.

Similarly, the Trade Agreements Act of 1979 (Public Law 96–39), as amended by the Uruguay Round Agreements Act (Public Law 103–465), prohibits Federal agencies from establishing any standards or engaging in related activities that create unnecessary obstacles to the foreign commerce of the United States. For purposes of these requirements, Federal agencies may participate in the establishment of international standards, so long as the standards have a legitimate domestic objective, such as providing for safety, and do not operate to exclude imports that meet this objective. The statute also requires consideration of international standards and, where appropriate, that they be the basis for U.S. standards.

PHMSA participates in the establishment of international standards to protect the safety of the American public, and we have assessed the effects of this final rule to ensure that it does not cause unnecessary obstacles to foreign trade. In fact, the rule is

designed to facilitate international trade. Accordingly, this rulemaking is consistent with E.O. 13609 and PHMSA's obligations under the Trade Agreement Act, as amended.

List of Subjects

49 CFR Part 171

Exports, Hazardous materials transportation, Hazardous waste, Imports, Incorporation by reference, Reporting and recordkeeping requirements.

49 CFR Part 172

Education, Hazardous materials transportation, Hazardous waste, Incorporation by reference, Labeling, Markings, Packaging and containers, Reporting and recordkeeping requirements.

49 CFR Part 173

Hazardous materials transportation, Incorporation by reference, Packaging and containers, Radioactive materials, Reporting and recordkeeping requirements, Uranium.

49 CFR Part 175

Air carriers, Hazardous materials transportation, Incorporation by reference, Radioactive materials, Reporting and recordkeeping requirements.

49 CFR Part 176

Hazardous materials transportation, Incorporation by reference, Maritime carriers, Radioactive materials, Reporting and recordkeeping requirements.

49 CFR Part 178

Hazardous materials transportation, Incorporation by reference, Motor vehicle safety, Packaging and containers, Reporting and recordkeeping requirements.

49 CFR Part 180

Hazardous materials transportation, Motor carriers, Motor vehicle safety, Packaging and containers, Railroad safety, Reporting and recordkeeping requirements.

In consideration of the foregoing, PHMSA is amending 49 CFR Chapter I as follows:

PART 171—GENERAL INFORMATION, REGULATIONS, AND DEFINITIONS

■ 1. The authority citation for part 171 continues to read as follows:

Authority: 49 U.S.C. 5101–5128, 44701; 49 CFR 1.45 and 1.53; Pub. L. 101–410 section 4 (28 U.S.C. 2461 note); Pub. L. 104–134 section 31001.

■ 2. Revise § 171.7 to read as follows:

§ 171.7 Reference material.

(a) *Matter incorporated by reference—*
(1) *General.* There is incorporated, by reference in parts 170–189 of this subchapter, matter referred to that is not specifically set forth. This matter is hereby made a part of the regulations in parts 170–189 of this subchapter. The matter subject to change is incorporated only as it is in effect on the date of issuance of the regulation referring to that matter. The material listed in paragraphs (b) through (ee) of this section have been approved for incorporation by reference by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Material is incorporated as it exists on the date of the approval and a notice of any change in the material will be published in the **Federal Register**. Matters referenced by footnote are included as part of the regulations of this subchapter.

(2) *Accessibility of materials.* All incorporated matter is available for inspection at:

(i) The Office of Hazardous Materials Safety, Office of Hazardous Materials Standards, East Building, PHH–10, 1200 New Jersey Avenue SE., Washington, DC 20590–0001. For information on the availability of this material at PHH–10, call 1–800–467–4922, or go to: <http://www.phmsa.dot.gov>; and

(ii) The National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

(b) *Air Transport Association of America*, 1301 Pennsylvania Avenue NW., Washington, DC 20004–1707.

(1) ATA Specification No. 300 Packaging of Airline Supplies, Revision 19, July 31, 1996, into § 172.102.

(2) [Reserved]

(c) *The Aluminum Association*, 1525 Wilson Blvd., Suite 6000, Arlington, VA 22209, telephone 703–358–2960, <http://www.aluminum.org>.

(1) Aluminum Standards and Data, Seventh Edition, June 1982, into §§ 172.102; 178.65.

(2) Welding Aluminum: Theory and Practice, 2002 Fourth Edition, into § 178.68.

(d) *American National Standards Institute, Inc.*, 25 West 43rd Street, New York, NY 10036.

(1) ANSI/ASHRAE 15–94, Safety Code for Mechanical Refrigeration, 1944, into §§ 173.306; 173.307.

(2) ANSI B16.5–77, Steel Pipe Flanges, Flanged Fittings, 1977, into § 178.360–4.

(3) ANSI N14.1 Uranium Hexafluoride—Packaging for Transport, 1971 Edition, into §§ 173.417; 173.420.

(4) ANSI N14.1 Uranium Hexafluoride—Packaging for Transport, 1982 Edition, into §§ 173.417; 173.420.

(5) ANSI N14.1 Uranium Hexafluoride—Packaging for Transport, 1987 Edition, into §§ 173.417; 173.420.

(6) ANSI N14.1 Uranium Hexafluoride—Packaging for Transport, 1990 Edition, into §§ 173.417; 173.420.

(7) ANSI N14.1 Uranium Hexafluoride—Packaging for Transport, 1995 Edition, into §§ 173.417; 173.420.

(8) ANSI N14.1 Uranium Hexafluoride—Packaging for Transport, 2001 Edition, into §§ 173.417; 173.420.

(e) *American Petroleum Institute*, 1220 L Street NW., Washington, DC 20005-4070.

(1) API Recommended Practice Closures of Underground Petroleum Storage Tanks, 3rd Edition, March 1996, into § 172.102.

(2) [Reserved]

(f) *American Pyrotechnics Association (APA)*, P.O. Box 30438, Bethesda, MD 20824, (301) 907-8181, www.americanpyro.com.

(1) APA Standard 87-1, Standard for Construction and Approval for Transportation of Fireworks, Novelties, and Theatrical Pyrotechnics, December 1, 2001 version into § 173.56.

(2) [Reserved]

(g) *American Society of Mechanical Engineers*, ASME International, 22 Law Drive, P.O. Box 2900, Fairfield, NJ 07007-2900, telephone 1-800-843-2763 or 1-973-882-1170, <http://www.asme.org>.

(1) 'ASME Code'; ASME Code, Sections II (Parts A and B), V, VIII (Division 1), and IX of 1998 Edition of American Society of Mechanical Engineers Boiler and Pressure Vessel Code, into §§ 172.102; 173.5b; 173.24b; 173.32; 173.306; 173.315; 173.318; 173.420; 178.245-1; 178.245-3; 178.245-4; 178.245-6; 178.245-7; 178.255-1; 178.255-2; 178.255-14; 178.255-15; 178.270-2; 178.270-3; 178.270-7; 178.270-9; 178.270-11; 178.270-12; 178.271-1; 178.272-1; 178.273; 178.274; 178.276; 178.277; 178.320; 178.337-1; 178.337-2; 178.337-3; 178.337-4; 178.337-6; 178.337-16; 178.337-18; 178.338-1; 178.338-2; 178.338-3; 178.338-4; 178.338-5; 178.338-6; 178.338-13; 178.338-16; 178.338-18; 178.338-19; 178.345-1; 178.345-2; 178.345-3; 178.345-4; 178.345-7; 178.345-14; 178.345-15; 178.346-1; 178.347-1; 178.348-1; 179.400-3; 180.407.

(2) ASME B31.4-1998 Edition, Pipeline Transportation Systems for Liquid Hydrocarbons and other Liquids,

Chapters II, III, IV, V and VI, November 11, 1998, into § 173.5a.

(h) *American Society for Testing and Materials*, 100 Barr Harbor Drive, West Conshohocken, PA 1942, telephone (610) 832-9585, <http://www.astm.org>. Copies of historical standards or standards that ASTM does not have may be purchased from: Engineering Societies Library, 354 East 47th Street, New York, NY 10017.

(1) ASTM A 20/A 20M-93a Standard Specification for General Requirements for Steel Plates for Pressure Vessels, 1993, into §§ 178.337-2; 179.102-4; 179.102-1; 179.102-17.

(2) ASTM A 47-68 Malleable Iron Castings, 1968, into § 179.200-15.

(3) ASTM A 53/A 53M-06a (ASTM A 53) Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless, 2006, into § 173.5b.

(4) ASTM A 106/A 106M-06a (ASTM A 106) Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service, 2006, into § 173.5b.

(5) ASTM A 240/A 240M-99b Standard Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels, 1999, into §§ 178.57; 178.358-5; 179.100-7; 179.100-10; 179.102-1; 179.102-4; 179.102-17; 179.200-7; 179.201-5; 179.220-7; 179.300-7; 179.400-5.

(6) ASTM A 242-81 Standard Specification for High-Strength Low-Alloy Structural Steel, 1981, into § 178.338-2.

(7) ASTM A 262-93a Standard Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels, 1993, into 179.100-7; 179.200-7; 179.201-4.

(8) ASTM A 285-78 Pressure Vessel Plates, Carbon Steel, Low- and Intermediate-Tensile Strength, 1978, into § 179.300-7.

(9) ASTM A 300-58 Steel Plates for Pressure Vessels for Service at Low Temperatures, 1958, into § 178.337-2.

(10) ASTM A 302/A 302M-93 Standard Specification for Pressure Vessel Plates, Alloy Steel, Manganese-Molybdenum and Manganese-Molybdenum Nickel, 1993, into § 179.100-7; 179.200-7; 179.220-7.

(11) ASTM A 333-67 Seamless and Welded Steel Pipe for Low-Temperature Service, 1967, into § 178.45.

(12) ASTM A 370-94 Standard Test Methods and Definitions for Mechanical Testing of Steel Products, 1994, into §§ 179.102-17; 179.102-1; 179.102-4.

(13) ASTM A 441-81 Standard Specification for High-Strength Low-

Alloy Structural Manganese Vanadium Steel, 1981, into § 178.338-2.

(14) ASTM A 514-81 Standard Specification for High-Yield Strength Quenched and Tempered Alloy Steel Plate, Suitable for Welding, 1981, into § 178.338-2.

(15) ASTM A 515/A 515M-03 Standard Specification for Pressure Vessel Plates, Carbon Steel, for Intermediate- and Higher-Temperature Service, 2003, into § 179.300-7.

(16) ASTM A 516/A 516M-90 Standard Specification for Pressure Vessel Plates, Carbon Steel, for Moderate and Lower-Temperature Service, 1990, into § 178.337-2; 179.100-7; 179.102-1; 179.102-2; 179.102-4; 179.102-17; 179.200-7; 179.220-7; 179.300-7.

(17) ASTM A 537/A 537M-91 Standard Specification for Pressure Vessel Plates, Heat-Treated, Carbon-Manganese-Silicon Steel, 1991, into § 179.100-7; 179.102-4; 179.102-17.

(18) ASTM A 572-82 Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Steels of Structural Quality, 1982, into § 178.338-2.

(19) ASTM A 588-81 Standard Specification for High-Strength Low-Alloy Structural Steel with 50 Ksi Minimum Yield Point to 4 in. Thick, 1981, into § 178.338-2.

(20) ASTM A 606-75 Standard Specification for Steel Sheet and Strip Hot-Rolled and Cold-Rolled, High-Strength, Low-Alloy, with Improved Atmospheric Corrosion Resistance, 1975 (Reapproved 1981), into § 178.338-2.

(21) ASTM A 607-98 Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Columbium or Vanadium, or Both, Hot-Rolled and Cold-Rolled, 1998, into § 178.338-2.

(22) ASTM A 612-72a High Strength Steel Plates for Pressure Vessels for Moderate and Lower Temperature Service, 1972, into § 178.337-2.

(23) ASTM A 633-79a Standard Specification for Normalized High-Strength Low-Alloy Structural Steel, 1979 Edition, into § 178.338-2.

(24) ASTM A 715-81 Standard Specification for Steel Sheet and Strip, Hot-Rolled, High-Strength, Low-Alloy with Improved Formability, 1981, into § 178.338-2.

(25) ASTM A 1008/A 1008M-03 Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High Strength Low-Alloy with Improved Formability, 2003, into § 178.338-2; 178.345-2.

(26) ASTM A 1011/A 1011M-03a Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low Alloy

and High Strength Low-Alloy with Improved Formability, 2003, into § 178.338-2; 178.345-2.

(27) ASTM B 162-93a Standard Specification for Nickel Plate, Sheet, and Strip, 1993, into § 173.249; 179.200-7.

(28) ASTM B 209-93 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate, 1993, into § 179.100-7; 179.200-7; 179.220-7.

(29) ASTM B 221-76 Aluminum Alloy Extruded Bars, Rods, Shapes, and Tubes, 1976, into § 178.46.

(30) ASTM B 557-84 Tension Testing Wrought and Cast Aluminum and Magnesium-Alloy Products, 1984, into § 178.46.

(31) ASTM B 580-79 Standard Specification for Anodic Oxide Coatings on Aluminum, (Re-approved 2000), into § 173.316; 173.318; 178.338-17.

(32) ASTM D 56-05, Standard Test Method for Flash Point by Tag Closed Cup Tester, approved May 1, 2005, into § 173.120.

(33) ASTM D 86-07a, Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure, approved April 1, 2007, into § 173.121.

(34) ASTM D 93-08, Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester, approved October 15, 2008, into § 173.120.

(35) ASTM D 1078-05, Standard Test Method for Distillation Range of Volatile Organic Liquids, approved May 15, 2005, into § 173.121.

(36) ASTM D 1238-90b Standard Test Method for Flow Rates of Thermoplastics for Extrusion Plastometer, 1990, into § 173.225.

(37) ASTM D 1709-01 Standard Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method, 2001, into § 173.197.

(38) ASTM D 1835-97 Standard Specification for Liquefied Petroleum (LP) Gases, 1997, into § 180.209.

(39) ASTM D 1838-64 Copper Strip Corrosion by Liquefied Petroleum (LP) Gases, 1964, into § 173.315.

(40) ASTM D 1922-00a Standard Test Method for Propagation Tear Resistance of Plastic Film and Thin Sheeting by Pendulum Method, 2000, into § 173.197.

(41) ASTM D 3278-96 (Reapproved 2004) E1, Standard Test Methods for Flash Point of Liquids by Small Scale Closed-Cup Apparatus, approved November 1, 2004, into § 173.120.

(42) ASTM D 3828-07a, Standard Test Methods for Flash Point by Small Scale Closed Cup Tester, approved July 15, 2007, § 173.120.

(43) ASTM D 4206-96 Standard Test Method for Sustained Burning of Liquid Mixtures Using the Small Scale Open-Cup Apparatus, 1996, into § 173.120.

(44) ASTM D 4359-90 Standard Test Method for Determining Whether a Material is a Liquid or a Solid, 1990 into § 171.8.

(45) ASTM E 8-99 Standard Test Methods for Tension Testing of Metallic Materials, 1999, into § 178.36; 178.37; 178.38; 178.39; 178.44; 178.45; 178.50; 178.51; 178.53; 178.55; 178.56; 178.57; 178.58; 178.59; 178.60; 178.61; 178.68.

(46) ASTM E 23-98 Standard Test Methods for Notched Bar Impact Testing of Metallic Materials, 1998, into § 178.57.

(47) ASTM E 112-88 Standard Test Methods for Determining Average Grain Size, 1988, into § 178.44.

(48) ASTM E 112-96 Standard Test Methods for Determining Average Grain Size, 1996 Edition, into § 178.274; Part 178, appendix A.

(49) ASTM E 114-95 Standard Practice for Ultrasonic Pulse-Echo Straight-Beam Examination by the Contact Method, 1995, into § 178.45.

(50) ASTM E 213-98 Standard Practice for Ultrasonic Examination of Metal Pipe and Tubing, into § 178.45.

(51) ASTM E 290-97a Standard Test Methods for Bend Testing of Material for Ductility, published February 1998, into § 178.37.

(i) *American Water Works Association*, 1010 Vermont Avenue NW., Suite 810, Washington, DC 20005.

(1) AWWA Standard C207-55, Steel Pipe Flanges, 1955, into § 178.360-4.

(2) [Reserved]

(j) *American Welding Society*, 550 NW. Le Jeune Road, Miami, Florida 33126.

(1) AWS Code B 3.0; Standard Qualification Procedure; 1972 (FRB 3.0-41, rev. May 1973), into §§ 178.356-2, 178.358-2.

(2) AWS Code D 1.0; Code for Welding in Building Construction (FR D 1.0-66, 1966), into §§ 178.356-2; 178.358-2.

(k) *Association of American Railroads*, American Railroads Building, 50 F Street NW., Washington, DC 20001; telephone (877) 999-8824, <http://www.aar.org/publications.com>.

(1) AAR Manual of Standards and Recommended Practices, Section C—Part III, Specifications for Tank Cars, Specification M-1002, (AAR Specifications for Tank Cars), December 2000, § 173.31; 179.6; 179.7; 179.15; 179.16; 179.20; 179.22; 179.100-9; 179.100-10; 179.100-12; 179.100-13; 179.100-14; 179.100-18; 179.101-1; 179.102-1; 179.102-4; 179.102-17; 179.103-5; 179.200-7; 179.200-9; 179.200-10; 179.200-11; 179.200-13; 179.200-17; 179.200-22; 179.201-6; 179.220-6; 179.220-7; 179.220-10; 179.220-11; 179.220-14; 179.220-18;

179.220-26; 179.300-9; 179.300-10; 179.300-15; 179.300-17; 179.400-5; 179.400-6; 179.400-8; 179.400-11; 179.400-12; 179.400-15; 179.400-18; 179.400-20; 179.400-25; 180.509; 180.513; 180.515; 180.517.

(2) AAR Manual of Standards and Recommended Practices, Section I, Specially Equipped Freight Car and Intermodal Equipment, 1988, into § 174.55; 174.63.

(3) AAR Specifications for Design, Fabrication and Construction of Freight Cars, Volume 1, 1988, into § 179.16.

(4) AAR Standard 286; AAR Manual of Standards and Recommended Practices, Section C, Car Construction Fundamentals and Details, Standard S-286, Free/Unrestricted Interchange for 286,000 lb Gross Rail Load Cars (Adopted 2002; Revised: 2003, 2005, 2006), into 179.13.

(l) *Chlorine Institute, Inc.*, 1300 Wilson Boulevard, Arlington, VA 22209.

(1) Chlorine Institute Emergency Kit “A” for 100-lb. & 150 lb. Chlorine Cylinders (with the exception of repair method using Device 8 for side leaks), Edition 10, June 2003, into 173.3.

(2) Chlorine Institute Emergency Kit “B” for Chlorine Ton Containers (with the exception of repair method using Device 9 for side leaks), Edition 9, June 2003, into 173.3.

(3) Type 1 JQ 225, Dwg., H51970, Revision F, November 1996, into § 173.315.

(4) Type 1 JQ 225, Dwg. H50155, Revision H, November 1996, into § 173.315.

(5) Section 3, Pamphlet 57, Emergency Shut-Off Systems for Bulk Transfer of Chlorine, Edition 4, October 2003, into § 177.840.

(6) Section 3, Pamphlet 166, Angle Valve Guidelines for Chlorine Bulk Transportation, 1st Edition, October 2002, into § 178.337-9.

(7) Standard Chlorine Angle Valve Assembly, Dwg. 104-8, July 1993, into § 178.337-9.

(8) Excess Flow Valve with Removable Seat, Dwg. 101-7, July 1993, into § 178.337-8.

(9) Excess Flow Valve with Removable Basket, Dwg. 106-6, July 1993, into § 178.337-8.

(10) Standards for Housing and Manway Covers for Steel Cargo Tanks, Dwg. 137-1 and 137-2, September 1, 1982, into § 178.337-10.

(11) Typical Manway Arrangement Chlorine Cargo Tank, Dwg 137-5, November 1996, into 178.337-10.

(m) *Canadian General Standards Board*, Place du Portage III, 6B1 11 Laurier Street, Gatineau, Quebec, Canada K1A 1G6.

(1) National Standard of Canada (CAN/CGSB 43.147—2005)

Construction, Modification, Qualification, Maintenance, and Selection and Use of Means of Containment for the Handling, Offering for Transport, or Transportation of Dangerous Goods by Rail, into § 171.12.

(2) [Reserved]

(n) *Compressed Gas Association (CGA)*, 1235 Jefferson Davis Highway, Arlington, VA 22202.

(1) CGA Pamphlet C-3, Standards for Welding on Thin-Walled Steel Cylinders, 1994, into § 178.47; 178.50; 178.51; 178.53; 178.55; 178.56; 178.57; 178.58; 178.59; 178.60; 178.61; 178.65; 178.68; 180.211.

(2) CGA C-5, Cylinder Service Life—Seamless Steel High Pressure Cylinders, 1991 (reaffirmed 1995), into § 173.302a.

(3) CGA Pamphlet C-6, Standards for Visual Inspection of Steel Compressed Gas Cylinders, 1993, into § 173.3, 173.198, 180.205, 180.209, 180.211, 180.411, 180.519.

(4) CGA Pamphlet C-6.1, Standards for Visual Inspection of High Pressure Aluminum Compressed Gas Cylinders, 2002, Fourth Edition, into § 180.205; 180.209.

(5) CGA Pamphlet C-6.2, Guidelines for Visual Inspection and Requalification of Fiber Reinforced High Pressure Cylinders, 1996, Third Edition, into § 180.205.

(6) CGA Pamphlet C-6.3, Guidelines for Visual Inspection and Requalification of Low Pressure Aluminum Compressed Gas Cylinders, 1991, into § 180.205; 180.209.

(7) CGA C-7, Guide to Preparation of Precautionary Labeling and Marking of Compressed Gas Containers, Appendix A, issued 2004 (8th Edition), into § 172.400a.

(8) CGA Pamphlet C-8, Standard for Requalification of DOT-3HT Cylinder Design, 1985, into § 180.205; 180.209.

(9) CGA Pamphlet C-11, Recommended Practices for Inspection of Compressed Gas Cylinders at Time of Manufacture, 2001, Third Edition, into § 178.35.

(10) CGA Pamphlet C-12, Qualification Procedure for Acetylene Cylinder Design, 1994, into § 173.301; 173.303; 178.59; 178.60.

(11) CGA Pamphlet C-13, Guidelines for Periodic Visual Inspection and Requalification of Acetylene Cylinders, 2000, Fourth Edition, into § 173.303; 180.205; 180.209.

(12) CGA Pamphlet C-14, Procedures for Fire Testing of DOT Cylinder Pressure Relief Device Systems, 1979, into § 173.301; 173.323.

(13) CGA Pamphlet G-2.2, Guideline Method for Determining Minimum of 0.2% Water in Anhydrous Ammonia,

1985, Second Edition, Reaffirmed 1997, into § 173.315.

(14) CGA Pamphlet G-4.1, Cleaning Equipment for Oxygen Service, 1985, into § 178.338-15.

(15) CGA Pamphlet P-20, Standard for the Classification of Toxic Gas Mixtures, 1995, into § 173.115.

(16) CGA Pamphlet P-20, Standard for the Classification of Toxic Gas Mixtures, 2003, Third Edition, into § 173.115.

(17) CGA S-1.1, Pressure Relief Device Standards—Part 1—Cylinders for Compressed Gases, (with the exception of paragraph 9.1.1.1), Twelfth Edition, 2005, into § 173.301, 173.304a 178.75.

(18) CGA Pamphlet S-1.2, Safety Relief Device Standards Part 2—Cargo and Portable Tanks for Compressed Gases, 1980, into § 173.315; 173.318; 178.276; 178.277.

(19) CGA S-7, Method for Selecting Pressure Relief Devices for Compressed Gas Mixtures in Cylinders, 2005, into § 173.301.

(20) CGA Technical Bulletin TB-2, Guidelines for Inspection and Repair of MC-330 and MC-331 Cargo Tanks, 1980, into § 180.407; 180.413.

(21) CGA Technical Bulletin TB-25, Design Considerations for Tube Trailers, 2008 Edition, into § 173.301.

(o) *Department of Defense (DOD)*, 2461 Eisenhower Avenue, Alexandria, VA 22331.

(1) DOD TB 700-2; NAVSEAINST 8020.8B; AFTO 11A-1-47; DLAR 8220.1: Explosives Hazard Classification Procedures, January 1998, into § 173.56.

(2) Packaging of Hazardous Material, DLAD 4145.41/AR 700-143/AFJI 24-210/NAVSUPINST 4030.55B/MCO 4030.40B, January 14, 2000, into § 173.7

(p) *Department of Energy (USDOE)*, 100 Independence Avenue SW., Washington, DC 20545. USDOE publications available from: Superintendent of Documents, Government Printing Office (GPO) or The National Technical Information Service (NTIS).

(1) USDOE, CAPE-1662, Revision 1, and Supplement 1, Civilian Application Program Engineering Drawings, April 6, 1988, into §§ 178.356-1; 178.356-2; 178.358-1; 178.358-2; 178.358-3; 178.358-4.

(2) USDOE, Material and Equipment Specification No. SP-9, Rev. 1, and Supplement—Fire Resistant Phenolic Foam, March 28, 1968, into §§ 178.356-2; 178.358-2.

(3) USDOE, KSS-471,—Proposal for Modifications to U.S. Department of Transportation Specification 21PF-1, Fire and Shock Resistant Phenolic Foam—Insulated Metal Overpack,

November 30, 1986, into § 178.358-1; 178.358-3.

(q) *General Services Administration*, Specification Office, Room 6662, 7th and D Street, S.W., Washington, DC 20407.

(1) Federal Specification RR-C-901D, Cylinders, Compressed Gas: Seamless Shatterproof, High Pressure DOT 3AA Steel, and 3AL Aluminum, February 21, 2003, into §§ 173.302; 173.336; 173.337.

(2) [Reserved]

(r) *Institute of Makers of Explosives*, 1120 19th Street NW., Suite 310, Washington, DC 20036-3605.

(1) IME Standard 22, IME Safety Library Publication No. 22, Recommendations for the Safe Transportation of Detonators in a Vehicle with Certain Other Explosive Materials, February 2007, into §§ 173.63; 177.835.

(2) [Reserved]

(s) *International Atomic Energy Agency (IAEA)*, P.O. Box 100, Wagramer Strasse 5, A-1400 Vienna, Austria. Also available from: Bernan Associates, 4611-F Assembly Drive, Lanham, MD 20706-4391, USA; or Renouf Publishing Company, Ltd., 812 Proctor Avenue, Ogdensburg, New York 13669, USA.

(1) No. TS-R-1 (ST-1, Revised), Regulations for the Safe Transport of Radioactive Material, (IAEA Regulations), 1996 Edition (Revised), into § 171.22; 171.23; 171.26, 173.415, 173.416, 173.417, 173.473.

(2) [Reserved]

(t) *International Civil Aviation Organization* (“ICAO”), 999 University Street, Montréal, Québec H3C 5H7, Canada, 1-514-954-8219, <http://www.icao.int>. ICAO Technical Instructions available from: INTEREG, International Regulations, Publishing and Distribution Organization, P.O. Box 60105, Chicago, IL 60660.

(1) Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO Technical Instructions), 2013-2014 Edition, into §§ 171.8; 171.22; 171.23; 171.24; 172.101; 172.202; 172.401; 172.512; 172.519; 172.602; 173.56; 173.320; 175.10, 175.33; 178.3.

(2) [Reserved]

(u) International Electrotechnical Commission (IEC), 3 rue de Varembé, P.O. Box 131, CH-1211, GENEVA 20, Switzerland.

(1) IEC 62282-6-100:2010(E), Fuel cell technologies—Part 6-100: Micro fuel cell power systems—Safety, Edition 1.0, March 2010, into §§ 173.230; 175.10.

(2) 62282-6-100 Amend. 1 IEC 2012(E), Amendment 1 to IEC 62282-6-100: Fuel cell technologies—Part 6-100: Micro fuel cell power systems—Safety,

Edition 1.0, October 2012, into §§ 173.230; 175.10

(v) *International Maritime Organization ("IMO")*, 4 Albert Embankment, London, SE1 7SR, United Kingdom or New York Nautical Instrument & Service Corporation, 140 West Broadway, New York, NY 10013, +44 (0) 20 7735 7611, <http://www.imo.org>.

(1) International Convention for the Safety of Life at Sea, 1974, Consolidated Edition (SOLAS), Chapter II-2, Construction—Fire protection, fire detection and fire extinction, Regulation 19, Carriage of dangerous goods, Fifth Edition 2009, into §§ 176.63, 176.84.

(2) International Maritime Dangerous Goods Code (IMDG Code), Incorporating Amendment 36-12 (English Edition), 2011, into §§ 171.22; 171.23; 171.25; 172.101 172.202; 172.203 172.401; 172.502; 172.519; 172.602; 173.21; 173.56; 176.2; 176.5; 176.11; 176.27; 176.30; 176.83; 176.84; 176.140; 176.720; 178.3; 178.274.

(w) *International Organization for Standardization*, Case Postale 56, CH-1211, Geneve 20, Switzerland, <http://www.iso.org>. Also available from: ANSI 25, West 43rd Street, New York, NY 10036, 1-212-642-4900, <http://www.ansi.org>.

(1) ISO 535-1991(E) Paper and board—Determination of water absorptiveness—Cobb method, 1991, into § 178.516; 178.707; 178.708.

(2) ISO 1496-1: 1990 (E)—Series 1 freight containers—Specification and testing, Part 1: General cargo containers. Fifth Edition, (August 15, 1990), into § 173.411.

(3) ISO 1496-3(E)—Series 1 freight containers—Specification and testing—Part 3: Tank containers for liquids, gases and pressurized dry bulk, Fourth edition, March 1995, into § 178.74; 178.75; 178.274.

(4) ISO 1516:2002(E), Determination of flash/no flash—Closed cup equilibrium method, Third Edition, 2002-03-01, into § 173.120.

(5) ISO 1523:2002(E), Determination of flash point—Closed cup equilibrium method, Third Edition, 2002-03-01, into § 173.120.

(6) ISO 2431-1984(E) Standard Cup Method, 1984, into § 173.121.

(7) ISO 2592:2000(E), Determination of flash and fire points—Cleveland open cup method, Second Edition, 2000-09-15, into § 173.120.

(8) ISO 2719:2002(E), Determination of flash point—Pensky-Martens closed cup method, Third Edition, 2002-11-15, into § 173.120.

(9) ISO 2919-1980(E) Sealed radioactive sources—Classification, 1980, into § 173.469.

(10) ISO 3036-1975(E) Board—Determination of puncture resistance, 1975, into § 178.708.

(11) ISO 3405:2000(E), Petroleum products—Determination of distillation characteristics at atmospheric pressure, Third Edition, 2000-03-01, into § 173.121.

(12) ISO 3574-1986(E) Cold-reduced carbon steel sheet of commercial and drawing qualities, into § 178.503; Part 178, appendix C.

(13) ISO 3679:2004(E), Determination of flash point—Rapid equilibrium closed cup method, Third Edition, 2004-04-01, into § 173.120.

(14) ISO 3680:2004(E), Determination of flash/no flash—Rapid equilibrium closed cup method, Fourth Edition, 2004-04-01, into § 173.120.

(15) ISO 3807-2(E), Cylinders for acetylene—Basic requirements—Part 2: Cylinders with fusible plugs, First edition, March 2000, into §§ 173.303; 178.71.

(16) ISO 3924:1999(E), Petroleum products—Determination of boiling range distribution—Gas chromatography method, Second Edition, 1999-08-01, into § 173.121.

(17) ISO 4126-1:2004(E): Safety devices for protection against excessive pressure—Part 1: Safety valves, Second edition 2004-02-15, into § 178.274.

(18) ISO 4126-7:2004(E): Safety devices for protection against excessive pressure—Part 7: Common data, First Edition 2004-02-15 into § 178.274.

(19) ISO 4126-7:2004/Cor.1:2006(E): Safety devices for protection against excessive pressure—Part 7: Common data, Technical Corrigendum 1, 2006-11-01, into § 178.274.

(20) ISO 4626:1980(E), Volatile organic liquids—Determination of boiling range of organic solvents used as raw materials, First Edition, 1980-03-01, into § 173.121.

(21) ISO 4706:2008(E), Gas cylinders—Refillable welded steel cylinders—Test pressure 60 bar and below, First Edition, 2008-04-15, Corrected Version, 2008-07-01, into § 178.71.

(22) ISO 6406(E), Gas cylinders—Seamless steel gas cylinders—Periodic inspection and testing, Second edition, February 2005, into § 180.207.

(23) ISO 6892 Metallic materials—Tensile testing, July 15, 1984, First Edition, into § 178.274.

(24) ISO 7225(E), Gas cylinders—Precautionary labels, Second Edition, July 2005, into § 178.71.

(25) ISO 7866(E), Gas cylinders—Refillable seamless aluminum alloy gas cylinders—Design, construction and testing, First edition, June 1999, into § 178.71.

(26) ISO 8115 Cotton bales—Dimensions and density, 1986 Edition, into § 172.102.

(27) ISO 9809-1(E): Gas cylinders—Refillable seamless steel gas cylinders—Design, construction and testing—Part 1: Quenched and tempered steel cylinders with tensile strength less than 1100 MPa., First edition, June 1999, into §§ 178.71; 178.75.

(28) ISO 9809-2(E): Gas cylinders—Refillable seamless steel gas cylinders—Design, construction and testing—Part 2: Quenched and tempered steel cylinders with tensile strength greater than or equal to 1100 MPa., First edition, June 2000, into §§ 178.71; 178.75.

(29) ISO 9809-3 (E): Gas cylinders—Refillable seamless steel gas cylinders—Design, construction and testing—Part 3: Normalized steel cylinders, First edition, December 2000, into §§ 178.71; 178.75.

(30) ISO 9978:1992(E)—Radiation protection—Sealed radioactive sources—Leakage test methods. First Edition, (February 15, 1992), into § 173.469.

(31) ISO 10156:2010(E): Gases and gas mixtures—Determination of fire potential and oxidizing ability for the selection of cylinder valve outlets, Third edition, 2010-04-01, into § 173.115.

(32) ISO 10156:2010/Cor.1:2010(E): Gases and gas mixtures—Determination of fire potential and oxidizing ability for the selection of cylinder valve outlets, Technical Corrigendum 1, 2010-09-01, into § 173.115.

(33) ISO 10297:2006(E), Transportable gas cylinders—Cylinder valves—Specification and type testing, Second Edition, 2006-01-15, into § 173.301b; 178.71.

(34) ISO 10461:2005(E), Gas cylinders—Seamless aluminum-alloy gas cylinders—Periodic inspection and testing, Second Edition, 2005-02-15 and Amendment 1, 2006-07-15, into § 180.207.

(35) ISO 10462 (E), Gas cylinders—Transportable cylinders for dissolved acetylene—Periodic inspection and maintenance, Second edition, February 2005, into § 180.207.

(36) ISO 10692-2:2001(E), Gas cylinders—Gas cylinder valve connections for use in the micro-electronics industry—Part 2: Specification and type testing for valve to cylinder connections, First Edition, 2001-08-01, into § 173.40.

(37) ISO 11114-1(E), Transportable gas cylinders—Compatibility of cylinder and valve materials with gas contents—Part 1: Metallic materials, First edition, October 1997, into §§ 173.301b; 178.71.

(38) ISO 11114-2(E), Transportable gas cylinders—Compatibility of cylinder and valve materials with gas contents—Part 2: Non-metallic materials, First edition, December 2000, into §§ 173.301b; 178.71.

(39) ISO 11117:2008(E): Gas cylinders—Valve protection caps and valve guards—Design, construction and tests, Second edition, 2008-09-01, into § 173.301b.

(40) ISO 11117:2008/Cor.1:2009(E): Gas cylinders—Valve protection caps and valve guards—Design, construction and tests, Technical Corrigendum 1, 2009-05-01, into § 173.301b.

(41) ISO 11118(E), Gas cylinders—Non-refillable metallic gas cylinders—Specification and test methods, First edition, October 1999, into § 178.71.

(42) ISO 11119-1(E), Gas cylinders—Gas cylinders of composite construction—Specification and test methods—Part 1: Hoop-wrapped composite gas cylinders, First edition, May 2002, into § 178.71.

(43) ISO 11119-2(E), Gas cylinders—Gas cylinders of composite construction—Specification and test methods—Part 2: Fully wrapped fibre reinforced composite gas cylinders with load-sharing metal liners, First edition, May 2002, into § 178.71.

(44) ISO 11119-3(E), Gas cylinders of composite construction—Specification and test methods—Part 3: Fully wrapped fibre reinforced composite gas cylinders with non-load-sharing metallic or non-metallic liners, First edition, September 2002, into § 178.71.

(45) ISO 11120(E), Gas cylinders—Refillable seamless steel tubes of water capacity between 150 L and 3000 L—Design, construction and testing, First edition, March 1999, into §§ 178.71; 178.75.

(46) ISO 11621(E), Gas cylinders—Procedures for change of gas service, First edition, April 1997, into §§ 173.302, 173.336, 173.337.

(47) ISO 11623(E), Transportable gas cylinders—Periodic inspection and testing of composite gas cylinders, First edition, March 2002, into § 180.207.

(48) ISO 13340:2001(E) Transportable gas cylinders—Cylinder valves for non-refillable cylinders—Specification and prototype testing, First edition, 2004-04-01, into §§ 173.301b; 178.71.

(49) ISO 13736:2008(E), Determination of flash point—Abel closed-cup method, Second Edition, 2008-09-15, into § 173.120.

(50) ISO 16111:2008(E), Transportable gas storage devices—Hydrogen absorbed in reversible metal hydride, First Edition, 2008-11-15, into §§ 173.301b; 173.311; 178.71.

(51) ISO 18172-1:2007(E), Gas cylinders—Refillable welded stainless steel cylinders—Part 1: Test pressure 6 MPa and below, First Edition, 2007-03-01, into § 178.71.

(52) ISO 20703:2006(E), Gas cylinders—Refillable welded aluminum-alloy cylinders—Design, construction and testing, First Edition, 2006-05-01, into § 178.71.

(x) *National Board of Boiler and Pressure Vessel Inspectors*, 1055 Crupper Avenue, Columbus, Ohio 43229.

(1) NB-23, National Board Inspection Code, A Manual for Boiler and Pressure Vessel Inspectors, 1992 Edition, into § 180.413.

(2) [Reserved]

(y) *National Fire Protection Association*, 1 Batterymarch Park, Quincy, MA, 02169-7471 1-617-770-3000, <http://www.nfpa.org>.

(1) NFPA 58-Liquefied Petroleum Gas Code, 2001 Edition, into §§ 173.5, 173.315.

(2) NFPA 498-Standards for Safe Havens and Interchange Lots for Vehicles Transporting Explosives, 2010 Edition, into § 177.835.

(z) *National Institute of Standards and Technology*, Department of Commerce, 5285 Port Royal Road, Springfield, VA 22151.

(1) USDC, NBS Handbook H-28 (1957), 1957 Handbook of Screw-Thread Standards for Federal Services, December 1966 Edition, into §§ 179.2; 178.45; 178.46.

(2) [Reserved]

(aa) *Organization for Economic Cooperation and Development (OECD)*, OECD Publications and Information Center, 2001 L Street, N.W., Suite 700, Washington, DC 20036.

(1) Test No. 404: Acute Dermal Irritation/Corrosion, OECD Guidelines for the Testing of Chemicals, Section 4: Health Effects, adopted April 24, 2002, into § 173.137.

(2) Test No. 430: In VitroSkin Corrosion: Transcutaneous Electrical Resistance Test (TER), OECD Guidelines for the Testing of Chemicals, Section 4: Health Effects, adopted April 13, 2004, into § 173.137.

(3) OECD (2004), Test No. 431: In VitroSkin Corrosion: Human Skin Model Test, OECD Guidelines for the Testing of Chemicals, Section 4: Health Effects, OECD Publishing, adopted April 13, 2004, into § 173.137.

(4) Test No. 435: In VitroMembrane Barrier Test Method for Skin Corrosion, OECD Guidelines for the Testing of Chemicals, Section 4: Health Effects, adopted July 19, 2006, into § 173.137.

(bb) *Transport Canada*, TDG Canadian Government Publishing

Center, Supply and Services, Canada, Ottawa, Ontario, Canada K1A 0S9, 416-973-1868, <http://www.tc.gc.ca>.

(1) Transportation of Dangerous Goods Regulations (Transport Canada TDG Regulations), into §§ 171.12; 171.22; 171.23; 172.401; 172.502; 172.519; 172.602; 173.31; 173.32; 173.33.

(i) SOR 2001-286, including Clear Language Amendments, August 2001.

(ii) SOR/2002-306 August 8, 2002.

(iii) SOR/2003-273 July 24, 2003

(iv) SOR/2003-400 December 3, 2003

(v) SOR/2005-216 July 13, 2005

(vi) SOR/2005-279 September 21, 2005

(vii) SOR/2008-34 February 7, 2008

(viii) SOR/2007-179 July 31, 2007

(2) [Reserved]

(cc) *Truck Trailer Manufacturers Association*, 1020 Princess Street, Alexandria, Virginia 22314.

(1) TTMA RP No. 61-98, Performance of manhole and/or Fill Opening Assemblies on MC 306, DOT 406, Non-ASME MC 312 and Non-ASME DOT 412 Cargo Tanks, June 1, 1998, into § 180.405.

(2) TTMA RP No. 81-97, Performance of Spring Loaded Pressure Relief Valves on MC 306, MC 307, MC 312, DOT 406, DOT 407, and DOT 412 Tanks, July 1, 1997 Edition, into §§ 178.345-10; 178.346-3.

(3) TTMA TB No. 107, Procedure for Testing In-Service Unmarked and/or Uncertified MC 306 and Non-ASME MC 312 Type Cargo Tank Manhole Covers, June 1, 1998 Edition, into § 180.405.

(dd) *United Nations*, Publications, 2 United Nations Plaza, Room DC2-853, New York, NY 10017, 1-212-963-8302, <http://unp.un.org>.

(1) UN Recommendations on the Transport of Dangerous Goods, Model Regulations (UN Recommendations), 17th revised edition, Volumes I and II (2011), into §§ 171.8; 171.12; 172.202; 172.401; 172.407; 172.502; 173.22; 173.24; 173.24b; 173.40; 173.56; 173.192; 173.302b; 173.304b; 178.75; 178.274.

(2) UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, fifth revised edition, amendment 1 (2011) (Manual of Tests and Criteria), into §§ 172.102; 173.21; 173.56; 173.57; 173.58; 173.60; 173.115; 173.124; 173.125; 173.127; 173.128; 173.137; 173.185; 173.220; Part 173, appendix H; 178.274.

(ee) *United States Enrichment Corporation, Inc. (USEC)*, USEC Inc., 6903 Rockledge Drive, Bethesda, MD 20817.

(1) USEC-651—Good Handling Practices for Uranium Hexafluoride, Revision 8, January 1999, into § 173.417.

(2) [Reserved]

TABLE 1 TO 49 CFR 171.7—MATERIALS NOT INCORPORATED BY REFERENCE

Source and name of material	49 CFR reference
<i>American Biological Safety Association</i> 1202 Allanson Road, Mundelein, IL 60060: Risk Group Classification for Infectious Agents, 1998	173.134.
<i>American Institute of Chemical Engineers (AIChE)</i> , 3 Park Avenue New York, NY 10016–5991: Process Safety Progress Journal, Vol. 21, No. 2, Example of a Test Method for Venting Sizing: OPPSD/SPI Methodology.	Note to § 173.225(h)(3)(vi).
<i>American Society for Testing and Materials</i> , 100 Barr Harbor Drive, West Conshohocken, PA 19428 (Non-current ASTM Standards are available from: Engineering Societies Library, 354 East 47th Street, New York, NY 10017): ASTM E 380–89 Standards for Metric Practice	171.10
<i>Association of American Railroads</i> , American Railroads Building, 50 F Street, NW., Washington, DC 20001: AAR Catalog Nos. SE60CHT; SE60CC; SE60CHTE; SE60CE; SE60DC; SE60DE	179.14
AAR Catalog Nos. SE67CC; SE67CE; SE67BHT; SE67BC; SE67BHTE; SE67BE	179.14
AAR Catalog Nos. SE68BHT; SE68BC; SE68BHTE; SE68BE	179.14
AAR Catalog Nos. SE69AHTE; SE69AE	179.14
AAR Catalog Nos. SF70CHT; SF70CC; SF70CHTE; SF70CE	179.14
AAR Catalog Nos. SF73AC; SF73AE; SF73AHT; SF73AHTE	179.14
AAR Catalog Nos. SF79CHT; SF79CC; SF79CHTE; SF79CE	179.14
<i>Bureau of Explosives</i> , Hazardous Materials Systems (BOE), Association of American Railroads, American Railroads Building, 50 F Street NW., Washington, DC 20001: Fetterley's Formula (The Determination of the Relief Dimensions for Safety Valves on Containers in which Liquefied gas is charged and when the exterior surface of the container is exposed to a temperature of 1,200 °F.).	173.315
Intermodal Loading Guide for Products in Closed Trailers and Containers, issued June 2001	174.55; 174.101; 174.112; 174.115.
Pamphlet 6, Illustrating Methods for Loading and Bracing Carload and Less-Than-Carload Shipments of Explosives and Other Dangerous Articles, 1962.	174.55; 174.101; 174.112; 174.115; 174.290.
Pamphlet 6A (includes appendix No. 1, October 1944 and appendix 2, December 1945), Illustrating Methods for Loading and Bracing Carload and Less-Than-Carload Shipments of Loaded Projectiles, Loaded Bombs, etc., 1943.	174.101; 174.290
Pamphlet 6C, Illustrating Methods for Loading and Bracing Trailers and Less-Than-Trailer Shipments of Explosives and Other Dangerous Articles Via Trailer-on-Flatcar (TOFC) or Container-on-Flatcar (COFC), 1985.	174.55; 174.63; 174.101; 174.112; 174.115
Emergency Handling of Hazardous Materials in Surface Transportation, 1989	171.7
<i>Centers for Disease Control and Prevention</i> 1600 Clifton Road, Atlanta, GA 30333: Biosafety in Microbiological and Biomedical Laboratories, Fourth Edition, April 1999	173.134
<i>Compressed Gas Association, Inc.</i> , 4221 Walney Road, 5th Floor, Chantilly, Virginia 20151: CGA C–1.1, Personnel Training and Certification Guidelines for Cylinder Requalification By the Volumetric Expansion Method, 2004, First Edition.	180.209
<i>National Institutes of Health</i> Bethesda, MD 20892: NIH Guidelines for Research Involving Recombinant DNA Molecules (NIH Guidelines), January 2001, Appendix B.	173.134
<i>Pantone Incorporated</i> 590 Commerce Boulevard, Carlstadt, New Jersey 07072–3098: Pantone ®Formula guide coated/uncoated, Second Edition 2004	172.407, 172.519
<i>Society of Plastics Industries, Inc.</i> , Organic Peroxide Producers Safety Division, 1275 K Street NW., Suite 400, Washington, DC 20005: Self Accelerating Decomposition Temperature Test, 1972	173.21
<i>Truck Trailer Manufacturers Association</i> , 1020 Princess Street, Alexandria, Virginia 22314, telephone (703) 549–3010, http://www.ttmanet.org : TTMA RP No. 96–01, TTMA RP No. 96–01, Structural Integrity of DOT 406, DOT 407, and DOT 412 Cylindrical Cargo Tanks, January 2001 Edition.	178.345–3

■ 3. In § 171.8, the definition of “Flexible bulk container” is added in alphabetical order to read as follows:

§ 171.8 Definitions and abbreviations.

* * * * *

Flexible bulk container means a flexible container with a capacity not exceeding 15 cubic meters and includes liners and attached handling devices and service equipment.

* * * * *

PART 172—HAZARDOUS MATERIALS TABLE, SPECIAL PROVISIONS, HAZARDOUS MATERIALS COMMUNICATIONS, EMERGENCY RESPONSE INFORMATION, AND TRAINING REQUIREMENTS

■ 4. The authority citation for part 172 continues to read as follows:

Authority: 49 U.S.C. 5101–5128; 44701; 49 CFR 1.53.

■ 5. In § 172.101:

■ a. Paragraph (c)(10)(i) introductory text is revised;

■ b. The first sentence in paragraph (c)(10)(iii) is revised;

■ c. Paragraph (k) is revised; and

■ d. The Hazardous Materials Table is amended by removing the entries under “[REMOVE]”, by adding the entries under “[ADD]”, and revising entries under “[REVISE]” in the appropriate alphabetical sequence.

The revisions and additions read as follows:

§ 172.101 Purpose and use of hazardous materials table.

* * * * *

(c) * * *

(10) *Mixtures and solutions.* (i) A mixture or solution meeting the definition of one or more hazard class that is not identified specifically by name, comprised of a single predominant hazardous material identified in the Table by technical name and one or more hazardous and/or non-hazardous material, must be described using the proper shipping name of the hazardous material and the qualifying word “mixture” or “solution”, as appropriate, unless—

* * * * *

(iii) A mixture or solution meeting the definition of one or more hazard class that is not identified in the Table specifically by name, comprised of two or more hazardous materials in the same hazard class, must be described using an appropriate shipping description (e.g., “Flammable liquid, n.o.s.”). * * *

* * * * *

(k) Column 10: Vessel stowage requirements. Column 10A [Vessel stowage] specifies the authorized stowage locations on board cargo and passenger vessels. Column 10B [Other provisions] specifies codes for stowage requirements for specific hazardous materials. Hazardous materials offered for transportation as limited quantities are allocated stowage category A and are not subject to the stowage codes assigned by column 10B. The meaning of each code in Column 10B is set forth in § 176.84 of this subchapter. Section 176.63 of this subchapter sets forth the physical requirements for each of the authorized locations listed in Column

10A. (For bulk transportation by vessel, see 46 CFR parts 30 to 40, 70, 98, 148, 151, 153 and 154.) The authorized stowage locations specified in Column 10A are defined as follows:

(1) Stowage category “A” means the material may be stowed “on deck” or “under deck” on a cargo vessel or on a passenger vessel.

(2) Stowage category “B” means—

(i) The material may be stowed “on deck” or “under deck” on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length; and

(ii) “On deck only” on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded.

(3) Stowage category “C” means the material must be stowed “on deck only” on a cargo vessel or on a passenger vessel.

(4) Stowage category “D” means the material must be stowed “on deck only” on a cargo vessel or on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers or one passenger per each 3 m of overall vessel length, but the material is prohibited on a passenger vessel in which the limiting number of passengers is exceeded.

(5) Stowage category “E” means the material may be stowed “on deck” or “under deck” on a cargo vessel or on a passenger vessel carrying a number of passengers limited to not more than the

larger of 25 passengers, or one passenger per each 3 m of overall vessel length, but is prohibited from carriage on a passenger vessel in which the limiting number of passengers is exceeded.

(6) Stowage category “01” means the material may be stowed “on deck” in closed cargo transport units or “under deck” on a cargo vessel (up to 12 passengers) or on a passenger vessel.

(7) Stowage category “02” means the material may be stowed “on deck” in closed cargo transport units or “under deck” on a cargo vessel (up to 12 passengers) or “on deck” in closed cargo transport units or “under deck” in closed cargo transport units on a passenger vessel.

(8) Stowage category “03” means the material may be stowed “on deck” in closed cargo transport units or “under deck” on a cargo vessel (up to 12 passengers) but the material is prohibited on a passenger vessel.

(9) Stowage category “04” means the material may be stowed “on deck” in closed cargo transport units or “under deck” in closed cargo transports on a cargo vessel (up to 12 passengers) but the material is prohibited on a passenger vessel.

(10) Stowage category “05” means the material may be stowed “on deck” in closed cargo transport units on a cargo vessel (up to 12 passengers) but the material is prohibited on a passenger vessel.

* * * * *

§ 172.101 Hazardous Materials Table

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class or division	(4) Identification Nos.	(5) PG	(6) Label codes	(7) Special provisions (§ 172.102)	(8) Packaging (§ 173.***)			(9) Quantity limitations (see §§ 173.27 and 175.75)			(10) Vessel stowage	
							(8A) Exceptions	(8B) Non-bulk	(8C) Bulk	(9A) Passenger aircraft/air/rail	(9B) Cargo aircraft only	(9C) Other		
	[REMOVE]													
	* Aerosols, poison, Packing Group III (each not exceeding 1 L capacity).	2.2	UN1950	*	2.2, 6.1	*	306	None	None	None	Forbidden	Forbidden	A	48, 87, 126
	Aerosols, flammable, (each not exceeding 1 L capacity).	2.1	UN1950		2.1	N82	306	None	None	None	75 kg	150 kg	A	48, 87, 126
	Aerosols, flammable, n.o.s. (engine starting fluid) (each not exceeding 1 L capacity).	2.1	UN1950		2.1	N82	306	304	None	None	Forbidden	150 kg	A	48, 87, 126
	Aerosols, non-flammable, (each not exceeding 1 L capacity).	2.2	UN1950		2.2		306	None	None	None	75 kg	150 kg	A	48, 87, 126
	Aerosols, poison, (each not exceeding 1 L capacity).	2.2	UN1950		2.2, 6.1		306	None	None	None	Forbidden	Forbidden	A	48, 87, 126
	* Amyl chlorides	3	UN1107	II	*	IB2, T4, TP1	150	*	202	242	5 L	60 L	B	
	* Amyl mercaptans	3	UN1111	II	*	A3, A6, IB2, T4, TP1	None	*	202	242	5 L	60 L	B	95, 102
	* Amyl nitrites	3	UN1113	II	*	IB2, T4, TP1	150	*	202	242	5 L	60 L	E	40
	* Butyl mercaptans	3	UN2347	II	*	A3, A6, IB2, T4, TP1	150	*	202	242	5 L	60 L	D	52, 95
	* Cartridges for weapons, blank or Cartridges, small arms, blank	1.4S	UN0014	II	*		63	*	62	None	25 kg	100 kg		
	* Iodine monochloride	8	UN1792	II	*	B6, IB8, IP2, IP4, N41, T7, TP2	None	*	212	240	Forbidden	50 kg	D	40, 66, 74, 89, 90
A	* Mercury contained in manufactured articles.	8	UN2809	III	*		None	*	164	None	No limit	No limit	B	40, 97
G	* Nitriles, toxic, liquid, n.o.s.	6.1	UN3276	I	*	5, T14, TP2, TP13, TP27	None	*	201	243	1 L	30 L	B	52
				II		IB2, T11, TP2, TP27	153		202	243	5 L	60 L	B	52
				III		IB3, T7, TP1, TP28	153		203	241	60 L	220 L	A	52

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class or division	(4) Identification Nos.	(5) PG	(6) Label codes	(7) Special provisions (§ 172.102)	(8) Packaging (§ 173.***)			(9) Quantity limitations (see §§ 173.27 and 175.75)		(10) Vessel stowage		
							Exceptions	Non-bulk	Bulk	Passenger aircraft/air/rail	Cargo aircraft only	Location	Other	
														(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
G	Nitriles, toxic, solid, n.o.s.	6.1	UN3439	I	6.1	IB7, IP1, T6, TP33.	*	None	211	242	5 kg	50 kg	D	52
				II	6.1	IB8, IP2, IP4, T3, TP33.		153	212	242	25 kg	100 kg	B	52
				III	6.1	IB8, IP3, T1, TP33.		153	213	240	100 kg	200 kg	A	52
G	Organophosphorus compound, toxic, liquid, n.o.s.	6.1	UN3278	I	6.1	5, T14, TP2, TP13, TP27.	*	None	201	243	1 L	30 L	B	
				II	6.1	IB2, T11, TP2, TP27.		153	202	243	5 L	60 L	B	
				III	6.1	IB3, T7, TP1, TP28.		153	203	241	60 L	220 L	A	
G	Organophosphorus compound, toxic, solid, n.o.s.	6.1	UN3464	I	6.1	IB7, IP1, T6, TP33.	*	None	211	242	5 kg	50 kg	B	
				II	6.1	IB8, IP2, IP4, T3, TP33.		153	212	242	25 kg	100 kg	B	
				III	6.1	IB8, IP3, T1, TP33.		153	213	240	100 kg	200 kg	A	
G	Organometallic compound, toxic, liquid, n.o.s.	6.1	UN3282	I	6.1	T14, TP2, TP13, TP27.	*	None	201	242	1 L	30 L	B	
				II	6.1	IB2, T11, TP2, TP27.		153	202	242	5 L	60 L	B	
				III	6.1	IB3, T7, TP1, TP28.		153	203	241	60 L	220 L	A	
G	Organometallic compound, toxic, solid, n.o.s.	6.1	UN3467	I	6.1	IB7, IP1, T6, TP33.	*	None	211	242	5 kg	50 kg	B	
				II	6.1	IB8, IP2, IP4, T3, TP33.		153	212	242	25 kg	100 kg	B	
				III	6.1	IB8, IP3, T1, TP33.		153	213	240	100 kg	200 kg	A	
G	Toxic by inhalation liquid, corrosive, flammable, n.o.s. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapor concentration greater than or equal to 500 LC50.	6.1	UN3492	I	6.1, 8, 3	1, B9, B14, B30, B72, T22, TP2, TP13, TP27, TP38, TP44.	*	None	226	244	Forbidden	Forbidden	D	40, 125

G	Toxic by inhalation liquid, corrosive, flammable, n.o.s. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapor concentration greater than or equal to 10 LC50.	6.1 UN3493	I	.....	6.1, 8, 3	2, B9, B14, B32, B74, T20, TP2, TP13, TP27, TP38, TP45.	None	.....	227	.....	244	.....	Forbidden	Forbidden	D	.....	40, 125
G	Toxic by inhalation liquid, flammable, corrosive, n.o.s. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapor concentration greater than or equal to 500 LC50.	6.1 UN3488	I	.....	6.1, 3, 8	1, B9, B14, B30, B72, T22, TP2, TP13, TP27, TP38, TP44.	None	.....	226	.....	244	.....	Forbidden	Forbidden	D	.....	40, 125
G	Toxic by inhalation liquid, flammable, corrosive, n.o.s. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapor concentration greater than or equal to 10 LC50.	6.1 UN3489	I	.....	6.1, 3, 8	2, B9, B14, B32, B74, T20, TP2, TP13, TP27, TP38, TP45.	None	.....	227	.....	244	.....	Forbidden	Forbidden	D	.....	40, 125
G	Toxic by inhalation liquid, n.o.s. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapor concentration greater than or equal to 500 LC50.	6.1 UN3381	I	.....	6.1	1, B9, B14, B30, T22, TP2, TP13, TP27, TP38, TP44.	None	.....	226	.....	244	.....	Forbidden	Forbidden	D	.....	40
G	Toxic by inhalation liquid, n.o.s. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapor concentration greater than or equal to 10 LC50.	6.1 UN3382	I	.....	6.1	2, B9, B14, B32, T20, TP2, TP13, TP27, TP38, TP45.	None	.....	227	.....	244	.....	Forbidden	Forbidden	D	.....	40
G	Toxic by inhalation liquid, flammable, n.o.s. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapor concentration greater than or equal to 10 LC50.	6.1 UN3383	I	.....	6.1, 3	1, B9, B14, B30, T22, TP2, TP13, TP27, TP38, TP44.	None	.....	226	.....	244	.....	Forbidden	Forbidden	D	.....	40
G	Toxic by inhalation liquid, flammable, n.o.s. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapor concentration greater than or equal to 10 LC50.	6.1 UN3384	I	.....	6.1, 3	2, B9, B14, B32, T20, TP2, TP13, TP27, TP38, TP45.	None	.....	227	.....	244	.....	Forbidden	Forbidden	D	.....	40

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class or division	(4) Identification Nos.	(5) PG	(6) Label codes	(7) Special provisions (§ 172.102)	(8) Packaging (§ 173.***)			(9) Quantity limitations (see §§ 173.27 and 175.75)		(10) Vessel stowage	
							(8A) Exceptions	(8B) Non-bulk	(8C) Bulk	(9A) Passenger aircraft/rail	(9B) Cargo aircraft only	(10A) Location	(10B) Other
G	Toxic by inhalation liquid, water-reactive, n.o.s. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapor concentration greater than or equal to 500 LC50.	6.1	UN3385	I	6.1, 4.3	1, B9, B14, B30, T22, TP2, TP13, TP38, TP44.	None	226	244	Forbidden	Forbidden	D	40
G	Toxic by inhalation liquid, water-reactive, n.o.s. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapor concentration greater than or equal to 10 LC50.	6.1	UN3386	I	6.1, 4.3	2, B9, B14, B32, T20, TP2, TP13, TP38, TP44.	None	227	244	Forbidden	Forbidden	D	40
G	Toxic by inhalation liquid, water-reactive, flammable, n.o.s. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapor concentration greater than or equal to 500 LC50.	6.1	UN3490	I	6.1, 4.3, 3	1, B9, B14, B30, B72, T22, TP2, TP13, TP27, TP38, TP44.	None	226	244	Forbidden	Forbidden	D	21, 28, 40, 49
G	Toxic by inhalation liquid, water-reactive, flammable, n.o.s. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapor concentration greater than or equal to 10 LC50.	6.1	UN3491	I	6.1, 4.3, 3	2, B9, B14, B32, B74, T20, TP2, TP13, TP27, TP38, TP45.	None	227	244	Forbidden	Forbidden	D	21, 28, 40, 49
G	Toxic by inhalation liquid, oxidizing, n.o.s. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapor concentration greater than or equal to 500 LC50.	6.1	UN3387	I	6.1, 5.1	1, B9, B14, B30, T22, TP2, TP13, TP38, TP44.	None	226	244	Forbidden	Forbidden	D	40
G	Toxic by inhalation liquid, oxidizing, n.o.s. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapor concentration greater than or equal to 10 LC50.	6.1	UN3388	I	6.1, 5.1	2, B9, B14, B32, T20, TP2, TP13, TP38, TP44.	None	227	244	Forbidden	Forbidden	D	40

UN Number	Classification	Label	Quantity	Other	Prohibited	Forbidden	Forbidden	Forbidden	D
6.1 UN3389	Toxic by inhalation liquid, corrosive, n.o.s. with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapor concentration greater than or equal to 500 LC50.	I	6.1, 8	1, B9, B14, B30, T22, TP2, TP13, TP27, TP38, TP44.	None	226	244	Forbidden	40
6.1 UN3390	Toxic by inhalation liquid, corrosive, n.o.s. with an inhalation toxicity lower than or equal to 1000 ml/m ³ and saturated vapor concentration greater than or equal to 10 LC50.	I	6.1, 8	2, B9, B14, B32, T20, TP2, TP13, TP27, TP38, TP45.	None	227	244	Forbidden	40
3 UN1305	Vinyltrichlorosilane, stabilized.	II	3, 8	A3, A7, B6, N34, T10, TP2, TP7, TP13.	None	206	243	1 L	B
[ADD]									
2.2 UN1950	Aerosols, corrosive, Packing Group II or III, (each not exceeding 1 L capacity).		2.2, 8	A34	306	None	None	75 kg	A
2.1 UN1950	Aerosols, flammable, (each not exceeding 1 L capacity).		2.1	N82	306	None	None	75 kg	A
2.1 UN1950	Aerosols, flammable, n.o.s. (engine starting fluid) (each not exceeding 1 L capacity).		2.1	N82	306	304	None	Forbidden	A
2.2 UN1950	Aerosols, non-flammable, (each not exceeding 1 L capacity).		2.2		306	None	None	75 kg	A
2.2 UN1950	Aerosols, poison, Packing Group III (each not exceeding 1 L capacity).		2.2, 6.1		306	None	None	Forbidden	A
3 UN1107	Amyl chloride	II	3	IB2, T4, TP1	150	202	242	5 L	B
3 UN1111	Amyl mercaptan	II	3	A3, A6, IB2, T4, TP1.	None	202	242	5 L	B
3 UN1113	Amyl nitrite	II	3	IB2, T4, TP1	150	202	242	5 L	E
3 UN2347	Butyl mercaptan	II	3	A3, A6, IB2, T4, TP1.	150	202	242	5 L	D
9 UN3499	Capacitor, electric double layer (with an energy storage capacity greater than 0.3 Wh).		9	361	176	176	176	No limit	A

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							(8A) Exceptions	(8B) Non-bulk	(8C) Bulk	(9A) Passenger aircraft/air/rail	(9B) Cargo aircraft/aircraft only	(10A) Location	(10B) Other
	Cartridges for weapons, blank or Cartridges, small arms, blank or Cartridges for tools, blank.	1.4S	UN0014	II	1.4S		63	62	None	25 kg	100 kg	01	25
G	Chemical under pressure, corrosive, n.o.s.	2.2	UN3503		*	362, T50, TP40	None	*	313	Forbidden	100 kg	D	40
G	Chemical under pressure, flammable, corrosive, n.o.s.	2.1	UN3505			362, T50, TP40	None	313	313	Forbidden	75 kg	D	40
G	Chemical under pressure, flammable, n.o.s.	2.1	UN3501			362, T50, TP40	None	313	313	Forbidden	75 kg	D	40
G	Chemical under pressure, flammable, toxic, n.o.s.	2.1	UN3504			362, T50, TP40	None	313	313	Forbidden	75 kg	D	40
G	Chemical under pressure, n.o.s.	2.2	UN3500			362, T50, TP40	None	313	313	75 kg	150 kg	B	40
G	Chemical under pressure, toxic, n.o.s.	2.2	UN3502			362, T50, TP40	None	313	313	Forbidden	100 kg	D	40
	Iodine monochloride, liquid.	8	UN3498	II	8	IB2, T7, TP2	154	202	242	1 L	30 L	D	40, 66, 74, 89, 90
	Iodine monochloride, solid.	8	UN1792	II	8	B6, IB8, IP2, IP4, N41, T7, TP2	None	212	240	Forbidden	50 kg	D	40, 66, 74, 89, 90
	Krill meal	4.2	UN3497	II	4.2	155, IB6, IP2, T3, TP33	None	212	242	No limit	No limit	B	25, 88, 128
A W	Mercury contained in manufactured articles.	8	UN3506	III	8, 6.1	A191	164	None	None	No limit	No limit	B	40, 97
G	Nitriles, liquid, toxic, n.o.s.	6.1	UN3276	I	6.1	5, T14, TP2, TP13, TP27	None	201	243	1 L	30 L	B	52
				II	6.1	IB2, T11, TP2, TP27	153	202	243	5 L	60 L	B	52
				III	6.1	IB3, T7, TP1, TP28	153	203	241	60 L	220 L	A	52
G	Nitriles, solid, toxic, n.o.s.	6.1	UN3439	I	6.1	IB7, IP1, T6, TP33	None	211	242	5 kg	50 kg	D	52
				II	6.1	IB8, IP2, IP4, T3, TP33	153	212	242	25 kg	100 kg	B	52
				III	6.1	IB8, IP3, T1, TP33	153	213	240	100 kg	200 kg	A	52

G	Organometallic compound, liquid, toxic, n.o.s.	*	6.1	UN3282	....	I	.....	6.1	.....	*	T14, TP2, TP13, TP27.	None	.....	201	.....	*	242	.....	*	1 L	.....	*	30 L	.....	B
						II	.....	6.1	.....	*	IB2, T11, TP2, TP27.	153	.....	202	.....	*	242	.....	*	5 L	.....	*	60 L	.....	B
						III	.....	6.1	.....	*	IB3, T7, TP1, TP28.	153	.....	203	.....	*	241	.....	*	60 L	.....	*	220 L	.....	A
G	Organometallic compound, solid, toxic, n.o.s.	*	6.1	UN3467	....	I	.....	6.1	.....	*	IB7, IP1, T6, TP33.	None	.....	211	.....	*	242	.....	*	5 kg	.....	*	50 kg	.....	B
						II	.....	6.1	.....	*	IB8, IP2, IP4, T3, TP33.	153	.....	212	.....	*	242	.....	*	25 kg	.....	*	100 kg	.....	B
						III	.....	6.1	.....	*	IB8, IP3, T1, TP33.	153	.....	213	.....	*	240	.....	*	100 kg	.....	*	200 kg	.....	A
G	Organophosphorus compound, liquid, toxic, n.o.s.	*	6.1	UN3278	....	I	.....	6.1	.....	*	5, T14, TP2, TP13, TP27.	None	.....	201	.....	*	243	.....	*	1 L	.....	*	30 L	.....	B
						II	.....	6.1	.....	*	IB2, T11, TP2, TP27.	153	.....	202	.....	*	243	.....	*	5 L	.....	*	60 L	.....	B
						III	.....	6.1	.....	*	IB3, T7, TP1, TP28.	153	.....	203	.....	*	241	.....	*	60 L	.....	*	220 L	.....	A
G	Organophosphorus compound, solid, toxic, n.o.s.	*	6.1	UN3464	....	I	.....	6.1	.....	*	IB7, IP1, T6, TP33.	None	.....	211	.....	*	242	.....	*	5 kg	.....	*	50 kg	.....	B
						II	.....	6.1	.....	*	IB8, IP2, IP4, T3, TP33.	153	.....	212	.....	*	242	.....	*	25 kg	.....	*	100 kg	.....	B
						III	.....	6.1	.....	*	IB8, IP3, T1, TP33.	153	.....	213	.....	*	240	.....	*	100 kg	.....	*	200 kg	.....	A
G	Toxic by inhalation liquid, flammable, corrosive, n.o.s. with an LC50 lower than or equal to 200 ml/m ³ and saturated vapor concentration greater than or equal to 500 LC50.	*	6.1	UN3488	....	I	.....	6.1, 3, 8	....	*	1, B9, B14, B30, B72, T22, TP2, TP13, TP27, TP38, TP44.	None	.....	226	.....	*	244	.....	*	Forbidden	.....	*	Forbidden	.....	D
						II	.....	6.1, 3, 8	....	*	2, B9, B14, B32, B74, T20, TP2, TP13, TP27, TP38, TP45.	None	.....	227	.....	*	244	.....	*	Forbidden	.....	*	Forbidden	.....	D
G	Toxic by inhalation liquid, flammable, corrosive, n.o.s. with an LC50 lower than or equal to 1000 ml/m ³ and saturated vapor concentration greater than or equal to 10 LC50.	*	6.1	UN3381	....	I	.....	6.1	.....	*	1, B9, B14, B30, T22, TP2, TP13, TP27, TP38, TP44.	None	.....	226	.....	*	244	.....	*	Forbidden	.....	*	Forbidden	.....	D
G	Toxic by inhalation liquid, n.o.s. with an LC50 lower than or equal to 200 ml/m ³ and saturated vapor concentration greater than or equal to 500 LC50.	*	6.1	UN3382	....	I	.....	6.1	.....	*	2, B9, B14, B32, T20, TP2, TP13, TP27, TP38, TP45.	None	.....	227	.....	*	244	.....	*	Forbidden	.....	*	Forbidden	.....	D
G	Toxic by inhalation liquid, n.o.s. with an LC50 lower than or equal to 1000 ml/m ³ and saturated vapor concentration greater than or equal to 10 LC50.	*	6.1	UN3382	I	6.1	*	2, B9, B14, B32, T20, TP2, TP13, TP27, TP38, TP45.	None	227	*	244	*	Forbidden	*	Forbidden	D

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							(8A) Exceptions	(8B) Non-bulk	(8C) Bulk	(9A) Passenger aircraft/rail	(9B) Cargo aircraft only		(10A) Location
G	Toxic by inhalation liquid, flammable, n.o.s. with an LC50 lower than or equal to 200 ml/m ³ and saturated vapor concentration greater than or equal to 500 LC50.	6.1	UN3383	I	6.1, 3	1, B9, B14, B30, T22, TP2, TP13, TP27, TP38, TP44.	None	226	244	Forbidden	Forbidden	D	(10B) 40
G	Toxic by inhalation liquid, flammable, n.o.s. with an LC50 lower than or equal to 1000 ml/m ³ and saturated vapor concentration greater than or equal to 10 LC50.	6.1	UN3384	I	6.1, 3	2, B9, B14, B32, T20, TP2, TP13, TP27, TP38, TP45.	None	227	244	Forbidden	Forbidden	D	40
G	Toxic by inhalation liquid, water-reactive, n.o.s. with an LC50 lower than or equal to 200 ml/m ³ and saturated vapor concentration greater than or equal to 500 LC50.	6.1	UN3385	I	6.1, 4, 3	1, B9, B14, B30, T22, TP2, TP13, TP38, TP44.	None	226	244	Forbidden	Forbidden	D	40
G	Toxic by inhalation liquid, water-reactive, n.o.s. with an LC50 lower than or equal to 1000 ml/m ³ and saturated vapor concentration greater than or equal to 10 LC50.	6.1	UN3386	I	6.1, 4, 3	2, B9, B14, B32, T20, TP2, TP13, TP38, TP44.	None	227	244	Forbidden	Forbidden	D	40
G	Toxic by inhalation liquid, water-reactive, flammable, n.o.s. with an LC50 lower than or equal to 200 ml/m ³ and saturated vapor concentration greater than or equal to 10 LC50.	6.1	UN3490	I	6.1, 4, 3, 3	1, B9, B14, B30, B72, T22, TP2, TP13, TP27, TP38, TP44.	None	226	244	Forbidden	Forbidden	D	21, 28, 40, 49
G	Toxic by inhalation liquid, water-reactive, flammable, n.o.s. with an LC50 lower than or equal to 500 LC50.	6.1	UN3491	I	6.1, 4, 3, 3	2, B9, B14, B32, B74, T20, TP2, TP13, TP27, TP38, TP45.	None	227	244	Forbidden	Forbidden	D	21, 28, 40, 49
G	Toxic by inhalation liquid, oxidizing, n.o.s. with an LC50 lower than or equal to 200 ml/m ³ and saturated vapor concentration greater than or equal to 500 LC50.	6.1	UN3387	I	6.1, 5, 1	1, B9, B14, B30, T22, TP2, TP13, TP38, TP44.	None	226	244	Forbidden	Forbidden	D	40

G	Toxic by inhalation liquid, oxidizing, n.o.s. with an LC50 lower than or equal to 1000 ml/m ³ and saturated vapor concentration greater than or equal to 10 LC50.	6.1 UN3388	I	6.1, 5.1	2, B9, B14, B32, T20, TP2, TP13, TP38, TP44.	None	227	244	Forbidden	Forbidden	D	40
G	Toxic by inhalation liquid, corrosive, n.o.s. with an LC50 lower than or equal to 200 ml/m ³ and saturated vapor concentration greater than or equal to 500 LC50.	6.1 UN3389	I	6.1, 8	1, B9, B14, B30, T22, TP2, TP13, TP27, TP38, TP44.	None	226	244	Forbidden	Forbidden	D	40
G	Toxic by inhalation liquid, corrosive, n.o.s. with an LC50 lower than or equal to 1000 ml/m ³ and saturated vapor concentration greater than or equal to 10 LC50.	6.1 UN3390	I	6.1, 8	2, B9, B14, B32, T20, TP2, TP13, TP27, TP38, TP45.	None	227	244	Forbidden	Forbidden	D	40
	Vinyltrichlorosilane	3 UN1305	II	3, 8	A3, A7, B6, N34, T10, TP2, TP7, TP13.	None	206	243	Forbidden	Forbidden	B	40
	[REVISE]						*	*	*	*		
I	Air bag inflators, or Air bag modules, or Seat-belt pretensioners.	1.4G UN0503	II	1.4G	161, A200	None	62	None	Forbidden	75 kg	02	25
	Air bag inflators, or Air bag modules, or Seat-belt pretensioners.	9 UN3268	III	9	160, A200	166	166	166	25 kg	100 kg	A	
	Ammonium nitrate based fertilizer.	5.1 UN2067	III	5.1	52, 150, B120, IB8, IP3, T1, TP33.	152	213	240	25 kg	100 kg	B	25, 59, 60, 66, 117
	Ammonium nitrate emulsion or Ammonium nitrate suspension or Ammonium nitrate gel, intermediate for blasting explosives.	5.1 UN3375	II	5.1	147, 163	None	214	214	Forbidden	Forbidden	D	25, 59, 60, 66, 124
D	Ammonium nitrate-fuel oil mixture containing only prilled ammonium nitrate and fuel oil.	1.5D NA0331	II	1.5D		None	62	None	Forbidden	Forbidden	03	25, 19E

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class or division	(4) Identification Nos.	(5) PG	(6) Label codes	(7) Special provisions (§ 172.102)	(8) Packaging (§ 173.***)			(9) Quantity limitations (see §§ 173.27 and 175.75)		(10) Vessel stowage	
							(8A) Exceptions	(8B) Non-bulk	(8C) Bulk	(9A) Passenger aircraft/rail	(9B) Cargo aircraft only	(10A) Location	(10B) Other
	Ammonium nitrate, with more than 0.2 percent combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance.	1.1D	UN0222	II	1.1D		None	62	None	Forbidden	Forbidden	04	25, 19E
	Ammonium nitrate, with not more than 0.2% total combustible material, including any organic substance, calculated as carbon to the exclusion of any other added substance.	5.1	UN1942	III	5.1	A1, A29, B120, IB8, IP3, T1, TP33.	152	213	240	25 kg	100 kg	A	25, 59, 60, 116
	Ammonium perchlorate ...	1.1D	UN0402	II	1.1D	107	None	62	None	Forbidden	Forbidden	04	25, 19E
	Ammonium picrate, dry or wetted with less than 10 percent water, by mass.	1.1D	UN0004	II	1.1D		None	62	None	Forbidden	Forbidden	04	25, 5E, 19E
	Ammunition, illuminating with or without burster, expelling charge or propelling charge.	1.2G	UN0171	II	1.2G			62	62	Forbidden	Forbidden	03	25
	Ammunition, illuminating with or without burster, expelling charge or propelling charge.	1.3G	UN0254	II	1.3G			62	62	Forbidden	Forbidden	03	25
	Ammunition, illuminating with or without burster, expelling charge or propelling charge.	1.4G	UN0297	II	1.4G			62	62	Forbidden	75 kg	02	25
	Ammunition, incendiary liquid or gel, with burster, expelling charge or propelling charge.	1.3J	UN0247	II	1.3J			62	None	Forbidden	Forbidden	05	25, 23E
	Ammunition, incendiary, white phosphorus, with burster, expelling charge or propelling charge.	1.2H	UN0243	II	1.2H			62	62	Forbidden	Forbidden	05	25, 14E, 15E, 17E

Ammunition, incendiary, white phosphorus, with burster, expelling charge or propelling charge.	1.3H UN0244	.... II	.....	1.3H	.....	62	.....	62	.....	Forbidden	Forbidden	05	.....	25, 14E, 15E, 17E
Ammunition, incendiary with or without burster, expelling charge, or propelling charge.	1.2G UN0009	.... II	.....	1.2G	.....	62	.....	62	.....	Forbidden	Forbidden	03	.....	25
Ammunition, incendiary with or without burster, expelling charge, or propelling charge.	1.3G UN0010	.... II	.....	1.3G	.....	62	.....	62	.....	Forbidden	Forbidden	03	.....	25
Ammunition, incendiary with or without burster, expelling charge or propelling charge.	1.4G UN0300	.... II	.....	1.4G	.....	62	.....	62	.....	Forbidden	75 kg	02	.....	25
Ammunition, practice	1.4G UN0362	.... II	.....	1.4G	.....	62	.....	62	.....	Forbidden	75 kg	02	.....	25
Ammunition, practice	1.3G UN0488	.... II	.....	1.3G	.....	62	.....	62	.....	Forbidden	Forbidden	03	.....	25
Ammunition, proof	1.4G UN0363	.... II	.....	1.4G	.....	62	.....	62	.....	Forbidden	75 kg	02	.....	25
Ammunition smoke, white phosphorus with burster, expelling charge, or propelling charge.	1.2H UN0245	.... II	.....	1.2H	.....	62	.....	62	.....	Forbidden	Forbidden	05	.....	25, 14E, 15E, 17E
Ammunition, smoke, white phosphorus with burster, expelling charge, or propelling charge.	1.3H UN0246	.... II	.....	1.3H	.....	62	.....	62	.....	Forbidden	Forbidden	05	.....	25, 14E, 15E, 17E
Ammunition, smoke with or without burster, expelling charge or propelling charge.	1.2G UN0015	.... II	.....	1.2G	.....	62	.....	62	.....	Forbidden	Forbidden	03	.....	25, 17E
Ammunition, smoke with or without burster, expelling charge or propelling charge.	1.3G UN0016	.... II	.....	1.3G	.....	62	.....	62	.....	Forbidden	Forbidden	03	.....	25, 17E
Ammunition, smoke with or without burster, expelling charge or propelling charge.	1.4G UN0303	.... II	.....	1.4G	.....	62	.....	62	.....	Forbidden	75 kg	02	.....	25, 14E, 15E, 17E
Ammunition, tear-producing with burster, expelling charge or propelling charge.	1.2G UN0018	.... II	.....	1.2G, 8, 6.1.	.....	62	.....	62	.....	Forbidden	Forbidden	03	.....	25, 17E
Ammunition, tear-producing with burster, expelling charge or propelling charge.	1.3G UN0019	.... II	.....	1.3G, 8, 6.1.	.....	62	.....	62	.....	Forbidden	Forbidden	03	.....	25, 17E
Ammunition, tear-producing with burster, expelling charge or propelling charge.	1.4G UN0301	.... II	.....	1.4G, 8, 6.1.	.....	62	.....	62	.....	Forbidden	75 kg	02	.....	25, 14E, 15E, 17E
Ammunition, toxic with burster, expelling charge or propelling charge.	1.2K UN0020 II	1.2K, 6.1	62	None	Forbidden	Forbidden	05	25, 14E, 15E, 17E

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							(8A) Exceptions	(8B) Non-bulk	(8C) Bulk	(9A) Passenger aircraft/rail	(9B) Cargo aircraft only	(10A) Location	(10B) Other
G	Ammunition, toxic with burster, expelling charge or propelling charge.	1.3K	UN0021	II	1.3K, 6.1		62	None	None	Forbidden	Forbidden	05	25, 14E, 15E, 17E
		*	*	II	*	*	*	None	None	Forbidden	Forbidden	03	25
	Articles, explosive, extremely insensitive or Articles, EEL.	1.6N	UN0486	II	1.6N		62	None	None	Forbidden	Forbidden	03	25
G	Articles, explosive, n.o.s	1.4S	UN0349	II	1.4S	101	62	None	None	25 kg	100 kg	01	25
G	Articles, explosive, n.o.s	1.4B	UN0350	II	1.4B	101	62	None	None	Forbidden	Forbidden	05	25
G	Articles, explosive, n.o.s	1.4C	UN0351	II	1.4C	101	62	None	None	Forbidden	75 kg	02	25
G	Articles, explosive, n.o.s	1.4D	UN0352	II	1.4D	101	62	None	None	Forbidden	75 kg	02	25
G	Articles, explosive, n.o.s	1.4G	UN0353	II	1.4G	101	62	None	None	Forbidden	75 kg	02	25
G	Articles, explosive, n.o.s	1.1L	UN0354	II	1.1L	101	62	None	None	Forbidden	Forbidden	02	25, 14E, 15E
G	Articles, explosive, n.o.s	1.2L	UN0355	II	1.2L	101	62	None	None	Forbidden	Forbidden	05	25, 14E, 15E
G	Articles, explosive, n.o.s	1.3L	UN0356	II	1.3L	101	62	None	None	Forbidden	Forbidden	05	25, 14E, 15E
G	Articles, explosive, n.o.s	1.1C	UN0462	II	1.1C	101	62	None	None	Forbidden	Forbidden	04	25
G	Articles, explosive, n.o.s	1.1D	UN0463	II	1.1D	101	62	None	None	Forbidden	Forbidden	04	25
G	Articles, explosive, n.o.s	1.1E	UN0464	II	1.1E	101	62	None	None	Forbidden	Forbidden	04	25
G	Articles, explosive, n.o.s	1.1F	UN0465	II	1.1F	101	62	None	None	Forbidden	Forbidden	05	25
G	Articles, explosive, n.o.s	1.2C	UN0466	II	1.2C	101	62	None	None	Forbidden	Forbidden	04	25
G	Articles, explosive, n.o.s	1.2D	UN0467	II	1.2D	101	62	None	None	Forbidden	Forbidden	04	25
G	Articles, explosive, n.o.s	1.2E	UN0468	II	1.2E	101	62	None	None	Forbidden	Forbidden	04	25
G	Articles, explosive, n.o.s	1.2F	UN0469	II	1.2F	101	62	None	None	Forbidden	Forbidden	05	25
G	Articles, explosive, n.o.s	1.3C	UN0470	II	1.3C	101	62	None	None	Forbidden	Forbidden	04	25
G	Articles, explosive, n.o.s	1.4E	UN0471	II	1.4E	101	62	None	None	Forbidden	75 kg	03	25
G	Articles, explosive, n.o.s	1.4F	UN0472	II	1.4F	101	62	None	None	Forbidden	Forbidden	05	25
		*	*	II	*	*	*	None	None	Forbidden	Forbidden	05	25, 14E, 15E, 17E
	Articles, pyrophoric	1.2L	UN0380	II	1.2L		62	None	None	Forbidden	Forbidden	05	25, 14E, 15E, 17E
	Articles, pyrotechnic for technical purposes.	1.1G	UN0428	II	1.1G		62	None	None	Forbidden	Forbidden	03	25
	Articles, pyrotechnic for technical purposes.	1.2G	UN0429	II	1.2G		62	None	None	Forbidden	Forbidden	03	25
	Articles, pyrotechnic for technical purposes.	1.3G	UN0430	II	1.3G		62	None	None	Forbidden	Forbidden	03	25
	Articles, pyrotechnic for technical purposes.	1.4G	UN0431	II	1.4G		62	None	None	Forbidden	75 kg	02	25
	Articles, pyrotechnic for technical purposes.	1.4S	UN0432	II	1.4S		62	None	None	25 kg	100 kg	01	25
A, G	Aviation regulated liquid, n.o.s.	9	UN3334		9	A35, A189	204	155	*	450 L	450 L	A	A
A, G	Aviation regulated solid, n.o.s.	9	UN3335		9	A35	204	155	*	400 kg	400 kg	A	A

* Barium azide, dry or wetted with less than 50 percent water, by mass.	* 1.1A	UN0224	.... II	.....	* 1.1A, 6.1	....	* 111, 117	.....	None	.....	* 62	.....	None	.....	* Forbidden	Forbidden	05	.....	25
* Batteries, dry, containing potassium hydroxide solid, electric storage.	* 8	UN3028 III	* 8	* 237	None	* 213	None	* 25 kg	230 kg	A	52
* Batteries, nickel-metal hydride see Batteries, dry, sealed, n.o.s. for nickel-metal hydride batteries transported by modes other than vessel.	* 9	UN3496 II	* 9	* 340	*	A	25
* Batteries, wet, filled with acid, electric storage.	* 8	UN2794 III	* 8	* A51	159	* 159	159	* 30 kg	No limit	A	146
* Batteries, wet, filled with alkali, electric storage.	* 8	UN2795 III	* 8	* A51	159	* 159	159	* 30 kg	No limit	A	52, 146
* Benzylidimethylamine	* 8	UN2619 II	* 8, 3	* B2, IB2, T7, TP2	154	* 202	243	* 1 L	30 L	A	25, 40
* Black powder, compressed or Black powder, in pellets or Gunpowder, in pellets.	* 1.1D	UN0028	.... II	.....	* 1.1D	.....	.....	.....	None	.....	* 62	.....	None	.....	* Forbidden	Forbidden	04	.....	25
* Black powder of Gunpowder, granular or as a meal.	* 1.1D	UN0027	.... II	.....	.....	.....	.....	.....	None	.....	* 62	.....	None	.....	* Forbidden	Forbidden	04	.....	25
* Bombs, photo-flash	* 1.1F	UN0037	.... II	.....	* 1.1F	.....	.....	.....	.....	.....	* 62	.....	None	.....	* Forbidden	Forbidden	05	.....	25
* Bombs, photo-flash	* 1.1D	UN0038	.... II	.....	* 1.1D	.....	.....	.....	.....	.....	* 62	.....	62	.....	* Forbidden	Forbidden	04	.....	25
* Bombs, photo-flash	* 1.2G	UN0039	.... II	.....	* 1.2G	.....	.....	.....	.....	.....	* 62	.....	62	.....	* Forbidden	Forbidden	03	.....	25
* Bombs, photo-flash	* 1.3G	UN0299	.... II	.....	* 1.3G	.....	.....	.....	.....	.....	* 62	.....	62	.....	* Forbidden	Forbidden	03	.....	25
* Bombs, with bursting charge.	* 1.1F	UN0033	.... II	.....	* 1.1F	.....	.....	.....	.....	.....	* 62	.....	None	.....	* Forbidden	Forbidden	05	.....	25
* Bombs, with bursting charge.	* 1.1D	UN0034	.... II	.....	* 1.1D	.....	.....	.....	.....	.....	* 62	.....	62	.....	* Forbidden	Forbidden	04	.....	25
* Bombs, with bursting charge.	* 1.2D	UN0035	.... II	.....	* 1.2D	.....	.....	.....	.....	.....	* 62	.....	62	.....	* Forbidden	Forbidden	04	.....	25
* Bombs, with bursting charge.	* 1.2F	UN0291	.... II	.....	* 1.2F	.....	.....	.....	.....	.....	* 62	.....	None	.....	* Forbidden	Forbidden	05	.....	25
* Bombs with flammable liquid, with bursting charge.	* 1.1J	UN0399	.... II	.....	* 1.1J	.....	.....	.....	.....	.....	* 62	.....	None	.....	* Forbidden	Forbidden	05	.....	25, 23E
* Bombs with flammable liquid, with bursting charge.	* 1.2J	UN0400	.... II	.....	* 1.2J	.....	.....	.....	.....	.....	* 62	.....	None	.....	* Forbidden	Forbidden	05	.....	25, 23E
* Boosters with detonator	* 1.1B	UN0225 II	None	25
* Boosters with detonator	* 1.2B	UN0268 II	None	25
* Boosters, without detonator.	* 1.1D	UN0042 II	None	25

W

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							Exceptions	Non-bulk	Bulk	Passenger aircraft/air/rail	Cargo aircraft only	Location	Other	
														(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
	Boosters, without detonator.	1.2D	UN0283	II	1.2D		None	62	None	None	Forbidden	Forbidden	04	25
*	Boron trifluoride	2.3	UN1008		*	2, 238, B9, B14	None	*	302	314, 315	Forbidden	Forbidden	D	40
*	Boron trifluoride dimethyl etherate.	4.3	UN2965	I	*	4-3, 8, 3	None	*	201	243	Forbidden	Forbidden	D	21, 28, 40, 49, 100
*	Bursts, explosive	1.1D	UN0043	II	*	1.1D	None	*	62	None	Forbidden	Forbidden	04	25
*	5-tert-Butyl-2,4,6-trinitro-m-xylene or Musk xylene.	4.1	UN2956	III	*	4.1	None	*	223	None	Forbidden	Forbidden	D	12, 25, 127
*	Calcium hypochlorite, dry, corrosive or Calcium hypochlorite mixture, dry, corrosive with more than 39% available chlorine (8.8% available oxygen).	5.1	UN3485	II	*	5.1, 8	152	*	212	None	5 kg	25 kg	D	4, 25, 52, 56, 58, 69, 142
	Calcium hypochlorite, dry or Calcium hypochlorite mixture dry with more than 39% available chlorine (8.8% available oxygen).	5.1	UN1748	II	*	5.1	152	*	212	None	5 kg	25 kg	D	4, 25, 52, 56, 58, 69, 142
	Calcium hypochlorite, hydrated, corrosive or Calcium hypochlorite, hydrated mixture, corrosive with not less than 5.5% but not more than 16% water.	5.1	UN3487	II	*	5.1, 8	152	*	212	240	5 kg	25 kg	D	4, 25, 52, 56, 58, 69, 142
	Calcium hypochlorite, hydrated or Calcium hypochlorite, hydrated mixture, with not less than 5.5% but not more than 16% water.	5.1	UN2880	II	*	5.1	152	*	212	240	5 kg	25 kg	D	4, 25, 52, 56, 58, 69, 142

Calcium hypochlorite mixture, dry, corrosive with more than 10% but not more than 39% available chlorine.	5.1 UN3486	III	5.1, 8	165, A1, A29, IB8, IP3, IP13, N34, W9, W10.	152	213	240	5 kg	25 kg	D	4, 25, 52, 56, 58, 69, 142
Calcium hypochlorite mixture, dry, with more than 10% but not more than 39% available chlorine.	5.1 UN2208	III	5.1	165, A1, A29, IB8, IP3, IP13, N34, W9, W10.	152	213	240	25 kg	100 kg	D	4, 25, 52, 56, 58, 69, 142
Calcium nitrate	5.1 UN1454	III	5.1	34, B120, IB8, IP3, T1, TP33.	152	213	240	25 kg	100 kg	A	
Cartridges, flash	1.1G UN0049	II	1.1G		None	62	None	Forbidden	Forbidden	03	25
Cartridges, flash	1.3G UN0050	II	1.3G		None	62	None	Forbidden	75 kg	03	25
Cartridges for weapons, blank.	1.1C UN0326	II	1.1C		None	62	None	Forbidden	Forbidden	04	25
Cartridges for weapons, blank.	1.2C UN0413	II	1.2C		None	62	None	Forbidden	Forbidden	04	25
Cartridges for weapons, blank or Cartridges, small arms, blank.	1.3C UN0327	II	1.3C		None	62	None	Forbidden	Forbidden	04	25
Cartridges for weapons, blank or Cartridges, small arms, blank.	1.4C UN0338	II	1.4C		None	62	None	Forbidden	75 kg	02	25
Cartridges for weapons, inert projectile.	1.2C UN0328	II	1.2C		None	62	62	Forbidden	Forbidden	04	25
Cartridges for weapons, inert projectile or Cartridges, small arms.	1.4S UN0012	II	1.4S		63	62	None	25 kg	100 kg	01	25
Cartridges for weapons, inert projectile or Cartridges, small arms.	1.4C UN0339	II	1.4C		None	62	None	Forbidden	75 kg	02	25
Cartridges for weapons, inert projectile or Cartridges, small arms.	1.3C UN0417	II	1.3C		None	62	None	Forbidden	Forbidden	04	25
Cartridges for weapons, with bursting charge.	1.1F UN0005	II	1.1F		None	62	None	Forbidden	Forbidden	05	25
Cartridges for weapons, with bursting charge.	1.1E UN0006	II	1.1E		None	62	62	Forbidden	Forbidden	04	25
Cartridges for weapons, with bursting charge.	1.2F UN0007	II	1.2F		None	62	None	Forbidden	Forbidden	05	25
Cartridges for weapons, with bursting charge.	1.2E UN0321	II	1.2E		None	62	62	Forbidden	Forbidden	04	25
Cartridges for weapons, with bursting charge.	1.4F UN0348	II	1.4F		None	62	None	Forbidden	Forbidden	05	25
Cartridges for weapons, with bursting charge.	1.4E UN0412	II	1.4E		None	62	62	Forbidden	75 kg	03	25
Cartridges, oil well	1.3C UN0277	II	1.3C		None	62	62	Forbidden	Forbidden	04	25
Cartridges, oil well	1.4C UN0278	II	1.4C		None	62	62	Forbidden	75 kg	02	25
Cartridges, power device	1.3C UN0275	II	1.3C		None	62	62	Forbidden	75 kg	04	25
Cartridges, power device	1.4C UN0276	II	1.4C	110	None	62	62	Forbidden	75 kg	02	25
Cartridges, power device	1.4S UN0323	II	1.4S	110, 347	None	62	62	25 kg	100 kg	01	25
Cartridges, power device	1.2C UN0381	II	1.2C		None	62	62	Forbidden	Forbidden	04	25
Cartridges, signal	1.3G UN0054	II	1.3G		None	62	None	Forbidden	75 kg	03	25
Cartridges, signal	1.4G UN0312	II	1.4G		None	62	None	Forbidden	75 kg	02	25

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							Exceptions	Non-bulk	Bulk	Passenger aircraft/air/rail	Cargo aircraft only	Location	Other
D	Cartridges, signal	1.4S	UN0405	II	1.4S		None	62	None	25 kg	100 kg	01	25
D	Cartridges, small arms	ORM-D	None		None	222	63	None	None	30 kg gross	Forbidden	A	
D	Cartridges power device (used to project fastening devices).	ORM-D	None		None	222	63	None	None	30 kg gross	Forbidden	A	
*	Cases, cartridge, empty with primer.	1.4S	UN0055	II	*	50	63	62	None	25 kg	100 kg	01	25
	Cases, cartridges, empty with primer.	1.4C	UN0379	II	1.4C	50	None	62	None	Forbidden	75 kg	02	25
	Cases, combustible, empty, without primer.	1.4C	UN0446	II	1.4C		None	62	None	Forbidden	75 kg	02	25
	Cases, combustible, empty, without primer.	1.3C	UN0447	II	1.3C		None	62	None	Forbidden	Forbidden	04	25
*	Cells, containing sodium	4.3	UN3292	II	4.3		189	189	189	25 kg	No limit	A	
*	Charges, bursting, plastics bonded.	1.1D	UN0457	II	1.1D		None	62	None	Forbidden	Forbidden	04	25
	Charges, bursting, plastics bonded.	1.2D	UN0458	II	1.2D		None	62	None	Forbidden	Forbidden	04	25
	Charges, bursting, plastics bonded.	1.4D	UN0459	II	1.4D		None	62	None	Forbidden	75 kg	02	25
	Charges, bursting, plastics bonded.	1.4S	UN0460	II	1.4S	347	None	62	None	25 kg	100 kg	01	25
	Charges, demolition	1.1D	UN0048	II	1.1D		None	62	62	Forbidden	Forbidden	04	25
	Charges, depth	1.1D	UN0056	II	1.1D		None	62	62	Forbidden	Forbidden	04	25
*	Charges, explosive, commercial without detonator.	1.1D	UN0442	II	1.1D		None	62	None	Forbidden	Forbidden	04	25
	Charges, explosive, commercial without detonator.	1.2D	UN0443	II	1.2D		None	62	None	Forbidden	Forbidden	04	25
	Charges, explosive, commercial without detonator.	1.4D	UN0444	II	1.4D		None	62	None	Forbidden	75 kg	02	25
	Charges, explosive, commercial without detonator.	1.4S	UN0445	II	1.4S	347	None	62	None	25 kg	100 kg	01	25
	Charges, propelling	1.1C	UN0271	II	1.1C		None	62	None	Forbidden	Forbidden	04	25
	Charges, propelling	1.3C	UN0272	II	1.3C		None	62	None	Forbidden	Forbidden	04	25
	Charges, propelling	1.2C	UN0415	II	1.2C		None	62	None	Forbidden	Forbidden	04	25
	Charges, propelling	1.4C	UN0491	II	1.4C		None	62	None	Forbidden	75 kg	02	25
	Charges, propelling, for cannon.	1.3C	UN0242	II	1.3C		None	62	None	Forbidden	Forbidden	04	25
	Charges, propelling, for cannon.	1.1C	UN0279	II	1.1C		None	62	None	Forbidden	Forbidden	04	25
	Charges, propelling, for cannon.	1.2C	UN0414	II	1.2C		None	62	None	Forbidden	Forbidden	04	25

Charges, shaped, flexible, linear.	1.4D UN0237	II	1.4D	None	62	None	Forbidden	75 kg	02	25
Charges, shaped, flexible, linear.	1.1D UN0288	II	1.1D	None	62	None	Forbidden	Forbidden	04	25
Charges, shaped, without detonator.	1.1D UN0059	II	1.1D	None	62	None	Forbidden	Forbidden	04	25
Charges, shaped, without detonator.	1.2D UN0439	II	1.2D	None	62	None	Forbidden	Forbidden	04	25
Charges, shaped, without detonator.	1.4D UN0440	II	1.4D	None	62	None	Forbidden	75 kg	02	25
Charges, shaped, without detonator.	1.4S UN0441	II	1.4S	347	62	None	25 kg	100 kg	01	25
Charges, supplementary explosive.	1.1D UN0060	II	1.1D	None	62	None	Forbidden	Forbidden	04	25
Chlorosilanes, flammable, corrosive, n.o.s.	3 UN2985	II	3, 8	T14, TP2, TP7, TP13, TP27	206	243	Forbidden	5 L	B	40
Chlorosilanes, toxic, corrosive, flammable, n.o.s.	6.1 UN3362	II	6.1, 8.3	T14, TP2, TP7, TP13, TP27	206	243	Forbidden	30 L	C	40, 125
Chlorosilanes, toxic, corrosive, n.o.s.	6.1 UN3361	II	6.1, 8	T14, TP2, TP7, TP13, TP27	206	243	Forbidden	30 L	C	40
Components, explosive train, n.o.s.	1.2B UN0382	II	1.2B	101	62	None	Forbidden	Forbidden	05	25
Components, explosive train, n.o.s.	1.4B UN0383	II	1.4B	101	62	None	Forbidden	75 kg	05	25
Components, explosive train, n.o.s.	1.4S UN0384	II	1.4S	101	62	None	25 kg	100 kg	01	25
Components, explosive train, n.o.s.	1.1B UN0461	II	1.1B	101	62	None	Forbidden	Forbidden	05	25
Contrivances, water-activated, with burster, expelling charge or propelling charge.	1.2L UN0248	II	1.2L	None	62	None	Forbidden	Forbidden	05	25, 14E, 15E, 17E
Contrivances, water-activated, with burster, expelling charge or propelling charge.	1.3L UN0249	II	1.3L	None	62	None	Forbidden	Forbidden	05	25, 14E, 15E, 17E
Copra	4.2 UN1363	III	4.2	IB8, IP3, IP7	213	241	Forbidden	Forbidden	A	13, 25, 119
Cord, detonating, flexible	1.1D UN0065	II	1.1D	102	62	63(a)	Forbidden	Forbidden	04	25
Cord, detonating, flexible	1.4D UN0289	II	1.4D	None	62	None	Forbidden	75 kg	02	25
Cord detonating or Fuse detonating metal clad.	1.2D UN0102	II	1.2D	None	62	None	Forbidden	Forbidden	04	25
Cord, detonating or Fuse, detonating metal clad.	1.1D UN0290	II	1.1D	None	62	None	Forbidden	Forbidden	04	25
Cord, detonating, mild effect or Fuse, detonating metal clad.	1.4D UN0104	II	1.4D	None	62	None	Forbidden	75 kg	02	25
Cord, igniter	1.4G UN0066	II	1.4G	None	62	None	Forbidden	75 kg	02	25
Cutters, cable, explosive	1.4S UN0070	II	1.4S	None	62	62	25 kg	100 kg	01	25

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class or division	(4) Identification Nos.	(5) PG	(6) Label codes	(7) Special provisions (§ 172.102)	(8) Packaging (§ 173.***)			(9) Quantity limitations (see §§ 173.27 and 175.75)		(10) Vessel stowage	
							Exceptions	Non-bulk	Bulk	Passenger aircraft/rail	Cargo aircraft only	Location	Other
	Cyclotramethylenetetra- nitramine, desensitized or Octogen, desensitized or HMX, desensitized.	1.1D	UN0484	II	1.1D	*	None	62	None	Forbidden	Forbidden	04	25
	Cyclotramethylenetetra- nitramine, wetted or HMX, wetted or Octogen, wetted with not less than 15 per- cent water, by mass.	1.1D	UN0226	II	1.1D	*	None	62	None	Forbidden	Forbidden	04	25
	Cyclotrimethylenetrinitra- mine, desensitized or Cyclonite, desensitized or Hexogen, desensitized or RDX, desensitized.	1.1D	UN0483	II	1.1D	*	None	62	None	Forbidden	Forbidden	04	25
	Cyclotrimethylenetrinitra- mine, wetted or Cyclo- nite, wetted or Hexogen, wetted or RDX, wetted with not less than 15 percent water by mass.	1.1D	UN0072	II	1.1D	*	None	62	None	Forbidden	Forbidden	04	25
	Deflagrating metal salts of aromatic nitroderivatives, n.o.s.	1.3C	UN0132	II	1.3C	*	None	62	None	Forbidden	Forbidden	04	25, 5E
	Detonator assemblies, non-electric for blasting.	1.1B	UN0360	II	1.1B	*	None	62	None	Forbidden	Forbidden	05	25
	Detonator assemblies, non-electric, for blast- ing.	1.4B	UN0361	II	1.4B	103	63(f), 63(g)	62	None	Forbidden	75 kg	05	25
	Detonator assemblies, non-electric, for blast- ing.	1.4S	UN0500	II	1.4S	347	63(f), 63(g)	62	None	25 kg	100 kg	01	25
	Detonators, electric, for blasting.	1.1B	UN0030	II	1.1B	*	63(f), 63(g)	62	None	Forbidden	Forbidden	05	25
	Detonators, electric, for blasting.	1.4B	UN0255	II	1.4B	103	63(f), 63(g)	62	None	Forbidden	75 kg	05	25
	Detonators, electric for blasting.	1.4S	UN0456	II	1.4S	347	63(f), 63(g)	62	None	25 kg	100 kg	01	25
	Detonators for ammuni- tion.	1.1B	UN0073	II	1.1B	*	None	62	None	Forbidden	Forbidden	05	25
	Detonators for ammuni- tion.	1.2B	UN0364	II	1.2B	*	None	62	None	Forbidden	Forbidden	05	25
	Detonators for ammuni- tion.	1.4B	UN0365	II	1.4B	103	None	62	None	Forbidden	75 kg	05	25

Detonators for ammunition.	1.4S UN0366	.... II	.....	1.4S	.....	347	.....	None	.....	62	.....	None	.....	25 kg	.....	100 kg	.....	01	.....	25
Detonators, non-electric, for blasting.	1.1B UN0029	.... II	.....	1.1B	.....	.....	.....	None	.....	62	.....	None	.....	Forbidden	.....	Forbidden	.....	05	.....	25
Detonators, non-electric, for blasting.	1.4B UN0267	.... II	.....	1.4B	.....	103	.....	63(f), 63(g)	.....	62	.....	None	.....	Forbidden	.....	75 kg	.....	05	.....	25
Detonators, non-electric, for blasting.	1.4S UN0455	.... II	.....	1.4S	.....	347	.....	63(f), 63(g)	.....	62	.....	None	.....	25 kg	.....	100 kg	.....	01	.....	25
Diazodinitrophenol, wetted with not less than 40 percent water or mixture of alcohol and water, by mass.	1.1A UN0074	.... II	.....	1.1A	.....	111, 117	.....	None	.....	62	.....	None	.....	Forbidden	.....	Forbidden	.....	05	.....	25
Dichlorophenyl isocyanates.	6.1 UN2250	.... II	.....	6.1	.....	IB8, IP2, IP4, T3, TP33.	.....	153	.....	212	.....	242	.....	25 kg	.....	100 kg	.....	B	.....	25, 40
Dicyclohexylammonium nitrite.	4.1 UN2687	.... III	.....	4.1	.....	IB8, IP3, T1, TP33.	.....	151	.....	213	.....	240	.....	25 kg	.....	100 kg	.....	A	.....	25
Diethyleneglycol dinitrate, desensitized with not less than 25 percent non-volatile water-insoluble phlegmatizer, by mass.	1.1D UN0075	.... II	.....	1.1D	.....	.....	.....	None	.....	62	.....	None	.....	Forbidden	.....	Forbidden	.....	04	.....	25, 21E
Dimethyl disulfide	3 UN2381	.... II	.....	3, 6.1	.....	IB2, T7, TP2, TP13, TP39.	.....	150	.....	202	.....	242	.....	Forbidden	.....	Forbidden	.....	B	.....	40
Dinitroglycoluril or Dingur	1.1D UN0489	.... II	.....	1.1D	.....	.....	.....	None	.....	62	.....	None	.....	Forbidden	.....	Forbidden	.....	04	.....	25
Dinitrophenol, dry or wetted with less than 15 percent water, by mass.	1.1D UN0076	.... II	.....	1.1D, 6.1	.....	.....	.....	None	.....	62	.....	None	.....	Forbidden	.....	Forbidden	.....	04	.....	25, 5E
Dinitrophenolates alkali metals, dry or wetted with less than 15 percent water, by mass.	1.3C UN0077	.... II	.....	1.3C, 6.1	.....	.....	.....	None	.....	62	.....	None	.....	Forbidden	.....	Forbidden	.....	04	.....	25, 5E
Dinitroresorcinol, dry or wetted with less than 15 percent water, by mass.	1.1D UN0078	.... II	.....	1.1D	.....	.....	.....	None	.....	62	.....	None	.....	Forbidden	.....	Forbidden	.....	04	.....	25, 5E
Dinitrobenzene	1.3C UN0406	.... II	.....	1.3C	.....	.....	.....	None	.....	62	.....	None	.....	Forbidden	.....	Forbidden	.....	04	.....	25
Dipicryl sulfide, dry or wetted with less than 10 percent water, by mass.	1.1D UN0401 II	1.1D	None	62	None	Forbidden	Forbidden	04	25

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							Exceptions	Non-bulk	Bulk	Passenger aircraft/air/rail	Cargo aircraft only	Location	Other	
														(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
	Engines, internal combustion, or Engines, fuel cell, <i>flammable gas powered</i> .	9	UN3166		9	135, A200	*	220	220	220	Forbidden	No limit	A	
	Engines internal combustion, or Engines, fuel cell, <i>flammable liquid powered</i> .	9	UN3166		9	135, A200	*	220	220	220	No limit	No limit	A	
G	Environmentally hazardous substance, solid, n.o.s.	9	UN3077	III	9	8, 146, 335, A112, B54, B120, IB8, IP3, N20, T1, TP33.	*	155	213	240	No limit	No limit	A	
	Ethyltrichlorosilane	3	UN1196	II	3, 8	A7, N84, T10, TP2, TP7, TP13.	*	None	206	243	Forbidden	5 L	B	40
	Explosive, blasting, type A.	1.1D	UN0081	II	1.1D		*	None	62	None	Forbidden	Forbidden	04	25, 19E, 21E
	Explosive, blasting, type B.	1.1D	UN0082	II	1.1D		*	None	62	None	Forbidden	Forbidden	04	25, 19E
	Explosive, blasting, type B or Agent blasting.	1.5D	UN0331	II	1.5D	105, 106	*	None	62	None	Forbidden	Forbidden	03	25, 19E
	Explosive, blasting, type C.	1.1D	UN0083	II	1.1D	123	*	None	62	None	Forbidden	Forbidden	04	25, 22E
	Explosive, blasting, type D.	1.1D	UN0084	II	1.1D		*	None	62	None	Forbidden	Forbidden	04	25
	Explosive, blasting, type E.	1.1D	UN0241	II	1.1D		*	None	62	None	Forbidden	Forbidden	04	25, 19E
	Explosive, blasting, type E or Agent blasting.	1.5D	UN0332	II	1.5D	105, 106	*	None	62	None	Forbidden	Forbidden	03	25, 19E
	Fireworks	1.1G	UN0333	II	1.1G	108	*	None	62	None	Forbidden	Forbidden	03	25
	Fireworks	1.2G	UN0334	II	1.2G	108	*	None	62	None	Forbidden	Forbidden	03	25
	Fireworks	1.3G	UN0335	II	1.3G	108	*	None	62	None	Forbidden	Forbidden	03	25
	Fireworks	1.4G	UN0336	II	1.4G	108	*	None	62	None	Forbidden	75 kg	02	25
	Fireworks	1.4S	UN0337	II	1.4S	108	*	None	62	None	Forbidden	100 kg	01	25
W	Fish meal, stabilized or Fish scrap, stabilized.	9	UN2216	III	None	155, IB8, IP3, T1, TP33.	*	155	218	218	No limit	No limit	B	25, 88, 122, 128
	Fish meal, unstabilized or Fish scrap, unstabilized.	4.2	UN1374	II	4.2	155, A1, A19, IB8, IP2, IP4, T3, TP33.	*	None	212	241	15 kg	50 kg	B	18, 25, 128

* Flares, aerial	1.3G UN0093	II	*	1.3G	*	None	*	62	None	*	None	*	Forbidden	75 kg	03	25
Flares, aerial	1.4G UN0403	II		1.4G		None		62	None		None		Forbidden	75 kg	02	25
Flares, aerial	1.4S UN0404	II		1.4S		None		62	None		None		25 kg	100 kg	01	25
Flares, aerial	1.1G UN0420	II		1.1G		None		62	None		None		Forbidden	Forbidden	03	25
Flares, aerial	1.2G UN0421	II		1.2G		None		62	None		None		Forbidden	Forbidden	03	25
Flares, surface	1.3G UN0092	II	*	1.3G	*	None	*	62	None	*	None	*	Forbidden	75 kg	03	25
Flares, surface	1.1G UN0418	II		1.1G		None		62	None		None		Forbidden	Forbidden	03	25
Flares, surface	1.2G UN0419	II		1.2G		None		62	None		None		Forbidden	Forbidden	03	25
Flash powder	1.1G UN0094	II	*	1.1G	*	None	*	62	None	*	None	*	Forbidden	Forbidden	03	25
Flash powder	1.3G UN0305	II		1.3G		None		62	None		None		Forbidden	Forbidden	03	25
Fracturing devices, explosive, without detonators for oil wells.	1.1D UN0099	II	*	1.1D	*	None	*	62	None	*	62	*	Forbidden	Forbidden	04	25
Fuel cell cartridges or contained in equipment or Fuel cell cartridges packed with equipment, containing corrosive substances.	8 UN3477		*	8	*	328	*	230	230	*	230	*	5 kg	50 kg	A	A
Fuel cell cartridges or contained in equipment or Fuel cell cartridges packed with equipment, containing flammable liquids.	3 UN3473		*	3	*	328	*	230	230	*	230	*	5 kg	50 kg	A	A
Fuel cell cartridges or contained in equipment or Fuel cell cartridges packed with equipment, containing hydrogen in metal hydride.	2.1 UN3479		*	2.1	*	328	*	230	230	*	230	*	1 kg	15 kg	B	B
Fuel cell cartridges or contained in equipment or Fuel cell cartridges packed with equipment, containing liquefied flammable gas.	2.1 UN3478		*	2.1	*	328	*	230	230	*	230	*	1 kg	15 kg	B	B
Fuel cell cartridges or contained in equipment or Fuel cell cartridges packed with equipment, containing water-reactive substances.	4.3 UN3476		*	4.3	*	328	*	230	230	*	230	*	5 kg	50 kg	A	A
Fuse, igniter tubular metal clad	1.4G UN0103	II	*	1.4G	*	None	*	62	None	*	None	*	Forbidden	75 kg	02	25
Fuse, non-detonating instantaneous or quickmatch.	1.3G UN0101	II		1.3G		None		62	None		None		Forbidden	Forbidden	03	25
Fuse, safety	1.4S UN0105	II		1.4S		None		62	None		None		25 kg	100 kg	01	25

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							(8A) Exceptions	(8B) Non-bulk	(8C) Bulk	(9A) Passenger aircraft/rail	(9B) Cargo aircraft only	(10A) Location		(10B) Other
	Fuzes, detonating	1.1B	UN0106	II	1.1B	*	None	62	None	Forbidden	Forbidden	05	25	
	Fuzes, detonating	1.2B	UN0107	II	1.2B		None	62	None	Forbidden	Forbidden	05	25	
	Fuzes, detonating	1.4B	UN0257	II	1.4B	116	None	62	None	Forbidden	75 kg	05	25	
	Fuzes, detonating	1.4S	UN0367	II	1.4S	116	None	62	None	25 kg	100 kg	01	25	
	Fuzes, detonating, with protective features.	1.1D	UN0408	II	1.1D		None	62	None	Forbidden	Forbidden	04	25	
	Fuzes, detonating, with protective features.	1.2D	UN0409	II	1.2D		None	62	None	Forbidden	Forbidden	04	25	
	Fuzes, detonating, with protective features.	1.4D	UN0410	II	1.4D	116	None	62	None	Forbidden	75 kg	02	25	
	Fuzes, igniting	1.3G	UN0316	II	1.3G		None	62	None	Forbidden	Forbidden	03	25	
	Fuzes, igniting	1.4G	UN0317	II	1.4G		None	62	None	Forbidden	75 kg	02	25	
	Fuzes, igniting	1.4S	UN0368	II	1.4S		None	62	None	25 kg	100 kg	01	25	
	Gallium	8	UN2803	III	8	T1, TP33	None	162	240	20 kg	20 kg	B	25	
	Gasoline, includes gasoline mixed with ethyl alcohol, with not more than 10% alcohol.	3	UN1203	II	3	144, 177, B1, B33, IB2, T4.	150	202	242	5 L	60 L	E		
	Grenades, hand or rifle, with bursting charge.	1.1D	UN0284	II	1.1D	*		62	None	Forbidden	Forbidden	04	25	
	Grenades, hand or rifle, with bursting charge.	1.2D	UN0285	II	1.2D			62	None	Forbidden	Forbidden	04	25	
	Grenades, hand or rifle, with bursting charge.	1.1F	UN0292	II	1.1F			62	None	Forbidden	Forbidden	05	25	
	Grenades, hand or rifle, with bursting charge.	1.2F	UN0293	II	1.2F			62	None	Forbidden	Forbidden	05	25	
	Grenades, practice, hand or rifle.	1.4S	UN0110	II	1.4S	*		62	None	25 kg	100 kg	01	25	
	Grenades, practice, hand or rifle.	1.3G	UN0318	II	1.3G			62	None	Forbidden	Forbidden	03	25	
	Grenades, practice, hand or rifle.	1.2G	UN0372	II	1.2G			62	None	Forbidden	Forbidden	03	25	
	Grenades practice, hand or rifle.	1.4G	UN0452	II	1.4G			62	None	Forbidden	75 kg	02	25	
	Guanyl nitrosaminoguanidene hydrazine, wetted with not less than 30 percent water, by mass.	1.1A	UN0113	II	1.1A	111, 117	None	62	None	Forbidden	Forbidden	05	25	

* Guanyl nitrosaminoguanyltetra- zene, wetted or Tetrazone, wetted with not less than 30 per- cent water or mixture of alcohol and water, by mass.	* 1.1A UN0114 ... II	* 1.1A	* 111, 117	* None	* 62	* None	* Forbidden	* Forbidden	* 05	* 25
* Hexanitrodiphenylamine or Dipicrylamine or Hexyl.	* 1.1D UN0079 ... II	* 1.1D	* 62	* None	* 62	* None	* Forbidden	* Forbidden	* 04	* 25
* Hexanitrostilbene	* 1.1D UN0392 ... II	* 1.1D	* 62	* None	* 62	* None	* Forbidden	* Forbidden	* 04	* 25
* Hexolite, or Hexotol dry or wetted with less than 15 percent water, by mass.	* 1.1D UN0118 ... II	* 1.1D	* 62	* None	* 62	* None	* Forbidden	* Forbidden	* 04	* 25
* Hexotonal	* 1.1D UN0393 ... II	* 1.1D	* 62	* None	* 62	* None	* Forbidden	* Forbidden	* 04	* 25
* Hydrogen in a metal hy- dride storage system or Hydrogen in a metal hydride storage system contained in equipment or Hydrogen in a metal hydride storage system packed with equipment.	* 2.1 UN3468 ...	* 2.1	* 167	* None	* 311	* None	* Forbidden	* 100 kg	* D	
* 1-Hydroxybenzotriazole, anhydrous, dry or wetted with less than 20 percent water, by mass.	* 1.3C UN0508 ...	* 1.3C	* 62	* None	* 62	* None	* Forbidden	* Forbidden	* 04	* 25
* Hypochlorites, inorganic, n.o.s.	* 5.1 UN3212 ... II	* 5.1	* 349, A9, IB8, IP2, IP4, T3, TP33.	* 152	* 212	* 240	* 5 kg	* 25 kg	* D	* 4, 25, 52, 56, 58, 69, 106, 116, 118
* Igniters	* 1.1G UN0121 ... II	* 1.1G	* 62	* None	* 62	* None	* Forbidden	* Forbidden	* 03	* 25
* Igniters	* 1.2G UN0314 ... II	* 1.2G	* 62	* None	* 62	* None	* Forbidden	* Forbidden	* 03	* 25
* Igniters	* 1.3G UN0315 ... II	* 1.3G	* 62	* None	* 62	* None	* Forbidden	* Forbidden	* 03	* 25
* Igniters	* 1.4G UN0325 ... II	* 1.4G	* 62	* None	* 62	* None	* Forbidden	* 75 kg	* 02	* 25
* Igniters	* 1.4S UN0454 ... II	* 1.4S	* 62	* None	* 62	* None	* 25 kg	* 100 kg	* 01	* 25

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or division	Identification Nos.	PG	Label codes	Special provisions (§ 172.102)	(8) Packaging (§ 173.***)			(9) Quantity limitations (see §§ 173.27 and 175.75)			(10) Vessel stowage		
							Exceptions	Non-bulk	Bulk	Passenger aircraft/rail	Cargo aircraft only	Location	Other		
G	Isocyanates, toxic, flammable, n.o.s. or isocyanate solutions, toxic, flammable, n.o.s., flash point not less than 23 degrees C but not more than 61 degrees C and boiling point less than 300 degrees C.	6.1	UN3080	II	6.1, 3	IB2, T11, TP2, TP13, TP27.	153	*	202	243	*	5 L	60 L	B	25, 40
G	Isocyanates, toxic, n.o.s. or isocyanate solutions, toxic, n.o.s., flash point more than 61 degrees C and boiling point less than 300 degrees C.	6.1	UN2206	II	6.1	IB2, T11, TP2, TP13, TP27.	153		202	243		5 L	60 L	E	25, 40
	Isocyanatobenzotrifluorides.	6.1	UN2285	III	6.1	IB3, T7, TP1, TP13, TP28.	153		203	241		60 L	220 L	E	25, 40
	Isosorbide-5-mononitrate	4.1	UN3251	III	4.1	66, 159, IB8	151	*	223	240		Forbidden	Forbidden	D	12, 25, 40, 84
D	Jet perforating guns, charged oil well, with detonator.	1.1D	NA0124	II	1.1D	55, 56	None	*	62	None	*	Forbidden	Forbidden	04	25
D	Jet perforating guns, charged oil well, with detonator.	1.4D	NA0494	II	1.4D	55, 56	None		62	None		Forbidden	Forbidden	02	25
	Jet perforating guns, charged, oil well, without detonator.	1.4D	UN0494	II	1.4D	55, 114	None		62	None		Forbidden	Forbidden	02	25
	Jet perforating guns, charged oil well, without detonator.	1.1D	UN0124	II	1.1D	55	None		62	None		Forbidden	Forbidden	04	25
	Lead azide, wetted with not less than 20 percent water or mixture of alcohol and water, by mass.	1.1A	UN0129	II	1.1A	111, 117	None	*	62	None	*	Forbidden	Forbidden	05	25
	Lead styphnate, wetted or Lead trinitroresorcinate, wetted with not less than 20 percent water or mixture of alcohol and water, by mass.	1.1A	UN0130	II	1.1A	111, 117	None	*	62	None	*	Forbidden	Forbidden	05	25

Lighters, fuse	*	1.4S	UN0131	....	II	.....	1.4S	.....	*	.....	None	.....	62	.....	*	.....	None	.....	*	.....	25 kg	.....	*	.....	100 kg	.....	01	.....	25
Lithium battery	*	9	UN3090	....	II	.....	9	.....	*	.....	185	.....	185	.....	*	.....	None	.....	*	.....	See A100	.....	*	.....	35 kg	.....	A	.....	A
Lithium batteries, contained in equipment.	*	9	UN3091	....	II	.....	9	.....	*	.....	185	.....	185	.....	*	.....	None	.....	*	.....	See A101, A104.	.....	*	.....	35 kg	.....	A	.....	A
Lithium batteries packed with equipment.	*	9	UN3091	....	II	.....	9	.....	*	.....	185	.....	185	.....	*	.....	None	.....	*	.....	See A101, A103.	.....	*	.....	35 kg	.....	A	.....	A
Lithium hypochlorite, dry or Lithium hypochlorite mixture.	*	5.1	UN1471	....	II	.....	5.1	.....	*	.....	152	.....	212	.....	*	.....	240	.....	*	.....	A9, IB8, IP2, IP4, N34, T3, TP33.	.....	*	.....	25 kg	.....	A	.....	4, 25, 52, 56, 58, 69, 106, 116
Magnesium nitrate	*	5.1	UN1474	....	III	.....	5.1	.....	*	.....	152	.....	213	.....	*	.....	240	.....	*	.....	IB8, IP3, N34, T1, TP33.	.....	*	.....	100 kg	.....	A	.....	4, 25, 52, 56, 58, 69, 106, 116
Mannitol hexanitrate, wetted or Nitromannite, wetted with not less than 40 percent water, or mixture of alcohol and water, by mass.	*	1.1D	UN0133	....	II	.....	1.1D	.....	*	.....	None	.....	62	.....	*	.....	None	.....	*	.....	332, A1, B120, IB8, IP3, T1, TP33.	.....	*	.....	100 kg	.....	A	.....	25 kg
5-Mercaptotetrazol-1-acetic acid.	*	1.4C	UN0448	....	II	.....	1.4C	.....	*	.....	None	.....	62	.....	*	.....	None	.....	*	.....	.....	.....	*	.....	75 kg	.....	02	.....	25
Mercury	*	8	UN2809	....	III	.....	8, 6.1	.....	*	.....	164	.....	164	.....	*	.....	240	.....	*	.....	.....	.....	*	.....	35 kg	.....	B	.....	40, 97
Mercury fulminate, wetted with not less than 20 percent water, or mixture of alcohol and water, by mass.	*	1.1A	UN0135	....	II	.....	1.1A	.....	*	.....	None	.....	62	.....	*	.....	None	.....	*	.....	.....	.....	*	.....	Forbidden	.....	05	.....	25
Methacrylonitrile, stabilized.	+	6.1	UN3079	....	I	.....	6.1, 3	.....	*	.....	None	.....	227	.....	*	.....	244	.....	*	.....	2, B9, B14, B32, T20, TP2, TP13, TP38, TP45.	.....	*	.....	Forbidden	.....	D	.....	12, 25, 40

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or division	Identification Nos.	PG	Label codes	Special provisions (§ 172.102)	(8) Packaging (§ 173.***)			(9) Quantity limitations (see §§ 173.27 and 175.75)		(10) Vessel stowage	
							Exceptions	Non-bulk	Bulk	Passenger aircraft/rail	Cargo aircraft only	Location	Other
*	Methyltrichlorosilane	3	UN1250	II	3, 8	A7, B6, B77, N34, T10, TP2, TP7, TP13.	None	206	243	Forbidden	5 L	B	40
*	Mines with bursting charge.	1.1F	UN0136	II	1.1F			62	None	Forbidden	Forbidden	05	25
*	Mines with bursting charge.	1.1D	UN0137	II	1.1D			62	62	Forbidden	Forbidden	04	25
*	Mines with bursting charge.	1.2D	UN0138	II	1.2D			62	62	Forbidden	Forbidden	04	25
*	Mines with bursting charge.	1.2F	UN0294	II	1.2F			62	None	Forbidden	Forbidden	05	25
*	Naphthalene, crude or Naphthalene, refined.	4.1	UN1334	III	4.1	A1, B120, B8, IP3, T1, TP33.	151	213	240	25 kg	100 kg	A	
*	Nitro urea	1.1D	UN0147	II	1.1D		None	62	None	Forbidden	Forbidden	04	25
*	5-Nitrobenzotriazol	1.1D	UN0385	II	1.1D		None	62	None	Forbidden	Forbidden	04	25
*	Nitrocellulose, dry or wetted with less than 25 percent water (or alcohol), by mass.	1.1D	UN0340	II	1.1D		None	62	None	Forbidden	Forbidden	04	25, 27E
*	Nitrocellulose, plasticized with not less than 18 percent plasticizing substance, by mass.	1.3C	UN0343	II	1.3C		None	62	None	Forbidden	Forbidden	04	25
*	Nitrocellulose, unmodified or plasticized with less than 18 percent plasticizing substance, by mass.	1.1D	UN0341	II	1.1D		None	62	None	Forbidden	Forbidden	04	25, 27E
*	Nitrocellulose, wetted with not less than 25 percent alcohol, by mass.	1.3C	UN0342	II	1.3C		None	62	None	Forbidden	Forbidden	04	25
*	Nitroglycerin, desensitized with not less than 40 percent non-volatile water insoluble phlegmatizer, by mass.	1.1D	UN0143	II	1.1D, 6.1	125	None	62	None	Forbidden	Forbidden	04	25, 21E

* Nitroglycerin, solution in alcohol, with more than 1 percent but not more than 10 percent nitroglycerin.	* 1.1D UN0144	.... II	..... 1.1D	..... *	..... None	..... 62	..... *	..... None	..... Forbidden	..... 04	..... 25, 21E
* Nitroguanidine or Picrite, dry or wetted with less than 20 percent water, by mass.	* 1.1D UN0282	.... II	..... 1.1D	..... *	..... None	..... 62	..... *	..... None	..... Forbidden	..... 04	..... 25
* Nitrostarch, dry or wetted with less than 20 percent water, by mass.	* 1.1D UN0146	.... II	..... 1.1D	..... *	..... None	..... 62	..... *	..... None	..... Forbidden	..... 04	..... 25
* Nitrotriazolone or NTO	* 1.1D UN0490	.... II	..... 1.1D	..... *	..... None	..... 62	..... *	..... None	..... Forbidden	..... 04	..... 25
* Octolite or Octol, dry or wetted with less than 15 percent water, by mass.	* 1.1D UN0266	.... II	..... 1.1D	..... *	..... None	..... 62	..... *	..... None	..... Forbidden	..... 04	..... 25
* Octonal	* 1.1D UN0496	....	..... 1.1D	.....	..... None	..... 62	.....	..... None	..... Forbidden	..... 04	..... 25
* Other regulated substances, liquid, n.o.s.	* 9 NA3082	.... III	..... 9	..... *	..... 155	..... 203	..... *	..... 241	..... No limit	..... A	.....
* Paraformaldehyde	* 4.1 UN2213	.... III	..... 4.1	..... *	..... 151	..... 213	..... *	..... 240	..... 25 kg	..... A	.....
* Pentaerythrite tetranitrate or Pentaerythritol tetranitrate or PETN, with not less than 7 percent wax by mass.	* 1.1D UN0411	.... II	..... 1.1D	..... *	..... None	..... 62	..... *	..... None	..... Forbidden	..... 04	..... 25
* Pentaerythrite tetranitrate, wetted or Pentaerythritol tetranitrate, wetted, or PETN, wetted with not less than 25 percent water, by mass, or Pentaerythrite tetranitrate, or Pentaerythritol tetranitrate or PETN, desensitized with not less than 15 percent phlegmatizer by mass.	* 1.1D UN0150	.... II	..... 1.1D	.....	..... None	..... 62	.....	..... None	..... Forbidden	..... 04	..... 25
* Pentolite, dry or wetted with less than 15 percent water, by mass.	* 1.1D UN0151	.... II	..... 1.1D	..... *	..... None	..... 62	..... *	..... None	..... Forbidden	..... 04	..... 25
* Phosgene	* 2.3 UN1076	....	..... 2.3, 8	..... *	..... None	..... 192	..... *	..... 314	..... Forbidden	..... D	..... 40

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or division	Identification Nos.	PG	Label codes	Special provisions (§ 172.102)	(8) Packaging (§ 173.***)			(9) Quantity limitations (see §§ 173.27 and 175.75)		(10) Vessel stowage		
							Exceptions	Non-bulk	Bulk	Passenger aircraft/rail	Cargo aircraft only	Location	Other	
*	Phosphorous acid	8	UN2834	III	8	IB8, IP3, T1, TP33.	154	*	213	240	25 kg	100 kg	A	25
*	Plastic molding compound in dough, sheet or extruded rope form evolving flammable vapor.	9	UN3314	III	9	32, IB8, IP3, IP7.	155	*	221	221	100 kg	200 kg	E	21, 25, 87, 144
*	Polymeric beads expandable, evolving flammable vapor.	9	UN2211	III	9	32, IB8, IP3, IP7, T1, TP33.	155	*	221	221	100 kg	200 kg	E	21, 25, 87, 144
*	Potassium nitrate	5.1	UN1486	III	5.1	A1, A29, B120, IB8, IP3, T1, TP33, W1.	152	*	213	240	25 kg	100 kg	A	
*	Powder cake, wetted or Powder paste, wetted with not less than 17 percent alcohol by mass.	1.1C	UN0433	II	1.1C		None	*	62	None	Forbidden	Forbidden	4	25
*	Powder cake, wetted or Powder paste, wetted with not less than 25 percent water, by mass.	1.3C	UN0159	II	1.3C		None	*	62	None	Forbidden	Forbidden	4	25
*	Powder, smokeless	1.1C	UN0160	II	1.1C		None	*	62	None	Forbidden	Forbidden	4	25, 26E
	Powder, smokeless	1.3C	UN0161	II	1.3C		None	*	62	None	Forbidden	Forbidden	4	25, 26E
	Powder, smokeless	1.4C	UN0509	II	1.4C		None	*	62	None	Forbidden	75 kg	2	25
*	Primers, cap type	1.4S	UN0044	II	None		None	*	62	None	25 kg	100 kg	1	25
	Primers, cap type	1.1B	UN0377	II	1.1B		None	*	62	None	Forbidden	Forbidden	5	25
	Primers, cap type	1.4B	UN0378	II	1.4B		None	*	62	None	Forbidden	75 kg	5	25
*	Primers, tubular	1.3G	UN0319	II	1.3G		None	*	62	None	Forbidden	Forbidden	3	25
	Primers, tubular	1.4G	UN0320	II	1.4G		None	*	62	None	Forbidden	75 kg	2	25
	Primers, tubular	1.4S	UN0376	II	None		None	*	62	None	25 kg	100 kg	1	25
*	Projectiles, inert, with tracer.	1.4S	UN0345	II	1.4S		None	*	62	62	25 kg	100 kg	1	25
	Projectiles, inert, with tracer.	1.3G	UN0424	II	1.3G		None	*	62	62	Forbidden	Forbidden	3	25
	Projectiles, inert, with tracer.	1.4G	UN0425	II	1.4G		None	*	62	62	Forbidden	75 kg	2	25
	Projectiles, with burster or expelling charge.	1.2D	UN0346	II	1.2D		None	*	62	62	Forbidden	Forbidden	4	25
	Projectiles, with burster or expelling charge.	1.4D	UN0347	II	1.4D		None	*	62	62	Forbidden	75 kg	2	25

Projectiles, with burster or expelling charge.	1.2F UN0426 ... II	1.2F		62	None	Forbidden	Forbidden	5	25
Projectiles, with burster or expelling charge.	1.4F UN0427 ... II	1.4F		62	None	Forbidden	Forbidden	5	25
Projectiles, with burster or expelling charge.	1.2G UN0434 ... II	1.2G		62	62	Forbidden	Forbidden	3	25
Projectiles, with burster or expelling charge.	1.4G UN0435 ... II	1.4G		62	62	Forbidden	75 kg	2	25
Projectiles, with burster or expelling charge.	1.1F UN0167 ... II	1.1F		62	None	Forbidden	Forbidden	5	25
Projectiles, with bursting charge.	1.1D UN0168 ... II	1.1D		62	62	Forbidden	Forbidden	4	25
Projectiles, with bursting charge.	1.2D UN0169 ... II	1.2D		62	62	Forbidden	Forbidden	4	25
Projectiles, with bursting charge.	1.2F UN0324 ... II	1.2F		62	None	Forbidden	Forbidden	5	25
Projectiles, with bursting charge.	1.4D UN0344 ... II	1.4D		62	62	Forbidden	75 kg	2	25
Propellant, liquid	1.3C UN0495 ... II	1.3C	*	62	None	Forbidden	*	4	25
Propellant, liquid	1.1C UN0497 ... II	1.1C	37	62	None	Forbidden	Forbidden	4	25
Propellant, solid	1.1C UN0498 ... II	1.1C	37	62	None	Forbidden	Forbidden	4	25, 26E
Propellant, solid	1.3C UN0499 ... II	1.3C		62	None	Forbidden	Forbidden	4	25, 26E
Propellant, solid	1.4C UN0501 ... II	1.4C		62	None	Forbidden	Forbidden	2	25, 24E
Propylene chlorohydrin	6.1 UN2611 ... II	6.1, 3	IB2, T7, TP2, TP13.	153	243	5 L	60 L	A	12, 25, 40
RDX and HMX mixtures, wetted with not less than 15 percent water by mass or RDX and HMX mixtures, desensitized with not less than 10 percent phlegmatizer by mass.	1.1D UN0391 ... II	1.1D	*	62	None	Forbidden	Forbidden	4	25
Release devices, explosive.	1.4S UN0173 ... II	1.4S	*	62	62	25 kg	100 kg	1	25
Rivets, explosive	1.4S UN0174 ... II	1.4S	*	62	62	25 kg	100 kg	1	25
Rocket motors	1.3C UN0186 ... II	1.3C	*	62	62	Forbidden	220 kg	4	25
Rocket motors	1.1C UN0280 ... II	1.1C	109	62	62	Forbidden	Forbidden	4	25
Rocket motors	1.2C UN0281 ... II	1.2C	109	62	62	Forbidden	Forbidden	4	25
Rocket motors, liquid fueled.	1.2J UN0395 ... II	1.2J	109	62	None	Forbidden	Forbidden	5	25, 23E
Rocket motors, liquid fueled.	1.3J UN0396 ... II	1.3J	109	62	None	Forbidden	Forbidden	5	25, 23E
Rocket motors with hypergolic liquids with or without an expelling charge.	1.3L UN0250 ... II	1.3L	109	62	None	Forbidden	Forbidden	5	25, 14E, 15E
Rocket motors with hypergolic liquids with or without an expelling charge.	1.2L UN0322 ... II	1.2L	109	62	None	Forbidden	Forbidden	5	25, 14E, 15E
Rockets, line-throwing	1.2G UN0238 ... II	1.2G		62	None	Forbidden	Forbidden	3	25
Rockets, line-throwing	1.3G UN0240 ... II	1.3G		62	None	Forbidden	75 kg	3	25
Rockets, line-throwing	1.4G UN0453 ... II	1.4G		62	None	Forbidden	75 kg	2	25

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or division	Identification Nos.	PG	Label codes	Special provisions (§ 172.102)	(8) Packaging (§ 173.***)			(9) Quantity limitations (see §§ 173.27 and 175.75)		(10) Vessel stowage		
							Exceptions		Non-bulk	Bulk	Passenger aircraft/air/rail	Cargo aircraft only	Location	Other
							None	None	62	None	None	Forbidden	Forbidden	5	25, 23E
	Rockets, liquid fueled with bursting charge.	1.1J	UN0397	II	1.1J		None	62	None	Forbidden	Forbidden	5	25, 23E	
	Rockets, liquid fueled with bursting charge.	1.2J	UN0398	II	1.2J		None	62	None	Forbidden	Forbidden	5	25, 23E	
	Rockets, with bursting charge.	1.1F	UN0180	II	1.1F		None	62	None	Forbidden	Forbidden	5	25	
	Rockets, with bursting charge.	1.1E	UN0181	II	1.1E		None	62	62	Forbidden	Forbidden	4	25	
	Rockets, with bursting charge.	1.2E	UN0182	II	1.2E		None	62	62	Forbidden	Forbidden	4	25	
	Rockets, with bursting charge.	1.2F	UN0295	II	1.2F		None	62	None	Forbidden	Forbidden	5	25	
	Rockets, with expelling charge.	1.2C	UN0436	II	1.2C		None	62	62	Forbidden	Forbidden	4	25	
	Rockets, with expelling charge.	1.3C	UN0437	II	1.3C		None	62	62	Forbidden	Forbidden	4	25	
	Rockets, with expelling charge.	1.4C	UN0438	II	1.4C		None	62	62	Forbidden	75 kg	2	25	
	Rockets, with inert head	1.3C	UN0183	II	1.3C		None	62	62	Forbidden	Forbidden	4	25	
	Rockets, with inert head	1.2C	UN0502		1.2C		None	62	62	Forbidden	Forbidden	2	25, 5E	
G	Samples, explosive, other than initiating explosives.		UN0190	II		113	None	62	None	Forbidden	Forbidden	5	25	
	Seed cake, containing vegetable oil solvent extractions and expeller seeds, with not more than 10 percent of oil and when the amount of moisture is higher than 11 percent, with not more than 20 percent of oil and moisture combined.	4.2	UN1386	III	None	IB8, IP3, IP7, N7.	None	213	241	Forbidden	Forbidden	A	13, 25	
I	Seed cake with more than 1.5 percent oil and not more than 11 percent moisture.	4.2	UN1386	III	None	IB8, IP3, IP7, N7.	None	213	241	Forbidden	Forbidden	E	13, 25	
I	Seed cake with not more than 1.5 percent oil and not more than 11 percent moisture.	4.2	UN2217	III	None	IB8, IP3, IP7, N7.	None	213	241	Forbidden	Forbidden	A	13, 25	
	Signal devices, hand	1.4G	UN0191	II	1.4G		None	62	None	Forbidden	75 kg	2	25	
	Signal devices, hand	1.4S	UN0373	II	1.4S		None	62	None	Forbidden	100 kg	1	25	
	Signals, distress, ship	1.1G	UN0194	II	1.1G		None	62	None	Forbidden	Forbidden	3	25	
	Signals, distress, ship	1.3G	UN0195	II	1.3G		None	62	None	Forbidden	75 kg	2	25	
	Signals, distress, ship	1.4G	UN0505		1.4G		None	62	None	Forbidden	75 kg	2	25	
	Signals, distress, ship	1.4S	UN0506		1.4S		None	62	None	Forbidden	100 kg	1	25	

Signals, railway track, explosive	1.1G	UN0192	II	1.1G	*	None	62	None	*	Forbidden	Forbidden	3	25
Signals, railway track, explosive	1.4S	UN0193	II	1.4S	*	None	62	None	*	25 kg	100 kg	1	25
Signals, railway track, explosive	1.3G	UN0492	III	1.3G	*	None	62	None	*	Forbidden	Forbidden	3	25
Signals, railway track, explosive	1.4G	UN0493	III	1.4G	*	None	62	None	*	Forbidden	75 kg	2	25
Signals, smoke	1.1G	UN0196	II	1.1G	*	None	62	None	*	Forbidden	Forbidden	3	25
Signals, smoke	1.4G	UN0197	II	1.4G	*	None	62	None	*	Forbidden	75 kg	2	25
Signals, smoke	1.2G	UN0313	II	1.2G	*	None	62	None	*	Forbidden	Forbidden	3	25
Signals, smoke	1.3G	UN0487	II	1.3G	*	None	62	None	*	Forbidden	Forbidden	3	25
Signals, smoke	1.4S	UN0507	II	1.4S	*	None	62	None	*	25 kg	100 kg	1	25
Sodium carbonate peroxide	5.1	UN3378	II	5.1	*	B120, IB8, IP2, IP4, T3, TP33	212	240	*	5 kg	25 kg	A	13, 25, 75
Sodium dinitro-oresolate, dry or wetted with less than 15 percent water, by mass.	1.3C	UN0234	II	1.3C	*	None	62	None	*	Forbidden	Forbidden	4	25, 5E
Sodium nitrate	5.1	UN1498	III	5.1	*	A1, A29, B120, IB8, IP3, T1, TP33, W1	213	240	*	25 kg	100 kg	A	
Sodium nitrate and potassium nitrate mixtures.	5.1	UN1499	III	5.1	*	A1, A29, B120, IB8, IP3, T1, TP33, W1	213	240	*	25 kg	100 kg	A	
Sodium perborate monohydrate.	5.1	UN3377	III	5.1	*	B120, IB8, IP3, T1, TP33	213	240	*	25 kg	100 kg	A	13, 25, 75
Sodium picramate, dry or wetted with less than 20 percent water, by mass.	1.3C	UN0235	II	1.3C	*	None	62	None	*	Forbidden	Forbidden	4	25, 5E
Sounding devices, explosive.	1.2F	UN0204	II	1.2F	*	None	62	62	*	Forbidden	Forbidden	5	25
Sounding devices, explosive.	1.1F	UN0296	II	1.1F	*	None	62	62	*	Forbidden	Forbidden	5	25
Sounding devices, explosive.	1.1D	UN0374	II	1.1D	*	None	62	62	*	Forbidden	Forbidden	4	25
Sounding devices, explosive.	1.2D	UN0375	II	1.2D	*	None	62	62	*	Forbidden	Forbidden	4	25
Substances, explosive, n.o.s.	1.1L	UN0357	II	1.1L	*	None	62	None	*	Forbidden	Forbidden	5	25, 14E, 15E
Substances, explosive, n.o.s.	1.2L	UN0358	II	1.2L	*	None	62	None	*	Forbidden	Forbidden	5	25, 14E, 15E
Substances, explosive, n.o.s.	1.3L	UN0359	II	1.3L	*	None	62	None	*	Forbidden	Forbidden	5	25, 14E, 15E

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or division	Identification Nos.	PG	Label codes	Special provisions (§ 172.102)	(8) Packaging (§ 173.***)			(9) Quantity limitations (see §§ 173.27 and 175.75)		(10) Vessel stowage	
							Exceptions	Non-bulk	Bulk	Passenger aircraft/air/rail	Cargo aircraft only	Location	Other
G	Substances, explosive, n.o.s.	1.1A	UN0473	II	1.1A	101, 111	None	62	None	Forbidden	Forbidden	5	25
G	Substances, explosive, n.o.s.	1.1C	UN0474	II	1.1C	101	None	62	None	Forbidden	Forbidden	4	25
G	Substances, explosive, n.o.s.	1.1D	UN0475	II	1.1D	101	None	62	None	Forbidden	Forbidden	4	25
G	Substances, explosive, n.o.s.	1.1G	UN0476	II	1.1G	101	None	62	None	Forbidden	Forbidden	3	25
G	Substances, explosive, n.o.s.	1.3C	UN0477	II	1.3C	101	None	62	None	Forbidden	Forbidden	4	25
G	Substances, explosive, n.o.s.	1.3G	UN0478	II	1.3G	101	None	62	None	Forbidden	Forbidden	3	25
G	Substances, explosive, n.o.s.	1.4C	UN0479	II	1.4C	101	None	62	None	Forbidden	75 kg	2	25
G	Substances, explosive, n.o.s.	1.4D	UN0480	II	1.4D	101	None	62	None	Forbidden	75 kg	2	25
G	Substances, explosive, n.o.s.	1.4S	UN0481	II	1.4S	101	None	62	None	25 kg	75 kg	1	25
G	Substances, explosive, n.o.s.	1.4G	UN0485	II	1.4G	101	None	62	None	Forbidden	75 kg	2	25
G	Substances, explosive, very insensitive, n.o.s. or Substances, EVI, n.o.s.	1.5D	UN0482	II	1.5D	101	None	62	None	Forbidden	Forbidden	3	25
D	Sulfur	9	NA1350	III	9	30, B120, IB8, IP2	None	None	240	No Limit	No Limit	A	25, 74
I	Sulfur	4.1	UN1350	III	4.1	30, B120, IB8, IP3, T1, TP33.	None	None	240	25 kg	100 kg	A	25, 74
*	Tetranitroaniline	1.1D	UN0207	II	1.1D		None	62	None	Forbidden	Forbidden	4	25
*	Tetrazol-1-acetic acid 1H-Tetrazole	1.4C	UN0407	II	1.4C		None	62	None	Forbidden	75 kg	2	25
*	Thallium compounds, n.o.s.	6.1	UN1707	II	6.1	IB8, IP2, IP4, T3, TP33.	153	212	242	25 kg	100 kg	A	25, 5E
*	Torpedoes, liquid fueled, with inert head.	1.3J	UN0450	II	1.3J		None	62	None	Forbidden	Forbidden	5	25, 23E
*	Torpedoes, liquid fueled, with or without bursting charge.	1.1J	UN0449	II	1.1J		None	62	None	Forbidden	Forbidden	5	25, 23E
*	Torpedoes with bursting charge.	1.1E	UN0329	II	1.1E		None	62	62	Forbidden	Forbidden	4	25
*	Torpedoes with bursting charge.	1.1F	UN0330	II	1.1F		None	62	None	Forbidden	Forbidden	5	25
*	Torpedoes with bursting charge.	1.1D	UN0451	II	1.1D		None	62	62	Forbidden	Forbidden	4	25
D	Toy Caps	1.4S	NA0397	II	1.4S		None	62	None	25 kg	100 kg	1	25

Tracers for ammunition ...	1.3G UN0212 ...	II	1.3G		None	62	None	Forbidden	3	25
Tracers for ammunition ...	1.4G UN0306 ...	II	1.4G		None	62	None	Forbidden	2	25
Trimethylchlorosilane	* 3 UN1298 ...	II	* 3, 8	A3, A7, B77, N34, T10, TP2, TP7, TP13.	None	* 206	* 243	Forbidden	E	40
Tritro-m-cresol	* 1.1D UN0216 ...	II	* 1.1D		None	62	None	Forbidden	4	25, 5E
Tritroaniline or Picramide.	* 1.1D UN0153 ...	II	* 1.1D		None	62	None	Forbidden	4	25
Tritroanisole	* 1.1D UN0213 ...	II	* 1.1D		None	62	None	Forbidden	4	25
Tritrobenzene, dry or wetted with less than 30 percent water, by mass.	* 1.1D UN0214 ...	II	* 1.1D		None	62	None	Forbidden	4	25
Tritrobenzenesulfonic acid.	* 1.1D UN0386 ...	II	* 1.1D		None	62	None	Forbidden	4	25, 5E
Tritrobenzoic acid, dry or wetted with less than 30 percent water, by mass.	* 1.1D UN0215 ...	II	* 1.1D		None	62	None	Forbidden	4	25
Tritrochlorobenzene or Picryl chloride.	* 1.1D UN0155 ...	II	* 1.1D		None	62	None	Forbidden	4	25
Tritrofluorenone	* 1.1D UN0387 ...	II	* 1.1D		None	62	None	Forbidden	4	25
Tritronaphthalene	* 1.1D UN0217 ...	II	* 1.1D		None	62	None	Forbidden	4	25
Tritrophenetole	* 1.1D UN0218 ...	II	* 1.1D		None	62	None	Forbidden	4	25
Tritrophenol or Picric acid, dry or wetted with less than 30 percent water, by mass.	* 1.1D UN0154 ...	II	* 1.1D		None	62	None	Forbidden	4	25, 5E
Tritrophenyl(methyl)nitramine or Tetyl.	* 1.1D UN0208 ...	II	* 1.1D		None	62	None	Forbidden	4	25
Tritroresorcinol or Styphnic acid, dry or wetted with less than 20 percent water, or mixture of alcohol and water, by mass.	* 1.1D UN0219 ...	II	* 1.1D		None	62	None	Forbidden	4	25, 5E
Tritroresorcinol, wetted or Styphnic acid, wetted with not less than 20 percent water, or mixture of alcohol and water by mass.	* 1.1D UN0394 ...	II	* 1.1D		None	62	None	Forbidden	4	25, 5E

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or division	Identification Nos.	PG	Label codes	Special provisions (§ 172.102)	(8) Packaging (§ 173.***)			(9) Quantity limitations (see §§ 173.27 and 175.75)			(10) Vessel stowage		
							Exceptions	Non-bulk	Bulk	Passenger aircraft/rail	Cargo aircraft only	Location	Other		
*	Tritrotoluene and Trinitrobenzene mixtures or TNT and trinitrobenzene mixtures or TNT and hexanitrostilbene mixtures or Tritrotoluene and hexanitrostilbene mixtures.	1.1D	UN0388	II	*	1.1D	None	*	62	None	*	Forbidden	Forbidden	4	25
	Tritrotoluene mixtures containing Trinitrobenzene and Hexanitrostilbene or TNT mixtures containing trinitrobenzene and hexanitrostilbene.	1.1D	UN0389	II		1.1D	None		62	None		Forbidden	Forbidden	4	25
	Tritrotoluene or TNT, dry or wetted with less than 30 percent water, by mass.	1.1D	UN0209	II		1.1D	None		62	None		Forbidden	Forbidden	4	25
*	Tritonal	1.1D	UN0390	II	*		None	*	62	None	*	Forbidden	Forbidden	4	25
*	Urea nitrate, dry or wetted with less than 20 percent water, by mass.	1.1D	UN0220	II	*		None	*	62	None	*	Forbidden	Forbidden	4	25
*	Vehicle, flammable gas powered or Vehicle, fuel cell, flammable gas powered.	9	UN3166		*	9	135, A200	*	220	220	*	Forbidden	No limit	A	A
	Vehicle, flammable liquid powered or Vehicle, fuel cell, flammable liquid powered.	9	UN3166			9	135, A200		220	220		No limit	No limit	A	A
*	Warheads, rocket with burster or expelling charge.	1.4D	UN0370	II	*	1.4D		*	62	62	*	Forbidden	75 kg	2	25
	Warheads, rocket with burster or expelling charge.	1.4F	UN0371	II		1.4F			62	None		Forbidden	Forbidden	5	25
	Warheads, rocket with bursting charge.	1.1D	UN0286	II		1.1D			62	62		Forbidden	Forbidden	4	25
	Warheads, rocket with bursting charge.	1.2D	UN0287	II		1.2D			62	62		Forbidden	Forbidden	4	25
	Warheads, rocket with bursting charge.	1.1F	UN0369	II		1.1F			62	None		Forbidden	Forbidden	5	25
	Warheads, torpedo with bursting charge.	1.1D	UN0221	II		1.1D			62	62		Forbidden	Forbidden	4	25

G	Water-reactive liquid, corrosive, n.o.s.	4.3	UN3129	....	I	.....	4.3, 8	.....	T14, TP2, TP7, TP13.	None	201	.....	243	.....	Forbidden	1 L	.....	D	
					II	.....	4.3, 8	.....	IB1, T11, TP2, TP7.	None	202	.....	243	.....	1 L	.....	5 L	.....	E
					III	.....	4.3, 8	.....	IB2, T7, TP2, TP7.	None	203	.....	242	.....	5 L	.....	60 L	.....	E
					*	*	*	*	*	*	*	*	*	*	
G	Water-reactive liquid, n.o.s.	4.3	UN3148	....	I	.....	4.3	.....	T13, TP2, TP7, TP41.	None	201	.....	244	.....	Forbidden	1 L	.....	E	
					II	.....	4.3	.....	IB1, T7, TP2, TP7.	None	202	.....	243	.....	1 L	.....	5 L	.....	E
					III	.....	4.3	.....	IB2, T7, TP2, TP7.	None	203	.....	242	.....	5 L	.....	60 L	.....	E
					*	*	*	*	*	*	*	*	*	*	
	Zirconium picramate, dry or wetted with less than 20 percent water, by mass.	1.3C	UN0236	....	II	.....	1.3C	.....	.....	None	62	.....	None	.....	Forbidden	Forbidden	4	.....	25, 5E
					*	*	*	*	*	*	*	*	*	*	

- 6. In § 172.102:
 - a. In paragraph (c)(1), special provisions 47, 48, 49, 118, 134, 155, and 237 are revised and special provisions 101, 222, 238, 328, 360, 361, 362 and 365 are added in numerical sequence.
 - b. In paragraph (c)(2), special provisions A60, A100 and A103 are revised and special provisions A51, A189, A191, and A200 are added in numerical sequence.
 - c. In paragraph (c)(3), special provision B120 is added in numerical sequence.
 - d. In paragraph (c)(4), Table 1 is revised.
 - e. Paragraph (c)(7)(iii) is revised.
 - f. In paragraph (c)(8)(ii), TP39, TP40 and TP41 are added in numerical sequence.
 - g. In paragraph (c)(9), W10 is added in numerical sequence.

The additions and revisions read as follows:

§ 172.102 Special Provisions.

* * * * *

- (c) * * *
- (1) * * *

47 Mixtures of solids that are not subject to this subchapter and flammable liquids may be transported under this entry without first applying the classification criteria of Division 4.1, provided there is no free liquid visible at the time the material is loaded or at the time the packaging or transport unit is closed. Except when the liquids are fully absorbed in solid material contained in sealed bags, for single packagings, each packaging must correspond to a design type that has passed a leakproofness test at the Packing Group II level. Small inner packagings consisting of sealed packets and articles containing less than 10 mL of a Class 3 liquid in Packing Group II or III absorbed onto a solid material are not subject to this subchapter provided there is no free liquid in the packet or article.

48 Mixtures of solids that are not subject to this subchapter and toxic liquids may be transported under this entry without first applying the classification criteria of Division 6.1, provided there is no free liquid visible at the time the material is loaded or at the time the packaging or transport unit is closed. For single packagings, each packaging must correspond to a design type that has passed a leakproofness test at the Packing Group II level. This entry may not be used for solids containing a Packing Group I liquid.

49 Mixtures of solids that are not subject to this subchapter and corrosive liquids may be transported under this entry without first applying the

classification criteria of Class 8, provided there is no free liquid visible at the time the material is loaded or at the time the packaging or transport unit is closed. For single packagings, each packaging must correspond to a design type that has passed a leakproofness test at the Packing Group II level.

* * * * *

101 The name of the particular substance or article must be specified.

* * * * *

118 This substance may not be transported under the provisions of Division 4.1 unless specifically authorized by the Associate Administrator (see UN0143 or UN0150 as appropriate).

* * * * *

134 This entry only applies to vehicles powered by wet batteries, sodium batteries, or lithium batteries and equipment powered by wet batteries or sodium batteries that are transported with these batteries installed. For the purpose of this special provision, vehicles are self-propelled apparatus designed to carry one or more persons or goods. Examples of such vehicles are electrically-powered cars, motorcycles, scooters, three- and four-wheeled vehicles or motorcycles, battery-assisted bicycles, lawn tractors, boats, aircraft, wheelchairs and other mobility aids. Examples of equipment are lawnmowers, cleaning machines or model boats and model aircraft. Equipment powered by lithium batteries must be consigned under the entries "Lithium batteries contained in equipment" or "Lithium batteries packed with equipment," as appropriate. Self-propelled vehicles that also contain an internal combustion engine must be consigned under the entry "Engine, internal combustion, flammable gas powered" or "Engine, internal combustion, flammable liquid powered" or "Vehicle, flammable gas powered" or "Vehicle, flammable liquid powered," as appropriate. These entries include hybrid electric vehicles powered by both an internal combustion engine and batteries. Additionally, self-propelled vehicles or equipment that contain a fuel cell engine must be consigned under the entries "Engine, fuel cell, flammable gas powered" or "Engine, fuel cell, flammable liquid powered" or "Vehicle, fuel cell, flammable gas powered" or "Vehicle, fuel cell, flammable liquid powered," as appropriate. These entries include hybrid electric vehicles powered by a fuel cell engine, an internal combustion engine, and batteries.

* * * * *

155 Fish meal, fish scrap and krill meal may not be transported if the temperature at the time of loading either exceeds 35 °C (95 °F), or exceeds 5 °C (41 °F) above the ambient temperature, whichever is higher.

* * * * *

222 Shipments offered for transportation by aircraft may not be reclassified as ORM-D.

237 "Batteries, dry, containing potassium hydroxide solid, *electric storage*" must be prepared and packaged in accordance with the requirements of § 173.159(a) and (c). For transportation by aircraft, the provisions of § 173.159(b)(2) apply. This entry may only be used for the transport of non-activated batteries that contain dry potassium hydroxide and that are intended to be activated prior to use by the addition of an appropriate amount of water to the individual cells.

238 Neutron radiation detectors:

a. Neutron radiation detectors containing non-pressurized boron trifluoride gas in excess of 1 gram and radiation detection systems containing such neutron radiation detectors as components may be transported by highway, rail, vessel, or cargo aircraft in accordance with the following:

(1) The pressure in each neutron radiation detector must not exceed 105 kPa absolute at 20 °C;

(2) The amount of gas must not exceed 12.8 grams per detector and the amount per outer packaging or per radiation detection system must not exceed 51.2 grams;

(3) Each neutron radiation detector must be of welded metal construction with brazed metal to ceramic feed through assemblies. They must have a minimum burst pressure of 1800 kPa; and

(4) Each neutron radiation detector must be packed in a sealed intermediate plastic liner with sufficient absorbent material to absorb the entire gas contents. Neutron radiation detectors must be packed in strong outer packagings that are capable of withstanding a 1.8 meter (6-foot) drop without leakage. Radiation detection systems containing neutron radiation detectors must also include absorbent material sufficient to absorb the entire gas contents of the neutron radiation detectors. Absorbent material must be surrounded by a liner or liners, as appropriate. They must be packed in strong outer packagings unless neutron radiation detectors are afforded equivalent protection by the radiation detection system.

b. Except for transportation by aircraft, neutron radiation detectors and

radiation detection systems containing such detectors transported in accordance with paragraph (a) of this special provision are not subject to the labeling and placarding requirements of part 172 of this subchapter.

c. When transported by highway, rail, vessel, or as cargo on an aircraft, neutron radiation detectors containing not more than 1 gram of boron trifluoride, including those with solder glass joints, and radiation detection systems containing such detectors, where the neutron radiation detectors meet and are packed in accordance with the requirements of paragraph (a) of this special provision, are not subject to any other requirements of this subchapter.

* * * * *

328 When lithium cells or batteries are contained in the fuel cell system, the item must be described under this entry and the entry "Lithium batteries, contained in equipment".

* * * * *

360 Vehicles only powered by lithium batteries must be assigned the identification number UN3171.

361 Capacitors with an energy storage capacity of 0.3 Wh or less are not subject to the requirements of this subchapter. Energy storage capacity means the energy held by a capacitor, as calculated using the nominal voltage and capacitance. This entry does not apply to capacitors that by design maintain a terminal voltage (e.g., asymmetrical capacitors.)

362 This entry applies to liquids, pastes or powders, pressurized with a propellant that meets the definition of a gas in § 173.115. A chemical under pressure packaged in an aerosol dispenser must be transported under UN1950. The chemical under pressure must be classed based on the hazard characteristics of the components in the propellant; the liquid; or the solid. The following provisions also apply:

(a) If one of the components, which can be a pure substance or a mixture, is classed as flammable, the chemical under pressure must be classed as flammable in Division 2.1. Flammable components are flammable liquids and liquid mixtures, flammable solids and solid mixtures or flammable gases and gas mixtures meeting the following criteria:

(i) A flammable liquid is a liquid having a flashpoint of not more than 93 °C (200 °F);

(ii) A flammable solid is a solid that meets the criteria in § 173.124 of this subchapter; or

(iii) A flammable gas is a gas that meets the criteria in § 173.115 of this subchapter.

(b) Gases of Division 2.3 and gases with a subsidiary risk of 5.1 must not be used as a propellant in a chemical under pressure.

(c) Where the liquid or solid components are classed as Division 6.1, packing groups II or III, or Class 8, packing groups II or III, the chemical under pressure must be assigned a subsidiary risk of Division 6.1 or Class 8 and the appropriate identification number must be assigned. Components classed as Division 6.1, packing group I, or Class 8, packing group I, must not be offered for transportation and transported under this description.

(d) A chemical under pressure with components meeting the properties of: Class 1 (explosives); Class 3 (liquid desensitized explosives); Division 4.1 (self-reactive substances and solid desensitized explosives); Division 4.2 (substances liable to spontaneous combustion); Division 4.3 (substances which, in contact with water, emit flammable gases or toxic gases); Division 5.1 (oxidizing substances); Division 5.2 (organic peroxides); Division 6.2 (Infectious substances); or, Class 7 (Radioactive material), must not be offered for transportation under this description.

(e) A description to which Special provision 170 or TP7 is assigned in Column 7 of the § 172.101 Hazardous Materials Table, and therefore requires air to be eliminated from the package vapor space by nitrogen or other means, must not be offered for transportation under this description.

365 For manufactured instruments and articles containing mercury, see UN3506.

(2) * * * * *

A51 Irrespective of the quantity limitations specified in Column (9A) of the § 172.101 Table or § 175.75(c), the following aircraft batteries may be transported on passenger aircraft as cargo:

a. Wet cell batteries, UN 2794 or UN 2795, up to a limit of 100kg net mass per package;

b. Lithium ion batteries, UN 3090, packages containing a single aircraft battery with a net mass not exceeding 35kg; and

c. Transport in accordance with this special provision must be noted on the dangerous goods transport document.

* * * * *

A60 Sterilization devices, when containing less than 30 mL per inner packaging with not more than 150 mL per outer packaging, may be transported in accordance with the provisions in § 173.4a, irrespective of § 173.4a(b),

provided such packagings were first subjected to comparative fire testing. Comparative fire testing between a package as prepared for transport (including the substance to be transported) and an identical package filled with water must show that the maximum temperature measured inside the packages during testing does not differ by more than 200 °C (392 °F). Packagings may include a vent to permit the slow escape of gas (i.e. not more than 0.1 mL/hour per 30 mL inner packaging at 20 °C (68 °F) produced from gradual decomposition.

* * * * *

A100 Primary (non-rechargeable) lithium batteries and cells are forbidden for transport aboard passenger-carrying aircraft. Secondary (rechargeable) lithium batteries and cells are authorized aboard passenger-carrying aircraft provided the net weight of lithium batteries does not exceed 5 kg (11 pounds) per package.

* * * * *

A103 Equipment is authorized aboard passenger-carrying aircraft provided the net weight of lithium batteries does not exceed 5 kg (11 pounds) per package.

* * * * *

A189 Except where the defining criteria of another class or division are met, concentrations of formaldehyde solution:

a. With less than 25 percent but not less than 10 percent formaldehyde, must be described as UN3334, Aviation regulated liquid, n.o.s.; and

b. With less than 10 percent formaldehyde, are not subject to this subchapter.

* * * * *

A191 Notwithstanding the Division 6.1 subsidiary risk for this description, the toxic subsidiary risk label and the requirement to indicate the subsidiary risk on the shipping paper are not required for manufactured articles containing less than 5 kg (11 pounds) of mercury.

* * * * *

A200 These articles must be transported as cargo and may not be carried aboard an aircraft by passengers or crewmembers in carry-on baggage, checked baggage, or on their person unless specifically authorized in § 175.10.

* * * * *

(3) * * * * *

* * * * *

B120 The use of flexible bulk containers conforming to the requirements in subpart R and subpart

S of part 178 of this subchapter is permitted. (4) * * *

TABLE 1—IB CODES (IBC CODES)

Table with 2 columns: IBC code and Authorized IBCs. Rows include IB1 through IB9 with detailed descriptions of authorized materials and additional requirements.

(7) * * * (iii) T50 When portable tank instruction T50 is indicated in Column (7) of the § 172.101 Hazardous Materials Table, the applicable liquefied compressed gas and chemical under pressure descriptions are authorized to be transported in portable tanks in accordance with the requirements of § 173.313 of this subchapter.

(8) * * * (ii) * * *

TP39 The portable tank instruction T4 prescribed may continue to be applied until December 31, 2018.

TP40 The portable tank must not be transported when connected with spray application equipment.

TP41 The portable tank instruction T9 may continue to be applied until December 31, 2018.

W10 When offered for transportation by vessel, the use of Large Packagings (see § 171.8 of this subchapter) is prohibited.

■ 7. In § 172.202, paragraph (a)(6)(vii) is added:

§ 172.202 Description of hazardous material on shipping papers.

- (a) * * * (6) * * *

(vii) For hazardous materials in limited quantities with a 30 kg gross mass limit in Column (9A) or (9B) of the § 172.101 Hazardous Materials Table, where different hazardous materials are packed together in the same outer packaging, the net quantity of each hazardous material followed by the gross mass of the completed package is indicated and:

■ 8. In § 172.203, paragraph (i)(3) is revised to read as follows:

§ 172.203 Additional description requirements.

- (i) * * *

(3) For a hazardous material consigned under an "n.o.s." entry not included in the segregation groups listed in section 3.1.4 of the IMDG Code (IBR see § 171.7 of this subchapter) but belonging, in the opinion of the consignor, to one of these groups, the appropriate segregation group must be shown in association with the basic description (for example, IMDG Code segregation group—1 Acids). When no segregation group is applicable, there is

no requirement to indicate that condition.

■ 9. In § 172.301, paragraph (a)(1) is revised to read as follows:

§ 172.301 General marking requirements for non-bulk packagings.

(a) Proper shipping name and identification number. (1) Except as otherwise provided by this subchapter, each person who offers a hazardous material for transportation in a non-bulk packaging must mark the package with the proper shipping name and identification number (preceded by "UN", "NA" or "ID," as appropriate) for the material as shown in the § 172.101 Hazardous Materials Table. The identification number marking preceded by "UN", "NA", or "ID" as appropriate must be marked in characters at least 12 mm (0.47 inches) high. Packages with a maximum capacity of 30 liters (8 gallons) or less, 30 kg (66 pounds) maximum net mass, or cylinders with a water capacity of 60 liters (16 gallons) or less must be marked with characters at least 6 mm (0.24 inches) high. Packages with a maximum capacity of 5 liters (1.32 gallons) or 5 kg (11 pounds) or less must be marked in a size appropriate for the size of the package.

(i) Transitional exception. For domestic transportation, until January 1, 2017, the identification number

markings are not subject to the minimum size requirements specified in paragraph this (a)(1).

(ii) Exception for permanently marked packagings. For domestic transportation, a packaging manufactured prior to January 1, 2017 and permanently marked (e.g., by embossing or through a heat stamp process) with the appropriate identification number marking may continue in service until the end of its useful life regardless of whether the identification number markings meet the minimum size requirements specified in this paragraph (a)(1).

* * * * *

■ 11. In § 172.312, paragraph (c)(3) is revised to read as follows:

§ 172.312 Liquid hazardous materials in non-bulk packagings.

* * * * *

(c) * * *

(3) When offered or intended for transportation by aircraft, packages containing liquid hazardous materials in inner packagings of 120 mL (4 fluid oz.) or less when packed with sufficient absorption material between the inner and outer packagings to completely absorb the liquid contents.

* * * * *

■ 12. In § 172.407, paragraph (f) is revised to read as follows:

§ 172.407 Label specifications.

* * * * *

(f) *Exceptions.* Except for materials poisonous by inhalation (See § 171.8 of this subchapter), a label conforming to specifications in the UN Recommendations (IBR, see § 171.7 of this subchapter) may be used in place of a corresponding label that conforms to the requirements of this subpart.

* * * * *

■ 13. In § 172.604, paragraph (d)(2) is revised to read as follows.

§ 172.604 Emergency response telephone number.

* * * * *

(d) * * *

(2) Materials properly described under the following shipping names:

Battery powered equipment.
Battery powered vehicle.
Carbon dioxide, solid.
Castor bean.
Castor flake.
Castor meal.
Castor pomace.
Consumer commodity.
Dry ice.
Engines, internal combustion.
Fish meal, stabilized.
Fish scrap, stabilized.

Krill Meal, PG III.
Refrigerating machine.
Vehicle, flammable gas powered.
Vehicle, flammable liquid powered.
Wheelchair, electric.

* * * * *

PART 173—SHIPPERS—GENERAL REQUIREMENTS FOR SHIPMENTS AND PACKAGINGS

■ 14. The authority citation for part 173 continues to read as follows:

Authority: 49 U.S.C. 5101–5128, 44701; 49 CFR 1.45, 1.53.

■ 15. In § 173.4b, paragraph (b)(8) is revised to read as follows:

§ 173.4b De minimus exceptions.

* * * * *

(b) * * *

(8) *Restrictions.* Except as provided in § 175.10, for transportation by aircraft, hazardous material packaged in accordance with this section may not be carried in checked or carry-on baggage by a passenger or crew member.

■ 16. In § 173.12, paragraph (b)(2)(ii)(A) is revised to read as follows:

§ 173.12 Exceptions for shipments of waste materials.

* * * * *

(b) * * *

(2) * * *

(ii) * * *

(A) A UN 1A2, UN 1B2 or UN 1N2 metal drum, a UN 1D plywood drum, a UN 1G fiber drum, or a UN 1H2 plastic drum, tested and marked to at least the Packing Group III performance level for liquids or solids;

* * * * *

■ 17. In § 173.21, paragraph (f)(3)(ii) is revised to read as follows:

§ 173.21 Forbidden materials and packages.

* * * * *

(f) * * *

(3) * * *

(ii) For transportation by vessel, shipments are authorized in accordance with the control temperature requirements in 7.3.7 of the IMDG Code (IBR, see § 171.7 of this subchapter).

* * * * *

■ 18. Section § 173.37 is added to read as follows:

§ 173.37 Hazardous Materials in Flexible Bulk Containers.

(a) No person may offer or accept a hazardous material for transportation in a Flexible Bulk Container except as authorized by this subchapter. Each Flexible Bulk Container used for the transportation of hazardous materials must conform to the requirements of its

specification and regulations for the transportation of the particular commodity.

(b) *Initial use and reuse of Flexible Bulk Containers.* A Flexible Bulk Container may be reused. Before a Flexible Bulk Container is filled and offered for transportation, the Flexible Bulk Container must be given an external visual inspection by the person filling the Flexible Bulk Container to ensure:

(1) The Flexible Bulk Container is free from corrosion, contamination, cracks, cuts, or other damage that would render it unable to pass the prescribed design type test to which it is certified and marked; and

(2) The Flexible Bulk Container is marked in accordance with requirements in § 178.1010 of this subchapter. Required markings that are missing, damaged or difficult to read must be restored or returned to original condition.

(3) The following components must be examined to determine structural serviceability:

- (i) Textile slings;
- (ii) Load-bearing structure straps;
- (iii) Body fabric; and

(iv) Lock device parts including metal and textile parts are free from protrusions or damage.

(4) The use of Flexible Bulk Containers for the transport of hazardous materials is permitted for a period not to exceed two years from the date of manufacture of the Flexible Bulk Container.

(c) During transportation—

(1) No hazardous material may remain on the outside of the Flexible Bulk Container; and

(2) Each Flexible Bulk Container must be securely fastened to or contained within the transport unit.

(3) If restraints such as banding or straps are used, these straps must not be over-tightened to an extent that causes damage or deformation to the Flexible Bulk Container.

(4) Flexible Bulk Containers must be transported in a conveyance with rigid sides and ends that extend at least two-thirds of the height of the Flexible Bulk Container.

(5) Flexible Bulk Containers must not be stacked for highway or rail transportation.

(6) Flexible Bulk Containers must not be transported in cargo transport units when offered for transportation by vessel.

(7) Flexible Bulk Containers when transported by barge must be stowed in such a way that there are no void spaces between the Flexible Bulk Containers in the barge. If the Flexible Bulk

Containers do not completely fill the barge, adequate measures must be taken to avoid shifting of cargo. The maximum permissible height of the stack of Flexible Bulk Containers must not exceed 3 containers high.

(d) A Flexible Bulk Container used to transport hazardous materials may not exceed 15 cubic meters (530 cubic feet) capacity.

■ 19. In § 173.50, paragraph (b)(6) is revised as follows.

§ 173.50 Class 1—Definitions.

* * * * *

(b) * * *
 (6) *Division 1.6*² consists of extremely insensitive articles that do not have a mass explosion hazard. This division is comprised of articles that contain only extremely insensitive substances and that demonstrate a negligible probability of accidental initiation or propagation.

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

■ 20. In § 173.52, in paragraph (b), in Table 1, the entry in the twelfth row is revised to read as follows:

§ 173.52 Classification codes and compatibility groups of explosives.

* * * * *

(b) * * *

TABLE 1—CLASSIFICATION CODES

Description of substances or article to be classified	Compatibility group	Classification code
* * * * *	*	*
Articles containing only extremely insensitive substances	N	1.6N
* * * * *	*	*

* * * * *
 ■ 21. In § 173.56 paragraph (h)(2) is revised to read as follows:

* * * * *

(h) * * *

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

* * * * *

■ 22. In § 173.59:

■ a. The word “detonating” is removed from the definition of *Articles, explosive, extremely insensitive (Articles, EEI)*.

■ b. The definition of *Auxiliary explosive component, isolated* is added.

■ c. The definition of “*Cartridges, blank*” is revised.

■ d. The definition of “*Explosive, extremely insensitive detonating substance (EIDS)*” is removed.

■ e. The definition of “*Explosive, extremely insensitive substance (EIS)*” is added.

The revision and additions are as follows:

§ 173.59 Description for explosive terms.

* * * * *

Auxiliary explosive component, isolated. A small device that explosively performs an operation related to the article’s functioning, other than its main explosive loads’ performance. Functioning of the component does not cause any reaction of the main explosive loads contained within the article.

* * * * *

Cartridges, blank. Articles that 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, tools, etc.

* * * * *

Explosive, extremely insensitive substance (EIS). A substance that has demonstrated through tests that it is so insensitive that there is very little probability of accidental initiation.

* * * * *

■ 23. In § 173.62, in paragraph (c), in the Table of Packing Methods, Packing Instructions 110(a), 111, 112(a), 112(b), 112(c), 113, 114(a), 114(b), 115, 116, 117, 130, 131, 132(a), 132(b), 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143 and 144 are revised to read as follows:

§ 173.62 Specific packaging requirements for explosives.

* * * * *

(c) * * *

TABLE OF PACKING METHODS

Packing instruction	Inner packagings	Intermediate packagings	Outer packagings
* * * * *	*	*	*
110(a)	Bags	Bags	Drums.
PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:	plastics, textile, plastic coated or lined	plastics, textile, plastic coated or lined	steel (1A1 or 1A2). other metal (1N1 or 1N2).
1. The Intermediate packagings must be filled with water saturated material such as an anti-freeze solution or wetted cushioning	rubber textile, rubberized textile	rubber textile, rubberized-	plastics-(1H1 or 1H2).
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	Receptacles wood	Receptacles plastics metal wood	
* * * * *	*	*	*
111	Bags	Not necessary	Boxes.

TABLE OF PACKING METHODS—Continued

Packing instruction	Inner packagings	Intermediate packagings	Outer packagings
<p>PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS: For UN0159, inner packagings are not required when metal (1A1, 1A2, 1B1, 1B2, 1N1 or 1N2) or plastics (1H1 or 1H2) drums are used as outer packagings</p>	<p>paper, waterproofed plastics textile, rubberized Sheets plastics textile, rubberized Receptacles wood</p>		<p>steel (4A). aluminum (4B). other metal (4N). natural wood, ordinary (4C1). natural wood, sift proof (4C2). plywood (4D). reconstituted wood (4F). fiberboard (4G). plastics, expanded (4H1). plastics, solid (4H2). Drums steel (1A1 or 1A2). aluminum (1B1 or 1B2). other metal (1N1 or 1N2). plywood (1D). fiberboard (1G). plastics (1H1 or 1H2).</p>
<p>112(a) PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS: 1. For UN Nos. 0004, 0076, 0078, 0154, 0219 and 0394, packagings must be lead free 2. Intermediate packagings are not required if leakproof drums are used as the outer packaging 3. For UN0072 and UN0226, intermediate packagings are not required</p>	<p>Bags paper, multiwall, water resistant plastics textile textile, rubberized woven plastics Receptacles metal plastics wood</p>	<p>Bags plastics textile, plastic coated or lined Receptacles metal plastics wood</p>	<p>Boxes. steel (4A). aluminum (4B). other metal (4N). natural wood, ordinary (4C1). natural wood, sift proof (4C2). plywood (4D). reconstituted wood (4F). fiberboard (4G). plastics, expanded (4H1). plastics, solid (4H2). Drums steel (1A1 or 1A2). aluminum (1B1 or 1B2). other metal (1N1 or 1N2). plywood (1D). fiber (1G). plastics (1H1 or 1H2).</p>
<p>112(b)</p>	<p>Bags</p>	<p>Bags</p>	<p>Boxes.</p>

TABLE OF PACKING METHODS—Continued

Packing instruction	Inner packagings	Intermediate packagings	Outer packagings
<p>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 UN0209, bags, sift-proof (5H2) are recommended for flake or prilled TNT in the dry state and a maximum net mass of 30 kg. For UN0222, inner packagings are not required 	<p>paper, Kraft</p> <p>paper, multiwall, water resistant</p> <p>plastics</p> <p>textile</p> <p>textile, rubberized</p> <p>plastics</p> <p>woven plastics</p>	<p>(for UN0150 only)</p> <p>plastics</p> <p>textile, plastic coated or lined</p>	<p>woven plastics sift-proof (5H2/3).</p> <p>plastics, film (5H4).</p> <p>textile, sift-proof (5L2).</p> <p>textile, water resistant (5L3).</p> <p>paper, multiwall, water resistant (5M2).</p> <p>Boxes</p> <p>steel (4A).</p> <p>aluminum (4B).</p> <p>other metal (4N).</p> <p>natural wood, ordinary (4C1).</p> <p>natural wood, sift proof (4C2).</p> <p>plywood (4D)</p> <p>reconstituted wood (4F).</p> <p>fiberboard (4G).</p> <p>plastics, expanded (4H1).</p> <p>plastics, solid (4H2).</p> <p>Drums</p> <p>steel (1A1 or 1A2).</p> <p>aluminum (1B1 or 1B2).</p> <p>plywood (1D).</p> <p>other metal (1N1 or 1N2).</p> <p>fiber (1G).</p> <p>plastics (1H1 or 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 UN0209, 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</p> <p>plastics</p> <p>woven plastics</p> <p>Receptacles</p> <p>fiberboard</p> <p>metal</p> <p>plastics</p> <p>wood</p>	<p>Bags</p> <p>paper, multiwall, water resistant with inner lining</p> <p>plastics</p> <p>Receptacles</p> <p>metal</p> <p>plastics</p> <p>wood</p>	<p>Boxes.</p> <p>steel (4A).</p> <p>aluminum (4B).</p> <p>other metal (4N).</p> <p>natural wood, ordinary (4C1).</p> <p>natural wood, sift proof (4C2).</p> <p>plywood (4D).</p> <p>reconstituted wood (4F).</p> <p>fiberboard (4G).</p> <p>plastics, solid (4H2).</p> <p>Drums.</p> <p>plastics (1H1 or 1H2).</p> <p>steel (1A1 or 1A2).</p> <p>aluminum (1B1 or 1B2).</p> <p>other metal (1N1 or 1N2).</p> <p>plywood (1D).</p> <p>fiber (1G).</p>
<p>113</p>	<p>Bags</p>	<p>Not necessary</p>	<p>Boxes.</p>

TABLE OF PACKING METHODS—Continued

Packing instruction	Inner packagings	Intermediate packagings	Outer packagings
<p>PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:</p> <ol style="list-style-type: none"> For UN0094 and UN0305, no more than 50 g of substance must be packed in an inner packaging For UN0027, inner packagings are not necessary when drums are used as the outer packaging At least one of the packagings must be sift-proof Sheets must only be used for UN0028 	<p>paper plastics textile, rubberized</p> <p>Receptacles fiberboard metal plastics wood</p> <p>Sheets paper, kraft paper, waxed</p>		<p>steel (4A). aluminum (4B). other metal (4N). natural wood, ordinary (4C1). natural wood, sift-proof walls (4C2). plywood (4D). reconstituted wood (4F). fiberboard (4G). plastics, solid (4H2).</p> <p>Drums plastics (1H1 or 1H2). steel (1A1 or 1A2). aluminum-(1B1 or 1B2). other metal (1N1 or 1N2). plywood (1D). fiber (1G).</p>
<p>114(a) This packing instruction applies to wetted solids</p> <p>PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:</p> <ol style="list-style-type: none"> For UN 0077, 0234, 0235 and 0236, packagings must be lead free For UN0342, inner packagings are not required when metal (1A1, 1A2, 1B1, 1B2, 1N1 or 1N2) or plastics (1H1 or 1H2) drums are used as outer packagings Intermediate packagings are not required if leakproof removable head drums are used as the outer packaging 	<p>Bags plastics textile woven plastics</p> <p>Receptacles metal plastics wood</p>	<p>Bags plastics textile, plastic coated or lined</p> <p>Receptacles metal plastics</p> <p>Dividing partitions wood</p>	<p>Boxes steel (4A). other metal (4N). natural wood, ordinary (4C1). natural wood, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fiberboard (4G). plastics, solid (4H2).</p> <p>Drums. steel (1A1 or 1A2). aluminum (1B1 or 1B2). other metal (1N1 or 1N2) plywood (1D). fiber (1G). plastics (1H1 or 1H2).</p>
<p>114(b) PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:</p> <ol style="list-style-type: none"> For UN Nos. 0077, 0132, 0234, 0235 and 0236, packagings must be lead free For UN0160 and UN0161, when metal drums (1A2, 1B2 or 1N2) 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 UN0160, UN0161, and UN0508, inner packagings are not necessary if drums are used as the outer packaging For UN0508 and UN0509, metal packagings must not be used 	<p>Bags paper, kraft plastics textile, sift-proof woven plastics, sift-proof.</p> <p>Receptacles fiberboard metal paper plastics wood woven plastics, sift-proof.</p>	<p>Not necessary</p>	<p>Boxes natural wood, ordinary (4C1). natural wood, sift-proof walls (4C2). plywood (4D). reconstituted wood (4F). fiberboard (4G).</p> <p>Drums. steel (1A1 or 1A2). aluminum (1B1 or 1B2). other metal (1N1 or 1N2). plywood (1D). fiber (1G). plastics (1H1 or 1H2).</p>
<p>115</p>	<p>Receptacles</p>	<p>Bags</p>	<p>Boxes</p>

TABLE OF PACKING METHODS—Continued

Packing instruction	Inner packagings	Intermediate packagings	Outer packagings
<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 liters 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 liters 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 UN0144, intermediate packagings are not necessary. Aluminum drums (1B1 and 1B2) and metal, other than steel or aluminum, drums (1N1 and 1N2) must not be used. 	<p>metal plastics wood</p>	<p>plastics in metal receptacles Drums metal Receptacles wood</p>	<p>natural wood, ordinary (4C1). natural wood, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fiberboard (4G). Drums. plastics (1H1 or 1H2). steel (1A1 or 1A2). aluminum (1B1 or 1B2). other metal (1N1 or 1N2). plywood (1D). fiber (1G). Specification MC-200 containers may be used for transport by motor vehicle.</p>
<p>116 PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:</p> <ol style="list-style-type: none"> For UN 0082, 0241, 0331 and 0332, inner packagings are not necessary if leakproof removable head drums are used as the outer packaging For UN 0082, 0241, 0331 and 0332, inner packagings are not required when the explosive is contained in a material impervious to liquid For UN0081, inner packagings are not required when contained in rigid plastic that is impervious to nitric esters For UN0331, inner packagings are not required when bags (5H2), (5H3) or (5H4) are used as outer packagings Bags (5H2 or 5H3) must be used only for UN0082, 0241, 0331 and 0332 For UN0081, bags must not be used as outer packagings 	<p>Bags Bags paper, water and oil resistant plastics textile, plastic coated or lined woven plastics, sift-proof Receptacles fiberboard, water resistant metal plastics wood, sift-proof Sheets paper, water resistant paper, waxed plastics</p>	<p>Not Necessary Not necessary</p>	<p>Bags Bags. woven plastics (5H1/2/3). paper, multiwall, water resistant (5M2). plastics, film (5H4). textile, sift-proof (5L2). textile, water resistant (5L3). Boxes. steel (4A). aluminum (4B). other metal (4N). wood, natural, ordinary (4C1). natural wood, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fiberboard (4G). plastics, solid (4H2). Drums. steel (1A1 or 1A2). aluminum (1B1 or 1B2). other metal (1N1 or 1N2). plywood (1D). fiber (1G). plastics (1H1 or 1H2). Jerricans. steel (3A1 or 3A2). plastics (3H1 or 3H2).</p>
<p>117</p>	<p>Not necessary</p>	<p>Not necessary</p>	<p>IBCs.</p>

TABLE OF PACKING METHODS—Continued

Packing instruction	Inner packagings	Intermediate packagings	Outer packagings
<p>PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:</p> <ol style="list-style-type: none"> This packing instruction may only be used for explosives of UN0082 when they are mixtures of ammonium nitrate or other inorganic nitrates with other combustible substances that are not explosive ingredients. Such explosives must not contain nitroglycerin, similar liquid organic nitrates, liquid or solid nitrocarbons, or chlorates. This packing instruction may only be used for explosives of UN0241 that 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 aluminum powder, but must not include nitro-derivatives such as trinitrotoluene. Metal IBCs must not be used for UN0082 and UN 0241. Flexible IBCs may only be used for solids. 			<p>metal (11A), (11B), (11N), (21A), (21B), (21N), (31A), (31B), (31N).</p> <p>flexible (13H2), (13H3), (13H4), (13L2), (13L3), (13L4), (13M2).</p> <p>rigid plastics (11H1), (11H2), (21H1), (21H2), (31H1), (31H2).</p> <p>composite (11HZ1), (11HZ2), (21HZ1), (21HZ2), (31HZ1), (31HZ2).</p>
130	Not necessary	Not necessary	Boxes
<p>Particular Packaging Requirements:</p> <ol style="list-style-type: none"> 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. 2. Subject to approval by the Associate Administrator, large explosive articles, as part of their operational safety and suitability tests, subjected to testing that meets the intentions of Test Series 4 of the UN Manual of Tests and Criteria with successful test results, may be offered for transportation in accordance with the requirements of this subchapter. 			<p>Steel (4A). Aluminum (4B). Other metal (4N). Wood natural, ordinary (4C1). Wood natural, sift-proof walls (4C2). Plywood (4D). Reconstituted wood (4F). Fiberboard (4G). Plastics, expanded (4H1). Plastics, solid (4H2).</p> <p>Drums. Steel (1A1 or 1A2). Aluminum (1B1 or 1B2). Other metal (1N1 or 1N2). Plywood (1D). Fiber (1G). Plastics (1H1 or 1H2).</p> <p>Large Packagings. Steel (50A). Aluminum (50B). Metal other than steel or aluminum (50N). Rigid plastics (50H). Natural wood (50C). Plywood (50D). Reconstituted wood (50F). Rigid fiberboard (50G).</p>
131	Bags	Not Necessary	Boxes

TABLE OF PACKING METHODS—Continued

Packing instruction	Inner packagings	Intermediate packagings	Outer packagings
<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 free moving 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 free moving of the caps and protects them from impact forces</p>	<p>paper plastics</p> <p>Receptacles fiberboard metal plastics wood</p> <p>Reels</p>		<p>steel (4A). aluminum (4B). other metal (4N). wood, natural, ordinary (4C1). natural wood, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fiberboard (4G).</p> <p>Drums. steel (1A1 or 1A2). Aluminum (1B1 or 1B2). other metal (1N1 or 1N2). Plywood (1D). fiber (1G). plastics (1H1 or 1H2).</p>
<p>132(a)</p> <p>For articles consisting of closed metal, plastic or fiberboard casings that contain detonating explosives, or consisting of plastics-bonded detonating explosives</p>	<p>Not necessary</p>	<p>Not necessary</p>	<p>Boxes steel (4A). aluminum (4B). other metal (4N). wood, natural; ordinary (4C1). wood, natural, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fiberboard (4G). plastics, solid (4H2).</p>
<p>132(b)</p> <p>For articles without closed casings</p>	<p>Receptacles</p> <p>fiberboard metal plastics wood</p> <p>Sheets paper plastics</p>	<p>Not necessary</p>	<p>Boxes steel (4A). aluminum (4B). other metal (4N). wood, natural, ordinary (4C1). wood, natural, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fiberboard (4G). plastics, solid (4H2).</p>
<p>133</p> <p>PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:</p> <p>1. For UN 0043, 0212, 0225, 0268 and 0306 trays are not authorized as inner packagings</p>	<p>Receptacles</p> <p>fiberboard metal plastics wood</p> <p>Trays, fitted with dividing partitions fiberboard plastics wood</p>	<p>Intermediate packagings are only required when trays are used as inner packagings.</p> <p>Receptacles fiberboard</p> <p>metal plastics wood</p>	<p>Boxes. steel (4A). aluminum (4B). other metal (4N). wood, natural, ordinary (4C1). wood, natural, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fiberboard (4G). plastics, solid (4H2).</p>
<p>134</p>	<p>Bags</p>	<p>Not necessary</p>	<p>Boxes.</p>

TABLE OF PACKING METHODS—Continued

Packing instruction	Inner packagings	Intermediate packagings	Outer packagings
	water resistant		steel (4A).
	Receptacles		aluminum (4B).
	fiberboard		other metal (4N).
	metal		wood, natural, ordinary (4C1).
	plastics		wood, natural, sift proof walls (4C2).
	wood		plywood (4D).
	Sheets		reconstituted wood (4F).
	fiberboard, corrugated		fiberboard (4G).
	Tubes		plastics, expanded (4H1).
	fiberboard		plastics, solid (4H2).
			Drums.
			fiberboard (1G).
			plastics (1H1 or 1H2).
			steel (1A1 or 1A2).
			aluminum (1B1 or 1B2).
			other metal (1N1 or 1N2).
			plywood (1D).
135	Bags	Not necessary	Boxes.
	paper		steel (4A).
	plastics		aluminum (4B).
	Receptacles		other metal (4N).
	fiberboard		wood, natural, ordinary (4C1).
	metal		wood, natural, sift proof walls (4C2).
	plastics		plywood (4D).
	wood		reconstituted wood (4F).
	Sheets		fiberboard (4G).
	paper		plastics, expanded (4H1).
	plastics		plastics, solid (4H2).
			Drums.
			steel (1A1 or 1A2).
			aluminum (1B1 or 1B2).
			other metal (1N1 or 1N2).
			plywood (1D).
			fiber (1G).
			plastics (1H1 or 1H2).
136	Bags	Not necessary	Boxes.
	plastics		steel (4A).
	textile		aluminum (4B).
	Boxes.		other metal (4N).
	fiberboard		wood, natural, ordinary (4C1).
	plastics		wood, natural, sift proof walls (4C2).
	wood		plywood (4D).
	Dividing partitions in the outer packagings		reconstituted wood (4F).
			fiberboard (4G).
			plastics, solid (4H2).
			Drums.
			steel (1A1 or 1A2).
			aluminum (1B1 or 1B2).
			other metal (1N1 or 1N2).
			plywood (1D).
			fiber (1G).
			plastics (1H1 or 1H2).
137	Bags	Not necessary	Boxes.

TABLE OF PACKING METHODS—Continued

Packing instruction	Inner packagings	Intermediate packagings	Outer packagings
<p>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</p>	<p>plastics Boxes fiberboard wood Tubes fiberboard metal plastics Dividing partitions in the outer packagings</p>		<p>steel (4A). aluminum (4B). other metal (4N). wood, natural, ordinary (4C1). wood, natural, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fiberboard (4G). Drums. steel (1A1 or 1A2). aluminum (1B1 or 1B2). other metal (1N1 or 1N2). plywood (1D). fiber (1G). plastics (1H1 or 1H2).</p>
<p>138 PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS: If the ends of the articles are sealed, inner packagings are not necessary</p>	<p>Bags Plastics</p>	<p>Not necessary</p>	<p>Boxes. steel (4A). aluminum (4B). other metal (4N). wood, natural, ordinary (4C1). wood, natural, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fiberboard (4G). plastics, solid (4H2). Drums. fiberboard (1G). plastics (1H1 or 1H2). steel (1A1 or 1A2). aluminum (1B1 or 1B2). other metal (1N1 or 1N2).</p>
<p>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 UN0065 and UN0289, inner packagings are not required when they are fastened securely in coils</p>	<p>Bags plastics Receptacles fiberboard metal plastics wood Reels Sheets paper plastics</p>	<p>Not necessary</p>	<p>Boxes. steel (4A). aluminum (4B). other metal (4N). wood, natural, ordinary (4C1). wood, natural, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fiberboard (4G). plastics, solid (4H2). Drums. steel (1A1 or 1A2). aluminum (1B1 or 1B2). other metal (1N1 or 1N2). plywood (1D). fiber (1G). plastics (1H1 or 1H2).</p>
<p>140</p>	<p>Bags</p>	<p>Not necessary</p>	<p>Boxes.</p>

TABLE OF PACKING METHODS—Continued

Packing instruction	Inner packagings	Intermediate packagings	Outer packagings
<p>PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:</p> <p>1. If the ends of UN0105 are sealed, no inner packagings are required</p> <p>2. For UN0101, 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</p> <p>3. For UN0101, steel or aluminum boxes or drums must not be used</p>	<p>plastics</p> <p>Reels</p> <p>Sheets</p> <p>paper, kraft</p> <p>plastics</p> <p>Receptacles</p> <p>wood</p>		<p>steel (4A).</p> <p>aluminum (4B).</p> <p>other metal (4N).</p> <p>wood, natural, ordinary (4C1).</p> <p>wood, natural, sift proof walls (4C2).</p> <p>plywood (4D).</p> <p>reconstituted wood (4F).</p> <p>fiberboard (4G).</p> <p>plastics, solid (4H2).</p> <p>Drums.</p> <p>plastics (1H1 or 1H2).</p> <p>steel (1A1 or 1A2).</p> <p>aluminum (1B1 or 1B2).</p> <p>other metal (1N1 or 1N2).</p> <p>plywood (1D).</p> <p>fiber (1G).</p>
141	<p>Receptacles</p> <p>fiberboard</p> <p>metal</p> <p>plastics</p> <p>wood</p> <p>Trays, fitted with dividing partitions</p> <p>plastics</p> <p>wood</p> <p>Dividing partitions in the outer packagings</p>	Not necessary	<p>Boxes.</p> <p>steel (4A).</p> <p>aluminum (4B).</p> <p>other metal (4N).</p> <p>wood, natural, ordinary (4C1).</p> <p>wood, natural, sift proof walls (4C2).</p> <p>plywood (4D).</p> <p>reconstituted wood (4F).</p> <p>fiberboard (4G).</p> <p>plastics, solid (4H2).</p> <p>Drums.</p> <p>steel (1A1 or 1A2).</p> <p>aluminum (1B1 or 1B2).</p> <p>other metal (1N1 or 1N2).</p> <p>plywood (1D).</p> <p>fiber (1G).</p> <p>plastics (1H1 or 1H2).</p>
142	<p>Bags</p> <p>paper</p> <p>plastics</p> <p>Receptacles</p> <p>fiberboard</p> <p>metal</p> <p>plastics</p> <p>wood</p> <p>Sheets</p> <p>paper</p> <p>Trays, fitted with dividing partitions</p> <p>plastics</p>	Not necessary	<p>Boxes.</p> <p>steel (4A).</p> <p>aluminum (4B).</p> <p>other metal (4N).</p> <p>wood, natural, ordinary (4C1).</p> <p>wood, natural, sift proof walls (4C2).</p> <p>plywood (4D).</p> <p>reconstituted wood (4F).</p> <p>fiberboard (4G).</p> <p>plastics, solid (4H2).</p> <p>Drums.</p> <p>steel (1A1 or 1A2).</p> <p>aluminum (1B1 or 1B2).</p> <p>other metal (1N1 or 1N2).</p> <p>plywood (1D).</p> <p>fiber (1G).</p> <p>plastics (1H1 or 1H2).</p>
143	<p>Bag</p>	Not necessary	<p>Boxes.</p>

TABLE OF PACKING METHODS—Continued

Packing instruction	Inner packagings	Intermediate packagings	Outer packagings
<p>PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:</p> <p>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</p> <p>2. Composite packagings (6HH2) (plastic receptacle with outer solid box) may be used in lieu of combination packagings</p>	<p>paper, kraft plastics textile textile, rubberized</p> <p>Receptacles fiberboard metal plastics wood</p> <p>Trays, fitted with dividing partitions plastics wood</p>		<p>steel (4A). aluminum (4B). other metal (4N). wood, natural, ordinary (4C1). wood, natural, sift proof walls (4C2). plywood (4D). reconstituted wood (4F). fiberboard (4G). plastics, solid (4H2).</p> <p>Drums. steel (1A1 or 1A2). aluminum (1B1 or 1B2). other metal (1N1 or 1N2). plywood (1D). fiber (1G). plastics (1H1 or 1H2).</p>
<p>144 PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS: For UN0248 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 that prevent the ingress of water</p>	<p>Receptacles fiberboard metal plastics wood</p> <p>Dividing partitions in the outer packagings</p>	<p>Not necessary</p>	<p>Boxes. steel (4A). aluminum (4B). other metal (4N). wood, natural, ordinary (4C1) with metal liner. plywood (4D) with metal liner. reconstituted wood (4F) with metal liner. plastics, expanded (4H1). plastics, solid (4H2).</p> <p>Drums. steel (1A1 or 1A2). aluminum (1B1 or 1B2). other metal (1N1 or 1N2). plastics (1H1 or 1H2). plywood (1D).</p>

* * * * *

■ 24. In § 173.63, paragraph (b) is revised to read as follows:

§ 173.63 Packaging exceptions.

* * * * *

(b) *Limited quantities of Cartridges, small arms, Cartridges, power devices, Cartridges for tools, blank, and Cases, cartridge, empty with primer.* (1)(i) Cartridges, small arms, Cartridges, power devices, Cartridges for tools, blank, and Cases, cartridge, empty with primer that have been classed as Division 1.4S explosive may be offered for transportation and transported as limited quantities when packaged in accordance with paragraph (b)(2) of this section. Packages containing such articles may be marked with either the marking prescribed in § 172.315(a) or (b) of this subchapter and offered for transportation and transported by any mode. For transportation by aircraft, the package must conform to the applicable

requirements of § 173.27 of this part. In addition, packages containing such articles offered for transportation by aircraft must be marked with the proper shipping name as prescribed in the § 172.101 Hazardous Materials Table of this subchapter. Packages containing such articles are not subject to the shipping paper requirements of subpart C of part 172 of this subchapter unless the material meets the definition of a hazardous substance, hazardous waste, marine pollutant, or is offered for transportation and transported by aircraft or vessel. Additionally, packages containing such articles are excepted from the requirements of subparts E (Labeling) and F (Placarding) of part 172 of this subchapter.

(ii) Until December 31, 2012, a package containing such articles may be marked with the proper shipping name “Cartridges, small arms” or “Cartridges for tools, blank (*used to project fastening devices*)” and reclassified as

“ORM–D–AIR” material if it contains properly packaged articles as authorized by this subchapter on October 1, 2010. Additionally, for transportation by aircraft, Cartridges, power devices must be successfully tested under the UN Test Series 6(d) criteria for reclassification as ORM–D–AIR material effective July 1, 2011. Until December 31, 2020, a package containing such articles may be marked with the proper shipping name “Cartridges, small arms” or “Cartridges, power device (*used to project fastening devices*)” and reclassified as “ORM–D” material if it contains properly packaged articles as authorized by this subchapter on October 1, 2010.

(iii) Cartridges, small arms and Cartridges for tools, blank, and Cases, cartridge empty with primer that may be shipped as a limited quantity or ORM–D material are as follows:

(A) Ammunition for rifle, pistol or shotgun;

(B) Ammunition with inert projectiles or blank ammunition;

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

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

(E) Cartridges for tools, blank; and

(F) Cases, cartridge, empty with primer.

(2) Packaging for Cartridges, small arms, Cartridges for tools, blank, Cases, cartridge empty with primer as limited quantity or ORM-D material must be as follows:

(i) Ammunition must be packed in inside boxes, or in partitions that 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 for tools, blank, Cases, cartridge, empty with primer, and 22 caliber rim-fire cartridges may be packaged loose in strong outside packagings.

* * * * *

■ 25. In § 173.115, paragraph (k), is revised to read as follows:

* * * * *

(k) For Division 2.2 gases, the oxidizing ability shall be determined by tests or by calculation in accordance with ISO 10156 (including Technical Corrigendum 1) (IBR, see § 171.7 of this subchapter).

* * * * *

■ 26. In § 173.121, paragraph (b)(1)(iii) is revised to read as follows:

§ 173.121 Class 3—Assignment of packing group.

* * * * *

(b) * * *

(1) * * *

(iii) The capacity of the packaging is not more than 30 L (7.9 gallons); except that for transportation by highway, rail or cargo aircraft, the capacity of the package is not more than 100 L (26.3 gallons); and

* * * * *

■ 27. In § 173.158, paragraphs (d)(2), (e), (f)(3), (g), and (h) introductory text are revised to read as follows:

§ 173.158 Nitric Acid.

* * * * *

(d) * * *

(2) In combination packagings with 1A2, 1B2, 1N2, 1D, 1G, 1H2, 3H2, 4A,

4B, 4N or 4G outer packagings with inner glass packagings of 2.5 L (0.66 gallons) or less capacity cushioned with a non-reactive, absorbent material and packed within a tightly closed intermediate packaging of metal or plastic.

(e) Nitric acid of less than 90 percent concentration, when offered for transportation or transported by rail, highway, or water may be packaged in 4A, 4B, or 4N metal boxes, 4G fiberboard boxes or 4C1, 4C2, 4D or 4F wooden boxes with inside glass packagings of not over 2.5 L (0.66 gallon) capacity each.

(f) * * *

(3) In combination packagings with 1A2, 1B2, 1N2, 1D, 1G, 1H2, 3H2, 4C1, 4C2, 4D, 4F, 4G, 4A, 4B or 4N outer packagings and plastic inner packagings not over 2.5 L (0.66 gallon) capacity further individually overpacked in tightly closed metal packagings.

(g) Nitric acid of more than 70 percent concentration, when offered for transportation or transported by cargo aircraft only, must be packaged in combination packagings with 1A2, 1B2, 1N2, 1D, 1G, 1H2, 3H2, 4C1, 4C2, 4D, 4F, 4G, 4A, 4B or 4N outer packagings with glass or earthenware inner packagings of not over 1 L (0.3 gallon) or glass ampoules of not over 0.5 L (0.1 gallon).

(h) Nitric acid of less than 70 percent concentration, when offered for transportation in cargo aircraft only must be packaged in combination packagings with 1A2, 1B2, 1N2, 1D, 1G, 1H2, 3H2, 4C1, 4C2, 4D, 4F, 4G, 4A, 4B or 4N outer packagings with inner packagings of—

* * * * *

■ 28. In § 173.159a, add paragraph (d)(3) to read as follows:

§ 173.159a Exceptions for non-spillable batteries.

* * * * *

(d) * * *

(3) For transport by aircraft, must be transported as cargo and may not be carried onboard an aircraft by passengers or crewmembers in carry-on baggage, checked baggage, or on their person unless specifically excepted by § 175.10.

■ 29. In § 173.160 is revised to read as follows:

§ 173.160 Bombs, smoke, non-explosive (corrosive).

Bombs, smoke, non-explosive may be shipped provided they are without ignition elements, bursting charges, detonating fuses or other explosive components. They must be packaged in metal (4A, 4B, 4N), wooden (4C1, 4C2),

plywood (4D), or reconstituted wood (4F), fiberboard (4G) or solid plastic (4H2) boxes, or metal (1A2, 1B2, 1N2), plastic (1H2), plywood drums (1D), or fiber (1G) drums that meet Packing Group II requirements.

■ 30. In § 173.162, paragraphs (a)(1), (a)(2), and (c) are revised to read as follows:

§ 173.162 Gallium.

(a) * * *

(1) In combination packagings intended to contain liquids consisting of glass, earthenware or rigid plastic inner packagings with a maximum net mass of 15 kg (33 pounds) each. The inner packagings must be packed in wood boxes (4C1, 4C2, 4D, 4F), fiberboard boxes (4G), plastic boxes (4H1, 4H2), fiber drums (1G) or steel, metal, other than steel or aluminum, and plastic drums or jerricans (1A1, 1A2, 1N1, 1N2, 1H1, 1H2, 3A2 or 3H2) with sufficient cushioning materials to prevent breakage. Either the inner packagings or the outer packagings must have an inner liner that is leakproof or bags of strong leakproof and puncture-resistant material impervious to the contents and completely surrounding the contents to prevent it from escaping from the package, irrespective of its position.

(2) In packagings intended to contain liquids consisting of semi-rigid plastic inner packagings of not more than 2.5 kg (5.5 pounds) net capacity each, individually enclosed in a sealed, leak-tight bag of strong puncture-resistant material. The sealed bags must be packed in wooden (4C1, 4C2), plywood (4D), reconstituted wood (4F), fiberboard (4G), plastic (4H1, 4H2) or metal, other than steel or aluminum (4N) boxes or in fiber (1G), steel (1A1, 1A2), metal, other than steel or aluminum (1N1, 1N2), or plastic (1H1 or 1H2) drums, that are lined with leak-tight, puncture-resistant material. Bags and liner material must be chemically resistant to gallium.

* * * * *

(c) Manufactured articles or apparatuses, each containing not more than 100 mg (0.0035 ounce) of gallium and packaged so that the quantity of gallium per package does not exceed 1 g (0.35 ounce) are not subject to the requirements of this subchapter. For transportation by aircraft, such articles and apparatuses must be transported as cargo and may not be carried onboard an aircraft by passengers or crewmembers in carry-on baggage, checked baggage, or on their person unless specifically excepted by § 175.10.

■ 31. In § 173.164:

■ a. Paragraphs (a)(1) is revised;

- b. Paragraph (a)(5) is added;
- c. Paragraphs (b) and (c)(2) are revised; and
- d. Paragraph (f) is added.

The revisions and additions read as follows:

§ 173.164 Mercury (metallic and articles containing mercury).

(a) * * *

(1) In inner packagings of earthenware, glass or plastic containing not more than 3.5 kg (7.7 pounds) of mercury, or inner packagings that are glass ampoules containing not more than 0.5 kg (1.1 pounds) of mercury, or iron or steel quicksilver flasks containing not more than 35 kg (77 pounds) of mercury. The inner packagings or flasks must be packed in steel drums (1A1, 1A2), metal, other than steel or aluminum drums (1N1, 1N2), steel jerricans (3A2), wooden boxes (4C1, 4C2), plywood boxes (4D), reconstituted wood boxes (4F), fiberboard boxes (4G), metal, other than steel or aluminum boxes (4N), plastic boxes (4H2), plywood drums (1D) or fiber drums (1G).

* * * * *

(5) When transported as cargo, lamps are excepted from the requirements of this subchapter provided, each lamp contains not more than 1 g of mercury and is packaged so that there is not more than 30 g of mercury per package. Packages must be so designed and constructed such that when dropped from a height of not less than 0.5 meter (1.5 feet) the packages must still be fit for transport and there must be no damage to the contents.

(b) When transported as cargo, manufactured articles or apparatuses, each containing not more than 100 mg (0.0035 ounce) of mercury and packaged so that the quantity of mercury per package does not exceed 1 g (0.035 ounce) are not subject to the requirements of this subchapter.

(c) * * *

(2) When transported as cargo, thermometers, switches and relays, each containing a total quantity of not more than 15 g (0.53 ounces) of mercury, are excepted from the requirements of this subchapter if installed as an integral part of a machine or apparatus and so fitted that shock of impact damage, leading to leakage of mercury, is unlikely to occur under conditions normally incident to transport.

* * * * *

(f) For vessel transport, manufactured articles or instruments containing less than 0.45 kg (1.0 pound) of mercury are not subject to the requirements of this subchapter.

- 32. Section 173.165 is revised to read as follows:

§ 173.165 Polyester resin kits.

(a) Polyester resin kits consisting of a base material component (Class 3, Packing Group II or III) and an activator component (Type D, E, or F organic peroxide that does not require temperature control)—

(1) The organic peroxide component must be packed in inner packagings not over 125 mL (4.22 fluid ounces) net capacity each for liquids or 500 g (17.64 ounces) net capacity each for solids.

(2)(i) Except for transportation by aircraft, the flammable liquid component must be packaged in suitable inner packagings.

(ii) For transportation by aircraft, a Packing Group II base material is limited to a quantity of 5 L (1.3 gallons) in metal or plastic inner packagings and 1 L (0.3 gallons) in glass inner packagings. A Packing Group III base material is limited to a quantity of 10 L (2.6 gallons) in metal or plastic inner packagings and 2.5 L (0.66 gallons) in glass inner packagings.

(3) If the flammable liquid component and the organic peroxide component will not interact dangerously in the event of leakage, they may be packed in the same outer packaging.

(4) The Packing Group assigned will be II or III, according to the criteria for Class 3, applied to the base material. Additionally, polyester resin kits must be packaged in specification combination packagings, based on the performance level required of the base material (II or III) contained within the kit, as prescribed in §§ 173.202 or 173.203 of this subchapter, as appropriate.

(5) For transportation by aircraft, the following additional requirements apply:

(i) Closures on inner packagings containing liquids must be secured by secondary means;

(ii) Inner packagings containing liquids must be capable of meeting the pressure differential requirements prescribed in § 173.27(c); and

(iii) The total quantity of activator and base material may not exceed 5 kg (11 lbs) per package for a Packing Group II base material. The total quantity of activator and base material may not exceed 10 kg (22 lbs) per package for a Packing Group III base material. The total quantity of polyester resin kits per package is calculated on a one-to-one basis (i.e., 1 L equals 1 kg).

(b) Polyester resin kits are eligible for the Small Quantity exceptions in § 173.4 and the Excepted Quantity exceptions in § 173.4a, as applicable.

(c) *Limited quantities.* Limited quantity packages of polyester resin kits are excepted from labeling requirements, unless the material is offered for transportation or transported by aircraft, and are excepted from the specification packaging requirements of this subchapter when packaged in combination packagings according to this paragraph. For transportation by aircraft, only hazardous material authorized aboard passenger-carrying aircraft may be transported as a limited quantity. A limited quantity package that conforms to the provisions of this section is not subject to the shipping paper requirements of subpart C of part 172 of this subchapter, unless the material meets the definition of a hazardous substance, hazardous waste, marine pollutant, or is offered for transportation and transported by aircraft or vessel, and is eligible for the exceptions provided in § 173.156 of this part. In addition, shipments of limited quantities are not subject to subpart F (Placarding) of part 172 of this subchapter. Each package must conform to the general packaging requirements of subpart B of this part and may not exceed 30 kg (66 pounds) gross weight.

(1) For other than transportation by aircraft, the organic peroxide component must be packed in inner packagings not over 125 mL (4.22 fluid ounces) net capacity each for liquids or 500 g (17.64 ounces) net capacity each for solids. For transportation by aircraft, the organic peroxide component must be packed in inner packagings not over 30 mL (4.22 fluid ounces) net capacity each for liquids or 100 g (17.64 ounces) net capacity each for solids.

(2) Except for transportation by aircraft, the flammable liquid component must be packed in inner packagings not over 5 L (1.3 gallons) net capacity each for a Packing Group II and Packing Group III liquid. For transportation by aircraft, the flammable liquid component must be packed in inner packagings not over 1 L (0.26 gallons) net capacity each for a Packing Group II material. The flammable liquid component must be packed in metal or plastic inner packagings not over 5.0 L (1.3 gallons) net capacity each or glass inner packagings not over 2.5 L (0.66 gallons) net capacity each for a Packing Group III material.

(3) If the flammable liquid component and the organic peroxide component will not interact dangerously in the event of leakage, they may be packed in the same outer packaging.

(4) For transportation by aircraft, the following additional requirements apply:

(i) *Closures*. Closures on inner packagings containing liquids must be secured by secondary means as prescribed in § 173.27(d);

(ii) *Liquids*. Inner packagings containing liquids must be capable of meeting the pressure differential requirements prescribed in § 173.27(c);

(iii) *Quantity*. The total quantity of activator and base material may not exceed 1 kg (2.2 lbs) per package for a Packing Group II base material. The total quantity of activator and base material may not exceed 5 kg (11 lbs) per package for a Packing Group III base material. The total quantity of polyester resin kits per package is calculated on a one-to-one basis (i.e., 1 L equals 1 kg);

(iv) *Drop test capability*. Fragile inner packagings must be packaged to prevent failure under conditions normally incident to transport. Packages of consumer commodities must be capable of withstanding a 1.2 m drop on solid concrete in the position most likely to cause damage; and

(v) *Stack test capability*. Packages of consumer commodities must be capable of withstanding, without failure or leakage of any inner packaging and without any significant reduction in effectiveness, a force applied to the top surface for a duration of 24 hours equivalent to the total weight of identical packages if stacked to a height of 3.0 m (including the test sample).

(d) *Consumer commodities*. Until December 31, 2020, a limited quantity package of polyester resin kits that are also consumer commodities as defined in § 171.8 of this subchapter may be renamed "Consumer commodity" and reclassified as ORM-D or, until December 31, 2012, as ORM-D-AIR material and offered for transportation and transported in accordance with the applicable provisions of this subchapter in effect on October 1, 2010.

■ 33. In § 173.175, paragraph (g) is added to read as follows:

§ 173.175 Permeation devices.

* * * * *

(g) For transportation by aircraft, permeation devices must be transported as cargo and may not be carried onboard an aircraft by passengers or crewmembers in carry-on baggage, checked baggage, or on their person unless specifically excepted by § 175.10.

■ 34. Section 173.176 is added to read as follows:

§ 173.176 Capacitors.

(a) Capacitors, including capacitors containing an electrolyte that does not meet the definition of any hazard class or division as defined in this part, must conform to the following requirements:

(1) Capacitors not installed in equipment must be transported in an uncharged state;

(2) Each capacitor must be protected against a potential short circuit hazard in transport as follows:

(i) Except for transport by air, when a capacitor's energy storage capacity is less than or equal to 10Wh or when the energy storage capacity of each capacitor in a module is less than or equal to 10 Wh, the capacitor or module must be protected against short circuit or be fitted with a metal strap connecting the terminals; and

(ii) For transport by air, or when the energy storage capacity of a capacitor or a capacitor in a module is more than 10 Wh, the capacitor or module must be fitted with a metal strap connecting the terminals;

(3) Capacitors containing an electrolyte that meets the definition of one or more hazard class or division as defined in this part, must be designed to withstand a 95 kPa (0.95 bar, 14 psi) pressure differential;

(4) Capacitors must be designed and constructed to safely relieve pressure that may build up in use, through a vent or a weak point in the capacitor casing. Any liquid that is released upon venting must be contained by the packaging or by the equipment in which a capacitor is installed; and

(5) Capacitors must be marked with the energy storage capacity in Wh.

(b) Capacitors must be packed in strong outer packagings. For transport by air, capacitors must be securely cushioned within the outer packagings. Capacitors installed in equipment may be offered for transport unpackaged or on pallets, when the capacitors are afforded equivalent protection by the equipment in which they are contained.

(c) Capacitors containing an electrolyte not meeting the definition of any hazard class or division as defined in this part, including when installed in equipment, are not subject to any other requirements of this subchapter.

(d) Capacitors containing an electrolyte that meets the definition of one or more hazard class or division as defined in this part, with an energy storage capacity of 10 Wh or less are not subject to any other requirements of this subchapter, when they are capable of withstanding a 1.2 m (3.9 feet) drop test unpackaged onto a rigid, non-resilient, flat and horizontal surface without loss of contents.

(e) Capacitors containing an electrolyte meeting the definition of one or more hazard class or division as defined in this part, that are not installed in equipment, and with an energy storage capacity of more than 10

Wh are subject to the requirements of this subchapter.

(f) Capacitors installed in equipment and containing an electrolyte meeting the definition of one or more hazard class or division as defined in this part, are not subject to any other requirements of this subchapter, provided the equipment is packaged in a strong outer packaging and in such a manner as to prevent accidental functioning of the capacitors during transport. Large, robust equipment containing capacitors may be offered for transport unpackaged or on pallets when the capacitors are afforded equivalent protection by the equipment in which they are contained.

■ 35. In § 173.181, paragraphs (b) and (c) are revised to read as follows:

§ 173.181 Pyrophoric materials (liquids).

* * * * *

(b) Steel boxes (4A), aluminum boxes (4B), metal boxes, other than steel or aluminum (4N), wooden boxes (4C1, 4C2, 4D, or 4F) or fiberboard boxes (4G); steel drums (1A1 or 1A2), aluminum drums (1B1 or 1B2), metal drums, other than steel or aluminum (1N1 or 1N2), plywood drums (1D), or fiber drums (1G); or steel jerricans (3A1 or 3A2) or aluminum jerricans (3B1 or 3B2) enclosing not more than four strong, tight metal cans with inner receptacles of glass or metal, not over 1 L (0.3 gallon) capacity each, having positive screwcap closures adequately gasketed. Inner packagings must be cushioned on all sides with dry, absorbent, incombustible material in a quantity sufficient to absorb the entire contents. The strong, tight metal cans must be closed by positive means, not by friction.

(c) Steel drums (1A1 or 1A2), aluminum drums (1B1 or 1B2), metal drums, other than steel or aluminum (1N1 or 1N2) or fiber drums (1G); steel jerricans (3A1 or 3A2) or aluminum jerricans (3B1 or 3B2); or steel boxes (4A), aluminum boxes (4B) or metal boxes, other than steel or aluminum (4N) not exceeding 220 L (58 gallons) capacity each with strong, tight inner metal cans not over 4.0 L (1 gallon) capacity each. The strong, tight metal cans must be closed by positive means, not friction.

■ 36. In § 173.183, paragraph (a) is revised to read as follows:

§ 173.183 Nitrocellulose base film.

* * * * *

(a) In steel drums (1A2), aluminum drums (1B2), other metal drums (4A2), steel jerricans (3A2), aluminum jerricans (3B2), steel, aluminum or other metal (4A, 4B, 4N) boxes, wooden (4C1,

4C2), plywood (4D) or reconstituted wood (4F) boxes or plywood drums (1D) with each reel in a tightly closed metal can, polypropylene canister, or strong cardboard or fiberboard inner packaging with cover held in place by adhesive tape or paper; or

* * * * *

■ 37. In § 173.184, paragraph (b) is revised to read as follows:

§ 173.184 Highway or rail fuse.

* * * * *

(b) Fusees (highway and railway) must be packaged in steel (1A2), aluminum (1B2) or other metal (1N2) drums, steel (3A2) or aluminum (3B2) jerricans, steel (4A), aluminum (4B) or other metal (4N) boxes, wooden (4C1, 4C2), plywood (4D) or reconstituted wood (4F) boxes or in fiberboard boxes (4G), plywood (1D) or fiber (1G) drums. If the fusees are equipped with spikes packagings must have reinforced ends to prevent penetration of spikes through the outer packagings; packages must be capable of passing drop test requirements (§ 178.603 of this subchapter), including at least one drop with spike in a downward position, and other requirements of part 178 of this subchapter, at the Packing Group II performance level.

■ 38. In § 173.186, paragraph (e) is revised to read as follows:

§ 173.186 Matches.

* * * * *

(e) Packagings. Strike-anywhere matches must be tightly packed in securely closed chipboard, fiberboard, wooden, or metal inner packagings to prevent accidental ignition under conditions normally incident to transportation. Each inner packaging may contain no more than 700 strike-anywhere matches and must be packed in outer steel drums (1A1, 1A2), aluminum drums (1B1, 1B2), other metal drums (1N1, 1N2), steel jerricans (3A1, 3A2), aluminum jerricans (3B1, 3B2), steel (4A), aluminum (4N), other metal (4N) boxes, wooden (4C1, 4C2), plywood (4D), reconstituted wood (4F) or fiberboard (4G) boxes, plywood (1D) or fiber (1G) drums. Gross weight of fiberboard boxes (4G) must not exceed 30 kg (66 pounds). Gross weight of other outer packagings must not exceed 45 kg (100 pounds).

■ 39. In § 173.187, paragraphs (a) and (d) are revised to read as follows:

§ 173.187 Pyrophoric solids, metals or alloys, n.o.s.

* * * * *

(a) In steel, aluminum or other metal boxes (4A, 4B or 4N) and contain no more than 15 kg (33 pounds) each.

* * * * *

(d) In steel, aluminum or other metal drums (1A1, 1A2, 1B1, 1B2, 1N1 or 1N2) with a gross mass not exceeding 150 kg (331 pounds) per drum.

* * * * *

■ 40. In § 173.188, paragraphs (a)(1) introductory text, (a)(2), and (b)(1) are revised to read as follows:

§ 173.188 White or yellow phosphorus.

* * * * *

(a) * * *

(1) Steel, aluminum or other metal boxes (4A, 4B or 4N) or wooden boxes (4C1, 4C2, 4D, or 4F) with:

* * * * *

(2) Steel, aluminum or other metal drums (1A1, 1B1 or 1N1) not over 250 L (66 gallons) capacity each or steel, aluminum or other metal drums (1A2, 1B2, or 1N2) not over 115 L (30 gallons) capacity each.

(b) * * *

(1) Steel, aluminum or other metal drums (1A2, 1B2 or 1N2) not over 115 L (30 gallons) capacity each, or

* * * * *

■ 41. In § 173.189, paragraph (b) is revised to read as follows:

§ 173.189 Batteries containing sodium or cells containing sodium.

* * * * *

(b) Cells must be protected against short circuit and must consist of hermetically sealed metal casings that fully enclose the hazardous materials and that are so constructed and closed as to prevent the release of the hazardous materials under normal conditions of transport. Cells must be placed in suitable outer packagings with sufficient cushioning material to prevent contact between cells and between cells and the internal surfaces of the outer packaging, and to ensure that no dangerous shifting of the cells within the outer packaging occurs in transport. Cells must be packaged in 1A2, 1B2, 1N2, 1D, 1G, 1H2, 4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2, 3A2, 3B2 or 3H2) outer packagings that meet the requirements of part 178 of this subchapter at the Packing Group II performance level.

* * * * *

■ 42. In § 173.193, in paragraph (a), the first sentence is revised to read as follows:

§ 173.193 Bromoacetone, methyl bromide, chloropicrin and methyl bromide or methyl chloride mixtures, etc.

(a) Bromoacetone must be packaged as follows in metal boxes (4A, 4B or 4N)

or wooden boxes (4C1, 4C2, 4D or 4F) with inner glass receptacles or tubes in hermetically sealed metal receptacles in corrugated fiberboard cartons. * * *

* * * * *

■ 43. In § 173.194, paragraphs (b)(1) and (2) are revised to read as follows:

§ 173.194 Gas identification sets.

* * * * *

(b) * * *

(1) If the poisonous material does not exceed 5 mL (0.2 fluid ounce) if a liquid or 5 g (0.2 ounce) if a solid, it may be packed in glass inner receptacles of not over 120 mL (4.1 fluid ounces) each. Each glass receptacle, cushioned with absorbent material must be packed in a hermetically sealed metal can of not less than 0.30 mm (0.012 inch) wall thickness. Metal cans, surrounded on all sides by at least 25 mm (1 inch) of dry sawdust, must be packed in 4A, 4B or 4N metal boxes or 4C1, 4C2, 4D or 4F wooden boxes. Not more than 100 mL (3.4 fluid ounces) or 100 g (3.5 ounces) of poisonous materials may be packed in one outer box.

(2) If the poisonous material does not exceed 5 mL (0.2 fluid ounce) if a liquid or 20 g (0.7 ounce) if a solid, it may be packed in glass inner receptacles with screw-top closures of not less than 60 mL (2 fluid ounces), hermetically sealed. Twelve bottles containing poisonous material, not to exceed 100 mL (3.4 fluid ounces) or 100 g (3.5 ounces), or both, may be placed in a plastic carrying case, each glass receptacle surrounded by absorbent cushioning and each separated from the other by sponge rubber partitions. The plastic carrying case must be placed in a tightly fitting fiberboard box which in turn must be placed in a tightly fitting 4A, 4B or 4N metal box or 4C1, 4C2, 4D or 4F wooden box.

■ 44. In § 173.196, paragraph (a)(3) is revised to read as follows:

§ 173.196 Category A infectious substances.

(a) * * *

(3) A rigid outer packaging of adequate strength for its capacity, mass and intended use; including, drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1, 1H2, 1D, 1G); boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1, 4H2); or jerricans (3A1, 3A2, 3B1, 3B2, 3H1, 3H2). The outer packaging must measure not less than 100 mm (3.9 inches) at its smallest overall external dimension.

* * * * *

■ 45. In § 173.199, paragraph (d)(1) is revised to read as follows:

§ 173.199 Category B infectious substances.

(d) * * *

(1) Ice or dry ice must be placed outside the secondary packaging or in an overpack. Interior supports must be provided to secure the secondary packaging in the original position. If ice is used, the outside packaging must be leakproof or must have a leakproof liner. If dry ice is used, the outside packaging must permit the release of carbon dioxide gas and otherwise meet the provisions in § 173.217. The primary receptacle and secondary packaging must maintain their integrity at the temperature of the refrigerant used, as well as the temperatures and pressures of transport by aircraft they could be subjected to if refrigeration were lost, and sufficient absorbent material must be provided to absorb all liquid, including melted ice.

* * * * *

§ 173.201 [Amended]

■ 46. In § 173.201, in the paragraph (b) list, the wording “Metal box other than steel or aluminum: 4N” is added between the entry “Solid plastic box: 4H2” and the entry “Inner packagings:”.

§ 173.202 [Amended]

■ 47. In § 173.202, in the paragraph (b) list, the wording “Metal box other than steel or aluminum: 4N” is added between the entry “Solid plastic box: 4H2” and the entry “Inner packagings:”.

§ 173.203 [Amended]

■ 48. In § 173.203, in the paragraph (b) list, the wording “Metal box other than steel or aluminum: 4N” is added between the entry “Solid plastic box: 4H2” and the entry “Inner packagings:”.

§ 173.211 [Amended]

■ 49. Section 173.211 is amended as follows:

■ a. In the paragraph (b) list, the wording “Metal box other than steel or aluminum: 4N” is added between the entry “Solid plastic box: 4H2” and the entry “Inner packagings:”.

■ b. In the paragraph (c) list, the wording “Metal box other than steel or aluminum with liner: 4N” is added between the entry “Aluminum box with liner: 4B” and the entry “Natural wood box, sift proof: 4C2”.

§ 173.212 [Amended]

■ 50. Section 173.212 is amended as follows:

■ a. In the paragraph (b) list, the wording “Metal box other than steel or aluminum: 4N” is added between the entry “Solid plastic box: 4H2” and the entry “Inner packagings:”.

■ b. In the paragraph (c) list, the wording “Metal box other than steel or aluminum with liner: 4N” is added between the entry “Aluminum box with liner: 4B” and the entry “Natural wood box: 4C1”.

§ 173.213 [Amended]

■ 51. Section 173.213 is amended as follows:

■ a. In the paragraph (b) list, the wording “Metal box other than steel or aluminum: 4N” is added between the entry “Solid plastic box: 4H2” and the entry “Inner packagings:”.

■ b. In the paragraph (c) list, the wording “Metal box other than steel or aluminum with liner: 4N” is added between the entry “Aluminum box with liner: 4B” and the entry “Natural wood box, sift proof: 4C2”.

■ 52. In § 173.219, paragraphs (b)(1), (c)(1), and (c)(5) are revised to read as follows:

§ 173.219 Life-saving appliances.

* * * * *

(b) * * *

(1) Division 2.2 compressed or liquefied gases must be packaged in cylinders in accordance with the requirements of this subchapter;

* * * * *

(c) * * *

(1) Division 2.2 compressed or liquefied gases must be packaged in cylinders in accordance with the requirements of this subchapter;

* * * * *

(5) Life-saving appliances containing no hazardous materials other than cylinders of Division 2.2 compressed or liquefied gases with no subsidiary risk, with a capacity not exceeding 120 mL, installed solely for the purpose of activating the appliance, are not subject to the provisions of this subchapter provided they are overpacked in rigid outer packagings with a maximum gross mass of 40 kg. For transportation by aircraft, such appliances must be transported as cargo and may not be carried onboard an aircraft by passengers or crewmembers in carry-on baggage, checked baggage, or on their person unless specifically excepted by § 175.10.

■ 53. In § 173.220, paragraph (d) is revised to read as follows:

§ 173.220 Internal combustion engines, self-propelled vehicles, mechanical equipment containing internal combustion engines, battery-powered equipment or machinery, fuel cell-powered equipment or machinery.

* * * * *

(d) *Lithium batteries.* Except as provided in § 172.102, Special Provision

A101 of this subchapter, vehicles, engines and machinery powered by lithium metal batteries that are transported with these batteries installed are forbidden aboard passenger-carrying aircraft. Lithium batteries contained in vehicles, engines or mechanical equipment must be securely fastened in the battery holder of the vehicle, engine or mechanical equipment and be protected in such a manner as to prevent damage and short circuits (e.g., by the use of non-conductive caps that cover the terminals entirely). Lithium batteries must be of a type that have successfully passed each test in the UN Manual of Tests and Criteria (IBR, see § 171.7 of this subchapter) as specified in § 173.185 of this subchapter, unless approved by the Associate Administrator. Equipment (other than vehicles, engines or mechanical equipment) containing lithium batteries, must be described as “Lithium ion batteries contained in equipment” or “Lithium metal batteries contained in equipment,” as appropriate, and transported in accordance with § 173.185 and applicable special provisions.

* * * * *

■ 54. In § 173.221, paragraph (a) is revised and paragraph (c) is added to read as follows:

§ 173.221 Polymeric beads, expandable and Plastic molding compound.

(a) Non-bulk shipments of Polymeric beads (or granules), expandable *evolving flammable vapor* and Plastic molding compound *in dough, sheet or extruded rope form, evolving flammable vapor* must be packed in: metal (4A, 4B, or 4N), wooden (4C1 or 4C2), plywood (4D), fiberboard (4G), reconstituted wood (4F), plastic (4H1 or 4H2) boxes, plywood drums (1D) or fiber drums (1G) with sealed inner plastic liners; in vapor tight metal or plastic drums (1A1, 1A2, 1B1, 1B2, 1N1, 1N2, 1H1 or 1H2); in vapor tight metal or plastic jerricans (3A1, 3A2, 3B1, 3B2, 3H1, or 3H2); or packed in non-specification packagings when transported in dedicated vehicles or freight containers. The packagings need not conform to the requirements for package testing in part 178 of this subchapter, but must be capable of containing any evolving gases from the contents during normal conditions of transportation.

* * * * *

(c) For transportation by vessel, the provisions of § 176.907 must be met.

■ 55. In § 173.225, the paragraph (c) “Organic Peroxide Table” and the paragraph (e) “Organic Peroxide IBC Table” are amended by adding the

entries under “[ADD]” and revising entries under “[REVISE]” in the appropriate alphabetical sequence to read as follows:

§ 173.225 Packaging requirements and other provisions for organic peroxides.

* * * * *
(c) * * *

ORGANIC PEROXIDE TABLE

Technical name (1)	ID No. (2)	Concentration (mass %) (3)	Diluent (mass %)			Water (mass %) (5)	Packing method (6)	Temperature (°C)		Notes (8)
			A (4a)	B (4b)	I (4c)			Control (7a)	Emergency (7b)	
[ADD]										
*((3R- (3R, 5aS, 6S, 8aS, 9R, 10R, 12S, 12aR**))-Decahydro-10-methoxy-3, 6, 9-trimethyl-3, 12-epoxy-12H-pyrano [4, 3-j]-1, 2-benzodioxepin)	UN3106	≤100	.....	.....	.....	.....	OP7	.....	.....	.....
3, 6, 9-Triethyl-3, 6, 9-trimethyl-1, 4, 7-triperoxonane	UN3110	≤17	≥18	.....	≥65	.....	OP8	.....	.....	.....
Di-(3, 5, 5-trimethylhexanoyl) peroxide	UN3119	>38–52	≥48	.....	.....	.....	OP8	+10	+15	.....
[REVISE]										
Diisopropyl peroxydicarbonate	UN3115	≤32	≥68	.....	.....	.....	OP7	– 15	– 5	.....
Di-(3,5,5-trimethylhexanoyl) peroxide	UN3115	>52–82	≥18	.....	.....	.....	OP7	0	+10	.....

* * * * *

(e) * * *

ORGANIC PEROXIDE IBC TABLE

UN No.	Organic peroxide	Type of IBC	Maximum quantity (liters)	Control temperature	Emergency temperature
[ADD]					
*	Diisobutyl peroxide, not more than 28% as a stable dispersion in water.	31HA1	1000	–20 °C	– 10 °C
		31A	1250	–20 °C	– 10 °C
	Diisobutyl peroxide, not more than 42% as a stable dispersion in water.	31HA1	1000	–25 °C	– 15 °C
		31A	1250	–25 °C	– 15 °C
[REVISE]					
*	Di-(3, 5, 5-trimethylhexanoyl) peroxide, not more than 52% in diluent type A.	31HA1	1000	+10 °C	+15 °C
*	1, 1, 3, 3-Tetramethylbutyl peroxyneodecanoate, not more than 52%, stable dispersion, in water.	31A	1250	–5 °C	+5 °C
		31HA1	1000	–5 °C	+5 °C

* * * * *

§ 173.226 [Amended]

■ 56. Section 173.226 is amended as follows:

■ a. In the paragraph (c)(1) list, the wording “Expanded plastic box: 4H2” is removed and the wording “Expanded plastic box: 4H1” is added in its place.

■ b. In the paragraph (c)(1) list, the wording “Metal box other than steel or aluminum: 4N” is added after the entry “Solid plastic box: 4H2”.

■ 57. In § 173.230, paragraphs (e)(2)(ii) and (f)(3) are revised to read as follows:

§ 173.230 Fuel cell cartridges containing hazardous material.

* * * * *

(e) * * *
(2) * * *

(ii) For fuel cell cartridges contained in equipment, the entire fuel cell system must be protected against short circuits and unintentional activation. The equipment must be securely cushioned in the outer packaging.

(f) * * *

(3) For transportation aboard passenger aircraft, for fuel cell cartridges contained in equipment, each fuel cell system and fuel cell cartridge must conform to IEC 62282–6–100 and IEC 62282–6–100 Amend. 1 (IBR, see § 171.7 of this subchapter) or a standard approved by the Associate Administrator;

* * * * *

■ 58. In § 173.240, paragraph (f) is added to read as follows:

§ 173.240 Bulk packaging for certain low hazard solid materials.

* * * * *

(f) *Flexible Bulk Containers.* Flexible Bulk Containers are authorized subject to the conditions and limitations of this section provided the use of a Flexible Bulk Container is authorized by the inclusion of bulk packaging code B120 in Column (7) of the § 172.101 Hazardous Materials Table of this subchapter and the Flexible Bulk Container conforms to the requirements in subpart S of part 178 of this subchapter. Flexible Bulk Containers may not be used for Packing Group I or II hazardous materials.

■ 59. In § 173.301b, paragraphs (c)(2)(ii) and (d) are revised to read as follows:

§ 173.301b Additional general requirements for shipment of UN pressure receptacles.

* * * * *

(c) * * *
(2) * * *

(ii) By equipping the UN pressure receptacle with a valve cap conforming to the requirements in ISO 11117 and Technical Corrigendum 1 (IBR, see § 171.7 of this subchapter). The cap must have vent-holes of sufficient cross-sectional area to evacuate the gas if leakage occurs at the valve;

* * *

(d) *Non-refillable UN pressure receptacles.* (1) When the use of a valve is prescribed, the valve must conform to the requirements in ISO 13340 (IBR, see § 171.7 of this subchapter).

(2) The receptacles must be transported as an inner package of a combination package;

(3) The receptacle must have a water capacity not exceeding 1.25 L when used for a flammable or toxic gas or 50 liters for receptacles used to contain chemical under pressure; and

(4) The receptacle is prohibited for Hazard Zone A material.

* * * * *

■ 60. In § 173.302a, paragraph (a)(3) is revised to read as follows

§ 173.302a Additional requirements for shipment of nonliquefied (permanent) compressed gases in specification cylinders.

(a) * * *

(3) DOT 39 *DOT 39 cylinders.* When the cylinder is filled with a Division 2.1 material, the internal volume of the cylinder may not exceed 1.23 L (75 in³) or 50 L (3050 in³) for chemical under pressure.

* * * * *

■ 61. In § 173.306, paragraph (j) is revised to read as follows:

§ 173.306 Limited quantities of compressed gases.

* * * * *

(j) *Aerosols and receptacles small, containing gas with a capacity of less than 50 mL.* Aerosols, as defined in § 171.8 of this subchapter, and receptacles, small, containing gas, with a capacity not exceeding 50 mL (1.7 fluid oz.) and with a pressure not exceeding 970 kPa (141 psig) at 55 °C (131 °F), containing no hazardous materials other than a Division 2.2 gas, are not subject to the requirements of this subchapter except that for transport by aircraft, such aerosols and receptacles must be transported as cargo and may not be carried onboard an aircraft by passengers or crewmembers in carry-on baggage, checked baggage, or on their person unless specifically excepted by § 175.10. The pressure limit may be increased to 2,000 kPa (290 psig) at 55 °C (131 °F) provided the aerosols are transported in outer packages that conform to the packaging requirements

of Subpart B of this part. This paragraph (j) does not apply to a self-defense spray (e.g., pepper spray).

* * * * *

■ 62. In § 173.313:

■ a. The section heading is revised;

■ b. The introductory text is revised;

■ c. The table name is revised;

■ d. In the table, the entry for UN3220 is revised; and

■ e. In the table, entries are added for UN3500, UN3501, UN3502, UN3503, UN3504 and UN3505.

The revisions and additions are to read as follows:

§ 173.313 UN Portable Tank Table for Liquefied Compressed Gases and Chemical Under Pressure.

The UN Portable Tank Table for Liquefied Compressed Gases and chemical under pressure is referenced in § 172.102(c)(7)(iii) of this subchapter for portable tanks that are used to transport liquefied compressed gases and chemicals under pressure. The table applies to each liquefied compressed gas and chemical under pressure that are identified with Special Provision T50 in Column (7) of the § 172.101 Hazardous Materials Table. In addition to providing the UN identification number and proper shipping name, the table provides maximum allowable working pressures, bottom opening requirements, pressure relief device requirements, and degree of filling requirements for liquefied compressed gas and chemical under pressure permitted for transportation in a T50 portable tank. In the minimum test pressure column, “small” means a portable tank with a diameter of 1.5 meters or less when measured at the widest part of the shell, “sunshield” means a portable tank with a shield covering at least the upper third of the shell, “bare” means no sunshield or insulation is provided, and “insulated” means a complete cladding of sufficient thickness of insulating material necessary to provide a minimum conductance of not more than 0.67 w/m²/k. In the pressure relief requirements column, the word “Normal” denotes that a frangible disc as specified in § 178.276(e)(3) of this subchapter is not required.

UN PORTABLE TANK TABLE FOR LIQUEFIED COMPRESSED GASES AND CHEMICALS UNDER PRESSURE

UN No.	Non-refrigerated liquefied compressed gases	Minimum design pressure (bar) small; bare; sunshield; insulated	Openings below liquid level	Pressure relief requirements (See § 178.276(e))	Maximum filling density (kg/l)
3220	Pentafluoroethane or Refrigerant gas R 125.	34.4 30.8 27.5 24.5	Allowed	Normal	0.87
3500	Chemical under pressure, n.o.s.	See MAWP § 178.276(a).	definition in Allowed	§ 178.276(e)(3)	See TP4 in § 172.102(c)
3501	Chemical under pressure, flammable, n.o.s.	See MAWP § 178.276(a).	definition in Allowed	§ 178.276(e)(3)	See TP4 in § 172.102(c)
3502	Chemical under pressure, toxic, n.o.s.	See MAWP § 178.276(a).	definition in Allowed	§ 178.276(e)(3)	See TP4 in § 172.102(c)
3503	Chemical under pressure, corrosive, n.o.s.	See MAWP § 178.276(a).	definition in Allowed	§ 178.276(e)(3)	See TP4 in § 172.102(c)
3504	Chemical under pressure, flammable, toxic, n.o.s.	See MAWP § 178.276(a).	definition in Allowed	§ 178.276(e)(3)	See TP4 in § 172.102(c)
3505	Chemical under pressure, flammable, corrosive, n.o.s.	See MAWP § 178.276(a).	definition in Allowed	§ 178.276(e)(3)	See TP4 in § 172.102(c)

■ 63. In § 173.316, paragraph (a)(8) is redesignated as paragraph (a)(9) and a new paragraph (a)(8) is added to read as follows:

§ 173.316 Cryogenic liquids in cylinders.

(a) * * *

(8) All pressure relief device inlets must under maximum filling conditions be situated in the vapor space of the closed cryogenic receptacle and the devices must be arranged to ensure that the escaping vapor is discharged unobstructed.

* * * * *

■ 64. In § 173.318, paragraph (b)(7)(vi) is added to read as follows:

§ 173.318 Cryogenic liquids in cargo tanks.

(b) * * *

(7) * * *

(vi) All pressure relief device inlets must under maximum filling conditions be situated in the vapor space of the closed cryogenic receptacle and the devices must be arranged to ensure that the escaping vapor is discharged unobstructed.

* * * * *

■ 65. Section 173.335 is added to read as follows:

§ 173.335 Chemical under pressure n.o.s.

(a) *General requirements.* A cylinder filled with a chemical under pressure must be offered for transportation in accordance with the requirements of this section and § 172.301. In addition, a DOT specification cylinder must meet the requirements in §§ 173.301a, 173.302, 173.302a, and 173.305, as

applicable. UN pressure receptacles must meet the requirements in §§ 173.301b and 173.302b, as applicable. Where more than one section applies to a cylinder, the most restrictive requirements must be followed.

(b) *Filling limits.* Cylinders must be filled so that at 50 °C (122 °F) the non-gaseous phase does not exceed 95% of their water capacity and they are not completely filled at 60 °C (140 °F). When filled, the internal pressure at 65 °C (149 °F) must not exceed the test pressure of the cylinder. The vapor pressures and volumetric expansion of all substances in the cylinders must be taken into account.

(c) *Minimum service pressure.* The minimum service pressure must be in accordance with the design specifications of part 178 of this subchapter for the propellant. In any case the minimum test pressure must not be less than 20 bar.

(d) *Periodic inspection.* The maximum requalification test period for cylinders transporting chemical under pressure n.o.s. is 5 years.

■ 66. In § 173.340, paragraphs (c)(1), (c)(2), and (d) are revised to read as follows:

§ 173.340 Tear gas devices.

* * * * *

(c) * * *

(1) In UN 4A, 4B, or 4N metal boxes or UN 4C1, 4C2, 4D, or 4F metal-strapped wooden boxes. Functioning elements not assembled in grenades or devices must be in a separate compartment of these boxes, or in inner

or separate outer boxes, UN 4C1, 4C2, 4D, or 4F, and must be packed and cushioned so that they may not come in contact with each other or with the walls of the box during transportation. Not more than 50 tear gas devices and 50 functioning elements must be packed in one box, and the gross weight of the outer box may not exceed 35 kg (77 pounds).

(2) In UN 1A2, 1B2, 1N2 or 1H2 drums. Functioning elements must be packed in a separate inner packaging or compartment. Not more than 24 tear gas devices and 24 functioning elements must be packed in one outer drum, and the gross weight of the drum may not exceed 35 kg (77 pounds).

* * * * *

(d) Tear gas devices may be shipped completely assembled when offered by or consigned to the U.S. Department of Defense, provided the functioning elements are packed so that they cannot accidentally function. Outer packaging must be UN 4A, 4B, or 4N metal boxes or UN 4C1, 4C2, 4D, or 4F metal-strapped wooden boxes.

PART 175—CARRIAGE BY AIRCRAFT

■ 67. The authority citation for part 175 continues to read as follows:

Authority: 49 U.S.C. 5101–5128; 44701; 49 CFR 1.45 and 1.53.

■ 68. In § 175.8, paragraph (b)(3) is revised to read as follows:

§ 175.8 Exceptions for operator equipment and items of replacement.

(b) * * *

(3) Aerosols of Division 2.2 only (for dispensing of food products), alcoholic beverages, colognes, liquefied gas lighters, perfumes, and portable electronic devices containing lithium cells or batteries that meet the requirements of § 175.10(a)(18) carried aboard a passenger-carrying aircraft by the operator for use or sale on that specific aircraft. A liquefied gas lighter design must be examined and successfully tested by a person or agency authorized by the Associate Administrator.

* * * * *

■ 69. In § 175.10:

- a. Paragraphs (a)(14) and (15) and paragraph (a)(18) introductory text are revised;
- b. Paragraph (a)(18)(iii) is added;
- c. Paragraphs (a)(19)(vii) and (viii) are revised; and
- d. Paragraphs (a)(20) through (24) are added.

The revisions and additions read as follows:

§ 175.10 Exceptions for passengers, crewmembers, and air operators.

(a) * * *

(14) Electrically powered heat-producing articles (e.g., battery-operated equipment such as diving lamps and soldering equipment) as checked or carry-on baggage only and with the approval of the operator of the aircraft. The heat-producing component, the energy source, or other component (e.g., fuse) must be removed to prevent unintentional functioning during transport. Any battery that is removed must be protected against short circuit by placement in original retail packaging or by otherwise insulating terminals (e.g., by taping over exposed terminals or placing each battery in a separate plastic bag or protective pouch).

(15) A wheelchair or other battery-powered mobility aid equipped with a nonspillable battery or a dry sealed battery when carried as checked baggage, provided—

- (i) The battery conforms to the requirements of § 173.159a(d) of this subchapter for non-spillable batteries;
- (ii) The battery conforms to the requirements of § 172.102(c)(1), Special provision 130 of this subchapter for dry sealed batteries, as applicable;
- (iii) Visual inspection including removal of the battery, where necessary, reveals no obvious defects (removal of the battery from the housing should be performed by qualified airline personnel only);

(iv) The battery is disconnected and the battery terminals are protected to prevent short circuits, unless the

wheelchair or mobility aid design provides an effective means of preventing unintentional activation, and

(v) The battery is—

(A) Securely attached to the wheelchair or mobility aid;

(B) Is removed and placed in a strong, rigid packaging marked “NONSPILLABLE BATTERY” (unless fully enclosed in a rigid housing that is properly marked);

(C) Is removed and placed in a strong, rigid packaging marked with the words “not restricted” in accordance with paragraph (c)(2) of § 172.102(c)(1), Special provision 130, of this subchapter; or

(D) Is handled in accordance with paragraph (a)(16)(iv) of this section.

* * * * *

(18) Except as provided in § 173.21 of this subchapter, portable electronic devices (for example, watches, calculating machines, cameras, cellular phones, lap-top and notebook computers, camcorders, etc.) containing cells or batteries (including lithium cells or batteries) and spare batteries and cells for these devices, when carried by passengers or crew members for personal use. Each spare battery must be individually protected so as to prevent short circuits (by placement in original retail packaging or by otherwise insulating terminals, e.g., by taping over exposed terminals or placing each battery in a separate plastic bag or protective pouch) and carried in carry-on baggage only. In addition, each installed or spare battery must comply with the following: * * *

(iii) For a non-spillable battery, the battery and equipment must conform to § 173.159(d). Each battery must not exceed a voltage greater than 12 volts and a watt-hour rating of not more than 100 Wh. No more than two individually protected spare batteries may be carried. Such equipment and spare batteries must be carried in checked or carry-on baggage.

(19) * * *

(vii) Each fuel cell and fuel cell cartridge must conform to IEC 62282–6–100 and Amend. 1 (IBR; see § 171.7 of this subchapter) and must be marked with a manufacturer’s certification that it conforms to the specification. In addition, each fuel cell cartridge must be marked with the maximum quantity and type of fuel in the cartridge;

(viii) Interaction between fuel cells and integrated batteries in a device must conform to IEC/PAS 62282–6–100 and Amend. 1 (IBR, see § 171.7 of this subchapter). Fuel cells whose sole function is to charge a battery in the device are not permitted; and * * *

(20) Permeation devices for calibrating air quality monitoring equipment when carried in checked baggage provided the devices are constructed and packaged in accordance with § 173.175.

(21) An internal combustion or fuel cell engine or a machine or apparatus containing an internal combustion or fuel cell engine when carried as checked baggage, provided—

(i) The engine contains no liquid or gaseous fuel. An engine may be considered as not containing fuel when the engine components and any fuel lines have been completely drained, sufficiently cleaned of residue, and purged of vapors to remove any potential hazard and the engine when held in any orientation will not release any liquid fuel;

(ii) The fuel tank contains no liquid or gaseous fuel. A fuel tank may be considered as not containing fuel when the fuel tank and the fuel lines have been completely drained, sufficiently cleaned of residue, and purged of vapors to remove any potential hazard;

(iii) It is not equipped with a wet battery (including a non-spillable battery), a sodium battery or a lithium battery; and

(iv) It contains no other hazardous materials subject to the requirements of this subchapter.

(22) Non-infectious specimens transported in accordance with § 173.4b(b).

(23) Insulated packagings containing refrigerated liquid nitrogen when carried in checked or carry-on baggage in accordance with the ICAO Technical Instructions (IBR, see § 171.7 of this subchapter), Packing Instruction 202, the packaging specifications in part 6, chapter 5, and special provision A152.

(24) Small cartridges fitted into devices with no more than four small cylinders of carbon dioxide or other suitable gas in in Division 2.2. The water capacity of each cylinder must not exceed 50 mL (equivalent to a 2.8 g carbon dioxide cartridge), with the approval of the operator.

* * * * *

PART 176—CARRIAGE BY VESSEL

■ 70. The authority citation for part 176 continues to read as follows:

Authority: 49 U.S.C. 5101–5128; 49 CFR 1.53.

■ 71. In § 176.2, definitions for *Closed cargo transport unit for Class 1 (explosive) materials, Potential or possible sources of ignition, and Protected from sources of heat* are added in alphabetical order to read as follows:

§ 176.2 Definitions.

* * * * *

Closed cargo transport unit for Class 1 (explosive) materials means a freight container or transport vehicle that fully encloses the contents by permanent structures and can be secured to the ship's structure and are, except for the carriage of division 1.4 explosives, structurally serviceable (see § 176.172). Portable magazines conforming to § 176.137 are also considered closed cargo transport units for Class 1. Small compartments such as deck houses and mast lockers are included. Cargo transport units with fabric sides or tops are not closed cargo transport units. The floor of any closed cargo transport unit must either be constructed of wood, close-boarded or so arranged that goods are stowed on sparrd gratings, wooden pallets or dunnage.

* * * * *

Potential or possible sources of ignition means, but is not limited to, open fires, machinery exhausts, galley uptakes, electrical outlets and electrical equipment including those on refrigerated or heated cargo transport units unless they are of a type designed to operate in a hazardous environment.

* * * * *

Protected from sources of heat means that packages and cargo transport units must be stowed at least 2.4 m from heated ship structures, where the surface temperature is liable to exceed 131°F (55°C). Examples of heated structures are steam pipes, heating coils, top or side walls of heated fuel and cargo tanks, and bulkheads of machinery spaces. In addition, packages not loaded inside a cargo transport unit and stowed on deck must be shaded from direct sunlight. The surface of a cargo transport unit can heat rapidly when in direct sunlight in nearly windless conditions and the cargo may also become heated. Depending on the nature of the goods in the cargo transport unit, and the planned voyage, precautions must be taken to ensure that exposure to direct sunlight is reduced.

* * * * *

■ 72. In § 176.63, paragraphs (a), (b), and (e) are revised to read as follows:

§ 176.63 Stowage locations.

(a) The table in § 172.101 of this subchapter specifies generally the locations authorized for stowage of the various hazardous materials on board vessels. This part prescribes additional requirements with respect to the stowage of specific hazardous materials in addition to those authorized in § 172.101 of this subchapter. This section sets forth the basic physical

requirements for the authorized locations. Hazardous materials offered for transport as limited quantities are allocated stowage category A and are not subject to any of the specific stowage requirements indicated in column 10B in § 172.101 of this subchapter for the material being transported.

(b) To qualify as "on deck" stowage, the location must be on the weather deck. If the location is in a house on the weather deck, the location must have a permanent structural opening to the atmosphere, such as a door, hatch, companionway or manhole, and must be vented to the atmosphere. The location may not have any structural opening to any living quarters, cargo, or other compartment unless the opening has means for being closed off and secured. Any deck house containing living quarters, a steering engine, a refrigerating unit, a refrigerated stowage box, or a heating unit may not be used unless that area is isolated from the cargo stowage area by a permanent, and tight, metallic bulkhead. Stowage in a shelter or 'tween deck is not considered to be "on deck". A barge that is vented to the atmosphere and is stowed on deck on a barge-carrying ship is considered to be "on deck". When an entry in § 172.101 of this subchapter requires "on-deck" stowage and is qualified by the requirement "protected from sources of heat", the stowage must be protected from the direct rays of the sun by means of structural erections or awnings except that such protection is not required for shipment in portable tanks.

* * * * *

(e) Notwithstanding the stowage provisions given in the table in § 172.101 of this subchapter, empty packages containing residue, including IBCs and large packages, may be stowed "on deck" or "under deck" in a mechanically ventilated cargo space. However, empty pressure receptacles containing residue that carry a label of class 2.3 must be stowed "on deck" and waste aerosols must be stowed in accordance with the table in § 172.101 of this subchapter.

* * * * *

■ 73. In § 176.76, paragraph (a)(11) is added to read as follows:

§ 176.76 Transport vehicles, freight containers, and portable tanks containing hazardous materials.

(a) * * *

(1) When packages are secured with banding or straps, these restraints must not be over-tightened to cause damage or deformation of the packages or the

securing points (such as D-rings) within the freight container or transport vehicle.

* * * * *

■ 74. In § 176.83 paragraphs (m)(1) through (3) are revised to read as follows:

§ 176.83 Segregation.

* * * * *

(m) * * *

(1) For the purpose of segregation, materials having certain similar chemical properties have been grouped together in segregation groups. The segregation groups (such as "acids", "chlorates", "permanganates") and the entries allocated to each of these groups include the substances identified in section 3.1.4 of the IMDG Code (IBR, see § 171.7 of this subchapter). When column (10B) of the § 172.101 Table refers to a numbered stowage provision set forth in § 176.84(b) such as "Stow 'away from' acids", that particular stowage/segregation requirement applies to all the materials allocated to the respective segregation group.

(2) Not all hazardous materials falling within a segregation group are listed by name in the regulations. These materials are shipped under "n.o.s." entries. Although these "n.o.s." entries are not listed themselves in the above groups, the person who offers a hazardous material for transportation must decide whether allocation under a segregation group is appropriate.

(3) The segregation groups described above do not address materials that fall outside the classification criteria of the hazardous materials regulations, although it is recognized that some non-hazardous materials have certain chemical properties similar to hazardous materials listed in the segregation groups. A person who offers a hazardous material for transportation or the person responsible for packing the materials into a cargo transport unit who does have knowledge of the chemical properties of such non-hazardous materials may identify a relevant segregation group and apply the segregation requirements for that segregation group.

■ 75. In § 176.84:

- a. Paragraph (a) is revised;
- b. In the table of provisions in paragraph (b), Stowage provisions 19, 48, and 50 are removed and Stowage provisions 25 and 128 are revised; and
- c. In paragraph (c)(2), stowage provisions 7E, 8E and 20E are removed, and Stowage provision 26E is revised.

The revisions read as follows:

§ 176.84 Other requirements for stowage and segregation for cargo vessels and passenger vessels.

(a) *General.* When Column 10B of the § 172.101 Table refers to a numbered or alpha-numeric stowage provision for water shipments, the meaning and requirements of that provision are set forth in this section. Terms in quotation marks are defined in § 176.83. Other terms used in the table in this section such as “acids”, “chlorates” and “permanganates” indicate different chemical groups referred to here as segregation groups. Materials falling within a segregation group are considered to have certain similar chemical properties and, although not exhaustive in nature, the materials belonging to each group include those substances identified in section 3.1.4 of the IMDG Code (IBR, see § 171.7 of this subchapter) as set forth in § 176.83(m).

(b) Table of provisions:

Code	Provisions
* * * * *	
25	Protected from sources of heat
* * * * *	
128	Stow in accordance with the IMDG Code, Sub-section 7.6.2.7.2 (incorporated by reference; see § 171.7 of this subchapter).
* * * * *	
* * * * *	
(c) * * *	
Notes	Provisions
* * * * *	
26E	For closed cargo transport units, a non-metallic lining is required when not in effectively sealed, sift-proof packages.
* * * * *	

■ 76. In § 176.116, paragraph (a) is revised and (f) is removed and reserved.

§ 176.116 General stowage conditions for class 1 (explosive) materials.

(a) *Stowage Location:* (1) Class 1 (explosive) materials must be stowed in a cool part of the ship and must be kept as cool as practicable while on board. Class 1 (explosives) must be stowed as far away as practicable from any potential source of heat or ignition.

(2) With the exception of division 1.4 (explosive) materials, Class 1 (explosive) materials may not be positioned closer to the ship's side than a distance equal

to one eighth of the beam or 2.4 m (8 feet), whichever is less.

(3) Except where the consignment of Class 1 (explosive) materials consists only of explosive articles, the wearing of shoes or boots with unprotected metal nails, heels, or tips of any kind is prohibited.

§ 176.128 [Removed and Reserved]

■ 77. Remove and reserve § 176.128.

§ 176.130 [Removed and Reserved]

■ 78. Remove and reserve § 176.130.

§ 176.133 [Removed and Reserved]

■ 79. Remove and reserve § 176.133.

§ 176.134 [Removed and Reserved]

■ 80. Remove and reserve § 176.134.

§ 176.136 [Removed and Reserved]

■ 81. Remove and reserve § 176.136.

■ 82. In § 176.138, paragraph (b) is revised to read as follows:

§ 176.138 Deck stowage.

(b) Class 1 (explosives) may not be stowed within a horizontal distance of 6 m (20 feet) from any source of heat and any possible sources of ignition. With the exception of division 1.4 (explosive) materials, Class 1 (explosives) materials may not be stowed within a horizontal distance of 12 m (39 feet) from the bridge, accommodation areas, and lifesaving appliances.

■ 83. In § 176.144:

- a. Note 1 in Table (a) is revised; and
- b. Paragraph (d) is revised.

The revisions read as follows:

§ 176.144 Segregation of Class 1 (explosive) materials.

(a) * * *

Notes: 1. Explosive articles in compatibility group G, other than fireworks, may be stowed with articles of compatibility groups C, D, and E, provided no explosive substances are carried in the same compartment, magazine or cargo transport unit.

(d) If some of the Class 1 (explosive) materials in a stowage mixture require non-metallic lining of the closed cargo transport unit, Class 1 (explosive) materials requiring ordinary stowage may be stowed in the same closed cargo transport. When a closed cargo transport unit is used for such substances that require non-metallic lining of the closed cargo transport unit, the other Class 1

(explosive) materials stowed therein must have no exposed parts of any ferrous metal or aluminum alloy, unless separated by a partition.

■ 84. In § 176.146, paragraphs (a) and (b) are revised and paragraph (c) is removed and reserved.

The revisions read as follows:

§ 176.146 Segregation from non-hazardous materials.

(a) Except as required by paragraph (b) of this section, Class 1 (explosive) materials need not be segregated from other cargo of a non-dangerous nature.

(b) Readily combustible materials may not be stowed in the same compartment or hold as Class 1 (explosive) materials other than those in compatibility group S.

■ 85. In § 176.170, paragraph (a) is revised and paragraph (c) is removed and reserved.

The revision reads as follows:

§ 176.170 Transport of Class 1 (explosive) materials in freight containers.

(a) When Class 1 (explosive) materials are stowed in a freight container, the freight container, for the purposes of this subpart, may be regarded as a closed transport unit for class 1 or a magazine but not a separate compartment.

■ 86. In § 176.200, paragraph (c) is revised to read as follows:

§ 176.200 General stowage requirements.

(c) When cylinders of Class 2 (compressed gas) materials being transported by vessel are stowed in a vertical position they must be stowed in a block and cribbed or boxed-in with suitable sound lumber and the box or crib dunnaged to provide clearance from a steel deck at least 10 cm (3.9 inches) off any metal deck. Pressure receptacles in the box or crib must be braced to prevent any shifting of the pressure receptacles. The box or crib (gas rack) must be securely chocked and lashed to prevent movement in any direction.

■ 87. Section 176.210 is revised to read as follows:

§ 176.210 On deck stowage requirements.

Cylinders of Class 2 (compressed gas) materials being transported by vessel must be protected from sources of heat. A tarpaulin covering the cylinders is not acceptable if it comes in contact with them.

■ 88. Section 176.230 is revised to read as follows:

§ 176.230 Stowage of Division 2.1 (flammable gas) materials.

Division 2.1 (flammable gas) materials transported in Specification 106A or 110A multi-unit car tanks must be stowed on deck only, and must be protected from sources of heat.

■ 89. In § 176.305, paragraph (a) is revised to read as follows:

§ 176.305 General stowage requirements.

(a) A Class 3 (flammable) or combustible liquid must be kept as cool as reasonably practicable, protected from sources of heat, and away from potential sources of ignition.

* * * * *

■ 90. In § 176.400, paragraphs (a) and (b) are revised to read as follows:

§ 176.400 Stowage of Division 1.5, Class 4 (flammable solids) and Class 5 (oxidizers and organic peroxides) materials.

(a) Class 4 (flammable solid) material and Division 5.2 (organic peroxide) material must be kept as cool as reasonably practicable, protected from sources of heat, and away from potential sources of ignition.

(b) Division 5.2 (organic peroxide) material must be stowed away from living quarters or access to them. Division 5.2 (organic peroxide) material not requiring temperature control must be protected from sources of heat, including radiant heat and strong sunlight, and must be stowed in a cool, well-ventilated area.

* * * * *

■ 91. In § 176.600, paragraph (d) is revised to read as follows:

§ 176.600 General stowage requirements.

* * * * *

(d) Each package of Division 2.3 (poisonous gas) material or Division 6.1 (poison) material that also bears a FLAMMABLE LIQUID or FLAMMABLE GAS label must be stowed in a mechanically ventilated space, kept as cool as reasonably practicable, and be protected from sources of heat and stowed away from potential sources of ignition.

■ 92. The heading for Subpart O is revised to read as follows:

Subpart O—Detailed Requirements for Cotton and Vegetable Fibers, Motor Vehicles, Polymeric Beads, and Plastic Molding Compounds

■ 93. Section 176.907 is added to read as follows:

§ 176.907 Polymeric Beads and Plastic Molding Compounds.

(a) When transported in cargo transport units, the cargo transport units must provide an adequate exchange of air in the unit. This adequate exchange of air may be accomplished by utilizing a ventilated container, an open-top container, or a container in one door off operation. When cargo transport units with venting devices are used these devices should be kept clear and operable. If mechanical devices are used for ventilation, they must be explosion-proof.

(b) As an alternative to the options presented in paragraph (a) of this section to ensure an adequate exchange of air; a refrigerated cargo transport unit may be used.

(c) The requirements in paragraph (a) and (b) of this section do not apply if the hazardous material is:

(1) Packed in hermetically sealed packagings or IBC's which conform to packing group II performance level for liquid dangerous goods with a total pressure in the packaging (i.e., the vapor pressure of the material plus the partial pressure of air or other inert gases, less 100kPa (15 psia)) at 55 °C (131 °F), determined on the basis of the hazardous material not completely filling the receptacle at a temperature of 55 °C (131 °C) or less at a filling temperature of 15 °C (59 °F), will not exceed two-thirds of the marked test pressure.

(2) [Reserved]

(d) Cargo transport units must be marked with a warning mark including the words "CAUTION—MAY CONTAIN FLAMMABLE VAPOR" or "CAUTION—MAY CONTAIN FLAMMABLE VAPOUR" with lettering having a height of at least 25 mm (1 inch). The mark must be affixed to each access point in a location where it will be easily seen by persons prior to opening or entering the cargo transport unit and must remain on the cargo transport unit until the following provisions are met:

(1) The cargo transport unit has been completely ventilated to remove any hazardous concentrations of vapor or gas;

(2) The immediate vicinity of the cargo transport unit is clear of any source of ignition; and

(3) The hazardous materials have been unloaded.

PART 178—SPECIFICATIONS FOR PACKAGINGS

■ 94. The authority citation for part 178 continues to read as follows:

Authority: 49 U.S.C. 5101–5128; 49 CFR 1.53.

■ 95. In § 178.71, paragraph (d)(2) is revised to read as follows:

* * * * *

(d) * * *

(2) Service equipment must be configured or designed to prevent damage that could result in the release of the pressure receptacle contents during normal conditions of handling and transport. Manifold piping leading to shut-off valves must be sufficiently flexible to protect the valves and the piping from shearing or releasing the pressure receptacle contents. The filling and discharge valves and any protective caps must be secured against unintended opening. The valves must conform to ISO 10297 (IBR, see § 171.7 of this subchapter), or ISO 13340 (IBR, see § 171.7 of this subchapter) for non-refillable pressure receptacles, and be protected as specified in § 173.301b(f) of this subchapter.

* * * * *

■ 96. In § 178.274:

■ a. In paragraph (f)(1)(v), the second sentence is revised;

■ b. Paragraph (f)(1)(vi) is redesignated as paragraph (f)(1)(vii); and

■ c. New paragraph (f)(1)(vi) is added.

The addition and revisions read as follows:

§ 178.274 Specifications for UN portable tanks.

* * * * *

(f) * * *

(1) * * *

(v) * * * For spring loaded pressure relief devices, the rated flow capacity must be determined according to ISO 4126–1 (including Technical Corrigendum 1) and ISO 4126–7 (IBR, see § 171.7 of this subchapter);

(vi) The cross sectional flow areas of the spring loaded pressure relief devices, frangible discs, and fusible elements in mm²; and

* * * * *

■ 97. In § 178.512, the section heading, paragraph (a), and paragraph (b) introductory text are revised to read as follows:

§ 178.512 Standards for steel, aluminum or other metal boxes.

(a) The following are identification codes for steel, aluminum, or other metal boxes:

(1) 4A for a steel box;

(2) 4B for an aluminum box; and

(3) 4N for an other metal box.

(b) Construction requirements for steel, aluminum or other metal boxes are as follows:

* * * * *

■ 98. In § 178.603, revise the second entry in the table in paragraph (a) and revise paragraph (b) to read as follows:

§ 178.603 Drop test.

(a) * * *

Packaging	Number of tests (samples)	Drop orientation of samples
<p style="text-align: center;">* * *</p> <p>Boxes of natural wood, Plywood boxes, Reconstituted wood boxes, Fiberboard boxes, Plastic boxes, Steel, aluminum or other metal boxes, Composite packagings that are in the shape of a box.</p> <p style="text-align: center;">* * *</p>	<p style="text-align: center;">*</p> <p>Five—(one for each drop).</p> <p style="text-align: center;">*</p>	<p style="text-align: center;">* * *</p> <p>First drop: Flat on the bottom (using the first sample). Second drop: Flat on the top (using the second sample). Third drop: Flat on the long side (using the third sample). Fourth drop: Flat on the short side (using the fourth sample). Fifth drop: On a corner (using the fifth sample).</p> <p style="text-align: center;">* * *</p>

(b) Exceptions. For testing of single or composite packagings constructed of stainless steel, nickel, or monel at periodic intervals only (i.e., other than design qualification testing), the drop test may be conducted with two samples, one sample each for the two drop orientations. These samples may have been previously used for the hydrostatic pressure or stacking test. Exceptions for the number of steel, aluminum and other metal packaging samples used for conducting the drop test are subject to the approval of the Associate Administrator.

■ 99. In § 178.705, paragraph (a)(3) is revised to read as follows:

§ 178.705 Standards for metal IBCs.

(a) * * *
(3) 31A, 31B, 31N for liquids.

■ 100. In § 178.910, paragraph (a)(1) introductory text is revised and paragraph (b) is added to read as follows:

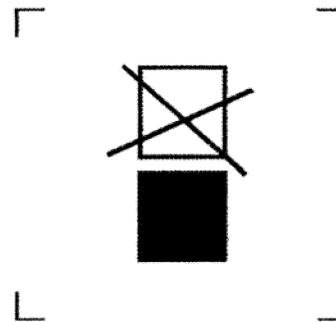
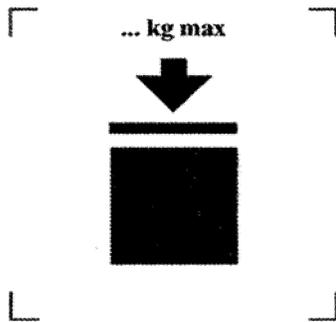
§ 178.910 Marking of Large Packagings.

(a) * * *
(1) Mark every Large Packaging in a durable and clearly visible manner. The marking may be applied in a single line or in multiple lines provided the correct sequence is followed with the information required by this section, in letters, numerals, and symbols of at least

12 mm in height. This minimum marking size requirement applies only to large packages manufactured after January 1, 2014. The following information is required in the sequence presented:

* * * * *

(b) All Large Packages manufactured, repaired or remanufactured after January 1, 2015 must be marked with the symbol applicable to a Large Package designed for stacking or not designed for stacking, as appropriate. The symbol must be not less than 100 mm by 100 mm as follows:



■ 101. In § 178.980, paragraphs (e)(2) and (3) are redesignated as paragraphs (e)(3) and (4), respectively, and a new paragraph (e)(2) is added to read as follows:

§ 178.980 Stacking test.

* * * * *

(e) * * *

(2) For fiberboard or wooden Large Packagings, there may be no loss of contents and no permanent deformation that renders the whole Large Packaging, including the base pallet, unsafe for transportation.

* * * * *

■ 102. Subpart R is added to read as follows:

Subpart R—Flexible Bulk Container Standards

- Sec.
- 178.1000 Purpose and scope.
- 178.1005 Flexible Bulk Container identification code.
- 178.1010 Marking of Flexible Bulk Containers.
- 178.1015 General Flexible Bulk Container standards.
- 178.1020 Period of use for transportation of hazardous materials in Flexible Bulk Containers.

Subpart R—Flexible Bulk Container Standards

§ 178.1000 Purpose and scope.

(a) This subpart prescribes requirements for Flexible Bulk Containers (FBCs) intended for the transportation of hazardous materials. FBC standards in this subpart are based on the UN Model Regulations.

(b) Terms used in this subpart are defined in § 171.8 of this subchapter.

§ 178.1005 Flexible Bulk Container identification code.

The Flexible Bulk Container code designation is BK3.

§ 178.1010 Marking of Flexible Bulk Containers.

(a) The manufacturer must:

(1) Mark every Flexible Bulk Container in a durable and clearly visible manner. The marking may be applied in a single line or in multiple lines provided the correct sequence is followed with the information required by this section. The following information is required in the sequence presented:

(i) Except as provided in § 178.503(e)(1)(ii), the United Nations packaging symbol as illustrated in § 178.503(e)(1)(i).

(ii) The code number designating the Flexible Bulk Container design type according to § 178.1005. The letter "W" must follow the Flexible Bulk Container

design type identification code on a Flexible Bulk Container when the Flexible Bulk Container differs from the requirements in subpart R of this part, or is tested using methods other than those specified in this subpart, and is approved by the Associate Administrator in accordance with § 178.1035;

(iii) The capital letter Z identifying that the Flexible Bulk Container meets Packing Group III performance standard under which the design type has been successfully tested.

(iv) The month (designated numerically) and year (last two digits) of manufacture;

(v) The country authorizing the allocation of the mark. The letters "USA" indicate that the Flexible Bulk

Container is manufactured and marked in the United States in compliance with the provisions of this subchapter.

(vi) The name and address or symbol of the manufacturer or the approval agency certifying compliance with subpart R and subpart S of this part. Symbols, if used, must be registered with the Associate Administrator.

(vii) The stacking test load in kilograms (kg). For Flexible Bulk Containers not designed for stacking the figure "0" must be shown.

(viii) The maximum permissible gross mass in kg.

(2) The following is an example of symbols and required markings for a Flexible Bulk container suitable for stacking; stacking load: 1,000 kg; maximum gross mass: 2,500 kg.



BK3/Z/02 12/USA/M9399/1000/2500

(b) [Reserved]

§ 178.1015 General Flexible Bulk Container standards.

(a) Each Flexible Bulk Containers must be sift-proof and completely closed during transport to prevent the release of contents and waterproof.

(b) Parts of the Flexible Bulk Container that are in direct contact with hazardous materials:

(1) Must not be affected or significantly weakened by those hazardous materials.

(2) Must not cause a dangerous effect with the dangerous goods (e.g., catalyzing a reaction or reacting with the hazardous materials).

(3) Must not allow permeation of the hazardous materials that could constitute a danger under conditions normally incident to transportation.

(c) Filling and discharge devices must be so constructed as to be protected against damage during transport and handling. The filling and discharge devices must be capable of being secured against unintended opening.

(d) Slings of the Flexible Bulk Container, if fitted with such, must withstand pressure and dynamic forces which can be expected under conditions normally incident to transportation.

(e) Handling devices must be strong enough to withstand repeated use.

(f) A venting device must be fitted to Flexible Bulk Containers intended to transport hazardous materials that may develop dangerous accumulation of gases within the Flexible Bulk

Container. Any venting device must be designed so that external foreign substances are prevented from entering the Flexible Bulk Container through the venting device under conditions normally incident to transportation.

§ 178.1020 Period of use for transportation of hazardous materials in Flexible Bulk Containers.

The use of Flexible Bulk Containers for the transport of hazardous materials is permitted for a period of time not to exceed two years from the date of manufacture of the Flexible Bulk Container.

■ 103. Subpart S is added to read as follows:

Subpart S—Testing of Flexible Bulk Containers

Sec.

178.1030	Purpose and scope.
178.1035	General requirements.
178.1040	Preparation of Flexible Bulk Containers for testing.
178.1045	Drop test.
178.1050	Top lift test.
178.1055	Stacking test.
178.1060	Topple test.
178.1065	Righting test.
178.1070	Tear test.

Subpart S—Testing of Flexible Bulk Containers**§ 178.1030 Purpose and scope.**

This subpart prescribes certain testing requirements for Flexible Bulk Containers identified in subpart R of this part.

§ 178.1035 General requirements.

(a) *General.* The test procedures prescribed in this subpart are intended to ensure that Flexible Bulk Containers containing hazardous materials can withstand normal conditions of transportation. These test procedures are considered minimum requirements. Each packaging must be manufactured and assembled so as to be capable of successfully passing the prescribed tests and to conform to the requirements of § 173.24 of this subchapter while in transportation.

(b) *Responsibility.* The Flexible Bulk Container manufacturer is responsible for ensuring each Flexible Bulk Containers is capable of passing the prescribed tests. To the extent a Flexible Bulk Container's assembly function, including final closure, is performed by the person who offers a hazardous material for transportation, that person is responsible for performing the function in accordance with §§ 173.22 and 178.2 of this subchapter.

(c) *Definitions.* For the purpose of this subpart:

(1) *Flexible Bulk Container design type* refers to a Flexible Bulk Container that does not differ in structural design, size, material of construction and packing.

(2) *Design qualification testing* is the performance of the drop, topple, righting, tear, stacking, and top-lift tests prescribed in this subpart, for each different Flexible Bulk Container design

type, at the start of production of that packaging.

(3) *Periodic design requalification test* is the performance of the applicable tests specified in paragraph (c)(2) of this section on a Flexible Bulk Container design type, to requalify the design for continued production at the frequency specified in paragraph (e) of this section.

(4) *Production inspection* is the inspection that must initially be conducted on each newly manufactured Flexible Bulk Container.

(5) *Different Flexible Bulk Container design type* is one that differs from a previously qualified Flexible Bulk Container design type in structural design, size, material of construction, wall thickness, or manner of construction, but does not include:

(i) A packaging that differs in surface treatment;

(ii) A packaging that differs only in its lesser external dimensions (*i.e.*, height, width, length) provided materials of construction and material thickness or fabric weight remain the same;

(d) *Design qualification testing*. The packaging manufacturer must achieve successful test results for the design qualification testing at the start of production of each new or different Flexible Bulk Container design type. Application of the certification mark by the manufacturer constitutes certification that the Flexible Bulk Container design type passed the prescribed tests in this subpart.

(e) *Periodic design requalification testing*. (1) Periodic design requalification must be conducted on each qualified Flexible Bulk Container design type if the manufacturer is to maintain authorization for continued production. The Flexible Bulk Container manufacturer must achieve successful test results for the periodic design requalification at sufficient frequency to ensure each packaging produced by the manufacturer is capable of passing the design qualification tests. Design requalification tests must be conducted at least once every 24 months.

(2) Changes in the frequency of design requalification testing specified in paragraph (e)(1) of this section are authorized if approved by the Associate Administrator.

(f) *Test samples*. The manufacturer must conduct the design qualification and periodic tests prescribed in this subpart using random samples of packagings, in the numbers specified in the appropriate test section.

(g) *Proof of compliance*. In addition to the periodic design requalification testing intervals specified in paragraph (e) of this section, the Associate

Administrator, or a designated representative, may at any time require demonstration of compliance by a manufacturer, through testing in accordance with this subpart, to ensure packagings meet the requirements of this subpart. As required by the Associate Administrator, or a designated representative, the manufacturer must either:

(1) Conduct performance tests or have tests conducted by an independent testing facility, in accordance with this subpart; or

(2) Make a sample Flexible Bulk Container available to the Associate Administrator, or a designated representative, for testing in accordance with this subpart.

(h) *Record retention*. Following each design qualification test and each periodic retest on a Flexible Bulk Container, a test report must be prepared. The test report must be maintained at each location where the Flexible Bulk Container is manufactured and each location where the design qualification tests are conducted, for as long as the Flexible Bulk Container is produced and for at least two years thereafter, and at each location where the periodic retests are conducted until such tests are successfully performed again and a new test report produced. In addition, a copy of the test report must be maintained by a person certifying compliance with this part. The test report must be made available to a user of a Flexible Bulk Container or a representative of the Department upon request. The test report, at a minimum, must contain the following information:

- (1) Name and address of test facility;
- (2) Name and address of applicant (where appropriate);
- (3) A unique test report identification;
- (4) Date of the test report;
- (5) Manufacturer of the packaging;
- (6) Description of the flexible bulk container design type (e.g., dimensions materials, closures, thickness, etc.), including methods of manufacture (e.g., blow molding) and which may include drawing(s) and/or photograph(s);
- (7) Maximum capacity;
- (8) Characteristics of test contents (e.g., particle size for solids);
- (9) Mathematical calculations performed to conduct and document testing (e.g., drop height, test capacity, outage requirements, etc.);
- (10) Test descriptions and results; and
- (11) Signature with the name and title of signatory.

§ 178.1040 Preparation of Flexible Bulk Containers for testing.

(a) Except as otherwise provided in this subchapter, each Flexible Bulk

Container must be closed in preparation for testing and tests must be carried out in the same manner as if prepared for transportation. All closures must be installed using proper techniques and torques.

(b) If the material to be transported is replaced for test purposes by a non-hazardous material, the physical properties (grain, size, viscosity) of the replacement material used that might influence the results of the required tests must correspond as closely as possible to those of the hazardous material to be transported. It is permissible to use additives, such as bags of lead shot, to achieve the requisite total package mass, so long as they do not affect the test results.

§ 178.1045 Drop test.

(a) *General*. The drop test must be conducted for the qualification of all Flexible Bulk Container design types and performed periodically as specified in § 178.1035(e) of this subpart.

(b) *Special preparation for the drop test*. Flexible Bulk Containers must be filled to their maximum permissible gross mass.

(c) *Test method*. (1) A sample of all Flexible Bulk Container design types must be dropped onto a rigid, non-resilient, smooth, flat and horizontal surface. This test surface must be large enough to be immovable during testing and sufficiently large enough to ensure that the test Flexible Bulk Container falls entirely upon the surface. The test surface must be kept free from local defects capable of influencing the test results.

(2) Following the drop, the Flexible Bulk Container must be restored to the upright position for observation.

(d) *Drop height*. (1) For all Flexible Bulk Containers, drop heights are specified as follows: Packing group III: 0.8 m (2.6 feet)

(2) Drop tests are to be performed with the solid to be transported or with a non-hazardous material having essentially the same physical characteristics.

(e) *Criteria for passing the test*. For all Flexible Bulk Container design types there may be no loss of the filling substance. However a slight discharge (e.g., from closures or stitch holes) upon impact is not considered a failure of the Flexible Bulk Container provided that no further leakage occurs after the container has been restored to the upright position.

§ 178.1050 Top lift test.

(a) *General*. The top lift test must be conducted for the qualification of all of

Flexible Bulk Containers design types to be lifted from the top.

(b) *Special preparation for the top lift test.* Flexible Bulk Container design types must be filled to six times the maximum permissible gross mass, the load being evenly distributed.

(c) *Test method.* (1) A Flexible Bulk Container must be lifted in the manner for which it is designed until clear of the floor and maintained in that position for a period of five minutes.

(2) If not tested as indicated in paragraph (c)(1) of this section, a Flexible Bulk Container design type must be tested as follows:

(i) Fill the Flexible Bulk Container to 95% full with a material representative of the product to be shipped.

(ii) Suspend the Flexible Bulk Container by its lifting devices.

(iii) Apply a constant downward force through a specially designed platen. The platen will be a minimum of 60 percent and a maximum of 80 percent of the cross sectional surface area of the Flexible Bulk Container.

(iv) The combination of the mass of the filled Flexible Bulk Container and the force applied through the platen must be a minimum of six times the maximum net mass of the Flexible Bulk Container. The test must be conducted for a period of five minutes.

(v) Other equally effective methods of top lift testing and preparation may be used with approval of the Associate Administrator.

(d) *Criteria for passing the test.* For all Flexible Bulk Containers design types designed to be lifted from the top, there may be no damage to the Flexible Bulk Container or its lifting devices that renders the Flexible Bulk Container unsafe for transport, and no loss of contents.

§ 178.1055 Stacking test.

(a) *General.* The stacking test must be conducted for the qualification of all Flexible Bulk Containers design types.

(b) *Special preparation for the stacking test.* All Flexible Bulk Containers design types must be loaded to their maximum permissible gross mass.

(c) *Test method.* (1) All Flexible Bulk Containers must be placed on their base on level, hard ground and subjected to a uniformly distributed superimposed test load that is four times the design type maximum gross weight for a period of at least twenty-four hours.

(2) For all Flexible Bulk Containers, the load must be applied by one of the following methods:

(i) Four Flexible Bulk Containers of the same type loaded to their maximum permissible gross mass and stacked on the test Flexible Bulk Container;

(ii) The calculated superimposed test load weight loaded on either a flat plate or a reproduction of the base of the Flexible Bulk Container, which is stacked on the test Flexible Bulk Container.

(d) *Criteria for passing the test.* There may be no deterioration that renders the Flexible Bulk Container unsafe for transportation and no loss of contents during the test or after removal of the test load.

§ 178.1060 Topple test.

(a) *General.* The topple test must be conducted for the qualification of all Flexible Bulk Containers design types.

(b) *Special preparation for the topple test.* Flexible Bulk Container design types must be filled to their maximum permissible gross mass, the load being evenly distributed.

(c) *Test method.* Samples of all Flexible Bulk Container design types must be toppled onto any part of its top by lifting the side furthest from the drop edge upon a rigid, non-resilient, smooth, flat and horizontal surface. This test surface must be large enough to be immovable during testing and sufficiently large enough to ensure that the test Flexible Bulk Container falls entirely upon the surface. The test surface must be kept free from local defects capable of influencing the test results.

(d) *Topple height.* (1) For all Flexible Bulk Containers, topple heights are specified as follows: Packing group III: 0.8 m (2.6 feet).

(e) *Criteria for passing the test.* For all Flexible Bulk Container design types there may be no loss of the filling substance. However a slight discharge (e.g., from closures or stitch holes) upon impact is not considered a failure of the Flexible Bulk Container.

§ 178.1065 Righting test.

(a) *General.* The righting test must be conducted for the qualification of all Flexible Bulk Containers design types designed to be lifted from the top or side.

(b) *Special preparation for the righting test.* Flexible Bulk Container design types must be filled to not less than 95% of their capacity and to their maximum permissible gross mass, the load being evenly distributed.

(c) *Test method.* A sample Flexible Bulk Container design type must be tested; the Flexible Bulk Container should start lying on its side and then must be lifted at a speed of at least 0.1m/s (0.328 ft/s) to an upright position clear of the floor, by no more than half of the lifting devices.

(d) *Criteria for passing the test.* For all Flexible Bulk Container design types there must be no damage that renders the Flexible Bulk Container unsafe for transport or handling.

§ 178.1070 Tear test.

(a) *General.* The tear test must be conducted for the qualification of all of Flexible Bulk Containers design types.

(b) *Special preparation for the tear test.* Flexible Bulk Container design types must be filled its maximum permissible gross mass, the load being evenly distributed.

(c) *Test method.* (1) A Flexible Bulk Container design type must be placed on the ground and a 300 mm (11.9 in) cut shall be made. This 300 mm (11.9 in) cut must:

(i) Completely penetrate all layers of the Flexible Bulk Container on a wall with a wide face.

(ii) Be made at a 45° angle to the principal axis of the Flexible Bulk Container, halfway between the bottom surface and the top level of the contents.

(2) The Flexible Bulk Container after being cut according to the provisions of § 178.1070(c)(1), must be subjected to a uniformly distributed superimposed load equivalent to twice the maximum gross mass of the package. This load must be applied for at least fifteen minutes. Flexible Bulk Containers that are designed to be lifted from the top or the side must, after removal of the superimposed load, be lifted clear of the floor and maintained in that position for a period of fifteen minutes.

(d) *Criteria for passing the test.* For all Flexible Bulk Container design types, the cut must not spread more than an additional 25% of its original length.

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Cynthia L. Quarterman,
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