

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

49 CFR Parts 171, 172, 173, 175, 176, 178, and 180

[Docket Nos. PHMSA–2009–0126 (HM–215K)]

RIN 2137–AE45

Hazardous Materials: Harmonization With the United Nations Recommendations, International Maritime Dangerous Goods Code, and the International Civil Aviation Organization Technical Instructions for the Safe Transport of Dangerous Goods by Air

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 limited quantities, and vessel stowage requirements. These revisions are necessary to harmonize the Hazardous Materials Regulations with recent changes made to the International Maritime Dangerous Goods Code, the International Civil Aviation Organization's Technical Instructions for the Safe Transport of Dangerous Goods by Air, and the United Nations Recommendations on the Transport of Dangerous Goods—Model Regulations.

DATES: *Effective date:* January 19, 2011.

Voluntary compliance date: PHMSA is authorizing voluntary compliance beginning January 1, 2011.

Delayed compliance date: Compliance with the amendments adopted in this final rule is required beginning January 1, 2012.

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 19, 2011.

FOR FURTHER INFORMATION CONTACT:

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SUPPLEMENTARY INFORMATION:

- I. Background
- II. Primary Topics of Concern Discussed in the ANPRM
- III. Comments Submitted in Response to Noteworthy Harmonization Amendments Proposed in the August 24, 2010 NPRM; the Final Rule
 - A. Harmonization Amendments Adopted in This Final Rule
 - B. Harmonization Amendments Not Considered for Adoption in This Final Rule
- IV. Section-by-Section Review
- V. Regulatory Analyses and Notices
 - A. Statutory/Legal Authority for the Rulemaking
 - B. Executive Order 12866 and DOT Regulatory Policies and Procedures
 - C. Executive Order 13132
 - D. Executive Order 13175
 - E. Regulatory Flexibility Act, Executive Order 13272, and DOT Procedures and Policies
 - F. Paperwork Reduction Act
 - G. Regulatory Identifier Number (RIN)
 - H. Unfunded Mandates Reform Act
 - I. Environmental Assessment
 - J. Privacy Act
 - K. International Trade Analysis

I. Background

In a final rule published under Docket HM–181 (55 FR 52402, December 21, 1990), the Research and Special Programs Administration (RSPA), the predecessor agency to the Pipeline and Hazardous Materials Safety Administration (PHMSA), comprehensively revised the Hazardous Materials Regulations (HMR; 49 CFR Parts 171 to 180) to harmonize U.S. hazardous materials transportation requirements with the United Nations Recommendations on the Transport of Dangerous Goods (UN Model Regulations). The UN Model Regulations are not regulations, but rather are recommendations issued by the UN Committee of Experts on the Transport of Dangerous Goods (UNSCOE) and the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). These Model Regulations are amended and updated biennially by the UNSCOE and serve as the basis for national, regional, and international modal regulations, including the International Maritime Organization's International Maritime Dangerous Goods Code (IMDG Code) and International Civil Aviation Organization's Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO Technical Instructions).

Since publication of the 1990 rule, we have issued eight additional international harmonization rules (Dockets HM–215A (59 FR 67390, December 29, 1994); HM–215B (62 FR 24690, December 16, 1996); HM–215C (63 FR 57929, October 29, 1998); HM–

215D (66 FR 8644, February 1, 2001); HM–215E (68 FR 1013, January 8, 2003); HM–215G (69 FR 76044, December 20, 2004); HM–215I (71 FR 78596, December 29, 2006); and HM–215J (74 FR 2200, January 14, 2009)) based on the corresponding biennial updates of the UN Model Regulations, the IMDG Code, and the ICAO Technical Instructions.

To maintain alignment of the HMR with international requirements, in this final rule, we are incorporating changes based on the sixteenth revised edition of the UN Model Regulations, Amendment 35–10 to the IMDG Code, and the 2011–2012 ICAO TI, which becomes effective January 1, 2011 (the IMDG Code is effective January 1, 2012).

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.*) permits PHMSA to depart from international standards in order to promote safety or other overriding public interest, but otherwise requires PHMSA to align the HMR with international transport standards and requirements to the extent practicable (*see* 49 U.S.C. 5120). Harmonization enhances international trade by minimizing the costs and other burdens of complying with multiple or inconsistent safety requirements for transportation of hazardous materials to and from the United States. This becomes increasingly important as the volume of international hazardous materials shipments grows. Harmonization also enhances safety for international movements, but only if the international standards themselves provide an appropriate level of safety. PHMSA actively participates in the development of international standards for the transportation of hazardous materials, frequently advocating the adoption in international standards of particular HMR requirements.

When considering the adoption of international standards under the HMR, we review and evaluate each amendment on its own merit, on the basis of its overall impact on transportation safety, and 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 and not impose undue burdens on the regulated public.

II. Primary Topics of Concern Discussed in the ANPRM

PHMSA published an advance notice of proposed rulemaking (ANPRM) (74

FR 53982, October 21, 2009) highlighting issues under consideration for harmonization with international standards and requesting comments as to whether the HMR should be amended to incorporate specific international standards and the potential benefits and costs of doing so.

Comments on specific harmonization issues covered in the ANPRM are discussed in brief below. Please review the notice of proposed rulemaking (NPRM) (75 FR 52070, August 24, 2010) for a complete discussion of comments to the ANPRM.

A. Limited Quantities and Consumer Commodities

PHMSA has long recognized the need to authorize limited exceptions for the transportation of classes and quantities of hazardous materials described as limited quantities, or consumer commodities reclassified as ORM-D. Considerable efforts have been made internationally to harmonize multimodal standards with regard to the transport of limited quantities, including consumer commodities. PHMSA held public meetings on this issue in February 2006 and March 2008 to discuss potential impacts on domestic stakeholders. Additionally, this issue was discussed during the agency's pre-UN public meetings held in 2006 and 2007. There was considerable domestic interest in pursuing further harmonization internationally due to the potential for substantial savings in transportation costs and improved transportation efficiency. In the ANPRM (74 FR 53982, October 21, 2009), PHMSA invited comments on this issue with regard to aligning the HMR with the UN Model Regulations for the domestic and international transport of limited quantities and consumer commodities. Of particular concern was any potential negative impact on domestic transportation through the elimination of the transportation mechanism for limited quantity hazardous materials reclassified as ORM-D. While some changes adopted in the UN Model Regulations are similar to provisions currently in the HMR (e.g., inner packaging limits and authorized use of non-specification outer packagings), some changes are not (e.g., marking and labeling). In the ANPRM, PHMSA suggested that, depending on comments received and our own evaluation, the agency may determine that the significance of any amendments on this issue may warrant a separate rulemaking action.

We received several comments submitted in response to the ANPRM

supporting adoption of the UN Model Regulation limited quantity provisions into the HMR. The commenters urged PHMSA to move forward and adopt the limited quantity provisions as prescribed in the sixteenth revised edition of the UN Model Regulations. However, several commenters expressed concern that this should not be done at the expense of the ORM-D provisions currently in the HMR. Some altogether opposed the elimination of the existing provisions for ORM-D materials as part of HM-215K and recommended that any changes to the requirements be made through a separate rulemaking.

In the NPRM (75 FR 52070, August 24, 2010), PHMSA outlined its determination, partially based on our perception of favorable comments received in response to the ANPRM, that aligning the existing limited quantity provisions in the HMR with the international standards and regulations (i.e., UN Model Regulations, IMDG Code and the ICAO TI) would enhance safety by facilitating a single, uniform system of transporting limited quantity materials. We emphasized the proposals did not include the immediate or short-term removal of the existing provisions in the HMR for limited quantities reclassified as ORM-D (including those for consumer commodities, cartridges, small arms and cartridges, power device) and included a delayed compliance period we believed was sufficient in length to allow stakeholders time to comply with the transition to the revised limited quantity requirements and eventual elimination of the ORM-D classification. Because the limited quantity provisions in the UN Model Regulations and the IMDG Code are closely aligned with those already contained in the HMR, we contended that domestic alignment for highway, rail and vessel transportation would result in minimal impact and regulatory burden. And, because of the inherent risk unique to air transportation, we believed full harmonization with the ICAO TI (where appropriate) was necessary with regard to the materials authorized and quantity limits for limited quantities (including consumer commodities) intended for transport by air.

B. Classification of Division 1.4S Explosives

For eight Division 1.4 explosive articles (UN0323, UN0366, UN0441, UN0445, UN0455, UN0456, UN0460, and UN0500), the UN Model Regulations have been amended to require a Type 6(d) test to determine whether such articles may be assigned to Compatibility Group S. Assignment

to Compatibility Group S indicates that hazardous effects from accidental functioning are limited to the extent the article or substance does not significantly hinder or prohibit fire fighting or emergency response efforts in the immediate vicinity of a package containing the material. The test is designed to be performed on a single package containing an explosive article or explosive substance to determine if the package is capable of containing any hazardous effects in the event of an accidental functioning of its contents. The amendment is supplemented by revisions to the explosives testing standards in the UN Manual of Tests and Criteria as well as the adoption of a new special provision that would authorize the use of the above mentioned identification numbers only if the results of the Type 6(d) test successfully demonstrate that any hazardous effects are confined within a package. In the ANPRM, we invited commenters to provide data and information concerning the possible safety impacts of the new test provisions and compliance costs that would be incurred if the new test were adopted into the HMR. In addition, we invited commenters to provide suggestions or recommendations concerning whether to apply the test to already-approved explosives.

We received several comments both supporting and opposing adoption of the Type 6(d) test to determine whether a Division 1.4 explosive article may be assigned to Compatibility Group S. All the commenters who addressed this issue indicated that, if adopted, the test must be applied to previously-approved articles in a manner that is reasonable and not overly broad. One suggestion was to allow the classification of previously-approved explosive articles to be based on results of testing of product groups by a PHMSA-approved laboratory or on results of self-testing and video documentation by the manufacturer.

Commenters opposing adoption of the Type 6(d) test suggested that more research on the practical effect of this testing requirement is necessary and that the lack of grandfathering criteria for products already approved as Division 1.4S explosives (e.g., power device cartridges) is impractical, expensive, and impedes commerce. They also indicated concern regarding the cost of articles consumed in testing in addition to the cost of pre-testing or redesign of an article by a manufacturer to ensure passing the Type 6(d) test, but did not quantify these costs.

C. Classification of Sour Crude Oil

Currently, all types of petroleum crude oil are listed as a Class 3 flammable liquid in the § 172.101 Hazardous Materials Table (HMT). PHMSA is aware that transportation of a certain type of crude oil known as "sour" crude oil may pose risks not associated with other types of crude oil due to its inherent potential of evolving hydrogen sulfide, a highly toxic and flammable gas. Sour crude oil, commonly found in North America, contains a high concentration of sulfur. The evolution of hydrogen sulfide vapors from crude oil is dependent on temperature, packaging confinement, transport conditions (e.g., sloshing), bacteria, and sulfur concentration, among many other potential factors. When transported in bulk packagings such as cargo tanks or tank cars, the evolved hydrogen sulfide gas may build up in the vapor space of the packaging, posing a potential risk, particularly during loading and unloading.

Based on the risk of toxic vapors, the UN Model Regulations were amended by assigning a new identification number and shipping description for sour crude oil with a flammable primary hazard and a toxic subsidiary hazard. Additionally, a new special provision was added specifying the assignment of a Packing Group (PG) based on the degree of danger presented by either the flammability or toxicity hazard of the sour crude oil. For example, sour crude oil meeting flammability criteria for Class 3, PG II, and toxicity criteria for Division 6.1, PG I, poisonous-by-inhalation, would be classified as a Class 3, PG I material.

In the ANPRM, PHMSA invited commenters to provide data and information concerning the impact on domestic shippers and carriers if these requirements were adopted in the HMR. The agency also asked for comments addressing which hazard communication methods (e.g., package markings, shipping papers) and/or packaging requirements are most cost-effective for communicating the hazards and reducing the risks of transporting sour crude oil.

We received comments opposing adoption of the UN amendments for the description and classification of sour crude oil into the HMR. The commenters recommended against requiring domestic use of the new proper shipping name for sour crude oil with a Division 6.1 subsidiary risk and recommended that use be limited to international transport. Commenters further recommended that PHMSA should require drivers engaged in the

loading and unloading of sour crude oil to wear a hydrogen sulfide monitoring device and have respiratory protection accessible, and require warning signs at the cargo tank manhole and area of operation. Additionally, commenters recognized that hydrogen sulfide gas is a hazard, but suggested that classification of crude oil at the time of shipment may not reflect the toxicity of hydrogen sulfide in the vapor space of a cargo tank or other packaging after the crude oil has been in transportation. They also noted that there are best industry practices already in place that address this issue and that the Occupational Safety and Health Administration (OSHA) has requirements in place to communicate the hazards of hydrogen sulfide in the workplace. They supported other means of hazard communication to ensure that workers are aware of the hazards of hydrogen sulfide such as a marking on a bulk packaging.

D. IBC Rebotling

Under both the UN Model Regulations and the HMR, replacement of the rigid plastic receptacle of a composite IBC is considered a "repair" under certain conditions and, thus not subject to design qualification testing as a new or different design. The UN Model Regulations were amended to specify that a replacement bottle (i.e., rigid plastic receptacle) must be of the original tested design type and limits the replacement to a bottle from the original manufacturer. In the ANPRM, we invited comments on this amendment and how, if adopted into the HMR, it would impact the use of IBCs in domestic or international commerce.

All commenters who addressed this issue supported the adoption of the UN Model Regulations definition of "repair" for IBC rebotling purposes. The comments included a request for an extended compliance date of January 1, 2012 to provide users and manufacturers of composite IBCs adequate time to implement the provision and not place them at an economic disadvantage with international counterparts.

E. Metal Hydride Storage Systems in Conveyances

A metal hydride storage system is a single complete hydrogen storage system that includes a receptacle, metal hydride, a pressure relief device, a shut-off valve, service equipment, and internal components. The HMR currently do not prescribe specific packaging or shipping methods for metal hydride storage systems

containing hydrogen. However, PHMSA has issued a number of special permits to allow the use of these systems for transport. The UN Model Regulations, in new Packing Instruction P205, prescribe standards for the construction, qualification, marking and requalification of such systems. In the ANPRM, PHMSA invited comments on whether similar standards should be adopted into the HMR. One commenter supported adoption of the standards for the construction, qualification, marking, and requalification of metal hydride storage systems containing hydrogen.

F. In Vitro Testing for Corrosivity

In 1993, RSPA began recognizing an alternative test method (i.e., *in vitro* testing commercially available as Corrositex®), which is not carried out in live animals, to determine the corrosivity of a hazardous material for transportation purposes under the terms and conditions specified in a special permit (DOT-SP 10904). Similar *in vitro* test methods are prescribed in the following Organization for Economic Cooperation and Development (OECD) Guidelines for the Testing of Chemicals and were adopted in the UN Model Regulations:

- No. 430, "In Vitro Skin Corrosion: Transcutaneous Electrical Resistance Test (TER)" (2004);
- No. 431, "In Vitro Skin Corrosion: Human Skin Model Test" (2004); and,
- No. 435, "In Vitro Membrane Barrier Test Method for Skin Corrosion" (2006).

Because methods 430 and 431 can be used to determine corrosivity for other than transportation purposes, they cannot be used to determine the Packing Group (PG) assignment of a material that tests positive for corrosivity for the purposes of hazardous materials transportation. A negative result for corrosivity under methods 430 and 431 can, however, preclude further testing to determine PG assignment using method 404, the current OECD Guideline involving *in vivo* testing or method 435, the newly adopted OECD Guideline involving *in vitro* testing.

All commenters responding to the ANPRM supported adoption and use of the OECD *in vitro* test methods for determining corrosivity on the basis of reducing the number of tests requiring live animals.

III. Comments Submitted in Response to Noteworthy Harmonization Amendments Proposed in the August 24, 2010 NPRM; the Final Rule

In our latest harmonization effort, we received over 2,200 comments in response to the NPRM (75 FR 52070, August 24, 2010). The majority of the

comments received were from individuals in support of adoption of corrosivity testing methods not based on the results of live animal testing. The following individuals, companies, and organizations submitted comments to the NPRM (in chronological order of submittal). We note, however, that in lieu of listing each individual commenting, we have listed PETA as a proxy for all comments received supporting adoption of corrosivity testing methods alternative to live animal testing:

- (1) R.R. Street & Co. (Street);
- (2) Infotrac;
- (3) Vanguard Logistics Services (VLS);
- (4) Zebrowski, Department of Energy (DOE);
- (5) 3M;
- (6) The Japan Electrical Manufacturer's Association (JEMA);
- (7) Andersen Products (Andersen);
- (8) FedEx Express (FedEx);
- (9) Saft America, Inc. (Saft);
- (10) People for the Ethical Treatment of Animals (PETA);
- (11) Toshiba America Electronic Components, Inc. (TAEC);
- (12) Association of Hazmat Shippers, Inc. (AHS);
- (13) National Nuclear Security Administration Service Center, DOE (NNSA);
- (14) Sporting Arms and Ammunition Manufacturer's Institute (SAAMI);
- (15) Baker Hughes (Baker);
- (16) Signa Chemistry, Inc. (Signa);
- (17) Institute of Maker's of Explosives (IME);
- (18) United Parcel Service (UPS);
- (19) Titan Specialties, Ltd. (Titan);
- (20) Human Focused Testing;
- (21) American Veterinary Medical Association (AVMA);
- (22) Valspar;
- (23) Utility Solid Waste Activities Group (USWAG);
- (24) Trulite, Inc. (Trulite);
- (25) The Rechargeable Battery Association (PRBA);
- (26) American Petroleum Institute (API);
- (27) American Coatings Association, Inc. (ACA);
- (28) BIC Corporation (BIC);
- (29) American Trucking Associations (ATA);
- (30) Council on Safe Transportation of Hazardous Articles, Inc. (COSTHA);
- (31) Healthcare Distribution Management Association (HDMA);
- (32) Aviation Suppliers Association (ASA);
- (33) Modification and Replacement Parts Association (MARPA);
- (34) International Vessel Operators Dangerous Goods Association (IVODGA);
- (35) TravelScoot, USA (Scoot);
- (36) Dangerous Goods Advisory Council (DGAC);
- (37) Lilliputian Systems, Inc. (LSI);
- (38) Department of Defense Explosives Safety Board (ESB);
- (39) Ensign-Bickford Aerospace & Defense (EBAD)
- (40) Safety Specialists, Inc. (SSI);

- (41) Owen Compliance Services, Inc. (OCS);
- (42) Potomac Strategy Associates (PSA);
- (43) Arkema, Inc. (Arkema);
- (44) Association of American Railroads (AAR);
- (45) Air Line Pilots Association (ALPA);
- (46) US Fuel Cell Council (USFCC);
- (47) International Air Transport Association (IATA);
- (48) Alaska Airlines (AA);
- (49) PPG Industries, Inc. (PPG); and
- (50) Edgcomb Law Group (ELG).

A. Harmonization Amendments Adopted in This Final Rule

In this final rule, PHMSA is adopting the following amendments to harmonize the HMR with the most recent revisions to the UN Model Regulations, ICAO Technical Instructions, and the IMDG Code:

1. Petitions for Rulemaking

We are addressing one petition for rulemaking, P-1550, from PETA requesting that PHMSA incorporate by reference OECD Guidelines 430, 431 and 435 into the HMR that prescribe *in vitro* testing methods for determining corrosivity.

2. Hazardous Materials Table (HMT)

Amendments to the HMT to add, revise, or remove certain proper shipping names, hazard classes, packing groups, special provisions, packaging authorizations, bulk packaging requirements, passenger and cargo aircraft maximum quantity limitations, and vessel stowage provisions.

3. Organic Peroxide Tables

Amendments to the Organic Peroxide Tables to add, revise, or remove certain hazardous materials and provisions.

4. Incorporation by Reference

Amendments to incorporate by reference the 2011–2012 ICAO Technical Instructions, Amendment 35–10 to the IMDG Code, sixteenth revised edition of the UN Model Regulations and the fifth revised edition of the UN Manual of Tests and Criteria. Additionally, we are updating our incorporation by reference of the Canadian Transportation of Dangerous Goods Regulations to include Amendment 6 (SOR/2008–34) February 7, 2008 (pertains to miscellaneous amendments); and Amendment 7 (SOR/2007–179) August 22, 2007 (pertains to highway cargo tanks). This incorporation by reference augments the broad reciprocity provided in § 171.12 where the HMR allow the use of the Canadian TDG Regulations under certain conditions when transporting hazardous materials to or from Canada by highway or rail.

5. Limited Quantities

We received a number of comments in response to the limited quantity and ORM–D classification amendments proposed in the August 2010 NPRM. Commenters can basically be categorized into two groups: Those supporting harmonization with the international standards and regulations for limited quantities and those in opposition to the eventual elimination of the ORM–D classification. The remainder of the commenters offered suggestions or revisions to clarify or aid understanding of the proposed amendments.

Those commenters generally supporting harmonization of the limited quantity provisions include:

- Alaska Airlines;
- American Coatings Association;
- American Trucking Associations;
- Association of Hazmat Shipper, Inc.;
- Council on Safe Transportation of Hazardous Articles, Inc.;
- Dangerous Goods Advisory Council;
- FedEx Express;
- International Vessel Operators Dangerous Goods Association;
- PPG Industries, Inc.;
- Sporting Arms and Ammunition Manufacturers Institute, Inc.;
- United Parcel Service.

Those commenters opposing the eventual elimination of the ORM–D hazard classification include:

- American Coatings Association;
- Aviation Suppliers Association;
- Healthcare Distribution Management Association;
- Modification and Replacement Parts Association;
- PPG Industries, Inc.;
- Safety Specialists, Inc.;
- Utility Solid Waste Activities Group; and
- Valspar.

Due to the large number of commenters and the variety of comments provided, we outline pertinent topic areas to better address all the comments. The comments are discussed and addressed as follows:

a. *Air-specific requirements.* In the NPRM, we proposed to revise § 173.27 to add a new table outlining air transport requirements for limited quantity material including package quantity limits consistent with the ICAO Technical Instructions. The proposed quantity limits for air transport differ from the quantity limits for other modes, which was a point of contention for some commenters. Three commenters (ACA, DGAC, SSI) disagreed with the adoption of the proposed package limits in the table and one commenter (COSTHA) expressed concern that the table is too broad. ACA asserted:

Introducing these limits will only frustrate domestic transportation and introduce unnecessary complexity into a fairly simple process. In the coatings industry, air shipments are not the norm and are only used when there is some urgency or the destination is a remote location. Requiring different inner and outer packaging quantity limits for air will eliminate the efficiency of a "one size fits all LQ shipments" process.

SSI added:

Some materials that were ORM-D may not be eligible to be shipped as limited quantity. Most inner packagings have been severely reduced. Isopropanol UN1219 (rubbing alcohol) can be presently shipped in inner containers up to 1 liter. Under the new Table 3 the inner container is reduced to 500 milliliter. This product is normally sold in pints, quarts, and gallons. Quarts would not be eligible for limited quantity air shipments. This will require shippers to ship in UN standard packaging, apply hazard class labels and meet all other requirements for fully regulated shipments.

We understand that more inner packagings may be required of a material authorized to be shipped as a limited quantity by air. SSI used Isopropanol as an example in their comments where the inner packaging quantity limits are reduced from 1 liter to 500 milliliters for a Packing Group II Class 3 (flammable liquid) when the current limits of the HMR are compared with the ICAO Technical Instructions. SSI also stated that the product is sold in pints, quarts and gallons. Currently under the HMR, the gallon is ineligible as a limited quantity. Under the amendment proposed in the NPRM, the gallon and quart would be ineligible for air transport as a limited quantity. However, because the outer packaging quantity limit is 1 liter for a Packing Group II Class 3 (flammable liquid), SSI would just have to substitute 2 one-pint inner packagings for a one-quart container of product in the same package.

DGAC reasoned:

The HMR limited quantity provisions predate ICAO TI limited quantity provisions. When limited quantity provisions were introduced in the ICAO TI * * * on the basis of existing U.S. limited quantity provisions, additional limitations were included * * * RSPA and PHMSA have, up until now, not deemed it necessary to incorporate these limitations in the HMR. The long intervening period between when the limits were first introduced in the ICAO TI and the present suggests that it is unnecessary to adopt these limits for the sake of harmonization. Further, [we are] unaware of any new safety information that would justify introducing these limits at this time.

DGAC further argued:

Introducing these limits will serve to frustrate domestic transportation. A key

objective of * * * PHMSA has been to provide multimodal harmonization * * * so that the same package will essentially be suitable by all modes of transportation. This is currently true for limited quantity packages * * * By introducing new limits, as shown in the table referenced by proposed § 173.27(f), limited quantity packages prepared for ground or sea transport may not necessarily be suitable for air transport. Most shippers commonly transport * * * limited quantity packages by modes other than air. Currently, with limited quantity package requirements for all modes closely aligned, transporting a limited quantity package is relatively straightforward. If the limitations on inner and outer package quantity limits and new performance requirements are introduced * * * it may be necessary to repackage ground/sea limited quantity packages for purposes of air transport. [We] are unaware of any safety concerns that would justify the imposition of these new limitations.

Major differences already exist under the HMR for the air transport of limited quantities as compared to other modes. For example, limited quantity and consumer commodity inner packagings containing liquids are subject to the pressure differential capability requirements in § 173.27(c).

COSTHA explained further confusion:

It is important for shippers to use the § 172.101 Table to determine eligibility for a limited quantity * * * However, if one uses only Table 3, the shipper may inappropriately determine that a material is eligible for shipment as a limited quantity. For example, [c]hlorosilanes are not permitted to be packaged in accordance with limited quantity provisions * * * however, [certain classes of PG II materials] (many chlorosilanes fall into these classes) are identified as having acceptable limits * * * according to the § 173.27 Table 3. Given that limited quantities is a source of confusion for many shippers and carriers, this table does less to clarify a point and more to confuse the reader.

Section 173.27(f) clearly states that, for transportation by aircraft, materials packaged as limited quantities must be eligible for transportation aboard a passenger-carrying aircraft. In this final rule, we are adding additional clarification in § 173.27(f) to emphasize this critical step in determining limited quantity eligibility by also referring the reader to Column (9A) of the HMT. As stated in the NPRM, PHMSA is studying the feasibility of revising the HMT to further assist in determining limited quantity eligibility by air or possibly by all modes of transportation.

Two commenters (ASA, MARPA) were critical of the nature of proposed regulatory changes without an apparent safety need, specifically with regard to the limited quantity marking for air transport consistent with the ICAO Technical Instructions. The commenters

argued that the constant changes make compliance with the regulations difficult. ASA and MARPA stated:

The 2009–2010 [ICAO TI] authorized * * * the UN identification number in a diamond shape [as] the mandatory way to mark limited quantity packages starting in 2011 * * * Beginning in 2011, ICAO has abandoned the marking protocols announced in 2009, and established a new, different identification protocol for identifying limited quantities * * * Instead of placing the UN identification number in the diamond shape, shippers will be required to place a "Y" in the diamond shape * * * There appears to be no reason other than mere harmonization for the sake of harmonization for adopting the ICAO limited quantity marking. [The] marking provides no additional value * * * because many people in the United States system will have no idea what the "Y" marking means * * * Although "Y" is the letter that precedes limited quantity packing instructions in the ICAO system, the letter "Y" has no special meaning in the existing United States Regulations.

b. *Dual marking system.* Support for harmonization efforts including the adoption of the square-on-point limited quantity marking (*i.e.*, the square-on-point with top and bottom portions black and the center white) generally coincided with support for the eventual elimination of the ORM-D classification along with the ORM-D marking. The basis for support was that this would eliminate a dual system of marking packages for domestic and international transportation. With regard to elimination of a dual marking system, some commenters (AA, FedEx, IVOGDA) indicated that a dual system of marking creates confusion and requires carriers and shippers to adjust their training programs to account for this dual system. They therefore recommend PHMSA consider an earlier implementation date than the proposed January 1, 2013 date. AA added:

We encounter almost every day roused boxes in the U.S. mail, passenger baggage, or cargo shipments that have old ORM-D marks. This takes considerable time to inspect and causes frustration to the public when non-hazardous shipments are denied transportation because of a marking they do not understand as an indication of hazardous materials.

PHMSA notes that adoption of a new limited quantity marking(s) may not necessarily alleviate or eliminate use of packaging premarked with the limited quantity square-on-point for non-hazardous materials.

Notwithstanding the general comments regarding dual marking, several commenters offered suggestions or revisions to improve or clarify the proposed requirements. As part of the NPRM, we authorized voluntary use of

the limited quantity marking. UPS urged PHMSA to delay voluntary use to allow carriers time to develop appropriate training in response to a final rule, stating that:

In [our] experience, this kind of authorization * * * can lead to practical difficulties which in turn could have compliance and safety implications * * * Training in UPS will be needed to educate U.S. package handlers of the meaning of the limited quantity marking.

Additionally, on the basis of their opposition to adoption of the air transport requirements for limited quantities consistent with the ICAO TI, DGAC recommended that:

The "Y" package mark [proposed] in § 172.315 not be required * * * [and] recommend that [PHMSA] allow permissive use of the "Y" mark for all modes of transport when the package meets the relevant requirements of the ICAO TI.

We agree with the DGAC recommendation that a "Y" marked package in full conformance with the air transport requirements for a limited quantity package should be authorized transportation by all modes and are revising § 171.22 accordingly. However, we do not agree with their suggestion that the limited quantity "Y" mark be voluntary. There are currently two different ways to mark a package of limited quantities in the HMR and a third (four if counting packaged ORM-D-AIR materials) would be very disruptive. Therefore, in this final rule, PHMSA is adopting the "Y" mark as proposed and providing a transition period to allow for the continued use of existing markings until January 1, 2012.

c. Elimination of the ORM-D class.

Most commenters opposing the elimination of the ORM-D classification recommend using a separate rulemaking to implement this proposal. Some question whether the costs of eliminating this classification have been fully considered; others question whether there is sufficient safety justification to warrant replacing the current domestic ORM-D provisions with internationally harmonized provisions. A sampling of comments received follows. ACA argued:

Although [we] supported harmonization of the limited quantities exceptions at the UN discussions, [there was an] understanding that the consumer commodity exception was a separate issue * * * In the coatings and adhesives industry, we are unaware of any major incidents with consumer commodity shipments. While PHMSA indicates that "aligning the existing limited quantity provisions in the HMR with the international standards will substantially enhance safety," we question how this applies to the proposal to eliminate ORM-D consumer commodities.

Valspar asserted:

We believe PHMSA has overreached the HM-215 harmonization process by proposing * * * to eliminate the well-defined ORM-D (Consumer Commodity) hazard class. We believe any proposal * * * should not be linked to the international harmonization program. In several industry/regulatory conferences it has been proposed that Limited Quantity and Consumer Commodity are synonymous. We do not agree with this premise and strive to ensure that our "Consumer Commodities" meet the spirit and HMR definition of " * * * intended or suitable for sale through retail sales agencies or instrumentalities for consumption by individuals for purposes of personal care or household use." [We ship] many items under Limited Quantity provisions that we do not believe meet the "suitability" test and assert there is an important distinction between the two. We applaud PHMSA for clearly defining the pathway to ORM-D through Limited Quantity and Special Provision options and can only imagine whether this can be misused through other less clear regulation * * * We challenge PHMSA to revisit the assertion to Executive Order 12866 cited in the HM-215K NPRM that only considers the listed harmonization to be beneficial, with no acknowledgement of the financial cost to ORM-D shippers.

DGAC expressed concern that:

Eliminating the ORM-D classification and package marking [will make it] that such packages will no longer be excepted from the § 175.75 requirements for air transport. No similar requirement applies under the ICAO TI so * * * this change cannot be justified on the basis of harmonization * * * [We believe] PHMSA considers limited quantity packages and currently classified ORM-D packages as posing comparable hazard[s]. Consistent with that approach, we recommend that PHMSA similarly except all limited quantity packages from the § 175.75 requirements.

We agree with DGAC regarding § 175.75 quantity limits for limited quantity packages and are revising the section accordingly. Limited quantity shipments will enjoy the same exception from the § 175.75 quantity limits as ORM-D-AIR materials currently receive.

USWAG stated:

We believe elimination of the ORM-D standards for transportation * * * will disrupt longstanding shipping practices while failing to provide commensurate safety benefits.

The commenter also expressed concern for downstream shippers who have received ORM-D packages but can no longer transport this package beginning on the January 1, 2014 proposed compliance date. USWAG encouraged PHMSA to implement a phased-in approach that would authorize downstream shippers (that do not repackage these materials) to use

ORM-D provisions for an additional period of time.

One commenter (HDMA) provided information that the proposal as written would impose significant cost on the domestic transport of medicines and other healthcare or consumer products. HDMA members concluded that compliance with the regulations would require replacement of more than 10 million plastic totes embossed with the ORM-D marking, costing members an estimated \$70 million to purchase new totes with the new limited quantity marking. HDMA is prepared to phase out the use of totes with the ORM-D marking but believes this should be done over an extended period of time to enable existing totes embossed with the marking to be used over their lifetime. HDMA stated:

PHMSA may not have recognized that some industries rely on containers that are embossed with the transport mark and hence conversion to a new mark is considerably more complicated than simply changing a label.

Just as PHMSA has done in the past, if there is merit to a particular segment of the regulated community requiring a longer transition period to be considered, it shall be observed on a case-by-case basis. In their comments, HDMA did not indicate what a "normal" lifetime would be. In their defense, however, they provided comments that were quantified and directly related to their concerns about the regulatory and economic burden placed upon their particular industry.

Finally, several commenters (*e.g.*, COSTHA, FedEx) noted concern over use of the ORM-D mark after the transition period ends (*i.e.*, beginning January 1, 2014). The commenters recommend that PHMSA clarify that at the end of the transition period, a package marked with the ORM-D mark will no longer indicate that a packaging contains a hazardous material (*i.e.*, a consumer commodity).

d. Conclusion. In the August 2010 NPRM, PHMSA outlined our determination, partially based on our perception of favorable comments received in response to the ANPRM, that aligning the existing limited quantity provisions in the HMR with the international standards and regulations (*i.e.*, UN Model Regulations, IMDG Code and the ICAO TI) would enhance safety by facilitating a single, uniform system of transporting limited quantity materials. We emphasized the proposals did not include the immediate or short-term removal of the existing provisions in the HMR for limited quantities reclassified as ORM-D (including those

for consumer commodities, cartridges, small arms and cartridges, power device) and included a delayed compliance period we believed was sufficient in length to allow stakeholders time to comply with the transition to the revised limited quantity requirements and eventual elimination of the ORM-D classification.

Based on careful consideration of the comments received in response to the proposals made in the NPRM, PHMSA is moving forward with a substantially revised final rule that adopts the new limited quantity provisions and the eventual phase-out of the ORM-D hazard class. This will implement a standardized system for national and international multimodal transportation. The approach of de minimis quantities, excepted quantities, limited quantities and consumer commodities will all have the same provisions and requirements for international and national transportation in a system that will promote compliance, efficiency and consistent training and lower costs after implementation.

6. Classification of Certain Division 1.4S Explosives

In the August 24, 2010 NPRM, PHMSA stated it understood commenter concerns that prescribing additional tests usually results in increased research and development costs. PHMSA also acknowledged that it believed there was merit to additional prescribed tests when they result in a credible and measureable increase in safety. Consequently, in the NPRM we proposed to require the phased-in testing of all new and previously approved Division 1.4S explosives articles and substances, depending on the intended mode of transport. For newly produced explosive articles, a person who successfully performs the Type 6(d) test would not be required to also perform the Type 6(a) test. PHMSA believes such initiatives will greatly reduce research and development costs without compromising safety.

In the NPRM, PHMSA proposed to adopt the requirement for the Type 6(d) test as prescribed in Section 16.7 of the fifth revised edition of the UN Manual of Tests and Criteria in the new § 172.102(c)(1), special provision 347. For affected articles (or substances) intended for transportation by aircraft, the proposed compliance date of this new requirement was April 1, 2011. If a manufacturer or approval holder of affected articles that previously classed and approved an article as Division 1.4S chooses to continue offering such shipments by aircraft, we proposed the articles must be successfully tested

under Test Series 6(d) and a new approval be obtained from PHMSA. Additionally, we proposed that a previously classed and approved Division 1.4S article that is not successfully tested under Test Series 6(d) must be assigned to a compatibility group other than "S" (e.g., B, C, or D) prior to the April 1, 2011 compliance date if intended for transportation by aircraft on or after that date. PHMSA also proposed that the effective date of testing to maintain Division 1.4S classification or reassignment to a higher compatibility group other than "S" be no later than January 1, 2014 for Division 1.4S articles approved prior to January 1, 2012 and are intended for domestic highway or rail transportation. For previously-approved affected articles transported by highway, rail and vessel, reassignment to a compatibility group other than "S" may be accomplished by using existing data and, when recommended by an authorized examination and testing agency, approved by PHMSA. For international highway, rail and vessel transportation, the effective date of Type 6(d) testing requirements or reassignment for new and previously produced affected articles would be January 1, 2012 (i.e., the compliance date of a final rule under this docket, if adopted as proposed).

A number of commenters (Baker, EBAD, ESD, IME, Infotrac, NNSA, OCS, SAAMI, and Titan) addressed our proposal to adopt the Type 6(d) test and associated requirements. Several commenters expressed support for comments submitted by IME and requested that PHMSA give consideration to their comments. Thus, our response to comments will primarily be structured based on the comments IME submitted.

a. *Compliance dates (i) Air transport.* IME expressed concern that the proposed compliance date for Type 6(d) testing to determine Division 1.4S classification for materials to be transported by air precedes the compliance date for the rulemaking in general. IME stated:

The "compliance date of a final rule under this docket" will be January 1, 2012. Simultaneously, however, the proposal establishes a compliance date for transportation by aircraft of April 1, 2011. Accordingly, the compliance date for an individual mode regulated under the rule would precede the compliance date for the rule itself, rendering the April 1, 2011 compliance date both unreasonable and unenforceable.

We disagree. As general policy, PHMSA implements a one-year transition period for international

harmonization rulemakings. Thus, we typically publish a rulemaking under the HM-215 docket to be effective January 1 of a given year (to coincide with international effective dates) and require compliance one year later to afford stakeholders the opportunity to prepare for compliance. PHMSA is not bound to the one year transition period and has discretion to institute an earlier compliance date when circumstances warrant. The implementation of this requirement was viewed to be significant by the ICAO Dangerous Goods Panel and an emergency addendum was requested from the Air Navigation Commission. Preventing the transportation of an explosive article with the ability to exit its packaging that could result in collateral damage on a passenger aircraft was determined to be an immediate safety concern and was implemented on very short notice for international air transportation. Therefore, because of concern for the safety in transport of these articles by air and to affect a transition for international air transport with minimal disharmony in compliance dates (the Type 6(d) test is required under ICAO Technical Instructions as of January 1, 2011), we proposed to implement the April 1, 2011, compliance date for Type 6(d) testing for transport by aircraft.

IME also expressed concern that the proposed compliance date of April 1, 2011 for air transport is unattainable. IME stated further:

[T]hat PHMSA's internal policy establishes a 120-day review period for processing approvals * * *. [W]e have determined that in order to meet the April 1, 2011 compliance deadline for air transportation, approval applicants planning to continue shipping by air would have to ensure that all required testing is completed and the results submitted to PHMSA by December 2, 2010. The required testing must be performed or witnessed by "an authorized examination and testing agency approved by PHMSA." On average, the lead time required to schedule testing with a PHMSA-approved laboratory is six weeks. An additional two weeks would then be required for testing the laboratory to perform the required tests and generate a report * * *. Accordingly, applicants intending to meet the April 1, 2011 deadline would have [had to] finalize arrangements with the testing laboratories by October 4, 2010—twenty-one days prior to the close of the public comment period * * *. Given the impossibility of timely compliance, the proposed April 1, 2011 date will function not as a compliance deadline, but as an automatic prohibition on [of] air transport of the affected 1.4S articles.

PHMSA acknowledges the strict compliance timeline proposed for the air transport of affected articles and substances. We note, however, that the PHMSA imposed 120-day period for

processing of approvals is not a minimum time period but general guidance for estimating the time period to review and process an approval application dependent on multiple factors such as the complexity of an application or errors in its submittal. The approval process may take less than 120 days and routinely does. Additionally, PHMSA's Approvals and Permits Division recently streamlined the explosive approval process to accommodate an influx of approval requests based on adoption of Type 6(d) test prescribed in this rulemaking. Finally, shippers are not constrained to the use of domestic laboratories approved by PHMSA but may utilize the resources of laboratories under the umbrella of other competent authorities (e.g., Transport Canada). However, given the strict timeline proposed in the August 2010 NPRM, the significant number of approval applications we expect to receive, and the potential for delays at authorized testing laboratories attempting to accommodate the volume of testing or reclassification requests, we are extending the compliance date for air transport to July 1, 2011.

(ii) *Vessel transport.* IME noted our failure to indicate a compliance date for domestic vessel transportation. We agree. Our intent was to implement a compliance date that coincides with the effective date of the IMDG Code requirement for the Type 6(d) test (January 1, 2012). Therefore in this final rule, we will require the Type 6(d) test for Division 1.4S classification beginning January 1, 2012 for both domestic and international vessel transportation.

(iii) *Modal variability.* IME expressed concern that the varying compliance dates for air transport (proposed April 1, 2011), international highway, rail, and vessel (domestic and international) (proposed January 1, 2012), and domestic highway and rail (proposed January 1, 2014) will result in confusion and unintentional noncompliance with specific regard to downstream customers. IME reasoned:

The customer has no way of knowing that the manufacturer ships only domestically [by highway] and has not, therefore, reclassified the product to meet the earlier compliance date for international transport. This leads to unintentional noncompliance by the downstream customer * * *. We recommend that PHMSA promulgate a single compliance date for all modes and for domestic and international transportation.

We disagree. Unawareness of a requirement cannot be used as a defense for non-compliance. Downstream customers or shippers may utilize a number of resources to determine

whether an explosive article or substance subject to the Type 6(d) test has been successfully tested. For example, they can obtain a copy of the approval issued by PHMSA. Additionally, it is the shipper's responsibility to properly class and describe a material (see § 173.22) and to be trained on any applicable requirements (see § 172.704) of the HMR. That said, the Approvals and Permits Division will issue guidance to all current approval holders for affected Division 1.4S articles and materials to provide detailed instruction on the new requirement for Type 6(d) testing. This will include issuing new or amended approvals indicating whether a Type 6(d) test has been successfully conducted which can then be used by downstream customers and shippers to aid in transport decision-making.

b. *Testing requirements.* (i) *Self-testing.* In response to the ANPRM, IME recommended allowing self-testing and video documentation for articles previously approved as Division 1.4S. IME continued to assert that testing requirements for previously approved articles not be overly broad and questioned why this recommendation was not addressed even though PHMSA specifically acknowledged IME's comments in the NPRM. IME reiterated:

Providing manufacturers with the option to self-test is an effective means of ensuring reasonable application of the new test. Additionally, allowing self-testing of already approved explosives articles will assist industry in minimizing the financial impact of implementation of a new test on already approved, safely transported, explosives.

We disagree. PHMSA believes a uniform process for testing using the Type 6(d) test to determine Division 1.4S classification is the best approach and we do not believe incorporating variability into the process by allowing self-testing and video-documentation for already approved articles complements this approach. PHMSA understands the need to facilitate any possible cost reduction regarding the application of this new testing requirement. We also maintain, however, that in the interest of uniform safety standards under the HMR, requiring that testing be observed or conducted by a PHMSA-approved laboratory is the best approach. This approach will not be codified in the HMR but rather will be incorporated into the explosives approval process as specified in § 173.56 of the HMR.

(ii) *Clarification of NPRM preamble.* Certain phrases and terms were used in the August 2010, NPRM which have caused confusion. We would like to clarify. Regarding the phrase "incremental testing," use of the phrase

refers to the staggered compliance dates depending on the mode of transport or domestic/international transport and does not indicate differences in reclassification testing. We are removing any reference to this phrase in the preamble to this final rule to avoid further confusion. Regarding the term "design," as in "previously approved designs," the term was meant to signify individual explosives articles or substances. We are also deleting any use of this term in the preamble to this final rule to avoid any ambiguity in the use of the term.

(iii) *Modal difference.* In response to our proposed implementation of the new testing requirement for Division 1.4S classification, IME objected to any varying testing criteria tied to the intended mode of transport, stating:

Such action is not consistent with the UN classification system; additionally, an explosive's reaction to stimuli is not affected by the mode of transport. PHMSA offers no rationale for excluding the use of existing test data for the reclassification of articles intended for air transport, and the distinction would inevitably result in confusion and unintended noncompliance in the regulated community.

We agree that there should be uniform testing criteria across all modes. We apologize for the lack of clarity in implementation of this new testing requirement and will clarify further in the following section (c) discussion of our implementation of the Type 6(d) test.

(iv) *Laboratory recommendation.* For previously approved articles, we proposed to allow reassignment to a compatibility group other than "S" using existing data and when recommended by a PHMSA-approved laboratory. IME did not support the proposal to require a recommendation from a PHMSA-approved laboratory where a previously approved article is being reassigned. IME argued:

Inability to successfully pass the new Type 6(d) test does not invalidate the original laboratory tests and recommendation[s] that were previously sufficient to attain 1.4S classification. Accordingly, there is no rational basis for requiring a laboratory recommendation to support a downgrade in classification. A laboratory recommendation should only be required where the original classification is not supported by laboratory testing and a corresponding recommendation * * * [W]e are also concerned that if the proposal is promulgated as drafted, some testing laboratories may be reticent to issue the required recommendation solely on the basis of existing test data, and may require new testing.

We appreciate the concerns presented by IME. Again, we apologize for any lack of clarity in implementing this new

provision. As indicated previously, our Approvals and Permits Division will be issuing guidance and instruction on testing or reclassification of previously approved Division 1.4S articles or substances. As part of that instruction and in order to alleviate any potential problems from laboratories being reticent to provide a recommendation based on existing data, the Approvals and Permits Division will be providing guidelines to laboratories for which types or batches of already approved articles and substances should be reclassified into which type of downgraded compatibility group.

c. Implementation of the Type 6(d) test in the explosives approval process. As IME accurately summarized in its comments, there are three categories of explosive articles or substances affected by the test requirement: (1) Previously approved Division 1.4S articles that will pass the Type 6(d) test; (2) previously approved Division 1.4S articles that will not pass the Type 6(d) test and therefore need to be reassigned to a more conservative compatibility group other than "S"; and (3) new explosive articles for which Division 1.4S classification must be determined through successful Type 6(d) testing. All explosive articles affected by the Type 6(d) test requirement fit into these three categories regardless of the mode of transport. The compliance date for affected articles is dependent upon the intended mode of transport and whether they are to be transported domestically or internationally. Beginning January 1, 2012, any new explosive articles must be successfully subjected to the Type 6(d) test to determine whether Division 1.4S classification is appropriate. However, for a new explosive material intended for transport by aircraft, the compliance date for successful Type 6(d) testing is no later than July 1, 2011. For existing approved Division 1.4S articles intended for transport by air, successful Type 6(d) testing is also required no later than July 1, 2011; otherwise, the articles must be reassigned to another compatibility group and a new approval issued by PHMSA prior to being offered for transportation or transported by aircraft. Beginning January 1, 2012, existing approved Division 1.4S articles intended for international transport by highway, rail, or vessel and for domestic transport by vessel, successful Type 6(d) testing is required; otherwise, the articles must be reassigned to another compatibility group and a new approval issued by PHMSA prior to being offered for transportation. Finally, for existing approved Division 1.4S articles

intended for domestic transportation by highway or rail, successful testing or compatibility group reassignment is required beginning January 1, 2014.

We realize the intended mode of transport may change as markets change and evolve but staggered compliance dates we believe are necessary in order to provide sufficient time to manufacturers, shippers, PHMSA-approved laboratories, and our Approvals and Permits Division to accommodate the number of approved Division 1.4S articles that will need testing or reclassification as well as attempting to allay some of the costs to manufacturers who only transport by domestic highway or rail.

d. Federal considerations. Two commenters (ESB, NNSA) within the Department of Defense and Department of Energy, respectively, objected to the Type 6(d) test requirement for previously approved Division 1.4S explosive material based on cost and logistical concerns. NNSA noted:

[M]ore significant than the added costs, are the limited testing assets available necessary to complete testing by the prescribed deadline in the NPRM. [We do not] recognize the need to conduct UN Test Series 6(d) testing on all future permanent hazard classification requests as specified in the NPRM.

ESB added:

[We object to] with applying the test Type 6(d) for articles previously classified. DOD has been assigning classifications using a methodology that includes assessing projections, fireballs, and jets of flame from unconfined initiation testing. DOD would consider this methodology as equivalent testing and criteria for the assignments of the eight Divisions 1.4 explosive [a]rticles. The DOD [has] not noted any transportation issues with the 378 articles assigned these UN numbers * * * Conducting test Type 6(d) for the 378 articles would take a considerable amount of time without any credible or measurable increase in safety * * * Reclassifying * * * by reassigning CGs other than S is also not a viable option due to the complexity of DOD logistics. Consolidating, and remarking each shipping container located at strategic positions around the world for [defense purposes] would be costly, time consuming and potentially have little safety improvements.

ESB recommended adding a grandfathered exception or issuing a special permit for previously approved DOD Division 1.4S material. We acknowledge concerns by Federal agencies regarding costs and time constraints in the interest of national security. We are currently working directly with potentially affected government stakeholders to remedy concerns regarding implementation of

the new requirement for the Type 6(d) test on such entities.

7. Classification of Sour Crude Oil

PHMSA agreed with comments submitted in response to the October 2009 ANPRM that a new proper shipping name is not necessary and that there are more appropriate ways to communicate the potential inhalation hazard risk to transport workers. Therefore, in the August 2010 NPRM, PHMSA proposed to adopt the new proper shipping name found in the UN Model Regulations—"Petroleum sour crude oil, flammable, toxic"—with the letter "I" in Column (1) of the HMT indicating that this description is appropriate for use during international transportation. However, PHMSA did not propose to require use of the new proper shipping name for domestic transportation. PHMSA did propose that a new marking be applied to bulk packagings containing sour crude oil to communicate the potential inhalation risk in transportation.

Three commenters (API, ATA, DGAC) opposed our proposed requirements as ill-conceived and impractical and had concerns with the new marking. They believe the new marking is not necessary based on industry best practices already in place. One commenter (AAR) sought clarification of rail carrier requirements in relation to the proposed marking requirement. Although the commenters opposed our proposed requirements, they strongly support hazard communication processes and procedures to protect employees, the public and the environment from any unreasonable risk of danger from hydrogen sulfide gas. API noted:

Cargo specific testing of individual packages upon loading, followed by the required identification, classification, packaging selection, marks, labels, placards, and documentation process is impractical. The physical and chemical criteria of the DG/HazMat define the basic shipping information * * * The preparation of shipping information and selection of packagings is typically done well in advance of loading on the basis of known, reliably measured, physical and chemical criteria of the materials being transported. When a wide range of the test results is possible, the DG/HazMat classifiers generally utilize the most conservative data to develop the basic shipping information * * * It is impossible to predict the concentration of H₂S in the head space vapors evolving from liquid petroleum crude oils. There is not [a] standardized test, statistical correlation, or known methodology to do this * * * Without a reliable, proven methodology, any attempt to develop a classification process regarding potential, future H₂S vapor space concentrations is unrealistic * * * API could

support the use of a differentiated graphic, unique in communicating the potential H₂S vapor [but any] such mark should be considered voluntary and not mandated * * *. Companies should be allowed the flexibility in choosing an option that works best for their operations.

DGAC added:

[We] are concerned that providing a warning for select crude oils may result in decreased vigilance when other substances also posing a potential hydrogen sulfide risk are handled * * *. If * * * PHMSA maintains that a mark is still necessary, we recommend that the applicability of any marking be limited to cargo tank truck operations * * * PHMSA should allow the warning to appear in the vicinity of the loading/unloading operation or on the vehicle at the loading location. This would avoid the need to add and remove the mark from the cargo tank truck * * * We consider the proposed GHS poison mark to be inappropriate * * * Applying the PHMSA proposed mark on crude oil tanks that do not meet the inhalation toxicity criteria results in a hazard communication conflict which should and can be avoided * * *. Should PHMSA maintain a warning is needed, we recommend a warning sign in English that conveys the message that there is a potential hydrogen sulfide hazard. An example could be * * * "Danger, Possible Hydrogen Sulfide Inhalation Hazard," * * * [to be possibly] supplemented by pictograms.

ATA expressed concerns that:

Not every load of sour crude will form hydrogen sulfide during transportation, which will require carriers to repeatedly affix and remove markings * * * If carriers are required to repeatedly alter marking requirements, issues of employee safety from climbing on top of tank trucks as well as economic issues * * * must be better understood. [We] recommend that the warning be located at the loading or unloading facility rather than on the tank truck or other bulk container.

We agree in part with the comments. We continue to maintain that there is a safety risk to hazmat employees that may become exposed to hydrogen sulfide vapor in proximity to openings on packagings during a loading or unloading operation due to elevated concentrations of hydrogen sulfide vapors. We do not believe this risk is limited to cargo tank motor vehicles. It may be that the primary mode of transportation for petroleum crude oil is by cargo tank motor vehicle, but we also continue to maintain that any proposed requirement should apply to all bulk packagings as we believe this risk may be present in any packaging with a bulk quantity of petroleum crude oil.

PHMSA agrees with commenters who have stated that a hazard warning statement specific to hydrogen sulfide gas on bulk packagings would provide for appropriate communication of the

risk of potential exposure to such gas. PHMSA notes that such a marking is both specific to the gas and aligns with corresponding warnings currently employed in practice on the shipping documentation. Therefore, in this final rule, PHMSA is amending the marking requirement originally proposed to provide more flexibility to shippers and carriers by allowing a text warning such as "Danger, Possible Hydrogen Sulfide Inhalation Hazard" on bulk packagings containing sour crude to communicate the potential inhalation risk in transportation. See Section 172.327 for a discussion of the new marking requirements.

8. IBC Rebottling

In the NPRM, PHMSA proposed to adopt the revised definition of "repair" for composite IBCs consistent with international standards. To specifically address commenters' concerns, PHMSA noted that any proposed compliance date would be no earlier than January 1, 2012, thus providing ample time to comply with the new IBC requirement. We did not receive any additional comments in response to the NPRM. Therefore, in this final rule we are adopting the revised definition of "repair" of an IBC as proposed. See Section 180.350 for a discussion of the revised requirement.

9. Metal Hydride Storage Systems in Conveyances

In the August 2010 NPRM, PHMSA proposed to adopt the standards for the construction, qualification, marking and equalization of hydrogen in metal hydride storage systems adopted in the UN Model Regulations. We did not receive any additional comments in response to the NPRM. Therefore, in this final rule we are adopting the requirements as proposed. See Section 173.311 for a discussion of requirements for hydrogen in a metal hydride storage system.

10. In Vitro Testing for Corrosivity

Based on the overwhelming support for adoption into the HMR, in the NPRM PHMSA proposed to adopt and authorize the use of the OECD *in vitro* methods. We received over 2,200 comments additional to that received from PETA, in response to the NPRM supporting the adoption of *in vitro* testing methods to determine corrosivity and urging PHMSA to stop the requirement for use of methods based on live animal testing. Therefore, in this final rule we are adopting the OECD *in vitro* testing methods as proposed. See Section 173.137 for further discussion of such methods.

B. Harmonization Amendments Not Considered for Adoption in This Final Rule

This final rule makes changes to the HMR based on amendments made in the UN Model Regulations (sixteenth revised edition), IMDG Code (Amendment 35–10) and the ICAO Technical Instructions (2011–2012), which becomes effective January 1, 2011 (the IMDG Code is effective January 1, 2012). We are not, however, adopting all the amendments made to the various international standards into the HMR. In many cases, we have not adopted amendments to the international recommendations and regulations because the framework or structure of the HMR makes adoption unnecessary. In other cases, we have handled, or will be handling, the amendments in separate rulemaking proceedings.

One of the goals of this rulemaking is to continue to maintain consistency between the HMR and the international requirements. We are not striving to make the HMR identical to the international regulations, but rather to remove or avoid potential barriers to international transportation.

Below is a listing of those significant amendments to the international regulations that we are not adopting in this final rule, with a brief explanation of why the amendment was not included:

1. Requirements for Radioactive Materials

In the NPRM, we did not propose to adopt provisions pertaining to the transportation of Class 7 (radioactive) materials into the HMR. Amendments to requirements pertaining to the transportation of Class 7 (radioactive) materials are based on changes contained in the International Atomic Energy Agency (IAEA) publication, "IAEA Safety Standards: Regulations for the Safe Transport of Radioactive Materials." Due to their complexity, these changes are being addressed in a separate rulemaking.

2. Requirements for Lithium Batteries

PHMSA published an NPRM under Docket HM–224F (75 FR 1302, January 11, 2010) that proposed to adopt provisions to ensure all lithium batteries are packaged properly to reduce the possibility of damage to lithium batteries that could lead to a catastrophic incident, and to minimize the consequences of an incident should one occur. In addition, PHMSA proposed to require lithium battery shipments to be accompanied by hazard communication that ensures appropriate

and careful handling by air carrier personnel, including the flight crew, and informs both transport workers and emergency response personnel of actions to be taken in an emergency. The NPRM, which PHMSA developed in close coordination with our colleagues in the Federal Aviation Administration, is the latest in a series of actions PHMSA has taken to address the very serious risks posed by lithium batteries in transportation. The NPRM included proposed revisions to the HMR that were based on lithium battery provisions in the sixteenth revised edition of the UN Model Regulations. Therefore, except for wheelchairs powered by lithium ion batteries, we are not adopting new provisions pertaining to the transportation of lithium cells and batteries in this rulemaking. The docket for the lithium battery rulemaking can be found elsewhere at <http://www.regulations.gov> under PHMSA–2009–0095.

We note that a number of commenters objected to our inclusion of limitations on the stowage of lithium batteries in § 175.75 of the HMR and strongly urged that the limitations be removed from this rulemaking and addressed in a separate lithium battery rulemaking such as HM–224F. We agree. All reference to lithium batteries in our revisions to § 175.75 are removed from this rulemaking.

3. Requirements for Air Packaging

We are not adopting provisions pertaining to certain packagings offered for transportation by aircraft under this rulemaking. PHMSA is considering certain amendments to the HMR related to requirements for the packaging of hazardous materials intended for transportation by aircraft under a separate docket (HM–231A). These would include amendments based on the reformatted packing instructions in the 2011–2012 ICAO Technical Instructions. PHMSA published an ANPRM (73 FR 38361, July 7, 2008) and an NPRM (75 FR 27273, May 14, 2010) related to combination packaging standards offered in air transportation. See <http://www.regulations.gov> under PHMSA–2007–29364 for more information.

IV. Section-by-Section Review

Following is a section-by-section review of the amendments in this final rule:

Part 171

Section 171.7

The “National Technology Transfer and Advancement Act of 1996” directs

agencies to use voluntary consensus standards. According to the Office of Management and Budget (OMB) Circular A–119, “Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities,” government agencies must use voluntary consensus standards wherever practical in the development of regulations. Agency adoption of industry standards promotes productivity and efficiency in government and industry, expands opportunities for international trade, conserves resources, improves health and safety, and protects the environment.

To these ends, PHMSA actively participates in the development and updating of consensus standards through representation on more than 20 consensus standard bodies. PHMSA regularly reviews updated consensus standards and considers their merit for inclusion in the HMR.

Section 171.7 lists all materials incorporated by reference (IBR materials) into the HMR. For this rulemaking, we evaluated updated international consensus standards and regulations 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 materials have a well-established and documented safety history. Their adoption maintains the high safety standard currently achieved under the HMR.

Some commenters (IATA, PRBA, Saft) indicated concern that the fifth revised edition of the UN Recommendations on the Transportation of Dangerous Goods, Manual of Tests and Criteria (UN Manual) was not included among the IBR materials to be updated and suggest that PHMSA include the document.

We agree. PHMSA proposed to incorporate by reference the fifth revised edition of the UN Manual under docket HM–224F published January 11, 2010 (75 FR 1302) because the revised version of the manual contained updated tests for lithium cells and batteries. However, that rulemaking will have an effective date later than this final rule. This rule contains provisions regarding new test requirements for other materials (e.g., explosives) that are found in the updated edition of the UN Manual making it necessary for us to incorporate by reference the fifth edition. Therefore, we are including the

updated fifth revised edition of the UN Manual and updating the IBR materials referenced in the HMR by adding and revising material under the following organizations:

- The *American Society for Testing and Materials (ASTM)*
 - ASTM D56–05, Standard Test Method for Flash Point by Tag Closed Tester (Referenced in § 173.120(c)(1)(i)(A); Added to § 171.7).
 - ASTM D86–07a, Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure (Referenced in § 173.121; Added to § 171.7).
 - ASTM D93–08, Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester (Referenced in § 173.120(c)(1)(ii)(A); Added to § 171.7).
 - ASTM D1078–05, Standard Test Method for Distillation Range of Volatile Organic Liquids (Referenced in § 173.121; Added to § 171.7).
 - ASTM D3278–96(2004)e1, Standard Test Methods for Flash Point of Liquids by Small Scale Closed-Cup Apparatus (Referenced in §§ 173.120(c)(1)(i)(B) and 173.120(c)(1)(ii)(B); Added to § 171.7).
 - ASTM D3828–07a, Standard Test Methods for Flash Point by Small Scale Closed cup Tester (Referenced in § 173.120(c)(1)(i)(C); Added to § 171.7).
- The *International Civil Aviation Organization (ICAO)* Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO Technical Instructions), 2009–2010 Edition is revised to incorporate 2011–2012 Edition.
 - The *International Convention for the Safety of Life at Sea, 1974, as amended (SOLAS)* Amendments 2002, Chapter II–2/Regulation 19, Consolidated Edition 2004 is revised to incorporate the 2009 Edition.
 - The *International Maritime Organization (IMO)* International Maritime Dangerous Goods Code, 2008 Edition, Incorporating Amendment 34–08, English Edition, Volumes 1 and 2 is revised to incorporate Amendment 35–10.
 - The *International Organization for Standardization (ISO)*
 - ISO 1516:2002(E), Determination of flash/no flash—Closed cup equilibrium method (Referenced in § 173.120; Added to § 171.7).
 - ISO 1523:2002(E), Determination of flash point—Closed cup equilibrium method (Referenced in § 173.120; Added to § 171.7).
 - ISO 2592:1973(E), Petroleum products—Determination of flash and fire points—Cleveland open cup method (Revised to incorporate the 2000 Edition).

○ ISO 2719:2002(E), Determination of flash point—Pensky-Martens closed cup method (Referenced in § 173.120; Added to § 171.7).

○ ISO 3405:2000(E), Petroleum products—Determination of distillation characteristics at atmospheric pressure (Referenced in § 173.121; Added to § 171.7).

○ ISO 3679:2004(E), Determination of flash point—Rapid equilibrium closed cup method (Referenced in § 173.120; Added to § 171.7).

○ ISO 3680:2004(E), Determination of flash/no flash—Rapid equilibrium closed cup method (Referenced in § 173.120; Added to § 171.7).

○ ISO 3924:1999(E), Petroleum products—Determination of boiling range distribution—Gas chromatography method (Referenced in § 173.121; Added to § 171.7).

○ ISO 4626:1980(E), Volatile organic liquids—Determination of boiling range of organic solvents used as raw materials (Referenced in § 173.121; Added to § 171.7).

○ ISO 4706:2008(E), Gas cylinders—Refillable welded steel cylinders—Test pressure 60 bar and below (Referenced in § 178.71; Added to § 171.7).

○ ISO 10297:1999, Gas cylinders—Refillable gas cylinder valves—Specification and type testing, First edition, May 1999, (E) (Revised to incorporate 2006 Edition).

○ ISO 10461:2005, Gas cylinders—Seamless aluminum-alloy gas cylinders, Periodic inspection and testing, Second edition, February 2005, (E) (Revised to incorporate Amendment 1 (2006)).

○ 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 (Referenced in § 173.40; Added to § 171.7).

○ ISO 13736:2008(E), Determination of flash point—Abel closed-cup method (Referenced in § 173.120; Added to § 171.7).

○ ISO 16111:2008(E), Transportable gas storage devices—Hydrogen absorbed in reversible metal hydride (Referenced in §§ 173.311 and 178.71; Added to § 171.7).

○ ISO 18172-1:2007(E), Gas cylinders—Refillable welded stainless steel cylinders—Part 1: Test pressure 6 MPa and below (Referenced in § 178.71; Added to § 171.7).

○ ISO 20703:2006(E), Gas cylinders—Refillable welded aluminum-alloy cylinders—Design, construction and testing (Referenced in § 178.71; Added to § 171.7).

• *Organization for Economic Cooperation and Development (OECD)*

○ Guidelines for the Testing of Chemicals, Test Guideline 404, Acute Dermal Irritation/Corrosion (1992) (Revised to incorporate 2002 edition).

○ Guidelines for the Testing of Chemicals, Test Guideline 430, *In Vitro* Skin Corrosion: Transcutaneous Electrical Resistance Test (TER) (2004) (Referenced in § 173.137; Added to § 171.7).

○ Guidelines for the Testing of Chemicals, Test Guideline 431, *In Vitro* Skin Corrosion: Human Skin Model Test (2004) (Referenced in § 173.137; Added to § 171.7).

○ Guidelines for the Testing of Chemicals, Test Guideline 435, *In Vitro* Membrane Barrier Test Method for Skin Corrosion (2006) (Referenced in § 173.137; Added to § 171.7).

• *Transport Canada*, Transportation of Dangerous Goods Regulations, including Clear Language Amendments 1 through 5 (Revised to add SOR/2008-34 (Amendment 6; February 7, 2008) in its entirety and SOR/2007-179 (Amendment 7; July 31, 2007)).

• *The United Nations Recommendations on the Transport of Dangerous Goods, Model Regulations*, fifteenth revised edition (2007), Volumes I and II (Revised to incorporate the sixteenth revised edition).

• *The United Nations Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria*, fourth revised edition, (2003), and Addendum 2 (2004). (Revised to incorporate the fifth revised edition).

Section 171.8

This section defines terms generally used throughout the HMR that have broad or multi-modal applicability. We received no comments regarding our proposed adoption of new definitions. Therefore, in this final rule PHMSA is adding the following defined terms based on their adoption in the UN Model Regulations:

Metal hydride storage system. This term means a single complete hydrogen storage system that includes a receptacle, metal hydride, pressure relief device, shut-off valve, service equipment and internal components used for the transportation of hydrogen only.

Open cryogenic receptacle. This term means a transportable thermally insulated receptacle for refrigerated liquefied gases maintained at atmospheric pressure by continuous venting of the refrigerated gas.

Additionally, we proposed to revise the definition of *Oxidizing gas* to specify that an oxidizing gas is a pure gas or gas mixture with an oxidizing power greater than 23.5% as determined

by a method specified in ISO 10156:1996 or 10156-2:2005. See also Sections 172.101 and 173.115, for discussion of changes to the “Compressed gas, n.o.s., UN1956.” HMT entry and definition, respectively. We received no comments on the revised definition. Therefore, in this final rule we are adopting the revision as proposed.

Section 171.23

Section 171.23 prescribes the conditional requirements for specific materials and packages transported under the various international standards as permitted by the HMR. In this final rule we are removing the § 171.23(b)(9) requirement that stipulates Division 6.1 poisonous materials transported as limited quantities are not excepted from labeling. This change aligns the labeling requirements in the HMR for limited quantities with the international standards without compromising safety.

Section 171.25

Section 171.25 prescribes the additional requirements for specific materials and packages transported under the IMDG Code as permitted by the HMR. In this final rule, we are deleting paragraphs (c)(5) and (d)(3). Paragraphs (c)(5) and (d)(3) required portable tanks, cargo tanks, and tank cars containing cryogenic liquids transported by vessel to be stowed on deck regardless of the stowage requirements authorized under the IMDG Code. The IMDG Code now requires this same stowage for certain packagings containing cryogenic materials aboard a vessel, thus, paragraphs (c)(5) and (d)(3) are no longer necessary.

Effective January 1, 1997, vehicles and mechanical equipment containing internal combustion engines were no longer subject to the IMDG Code as conditionally designated under Amendment 28-96. Effective January 1, 2012, such articles will once again be subject to the IMDG Code under Amendment 35-10. Because the new requirements in the IMDG Code are more stringent than requirements for similar material in the HMR, PHMSA is amending § 171.25 by revising paragraph (b)(1) and adding a new paragraph (b)(4) permitting use of the IMDG Code or the HMR to prepare and stow vehicles and mechanical equipment containing internal combustion engines when offered for transport by vessel.

Part 172

Section 172.101

Introductory text to the § 172.101 HMT contains explanatory text for each of the columns that comprise the HMT. Currently, § 172.101(c)(10) provides specific requirements regarding the selection of an appropriate proper shipping name for mixtures and solutions containing more than one hazardous material of the same hazard class. In many cases, such mixtures and solutions are best described by a generic or “not otherwise specified” entry (*i.e.*, an “n.o.s.” entry). For example, a solution containing two or more flammable liquid constituents may best be described under the entry “Flammable liquids, n.o.s., UN1993.” However, in some cases where two or more hazardous materials are present, a single hazardous material may predominate where the other hazardous materials may be present in only trace amounts. In such cases, a description applicable to the predominant material may be more appropriate. A recent incident underscores the importance of using the most specific and appropriate shipping description. In that incident, an aluminum cylinder containing 99.9% pure ethyl chloride ruptured in storage incidental to transport. It was determined that the root cause was a reaction between the cylinder’s contents and the aluminum. The relevant construction standard for the cylinder indicated that ethyl chloride was reactive with aluminum and that aluminum was not recommended for the transport of ethyl chloride. However, the shipper selected a generic compressed gas shipping description rather than the ethyl chloride name due to the presence of trace amounts of other hazardous materials. While we note that the general requirements for packagings still broadly address the responsibility of the shipper in selecting a packaging that is compatible with its lading, and that these requirements were also applicable and apparently overlooked, the incident nonetheless highlights the benefit of using a more specific description, where appropriate, to help ensure that the most appropriate transport provisions are followed.

To address this issue, the UN Model Regulations were amended to require, except as otherwise specified, that a mixture or solution of a single predominant hazardous material containing only traces of one or more additional hazardous materials listed by name in the HMT or additional non-

hazardous constituents be assigned the UN number and proper shipping name of the predominant material contributing to the overall hazard classification of the mixture or solution. Adopting a similar provision in the HMR will enhance a shipper’s ability to select the most appropriate shipping description. In the NPRM, PHMSA proposed to add a new paragraph, § 172.101(c)(10)(iv), outlining the authorization to describe the mixture or solution based on the predominant material contributing to the hazard classification.

One commenter (DOE) suggested that we remove the reference to non-hazardous material in § 172.101(c)(10)(iv) because the mixture of hazardous material and non-hazardous material is already addressed in § 172.101(c)(10)(i). Additionally, the commenter asked for clarification of instances when the provision should be used and asked to define the meaning of “trace amounts.”

We agree. It is correct that § 172.101(c)(10)(i) already addresses a mixture or solution of a hazardous material and non-hazardous material. The provision pertains to a mixture or solution containing non-hazardous material in such quantities that it does not alter the physical state or purity of the hazardous material it is mixed with, as well as either the hazard classification, packing group, subsidiary hazard, or emergency response procedures. The intent of new paragraph § 172.101(c)(10)(iv) is to provide instruction for selecting the most appropriate proper shipping name for a mixture or solution of a hazardous material and traces of one or more other hazardous materials, one or more non-hazardous materials, or both. Where such a mixture or solution occurs that the trace amount of material does not affect the classification, the material must be described using the most appropriate proper shipping name for the predominant hazardous material. Based on the comment received and reconsideration of our proposal, we are instead revising paragraph (c)(10)(i) to provide clarification on properly describing a material that is a mixture or solution of a predominant hazardous material and trace amounts of hazardous or non-hazardous material, or both; rather than add a new paragraph (c)(10)(iv). The six conditions in § 172.101(c)(10)(i) that currently limit a mixture or solution of hazardous material with a non-hazardous material from being described using the proper

shipping name of the hazardous material would also apply to a mixture or solution of a single predominant hazardous material and trace amounts of other hazardous or non-hazardous materials or both.

With regard to instances when the provision would be used, we would expect it to be applied in cases of mixtures or solutions of a hazardous material that contain small amounts of preservatives or are contaminated with trace amounts of hazardous material in such a way that the “trace amounts” do not affect the packaging, the hazard class, the packing group, *etc* of the hazardous material. As for defining “trace amounts” we do not specifically define this term because determination of when an amount of material affects the hazard classification is highly variable depending on the physical and chemical properties of the materials involved and the quantities of material involved. Therefore, in this final rule, we are revising § 172.101(c)(10)(i) to provide instruction on properly describing a material that is a mixture or solution of a predominant hazardous material and trace amounts of hazardous or non-hazardous material, or both.

Paragraph (e) of § 172.101 provides explanations for the letters that precede identification numbers assigned to proper shipping names in the HMT. In this final rule, PHMSA is adding an explanation for identification numbers associated with certain descriptions under the ICAO Technical Instructions and are preceded by the letters “ID.” Additionally, PHMSA is authorizing use of the international air description, “ID8000, Consumer commodity, 9” in the HMT with material and article eligibility for use of the description based on Special provision A112 and Packing Instruction Y963 of the 2011–2012 ICAO Technical Instructions.

Hazardous Materials Table (HMT)

In this final rule, PHMSA is making various amendments to 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

UN3482	Alkali metal dispersions, flammable <i>or</i> Alkaline earth metal dispersions, flammable.
UN3496	Batteries, nickel-metal hydride.

This new HMT entry for UN3496 includes a W in Column (1) to indicate use of this hazardous materials description is limited to vessel transport of these materials.

Two commenters (Saft, PRBA) indicated concern with our proposed assignment of Special Provision 130 (for transportation of dry batteries—*i.e.*, “Batteries, dry, sealed, n.o.s.”) to this

entry and the potential for confusion leading to use of this entry for modes other than vessel.

We agree. To help clarify the use of this entry, we have included additional language in Column (2) to refer shippers transporting nickel-metal hydride batteries by modes other than vessel to the HMT entry “Batteries, dry, sealed, n.o.s.” for instruction on the transport

requirements for nickel-metal hydride batteries. Additionally, we have revised Special Provision 130 to make clear that for other than nickel-metal hydride batteries transported by vessel subject to Special Provision 340, dry batteries must be transported in accordance with Special Provision 130.

UN3485	Calcium hypochlorite, dry, corrosive <i>or</i> Calcium hypochlorite mixtures, dry, corrosive <i>with more than 39% available chlorine (8.8% available oxygen).</i>
UN3487	Calcium hypochlorite, hydrated, corrosive <i>or</i> Calcium hypochlorite, hydrated mixture, corrosive <i>with not less than 5.5% but not more than 16% water.</i>
UN3486	Calcium hypochlorite mixture, dry, corrosive <i>with more than 10% but not more than 39% available chlorine.</i>
ID8000	Consumer commodity.

This shipping description is added to the HMT as a Class 9 miscellaneous hazardous material to be used for the air transportation of limited quantities of certain hazardous materials of Class 2

(non-toxic aerosols only), Class 3 (PG II and III only), Division 6.1 (PG III only), and of UN identification numbers UN3077, UN3082, and UN3175, provided such materials do not have a

subsidiary risk and are authorized aboard a passenger-carrying aircraft. This amendment is based on changes incorporated into the 2011–2012 ICAO TI.

UN3484	Hydrazine aqueous solution, flammable <i>with more than 37% hydrazine, by mass.</i> Iodine.
UN3495	

Iodine is transported globally under a number of different shipping descriptions dependent on the shipper. In the interest of reducing risks associated with transport of iodine

under various descriptions and therefore, various packaging, we are adding this unique UN identification number and shipping description to provide for specific packaging

requirements and faster identification and access to emergency response information.

UN1471	Lithium hypochlorite, dry <i>or</i> Lithium hypochlorite mixture, Division 5.1, PG III.
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Lithium hypochlorite is a common commercial product used as a disinfectant that is often mixed with other non-hazardous organic salts. Currently, the HMT only provides for a Division 5.1, PG II designation for this material, yet testing conducted in accordance with the UN Manual of Tests and Criteria has indicated that some common commercial mixtures meet the criteria for classification in Division 5.1, PG III. Therefore, PHMSA is adding a line to the current entry to allow for classification of lithium hypochlorite and mixtures of lithium hypochlorite in PG III, where appropriate.

One commenter (FMC) noted that the addition of the proposed PG III entry for the “Lithium hypochlorite, UN1471” shipping description retains the italicized text “with more than 39% available chlorine (8.8% available oxygen)” as well as the word “dry” for lithium hypochlorite mixtures and that

this is not consistent with the hazardous materials description in the dangerous goods list in the UN Model Regulations, the ICAO Technical Instructions, and the soon to be adopted IMDG Code. FMC requested that PHMSA revise the entry by deleting the qualifying text as well as the word “dry” to be consistent with international standards and regulations and to provide shippers with the most appropriate shipping description for the transport of lithium hypochlorite materials. Additionally, FMC stated:

[M]ore fundamental and practical problems will arise if this qualifying text is retained in the HMR entry for UN1471. Some of the commercial lithium hypochlorite products shipped domestically and internationally by FMC have less than 39% available chlorine (8.8% available oxygen), and so would not be properly described by the entry as it is proposed to be modified. [T]hese products nevertheless meet the criteria for classification in Division 5.1, Packing Group II or III. Consequently, under the HMR, FMC

must describe these products by an appropriate entry in the HMT associated with the correct class and packing group, namely “Hypochlorites, inorganic, n.o.s.” (UN3212) if the product meets Packing Group II criteria, or, since UN3212 does not provide a Packing Group III option, “Oxidizing solid, n.o.s.” (UN1479) if the product meets the criteria for assignment to Packing Group III. Thus, for road and rail transport within the United States FMC’s lithium hypochlorite products would have to be described by one of three different entries.

We agree. Removing the italicized text would facilitate a uniform process of describing lithium hypochlorite materials for transport purposes without reducing the safety of transport when using this description in lieu the descriptions discussed in the comment by FMC. Additionally, we are making a conforming amendment (with the IMDG Code) to the PG II entry for UN1471 to assign special provisions T3 and TP33 applicable to a portable tank when used to transport this material. T3 outlines

the minimum test pressure, minimum shell thickness, bottom opening requirements, and pressure relief requirements in addition to the design and constructions requirements for the portable tank. TP33 outlines provisions

for transport of granular or powdered solids. Therefore, in this final rule, we are adopting the PG III entry for “Lithium hypochlorite, UN1471” without the italicized text and the word “dry,” as well as making a conforming

revision to the shipping description for the PG II entry already in the HMT to read, “Lithium hypochlorite, dry or Lithium hypochlorite mixtures, UN1471.”

UN3483	Motor fuel anti-knock mixture, flammable.
UN3494	Petroleum sour crude oil, flammable, toxic (this entry is identified in the HMT as appropriate for international transportation under § 172.101(b)(5)).
UN3492	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 LC ₅₀ .
UN3493	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 LC ₅₀ .
UN3488	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 LC ₅₀ .
UN3489	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 LC ₅₀ .
UN3490	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 LC ₅₀ .
UN3491	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 LC ₅₀ .

Based on a recommendation by a commenter (PPG), we note that two new entries for toxic-by-inhalation (TIH) material (i.e., UN3492 and UN3493) added in the sixteenth revised edition of the UN Model Regulations and in this final rule will likely be removed from the dangerous goods table in the seventeenth revised edition of the UN Model Regulations. Shippers who choose to use these new descriptions on shipping papers and markings on boxes may incur additional costs when having to change the material descriptions again should the descriptions be removed from the UN Model Regulations and subsequently, the HMR.

Additionally, because of the addition of generic TIH descriptions for toxic, flammable, corrosive material (i.e., UN 3488, UN3499), PPG believes the domestic entries for “sec-Butyl chloroformate, NA2742” and “Isobutyl chloroformate, NA2742” are obsolete and recommended that these materials be described using the generic TIH descriptions for consistent hazard communication of these materials between modes of transportation.

We agree. Therefore, in this final rule, as a conforming amendment to the addition of the generic TIH entries, we are deleting the domestic use entries “sec-Butyl chloroformate, NA2742” and

“Isobutyl chloroformate, NA2742” from the HMT.

Amendments to the Column (1) Symbols

The entries “Elevated temperature liquid, flammable, n.o.s., with flash point above 37.8 °C, at or above its flash point, UN3256,” “Elevated temperature liquid, n.o.s., at or above 100 °C and below its flash point (including molten metals, molten salts, etc.), UN3257,” and “Elevated temperature solid, n.o.s., at or above 240 °C, UN3258” are revised by adding the symbol G. The symbol G identifies proper shipping names for which a technical name of the hazardous material is required in parentheses in association with the basic description. Requiring the technical name(s) for certain elevated temperatures materials will help emergency responders in selecting the proper materials for extinguishing a fire involving these hazardous materials and will aid in estimating the temperature properties of the materials (e.g., the melting point).

The entries “Metal catalyst, dry, UN2881” and “Metal catalyst, wetted with a visible excess of liquid, UN1378” are revised by adding the symbol G. The symbol G identifies proper shipping names for which a technical name of the hazardous material is required in parentheses in association with the

basic description. Requiring the technical name(s) for metal catalysts will aid emergency responders in selecting the proper fire suppressant (e.g., CO₂) if the hazardous material is involved in a fire or in identifying other materials the metal catalyst could react with.

The entry “Powder, smokeless, UN0509,” is revised by deleting the symbol D. The symbol D identifies a proper shipping name for domestic use only. This entry has been adopted into the UN Model Regulations, the ICAO TI, and the IMDG Code. This deletion is consistent with our final rule published under Docket HM–215J (74 FR 2200, January 14, 2009) in which we indicated our intent to remove the symbol D in a future rulemaking upon adoption of the entry into international regulations.

For the following Division 5.1 (oxidizer) materials and Division 6.1 (toxic) materials, the entries are revised by adding the symbol G. 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. Knowledge of the technical name of toxic materials may aid emergency responders with implementing more appropriate first aid measures:

UN3141	Antimony compounds, inorganic, liquid, n.o.s.
UN1549	Antimony compounds, inorganic, solid, n.o.s.
UN1556	Arsenic compounds, liquid, n.o.s. <i>inorganic, including arsenates, n.o.s.; arsenites, n.o.s.; arsenic sulfides, n.o.s.; and organic compounds of arsenic, n.o.s.</i>
UN1557	Arsenic compounds, solid, n.o.s. <i>inorganic, including arsenates, n.o.s.; arsenites, n.o.s.; arsenic sulfides, n.o.s.; and organic compounds of arsenic, n.o.s.</i>
UN1564	Barium compounds, n.o.s.
UN1566	Beryllium compounds, n.o.s.
UN3213	Bromates, inorganic, aqueous solution, n.o.s.
UN1450	Bromates, inorganic, n.o.s.

UN2570	.....	Cadmium compounds.
UN3210	.....	Chlorates, inorganic, aqueous solution, n.o.s.
UN1461	.....	Chlorates, inorganic, n.o.s.
UN1462	.....	Chlorites, inorganic, n.o.s.
UN1583	.....	Chloropicrin mixtures, n.o.s.
UN3362	.....	Chlorosilanes, toxic, corrosive, flammable, n.o.s.
UN3361	.....	Chlorosilanes, toxic, corrosive, n.o.s.
UN1935	.....	Cyanide solutions, n.o.s.
UN2856	.....	Fluorosilicates, n.o.s.
UN3212	.....	Hypochlorites, inorganic, n.o.s.
UN2291	.....	Lead compounds, soluble, n.o.s.
UN2024	.....	Mercury compounds, liquid, n.o.s.
UN2025	.....	Mercury compounds, solid, n.o.s.
UN3144	.....	Nicotine compounds, liquid, n.o.s. or Nicotine preparations, liquid, n.o.s.
UN1665	.....	Nicotine compounds, solid, n.o.s. or Nicotine preparations, solid, n.o.s.
UN3219	.....	Nitrites, inorganic, aqueous solution, n.o.s.
UN2627	.....	Nitrites, inorganic, n.o.s.
UN3214	.....	Permanganates, inorganic, aqueous solution, n.o.s.
UN1482	.....	Permanganates, inorganic, n.o.s.
UN2026	.....	Phenylmercuric compounds, n.o.s.
UN2630	.....	Selenates or Selenites.
UN3440	.....	Selenium compound, liquid, n.o.s.
UN3283	.....	Selenium compound, solid, n.o.s.
UN3284	.....	Tellurium compound, solid, n.o.s.
UN3285	.....	Vanadium compound, solid, n.o.s.

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

The proper shipping name for the entry “Detonator, assemblies, non-electric, for blasting, UN0500,” is revised by removing the comma after “Detonator” to read “Detonator assemblies, non-electric, for blasting.” This revision appears as a “Remove/Add” in this rulemaking.

The proper shipping name for the entry “Engines, internal combustion, flammable gas powered, UN3166,” is revised to read “Engines, internal combustion or Engines, fuel cell, flammable gas powered.” This revision appears as a “Remove/Add” in this rulemaking.

One commenter (IATA) suggests that we revise this proper shipping name to the singular “engine” in alignment with use of the singular form for the entries in the UN Model Regulations. We disagree. As indicated by the commenter, § 172.101(c)(1) authorizes use of proper shipping names in the singular or plural form. Therefore, we believe it is not necessary to revise the proper shipping name to the singular “engine” when the shipper is authorized to modify the proper shipping name between singular and plural forms.

The proper shipping name for the entry “Engines, internal combustion, flammable liquid powered, UN3166,” is revised to read “Engines, internal combustion or Engines, fuel cell, flammable liquid powered.” This revision appears as a “Remove/Add” in this rulemaking.

One commenter (IATA) suggests that we revise this proper shipping name to

the singular “engine” in alignment with use of the singular form for the entries in the UN Model Regulations. We disagree. As indicated by the commenter, § 172.101(c)(1) authorizes use of proper shipping names in the singular or plural form. Therefore, we believe it is not necessary to revise the proper shipping name to the singular “engine.”

The proper shipping names “Formaldehyde, solutions, flammable, UN1198” and “Formaldehyde, solutions, with not less than 25 percent formaldehyde, UN2209” are revised to remove an errant comma between the words “Formaldehyde” and “solutions.” This revision appears as a “Remove/Add” in this rulemaking.

The proper shipping name for the entry “1-Hydroxybenzotriazole, anhydrous, wetted with not less than 20 percent water, by mass, UN3474” is revised to read “1-Hydroxybenzotriazole, monohydrate.” This revision appears as a “Remove/Add” in this rulemaking.

The proper shipping name for the PG II entry for Lithium hypochlorite, dry with more than 39% available chlorine (8.8% available oxygen) or Lithium hypochlorite mixture, dry with more than 39% available chlorine (8.8% available oxygen), UN1471” is revised to read “Lithium hypochlorite, dry or Lithium hypochlorite mixture” to conform with the addition of the new PG III entry and international use of this proper shipping name. This revision appears as a “Remove/Add” in this rulemaking.

The proper shipping name for the entry “Nitric acid other than red fuming, with less than 65 percent nitric acid,

UN2031” is revised to read “Nitric acid other than red fuming, with more than 20 percent and less than 65 percent nitric acid, UN2031.” The proper shipping name for the Packing Group I entry “Nitric acid other than red fuming, with more than 70 percent nitric acid, UN2031” is added to the HMT. In a final rule published on January 14, 2009 (HM–215J; 74 FR 2200), errors were made to both nitric acid entries and in this final rule, PHMSA aligns them correctly in accordance with the various international standards. Additionally, we are removing the outdated Packing Group II entry “Nitric acid other than red fuming, with not more than 70 percent nitric acid, UN2031” that should have been removed from the HMT in the same final rule.

The proper shipping name for the entry “Tars, liquid including road asphalt and oils, bitumen and cut backs, UN1999” is revised to read “Tars, liquid including road oils and cutback bitumens.” The entries in the HMT applicable to transport of bitumen may cause confusion with respect to the proper classification of the material. The entries include “Combustible liquid, n.o.s., NA1993, combustible liquid” and “Tars, liquid including road asphalt and oils, bitumen and cut backs, UN1999, 3,” and the entries “Elevated temperature liquid, flammable, n.o.s., UN3256, 3” and “Elevated temperature liquid, n.o.s., UN3257, 9,” when the material is heated and offered for transport. Bitumen is a hydrocarbon material derived from crude oil having a flashpoint of 160 °C or greater. Bitumens typically do not meet the classification for a Class 3 flammable

liquid except for cutback bitumens which are blended with a flammable material such as kerosene. Also, road asphalt is bitumen mixed with sand and fillers which also does not meet the classification for a Class 3 flammable liquid. Therefore, we are revising the proper shipping name “Tars, liquid including road asphalt and oils, bitumen and cut backs” by removing reference to asphalt and clarifying applicability to cutback bitumens to read “Tars, liquid including road oils and cutback bitumens.” This revision appears as a “Remove/Add” in this rulemaking.

The proper shipping name for the entry “Trinitro-meta-cresol, UN0216” is revised to read “Trinitro-m-cresol.” This revision appears as a “Remove/Add” in this rulemaking.

The proper shipping name for the entry “Vehicle, flammable gas powered, UN3166,” is revised to read “Vehicle, flammable gas powered or Vehicle, fuel cell, flammable gas powered.” This revision appears as a “Remove/Add” in this rulemaking.

The proper shipping name for the entry “Vehicle, flammable liquid powered, UN3166,” is revised to read “Vehicle, flammable liquid powered or Vehicle, fuel cell, flammable liquid powered.” This revision appears as a “Remove/Add” in this rulemaking.

Amendments to the Column (3) Hazard Class or Division

PHMSA is revising the classification of a number of entries to Division 6.1 poisonous primary hazards for consistency with the adoption of classification changes into the sixteenth

revised edition of the UN Model Regulations. The changes are based on data provided from a thorough review of literature on toxic-by-inhalation materials. The review of literature is provided in Informal Document UN/SCETDG/33/INF.8 submitted to the 33rd session of the UN Sub-Committee of Experts on the Transport of Dangerous Goods which is available at <http://www.unece.org/trans/main/dgdb/dgsubc/c3inf33.html>.

For the entry “Tetranitromethane, UN1510,” the Class 5 (oxidizer) material’s primary hazard is revised to a Division 6.1 (poisonous) material primary hazard.

For the following Class 3 (flammable liquid) materials, the Class 3 primary hazard is revised to a Division 6.1 (poisonous) material primary hazard.

UN2481	Ethyl isocyanate.
UN2486	Isobutyl isocyanate.
UN2483	Isopropyl isocyanate.
UN3079	Methacrylonitrile, stabilized.
UN2605	Methoxymethyl isocyanate.

For the following Class 8 (corrosive) materials, the Class 8 primary hazard is revised to a Division 6.1 (poisonous) material primary hazard.

UN1810	Phosphorous oxychloride.
UN1834	Sulfur chloride.
UN1838	Titanium tetrachloride.

Amendments to the Column (5) Packing Group (PG)

The entry “Carbon dioxide, solid or Dry ice, UN1845” is revised by deleting the PG III designation. In general, the PG assigned to a material identifies the degree of hazard the material represents

and determines the performance level of the packaging required for the material. For example, a PG II material (*i.e.*, a moderate hazard material) is considered more hazardous and requires more stringent packaging than a PG III material (*i.e.*, a low hazard material). Dry ice presents minimal risk during

transport except where concentrations may build up in a confined space. Therefore, in this final rule, PHMSA is deleting the PG III designation from the entry.

For the following Division 6.1 poisonous materials, the PG is revised to read PG I.

UN2668	Chloroacetonitrile.
UN1810	Phosphorous oxychloride.
UN2474	Thiophosgene.
UN1838	Titanium tetrachloride.

PHMSA is making this revision to the PG assignment for these entries for consistency with the adoption of changes into the sixteenth revised edition of the UN Model Regulations. The changes are based on data provided from a thorough review of literature on toxic-by-inhalation materials. The review of literature is provided in Informal Document UN/SCETDG/33/INF.8 submitted to the 33rd session of

the UN Sub-Committee of Experts on the Transport of Dangerous Goods which is available at <http://www.unece.org/trans/main/dgdb/dgsubc/c3inf33.html>.

Amendments to the Column (6) Label(s)

For the following hazardous material entries, PHMSA is revising the label requirements for consistency with changes made to the classification of

these materials under amendments to Column (3) (*see above*). The Class 3 (flammable liquid), Class 8 (corrosive), or Division 5.1 (oxidizer) primary hazard labels, as appropriate, and the Division 6.1 (poisonous) subsidiary hazard label are revised to a Division 6.1 (poisonous) material primary hazard label and Class 3, Class 8, or Division 5.1 subsidiary hazard label to read “6.1, 3,” “6.1, 8,” or “6.1, 5.1,” as appropriate.

UN2481	Ethyl isocyanate.
UN2486	Isobutyl isocyanate.
UN2483	Isopropyl isocyanate.
UN3079	Methacrylonitrile, stabilized.

UN2605	Methoxymethyl isocyanate.
UN1810	Phosphorous oxychloride.
UN1834	Sulfur chloride.
UN1838	Titanium tetrachloride.

The entry “Chlorosilanes, toxic, corrosive, flammable, n.o.s., UN3362” is revised by correctly ordering the sequence of labeling hazards to reflect the proper shipping name to read “6.1, 8, 3.”

Amendments to the Column (7) Special Provisions

The entry “Chloropicrin, UN1580” is revised by replacing the portable tank instruction T Code T14 with T22. The UN Committee of Experts on the Transport of Dangerous Goods revised the T Code assignment for a number of Division 6.1 (toxic-by-inhalation) materials from T14 to T22. Assigning T22 requires a higher pressure for the periodic hydrostatic test (6 bar to 10 bar) and a thicker minimum shell thickness (6 mm to 10 mm). Therefore, for consistency with revisions made to the T Code assignments under the sixteenth revised edition of the UN Model Regulations, we are revising the T Code to read T22.

The entry “Compressed gas, n.o.s., UN1956” is revised by deleting special provision 77 which authorizes the use of this entry for mixtures of gases with less than 23.5% oxygen when no other oxidizing gases are present. Because we are modifying the definition of oxidizing gas in § 171.8 of the HMR to indicate that “a gas which may, by providing oxygen, cause or contribute to the combustion of other material more than air does means pure gases or gas mixtures with an oxidizing power greater than 23.5% oxygen” and because the entry “Compressed gas, oxidizing, n.o.s., UN3156” is currently available in the HMT, the special provision is redundant and no longer necessary.

The entry “Environmentally hazardous substance, solid, UN3077” is revised by adding new special provision A112 authorizing the transportation of certain IBCs containing this material up to a maximum net quantity of 1,000 kg by passenger or cargo-only aircraft.

The entry “Ethylene oxide or Ethylene oxide with nitrogen up to a total pressure of 1 MPa (10 bar) at 50 degrees C, UN1040 is revised by deleting special provision A59 and adding new special provision 342. The provisions in A59 applied only to air transport but they now apply to all modes under new

Special provision 342. See Section 172.102 special provisions for a discussion of new special provision 342.

The entry “1-Hydroxybenzotriazole, monohydrate, UN3474” is revised by deleting special provision 162. Special provision 162 requires that for the material to be transported as a Division 4.1 desensitized material, it must be transported in such a manner that at no time during the course of transportation does the percentage concentration of water fall below 20%. Anhydrous hydroxybenzotriazole rapidly converts to the monohydrate form in the presence of water, that is, the thermally stable form of the substance. Additionally, tests have indicated that the monohydrate maintains its water content under temperature conditions encountered in storage and transport over extended periods of time. This conforms to the intent of the provisions specified in special provision 162 and therefore, we are deleting special provision 162 from the entry.

The entry “Motor fuel anti-knock mixtures, UN1649” is revised by deleting special provision 151. Special provision 151 requires that if this material also meets the definition of a Class 3 (flammable) liquid under § 173.120 of the HMR, a FLAMMABLE LIQUID label is required and the basic description on the shipping paper must indicate the Class 3 subsidiary hazard. However, because of the addition of the new entry “Motor fuel anti-knock mixtures, flammable, UN3483” which indicates a Class 3 subsidiary hazard, we believe it is no longer necessary to assign special provision 151 to this entry.

The entry “Nitrogen, refrigerated liquid cryogenic liquid, UN1977” is revised by adding new special provisions 345 and 346. See Section 172.102 special provisions for a discussion of new special provisions 345 and 346.

The entry “Oxygen, compressed, UN1072” is revised by adding special provision 110 authorizing an actuating cartridge (e.g., power device cartridges of Division 1.4, compatibility groups C and S) to be installed on a cylinder containing oxygen without changing the classification of Division 2.2. See Section 172.102 special provisions for a

discussion of our revision to special provision 110.

The entry “Pentaerythrite tetranitrate or Pentaerythritol tetranitrate or PETN, with not less than 7 percent wax by mass, 0411)” is revised by assigning special provision 120 to the entry. A final rule published in the **Federal Register** under Docket HM-215B (62 FR 24689, May 6, 1997), added special provision 120 to § 172.102(c)(1) of the HMR and assigned it to one of the phlegmatized HMT entries for PETN (UN0411). In this final rule, PHMSA is reassigning special provision 120 to UN0411 in Column (7) of the HMT because it never appeared in the subsequent printing of the HMR but the requirement remains valid.

The entry “Petroleum crude oil, UN1267” is revised by adding new special provision 357 instructing a shipper, if applicable, to use the entry “Petroleum sour crude oil, flammable, toxic, UN3494” for petroleum crude oil containing hydrogen sulfide in sufficient concentration that vapors evolved from the crude oil can present an inhalation hazard when this material is offered for transportation internationally. See Section 172.102 Special provisions for a discussion of special provision 357.

The entry “Zinc ammonium nitrate, UN1512” is revised by deleting special provision IP2 which requires IBCs other than metal or rigid plastic IBCs to be offered for transportation in a closed freight container or a closed transport vehicle.

The following Division 1.4, Compatibility Group S (1.4S) explosive article entries in the HMT are revised by adding new special provision 347 which limits the use of the entries to only those articles that have successfully passed Test series 6(d) of Part I of the UN Manual of Tests and Criteria. For clarity, we are also adding the special provision to the entry “Cartridges, power device (used to project fastening devices), ORM-D” to indicate that the requirements for special provision 347 also apply to Division 1.4S articles that may be reclassified as ORM-D. See Section 172.102 Special Provisions for a discussion of new special provision 347.

UN0323	Cartridges, power device.
UN0460	Charges, bursting, plastics bonded.
UN0445	Charges, explosive, commercial <i>without detonator</i> .

UN0441	Charges, shaped <i>without detonator</i> .
UN0500	Detonator assemblies, non-electric <i>for blasting</i> .
UN0456	Detonators, electric <i>for blasting</i> .
UN0366	Detonators for ammunition.
UN0455	Detonators, non-electric <i>for blasting</i> .

The following Division 6.1 (toxic-by-inhalation) materials entries are revised by replacing the portable tank instruction T Code T22 with T20. The UN Committee of Experts on the Transport of Dangerous Goods revised the T Code assignment for a number of Division 6.1 (toxic-by-inhalation) materials from T14 to T20. Assigning T20 requires a higher pressure for the periodic hydrostatic test (6 bar to 10 bar)

and a thicker minimum shell thickness (6 mm to 8 mm). This change is consistent with the T Code assigned to the same materials in the HMT. However, for the materials listed below, we assigned a T Code T22 which requires a minimum shell thickness of 10 mm. We do not believe there would be a safety risk in reducing the minimum shell thickness for portable tanks containing these materials from 10

mm to 8 mm. Therefore, for consistency with revisions made to the T Code assignments under the sixteenth revised edition of the UN Model Regulations as well as consistency with the current assignment of T20 to a number of other Division 6.1 (toxic-by-inhalation material) entries, the T Code T20 would be assigned for the following materials.

UN2484	tert-Butyl isocyanate.
UN2481	Ethyl isocyanate.
UN2486	Isobutyl isocyanate.
UN2483	Isopropyl isocyanate.
UN2605	Methoxymethyl isocyanate.
UN2482	n-Propyl isocyanate.

The following Division 6.1 (toxic-by-inhalation) material entries are revised by adding the portable tank special provision TP13 as a conforming

amendment to the changes to the PG assignment for these materials (*see Amendments to Column (5)* above). Special provision TP13 requires the use

of self-contained breathing apparatus when the hazardous material is transported by vessel.

UN2668	Chloroacetonitrile.
UN1810	Phosphorous oxychloride.
UN1834	Sulfur chloride.
UN2474	Thiophosgene.

The following organometallic substance entries are revised by adding portable tank special provision TP36

which authorizes use of fusible elements in the vapor space on portable tanks transporting these materials. *See*

Section 178.275 for a discussion of the authorized use of fusible elements on portable tanks.

UN3392	Organometallic substance, liquid, pyrophoric.
UN3394	Organometallic substance, liquid, pyrophoric, water-reactive.
UN3398	Organometallic substance, liquid, water-reactive.
UN3399	Organometallic substance, liquid, water-reactive, flammable.
UN3391	Organometallic substance, solid, pyrophoric.
UN3393	Organometallic substance, solid, pyrophoric, water-reactive.
UN3400	Organometallic substance, solid, self-heating.
UN3395	Organometallic substance, solid, water-reactive.
UN3396	Organometallic substance, solid, water-reactive, flammable.
UN3397	Organometallic substance, solid, water-reactive, self-heating.

The following Division 5.1 (oxidizer) substance entries are revised by adding new special provision W1. Special provision W1 excepts these substances

from the HMR for vessel transport when transported in non-friable prill or granule form provided the substance has been successfully tested in accordance

with the UN Manual of Tests and Criteria.

UN1486	Potassium nitrate.
UN1498	Sodium nitrate.
UN1499	Sodium nitrate and potassium nitrate mixtures.

Amendments to the Column (8) Packaging Authorizations

The four flammable liquid entries “Alcohols, n.o.s., UN1987,” “Ethanol,

UN1170,” “Formaldehyde solutions, flammable, UN1198” and “Isopropanol, UN1219” are revised in Column (8A) by adding reference to § 173.4b for additional exceptions for these

materials. Section 173.4b prescribes the requirements for *de minimis* quantities of hazardous materials offered for transportation and transported by all modes, domestic or international. We

are adding a new paragraph (b) to except non-infectious specimens (e.g., museum specimens) preserved with small amounts of certain Class 3 materials from the HMR as recently adopted in the international standards. This amendment is consistent with previous interpretations we have issued on this matter.

The entry “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, UN3468” is revised in Column (8B) by deleting the reference to § 173.214 for authorized non-bulk packaging and adding new section reference § 173.311. See Section 173.311

for a discussion of authorized packaging provisions for hydrogen in a metal hydride storage system.

The entry “Polyester resin kit, UN3269” is revised by amending Columns (8A) and (8B) to read 165 in reference to packaging provisions in § 173.165. Column (8A) previously referred to § 173.152 and Column (8B) referred to § 173.225 for authorized packaging. For clarity and consistency, such articles are now subject to packaging provisions incorporated into the HMR specific to these articles.

Amendments to the Column (9) Quantity Limitations

We received three comments (3M, IATA, UPS) requesting that PHMSA

harmonize with ICAO Technical Instructions amendments that forbid the transport of certain chlorosilane materials in passenger aircraft (UN1818, UN2434, UN2437, UN2986, and UN2987).

We agree. Our original intent was to incorporate these amendments in the August 2010 proposed rule. Therefore, based on our intent and comments received, the following entries are revised by amending the Column (9A) package quantity limitations for passenger air and rail to read “Forbidden,” consistent with the 2011–2012 ICAO Technical Instructions:

UN1818	Silicon tetrachloride.
UN2434	Diphenyldichlorosilane.
UN2437	Methylphenyldichlorosilane.
UN2986	Chlorosilanes, corrosive, flammable, n.o.s.
UN2987	Chlorosilanes, corrosive, n.o.s.

The entries “Medicine, liquid, flammable, toxic, n.o.s., UN3248,” “Medicine, liquid, toxic, n.o.s., UN1851,” and “Medicine, solid, toxic, n.o.s., UN3249” are revised in the Column (9A) and (9B) package quantity limitations authorizing a greater maximum quantity per package

consistent an changes made to the 2011–2012 ICAO TI.

Amendments to the Column (10) Vessel Stowage Requirements

Vessel stowage location (10A). For the following materials, we are revising the authorized stowage locations in Column (10A) by revising the stowage category to read D. Assignment of stowage

category D means the material must be stowed “on deck only” 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 meters of overall vessel length. The material is prohibited on passenger vessels in which the limiting number is exceeded.

UN1951	Argon, refrigerated liquid (<i>cryogenic liquid</i>).
UN2187	Carbon dioxide, refrigerated liquid.
UN1143	Crotonaldehyde or Crotonaldehyde, stabilized.
UN1963	Helium, refrigerated liquid (<i>cryogenic liquid</i>).
UN1970	Krypton, refrigerated liquid (<i>cryogenic liquid</i>).
UN1647	Methyl bromide and ethylene dibromide mixtures, liquid.
UN2644	Methyl iodide.
UN2477	Methyl isothiocyanate.
UN2606	Methyl orthosilicate.
UN1913	Neon, refrigerated liquid (<i>cryogenic liquid</i>).
UN2201	Nitrous oxide, refrigerated liquid.
UN2337	Phenyl mercaptan.
UN1810	Phosphorous oxychloride.
UN1834	Sulfur chloride.
UN2474	Thiophosgene.
UN1838	Titanium tetrachloride.
UN2591	Xenon, refrigerated liquid (<i>cryogenic liquids</i>).

Vessel stowage codes (10B). For the following hazardous materials, we are removing from Column (10B) stowage code 18 (stowage code 143 for UN3392), which prohibits the material from being

transported on any vessel carrying explosives (except Division 1.4S explosives), and we are adding in its place stowage code 78, which requires the materials to be stowed “separated

longitudinally by an intervening complete compartment or hold from” explosives.

UN1131	Carbon disulfide.
UN1259	Nickel carbonyl.
UN3392	Organometallic substance, liquid, pyrophoric.
UN3394	Organometallic substance, liquid, pyrophoric, water-reactive.
UN3194	Pyrophoric liquid, inorganic, n.o.s.
UN2845	Pyrophoric liquids, organic, n.o.s.

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 adopting the following revisions to § 172.102, special provisions.

Special provision 15 is revised by removing redundant regulatory text applicable to “Chemical kits, UN3316” and “First aid kits, UN3316.”

Special provision 40 is revised to indicate that “Polyester resin kit, UN3269” requires specification outer packaging based on the PG assigned to the base (Class 3) material unless excepted as a limited or excepted quantity material. This revision is a clarification of the existing requirement.

Special provision 77 is deleted. Special provision 77 allows use of the entry “Compressed gas, n.o.s., UN1956” for mixtures of gases with less than 23.5% oxygen when no other oxidizing gases are present. PHMSA is modifying the definition of oxidizing gas in § 171.8 to state that “a gas which may, by providing oxygen, cause or contribute to the combustion of other material more than air does,” meaning, pure gases or gas mixtures with an oxidizing power greater than 23.5% oxygen. Because of the availability of the entry “Compressed gas, oxidizing, n.o.s., UN3156” in the HMT, we believe special provision 77 is no longer necessary.

Special provision 78 is revised to direct shippers to use the entry “Compressed gas, oxidizing, n.o.s., UN3156” to describe compressed air that contains pure gases or gas mixtures with an oxidizing power greater than 23.5% oxygen. PHMSA is modifying the definition of oxidizing gas in § 171.8 of the HMR to indicate that “a gas which may, by providing oxygen, cause or contribute to the combustion of other material more than air does,” meaning, pure gases or gas mixtures with an oxidizing power greater than 23.5% oxygen. Therefore, we are revising this special provision to emphasize the revised definition and use of the proper shipping description.

Special provision 110 is revised to include oxygen cylinders for emergency use. Fire extinguishers (UN1044) are assigned special provision 110, which authorizes the installation of a cartridge power device (of Divisions 1.4C and S) on the fire extinguisher without changing its classification from Division 2.2, provided the actuating cartridge

does not contain deflagrating (propellant) explosives exceeding 3.2 g. Many of these types of fire extinguishers are used in commercial aircraft applications where the actuating cartridge is necessary for remote activation to discharge the fire suppressant contained in the cylinder. Similarly, commercial aircraft are being designed to incorporate small oxygen cylinders in the overhead panels above passenger seats to provide emergency oxygen in the event of a depressurization. The design of the system is that a small actuating cartridge attached to each cylinder will be initiated once the passenger starts breathing into the mask, which will allow the flow of oxygen from these cylinders. In connection with the manufacturing and maintenance of the aircraft, it is necessary for these small cylinders to be transported with the actuator installed. The principal hazard presented by these oxygen cylinders remains that of Division 2.2, and not the Division 1.4 explosive hazard of the actuating cartridge. Therefore, in this final rule PHMSA is authorizing the transport of oxygen cylinders for emergency use with an installed actuating cartridge without changing the classification of Division 2.2 provided that the total quantity of deflagrating (propellant) explosives does not exceed 3.2 g per oxygen cylinder, and further provided that the cylinders have an effective means of preventing inadvertent activation.

Special provision 130 is revised in conformance with adoption of new special provision 340 and new § 172.101 HMT entry, “Batteries, nickel-metal hydride, UN3496,” applicable to nickel-metal hydride batteries transported by vessel. Two commenters (PRBA, Saft) requested a revision to clarify the appropriate use of this special provision for the transport of nickel-metal hydride batteries. We agree that special provision 130 should be clarified to avoid confusion over appropriate use of entries applying to nickel-metal hydride batteries. Because these batteries are dry batteries, they are subject to conditions in special provision 130, which outlines that the provision applies to dry batteries when not specifically covered by another entry in the HMT. Because there is now another entry for nickel-metal hydride batteries that is modal specific, there is potential for confusion. We are therefore adding language to special provision 130 clarifying that, except for nickel-hydride batteries shipped under conditions specified in special provision 340 for vessel transportation, nickel-metal hydride

batteries are covered by the entry “Batteries, dry, sealed, n.o.s.”

In addition, one commenter (PRBA) suggested that we codify guidance offered in several recently issued letters of interpretation (e.g., Ref. No. 09–0194) indicating our determination that spent or used dry batteries of not more than 9 volts are not likely to generate a dangerous quantity of heat, short circuit, or create sparks during the normal course of transportation and thus, are not subject to the HMR when transported for purposes of recycling, reconditioning, or disposal. We agree. Therefore, in this final rule we are revising special provision 130 by adding a conditional exception for the ground transportation of spent or used dry batteries.

For conformance with the addition of new proper shipping names for UN3166, special provision 134 is revised to specify that a battery-powered vehicle or equipment that also contains 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. Furthermore, a battery-powered vehicle or equipment that contains a fuel cell-powered engine must be consigned under the entry “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, an internal combustion engine, and batteries.

Special provision 135 is revised to specify that an internal combustion engine installed in a vehicle must be consigned to the entry “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 installed wet, sodium or lithium batteries. If a fuel cell-powered engine is installed in a vehicle, the vehicle must be consigned using the entry “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, an internal combustion engine, and batteries.

Special provision 149 is revised to indicate the exception provided may not

be used for transportation by aircraft. This special provision authorizes an increased amount of certain Class 3 (flammable liquid) materials in PG II that are also consumer commodities. We received one comment, from Safety Specialists, Inc. (SSI), opposing the elimination of air eligibility for use of the exception provided in the special provision. SSI asserts that because the materials currently authorized to use the packaging exception provided by special provision 149 are not "extremely" hazardous materials, they should continue to be authorized in air transportation in far greater quantities per inner packaging than are limited quantities packaged under the ICAO Technical Instructions. We disagree. Standardization in today's safety culture enhances safety, lowers training costs and facilitates commerce through greater productivity. PHMSA has made concessions in this final rule, such as lifting the § 175.75 cargo compartment loading restriction on packages of limited quantity materials, to offset per inner and outer packaging limitations adopted through harmonization with the ICAO Technical Instructions. We will also vigorously advocate for change at the international level when warranted.

Special provision 157 is deleted because the language of this provision has been combined with the language of revised special provision 135. Special provision 157 was assigned to the entries "Vehicle, flammable gas powered" and "Vehicle, flammable liquid powered" and instructed shippers that these entries include hybrid electric vehicles powered by both internal combustion engines and installed wet, sodium or lithium batteries. This language is now in special provision 135.

Special provision 167 is revised to require a metal hydride storage system installed in conveyances, to be approved by the Associate Administrator before acceptance for transport. Special provision 167 is also applicable, where appropriate, to UN3166 entries powered by fuel cells.

Special provision 198 is revised to include "Perfumery products, UN1266" among the list of products that nitrocellulose solutions containing not more than 20% nitrocellulose can be transported as. PHMSA is also revising this provision to clarify that the nitrocellulose may not contain more than 12.6% nitrogen by dry mass.

A new special provision 340 is added to provide special instruction for the vessel transport of nickel-metal hydride batteries (including cells). Except for nickel-metal hydride button cells or

nickel-metal hydride cells or batteries packed with or contained in equipment, when nickel-metal hydride batteries are loaded in a vessel cargo transport unit in a total quantity of 100 kg gross mass or more, shipment of the nickel-metal hydride batteries is subject to the shipping paper, dangerous cargo manifest requirements under § 176.30, and stowage conditions assigned to the "Batteries, nickel-metal hydride, UN3496" entry in the § 172.101 HMT. Additionally, the nickel-metal hydride batteries are required to be securely packed and protected against a dangerous evolution of heat, short circuits and damage to terminals.

A new special provision 342 is added to be consistent with the adoption of the same provisions in the UN Model Regulations and the IMDG Code as well as amendments made to special provision A131 in the ICAO Technical Instructions. The special provision allows sterilization devices containing ethylene oxide conforming to the conditions in the special provision and packaged in accordance with § 173.4a of the HMR to be offered for transportation and transported by all modes even though Column (9A) of the § 172.101 HMT lists the material as forbidden by passenger aircraft. The addition of this special provision coincides with the deletion of special provision A59 which restricted the applicability of the special provision to air transport. See Special provision A59 for additional discussion of this amendment.

A new special provision 343 is added and assigned to the new HMT entry "Petroleum sour crude oil, flammable, toxic, UN3494," indicating that for international transportation, this entry in the HMT must be used for petroleum crude oil containing hydrogen sulfide in sufficient concentration that vapors evolved from the crude oil can present an inhalation hazard. However, any bulk packaging used for the domestic transport of petroleum crude oil would be required to be marked in accordance with the new markings prescribed in § 172.327 of the HMR to provide warning of the potential hazard from inhalation of hydrogen sulfide vapors.

A new special provision 345 is added excepting from the requirements of the HMR "Nitrogen, refrigerated liquid *cryogenic liquid*, UN1977" transported in open cryogenic receptacles with a maximum capacity of 1 L. The receptacles must be constructed with glass double walls having the space between the walls vacuum insulated and each receptacle must be transported in an outer packaging with sufficient cushioning and absorbent materials to protect the receptacle from damage.

A new special provision 346 is added excepting from the requirements of the HMR "Nitrogen, refrigerated liquid *cryogenic liquid*, UN1977" transported in accordance with the requirements for open cryogenic receptacles in § 173.320 of the HMR. The receptacle must contain no hazardous materials other than the liquid nitrogen which must be fully absorbed in a porous material in the receptacle.

A new special provision 347 is added restricting the use of certain HMT entries classed as Division 1.4S explosive materials to those articles successfully passing Test series 6(d) of Part I of the UN Manual of Tests and Criteria. See Section 172.101 Hazardous Materials Table (HMT) for the list of proper shipping names that are assigned special provision 347. A Division 1.4 explosive is defined as an explosive that presents a minor explosion hazard such that hazardous effects are confined to a package and no projection of fragments of appreciable size or range are expected; and that an external fire must not cause virtually instantaneous explosion of almost the entire contents of a package containing a Division 1.4 explosive. Under § 173.58 of the HMR, an explosive article or substance is subjected to Test Series 6(a), 6(b), and 6(c) for assignment to an appropriate division (e.g. Division 1.4). Explosive articles or substances are assigned to Division 1.4, Compatibility Group S (1.4S) if hazardous effects are confined within a package or the blast and projection effects do not significantly hinder emergency response efforts. Test Series 6(a), 6(b), and 6(c) address hazard effects from exposure of the package to a fire but do not address whether hazardous effects from functioning of the articles or substances is confined within the package. PHMSA is concerned that there is a possibility that products classified as Division 1.4S based on behavior in a fire according to test procedures of Type 6(c) may still produce a hazardous effect that, when initiated, is not confined to a package. Initiation or ignition as a result of fire, after the package is degraded, may produce different results from functioning with the intended means of ignition or initiation. Knowledge of the behavior of the article or substance in both cases is needed to allow proper classification.

As discussed in the comment summary in response to the NPRM, PHMSA is requiring the Type 6(d) test as prescribed in Section 16.7 of the fifth revised edition of the UN Manual of Tests and Criteria in the new special provision 347. For affected articles intended for transportation by aircraft,

the compliance date of this new requirement is July 1, 2011. If a manufacturer or approval holder of affected articles previously classed and approved as Division 1.4S chooses to continue offering such shipments as Division 1.4S material by aircraft, the articles must be successfully tested under Test Series 6(d) and a new approval obtained from PHMSA. Additionally, a previously classed and approved Division 1.4S article that is not successfully tested under Test Series 6(d) must be assigned to a compatibility group other than S (e.g., B, C, or D) prior to being transported by aircraft. Based on knowledge that an article or substance will not pass the Type 6(d) test, a manufacturer or approval holder may choose to have a previously approved Division 1.4S explosive reassigned to a different compatibility group based on existing data and recommendation by a PHMSA-approved explosives testing and examination facility in lieu of conducting the Type 6(d) test. For new Division 1.4S articles approved prior to January 1, 2012 intended for domestic highway or rail transportation only, the compliance date for testing to maintain Division 1.4S classification or reassignment to a higher compatibility group other than S is January 1, 2014. For international highway, rail and vessel transportation and domestic vessel transportation, the compliance date for Type 6(d) testing or reassignment for new and previously produced affected articles is January 1, 2012.

A new special provision 349 is added and assigned to "Hypochlorites, inorganic, n.o.s., UN3212" to specify that transport of mixtures of hypochlorite and an ammonium salt is forbidden.

A new special provision 350 is added and assigned to "Bromates, inorganic, n.o.s., UN1450" and "Bromates, inorganic, aqueous solution, n.o.s., UN3213" to specify that transport of ammonium bromate and its aqueous solutions and mixtures of a bromate and an ammonium salt is forbidden.

A new special provision 351 is added and assigned to "Chlorates, inorganic, n.o.s., UN1461" and "Chlorates, inorganic, aqueous solution, n.o.s., UN3210" to specify that transport of ammonium chlorate and its aqueous solutions and mixtures of a chlorate and an ammonium salt is forbidden.

A new special provision 352 is added and assigned to "Chlorites, inorganic, n.o.s., UN1462" to specify that transport of ammonium chlorite and its aqueous solutions and mixtures of a chlorite and an ammonium salt is forbidden.

A new special provision 353 is added and assigned to "Permanganates, inorganic, n.o.s., UN1482" and "Permanganates, inorganic, aqueous solution, n.o.s., UN3214" to specify that transport of ammonium permanganate and its aqueous solutions and mixtures of a permanganate and an ammonium salt is forbidden.

A new special provision 357 is added and assigned to the entry "Petroleum crude oil, UN1267" to clarify that when transported internationally, petroleum crude oil containing hydrogen sulfide in sufficient concentration that vapors evolved from the crude oil can present an inhalation hazard must be transported under the entry "Petroleum sour crude oil, flammable, toxic, UN3494." As discussed in detail in response to comments submitted to the ANPRM, for domestic transportation, use of the toxic description is not required; however, a bulk package is required to be marked in accordance with the requirement of new § 172.327 of the HMR. See Section 173.327 for a discussion of the marking requirement.

In the August 2010 NPRM, PHMSA proposed to revise special provision A59 for consistency with amendments made to special provision A131 of the 2011–2012 ICAO Technical Instructions. Special provision A59 allows sterilization devices containing ethylene oxide to be offered for transportation and transported by air under the excepted quantity provisions of § 173.4a of the HMR. One commenter (Andersen) supported the amendments to A59 but noted that the special provision originally appearing in the ICAO Technical Instructions (as special provision A131) applicable to air transport has been adopted in the UN Model Regulations as special provision 342 for use by other modes of transport. Additionally, special provision 342 is also to be incorporated into the IMDG Code. The commenter questioned the appropriateness of adopting an "A" prefix special provision which limits the special provision, to air transport only. Andersen stated:

In the preamble to the [NPRM], on page 53085, PHMSA observes that "Special provision A59 allows for sterilization devices containing ethylene oxide to be offered for transportation and transported by air (*and thereby all modes*) under the excepted quantity provisions of § 173.4a" (emphasis added) * * * notwithstanding PHMSA's statement in regard to the multi-modal applicability of this special provision, it is not at all clear from the wording of § 172.102(c)(2) [A59] * * * that this special provision extends to all modes of transport.

The commenter suggested that, in order to achieve complete

harmonization and for greater clarity of the applicability of the special provision, PHMSA revise the applicability of the special provision to all modes and not restrict the special provision to air transport through the use of the "A" prefix as currently implemented.

We agree. Therefore, in this final rule we are deleting Special provision A59 and adopting new Special provision 342 which applies conditions for transportation of sterilization devices containing ethylene oxide to all modes of transportation.

A new Special provision A112 is added authorizing the transportation of certain IBCs by passenger and cargo-only aircraft that contain up to a maximum net quantity of 1,000 kg of an "Environmentally hazardous substance, solid, n.o.s. UN3077." This amendment is consistent with the authorization in the 2011–2012 ICAO Technical Instructions.

In paragraph (c)(4), the Table 1 (IBC Codes) are editorially revised to remove UN Specifications 31A, 31B and 31N from IBC Codes IB4, IB5, IB6, IB7, and IB8. This revision is consistent with amendments to international standards and removes 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 which are assigned to liquid materials only.

Paragraph (c)(7) outlines provisions that apply to the transportation of hazardous materials in UN portable tanks. Two commenters (DGAC, PSA) requested that PHMSA revise § 172.102(c)(7) to allow shipment of solid materials in certain portable tanks using bottom outlets. PSA stated:

At the recommendation of the United States, new provisions governing the use of bottom outlets on portable tanks were adopted in the [UN] Model Regulations * * * However, the United States does not follow its own recommendation in the Proposed Rule * * * To date * * * the HMRS flatly prohibit the use of bottom outlets for solids referenced in the American proposal to the U.N. In the Table of Portable Tank T Codes T1–22, which appears in 49 C.F.R. § 172.102(c)(7), instructions T9 and T21 indicate "prohibited" in the column designated "bottom outlet requirements." The text of § 172.101(c)(7)(ii) explains that the word "prohibited" in that column of the Table "means bottom openings are prohibited." In the Proposed Rule, and without explanation, the agency did not propose to adopt its own bottom outlet provision.

In the interest of harmonization with specific regard to the January 1, 2011

effective date for international regulations, the commenters urged PHMSA to adopt the provisions we successfully persuaded international organizations to adopt.

We agree. In the paper submitted to the UN Sub-Committee of Experts (UNSCOE) on the Transport of Dangerous Goods (*see* UN document ST/SG/AC.10/C.3/2007/24 available at <http://www.unece.org/trans/main/dgdb/dgsubc/c32007.html>), the U.S. successfully persuaded UNSCOE to adopt provisions authorizing the use of bottom outlets on portable tanks used to transport PG I solid material on the basis that (1) transport of these materials in portable tanks without bottom openings is impractical and it is virtually impossible to unload the material from the portable tank through top openings; and (2) there is no compelling safety reason to prohibit bottom openings in portable tanks suitable for such material when the authorized portable tanks afford a level of safety in transport substantially greater than that afforded by other packagings authorized for the material (*e.g.*, UN1A2 removable head steel drums). Although PHMSA did not propose this amendment in the August 2010 NPRM, based on comments received and the relief provided to industry by authorizing an alternative method of unloading PG I solid material without a reduction in packaging safety, in this final rule we are revising § 172.101(c)(7) by revising T Codes T9 and T21 to prohibit bottom openings for liquid only and specify applicable requirements for the bottom openings. The revision includes adding clarifying language to § 172.101(c)(7)(ii) to specify the meaning of “prohibited” for liquids in the appropriate context. With regard to PSA’s suggested revised regulatory text, we do not believe it is necessary to add language specifying that the bottom outlets must conform to 6.7.2.6.2 of the UN Model Regulations (bottom opening requirements for portable tanks used for solid material) because these provisions are dealt with under § 178.275(d)(2), which we are referencing in the revised entries for portable tank T Codes T9 and T22.

A new portable tank special provision TP36 is added authorizing the use of fusible elements in the vapor space of portable tanks with a gauge test pressure that exceeds 265 kPa (38.4 psig/2.65 bar). *See* Section 178.275 for a detailed discussion. *See* Section 172.101 Hazardous Materials Table for a listing of materials assigned this special provision.

A new special provision W1 is added indicating that the hazardous materials

“Potassium nitrate, UN1486,” “Sodium nitrate, UN1498,” and “Sodium nitrate and Potassium nitrate mixtures, UN1499” are not subject to the HMR when transported by vessel in non-friable prills or granules form. The material must be accompanied by a certificate from an accredited laboratory stating that the product has been properly sampled and tested by the laboratory according to the UN Manual of Tests and Criteria.

Section 172.200

Section 172.200 prescribes the applicability of shipping paper requirements for the transportation of hazardous materials. Paragraph (b)(3) is revised to remove the exceptions for ORM–D material in conformance with the changes made to the limited quantities requirements under this final rule.

Section 172.203

Section 172.203 specifies additional hazardous materials description requirements on shipping papers. Paragraph (b) is revised to indicate that when a shipping paper is required, a limited quantity must be indicated as such. This revision is necessary due to the shipping paper exception adopted in this final rule for limited quantities intended for transportation by highway or rail.

Section 172.300

Section 172.300 prescribes the applicability of the HMR marking requirements incorporated in subpart D of Part 172. Paragraph (l)(1)(ii) of § 172.101 authorizes up to a one-year transition period for continued use of stock of pre-printed packaging marked with proper shipping names revised in the HMT under a rulemaking. Consistent with the transition period authorized in § 172.101(l)(1)(ii), in this final rule we are amending § 172.300 of the HMR to authorize the continued use of stock of preprinted packaging for one year from the date of compliance or until depleted (whichever is less) for a revision to a required marking. This amendment allows the continued use of preprinted packaging stock that is marked in accordance with the manner previously authorized.

Section 172.301

Section 172.301 prescribes general marking requirements for non-bulk packagings. In this final rule, PHMSA is amending paragraph (a) to clarify that a proper shipping name and identification number is not required to be marked on package containing only limited quantity material marked in accordance

with § 172.315(a). Additionally, it is amended by adding that until January 1, 2014 (January 1, 2013 if intended for transportation by aircraft), an identification number is not required to be marked on package containing only a Consumer commodity, ORM–D or ORM–D–AIR material, as defined in § 171.8 of this subchapter in effect on October 1, 2010, provided the package is marked in accordance with § 172.316.

Section 172.312

Section 172.312 prescribes the required orientation markings for non-bulk packages containing liquids. PHMSA is amending paragraph (c)(5) to clarify that the exception applies only to a hermetically sealed inner packaging or receptacle not exceeding 500 mL each.

Section 172.315

Section 172.315 specifies the markings required on a package containing limited quantities of hazardous materials. These new markings are consistent with the UN Model Regulations, ICAO TI and IMDG Code and are required on packages of limited quantities offered for transportation by highway, rail, air and vessel. Additionally, PHMSA received positive comments submitted in response to the ANPRM concerning the new marking because the requirement specifies minimum dimensions on each side (100 mm) that substantially increases the visibility of the marking when compared with the current ORM–D marking prescribed in § 172.316 of the HMR. Commenters stated that increased visibility of the mark will enhance safety while reducing regulatory burden.

For limited quantities intended for transportation by vessel, this new marking with minimum dimensions of 250 mm on each side is required on cargo transport units containing limited quantities and no other hazardous materials. For limited quantities intended for transportation by aircraft, the marking requirements are consistent with the 2011–2012 ICAO TI (*i.e.*, “Y” mark on a white square on point) in addition to any required labels.

Section 172.316

Section 172.316 prescribes marking requirements for packages containing materials classed as ORM–D and ORM–D–AIR. The marking prescribed in this section will no longer be authorized for limited quantities effective January 1, 2014.

Section 172.322

Section 172.322 prescribes marking requirements for packages containing marine pollutants. PHMSA is adding an

exception from the marking requirement in new paragraph (d)(4) for packages of limited quantities marked in accordance with § 172.315.

Section 172.324

Section 172.324 prescribes marking requirements for packages containing hazardous substances in non-bulk packagings. PHMSA is revising paragraph (b) for packages containing hazardous substances marked in accordance with the limited quantity marking prescribed in § 172.315.

Section 172.326

Section 172.326 prescribes the marking requirements for portable tanks. In this final rule, we are revising paragraph (a) to align with the IMDG Code the minimum height for a proper shipping name marked on a portable tank to 65 mm when offered for transportation and transported by vessel. This amendment is in response to a revision made in Amendment 35-10 of the IMDG Code.

One commenter (Arkema) requests that we allow a one year transition period from the publication of the final rule to allow for depletion of label inventory and/or restenciling of portable tanks. We agree that there should be a transition period and note that, in this final rule, we are implementing a delayed compliance date of January 1, 2012, which is one year from the effective date of the rule, unless otherwise specified in provisions adopted or revised in this final rule.

Section 172.327

New section 172.327 specifies the marking required for a bulk packaging containing petroleum crude oil to warn of the potential toxic inhalation hazard from vapors evolved from hydrogen sulfide present in the crude oil. PHMSA proposed to require placement of the marking used for toxic materials under the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) in the immediate vicinity of any location on a bulk packaging that could pose a health risk to transportation workers if exposed to hydrogen sulfide vapors emitted from that location, such as loading heads and manholes. This proposed hazard communication marking requirement is applicable to bulk packagings in domestic transportation only. The new hazardous materials description for "Petroleum sour crude oil, flammable, toxic, UN3494" added to the HMT must be used for international transportation of petroleum crude oil with hydrogen sulfide in sufficient concentration that vapors evolved from the crude oil

present an inhalation hazard (for both bulk and non-bulk packagings).

One commenter (AAR) expressed concern that this new marking requirement would place an undue burden on rail carriers with regard to inspection requirements under § 174.9 of the HMR. The commenter had concerns regarding the safety of rail carrier employees having to climb tank cars to determine whether markings are present or correct. AAR stated:

[We] we would not oppose the proposed marking if it were made clear that railroads have no obligation to inspect for markings. Accordingly, [we suggest] amending [§ 173.127 to indicate] carrier personnel are not required to inspect for markings that would not be visible or legible from the ground.

We agree, although we do not believe a regulatory revision is warranted. Section 174.9 requires a rail carrier to inspect each rail car containing a hazardous material, at ground level, for required markings, labels, and placards, *etc.* This requirement already limits the inspection to ground level and predisposes the carrier from having to climb onto a rail car to inspect for hazard communications. As indicated in the comments by AAR, the intent of this marking is to alert hazmat employees who may be exposed to hydrogen sulfide vapors during a loading or unloading operation to a potential hazard and not to communicate the hazard for emergency response purposes. Thus, carriers will not be obligated to inspect for markings placed in the vicinity of tank car openings on a rail car that are not readily visible or legible from ground level.

Based on comments received, we are revising our proposed requirements to authorize an alternative marking to the GHS toxic material pictogram. See the Sections II.C and III.A.7 discussion of the classification of petroleum sour crude oil.

Section 172.500

Section 172.500 specifies the applicability of placarding requirements to certain materials. PHMSA is amending paragraph (b)(3) to clarify that limited quantities marked in accordance with revised § 172.315 of the HMR are not subject to placarding requirements.

Section 172.502

Section 172.502 specifies prohibited and permissive placarding requirements. In this final rule, PHMSA is revising the exceptions provided in paragraph (b)(2) to include the petroleum sour crude oil marking and the limited quantity marking in

§§ 172.315 and 172.327 of the HMR, respectively.

Part 173

Section 173.4

Section 173.4 prescribes the requirements for small quantities of hazardous materials offered for transportation and transported by domestic highway or rail. PHMSA is revising paragraph (a) and adding new paragraph (a)(1)(v) to allow Division 2.2 (non-flammable, non-poisonous, compressed gas) material without a subsidiary hazard (except for aerosols) without applying for an approval from the Associate Administrator as prescribed under paragraph (c) of this section. Other Class 2 materials, including Division 2.2 aerosols, will still require approval under § 173.4(c) of the HMR. These amendments are consistent with the authorization under § 173.4a(b)(1) for Division 2.2 gases without a subsidiary hazard in addition to the new restriction to exclude aerosols from authorized materials in § 173.4a of the HMR. See Section 173.4a for a discussion of revisions for excepted quantities of hazardous materials.

Section 173.4a

Section 173.4a prescribes the requirements for excepted quantities of hazardous materials offered for transportation and transported by all modes, domestic or international. PHMSA is amending paragraph (a) by adding a new paragraph (a)(4) regarding pressure differential capability for packages intended for transportation by aircraft in accordance with § 173.27(c) of the HMR. PHMSA is also amending paragraph (b)(1) to clarify that the authorization for Division 2.2 (non-flammable, non-poisonous, compressed gas) excludes aerosols as an excepted quantity material. Such articles are authorized as a limited quantity under both domestic and international standards. Additionally, PHMSA is revising paragraph (b)(5) to add polyester resin kits to the types of Division 5.2 (organic peroxide) material authorized as an excepted quantity and is revising paragraph (d)(3) by correcting the outer packaging aggregate quantity limit for Division 5.2 liquids from 250 mL to 500 mL. Lastly, PHMSA is adding a new paragraph (g)(3) that requires when packages of excepted quantities (see the Section 173.25 discussion) are contained in an overpack, and the package markings required by this section are not visible inside the overpack, the excepted quantities marking must also be placed on the

overpack. Additionally, an overpack containing packages of excepted quantities is not required to be marked with the word "OVERPACK."

Section 173.4b

Section 173.4b prescribes the requirements for *de minimis* quantities of hazardous materials offered for transportation and transported by all modes, domestic or international. Consistent with the international standards, PHMSA is adding a new paragraph (b) to except non-infectious specimens (e.g., museum specimens) preserved with small amounts of certain Class 3 (flammable liquid) materials for scientific purposes from the requirements of the HMR. This amendment is consistent with previous interpretations we have issued on this matter indicating these specimens do not pose a risk to safety during the course of transportations.

One commenter (AVMA) expressed support for the adoption of this exception as essential to the conduct of professional work of veterinarians. Therefore, in this final rule, we are adopting the exception from full regulation under the HMR for non-infectious specimens preserved with small amounts of certain Class 3 (flammable liquid) material for scientific purposes.

Section 173.25

Section 173.25 prescribes the requirements for certain authorized packagings and overpacks. Consistent with the international standards, PHMSA is requiring an overpack containing packages of limited quantity material marked with the new limited quantities marking required by this final rule (see the Section 172.315 discussion) to be marked with the word "OVERPACK" if the markings are not visible, in addition to all other required package markings. This mark is an indication that the packages contained within the overpack are in accordance with the HMR. Additionally, for excepted quantities (see the Section 173.4a discussion) where the required package markings are not visible inside an overpack, the excepted quantities marking must also be placed on the overpack. An overpack containing packages of excepted quantities is not required to be marked with the word "OVERPACK."

Section 173.27

Section 173.27 prescribes the general requirements for packaging offered or intended for air transportation. In this final rule, PHMSA is amending paragraph (f) by adding a new Table 3

that outlines the requirements for limited quantities intended for air transportation consistent with the 2011–2012 ICAO Technical Instructions, where appropriate. See the limited quantity, consumer commodity and ICAO Technical Instructions alignment NPRM comment discussion in Section III.A.5 of this rule.

Section 173.40

Section 173.40 specifies the general packaging requirements for toxic materials packaged in cylinders. PHMSA is amending paragraph (c)(1) concerning closure requirements by requiring the valve connections on UN Specification cylinders to be made by a taper thread or some other means in accordance with ISO Standard 10692–2:2001.

Section 173.58

Section 173.58 outlines the assignment of class and division for new explosives. Based on a recommendation from comments provided by IME, we are revising paragraph (a)(5) to include a reference to the Type 6(d) test for determination of Division 1.4S classification for consistency with the adoption of the new test.

Section 173.59

Section 173.59 provides definitions of explosive terms that are intended for information only. The UN Committee of Experts (COE) recently defined the term "phlegmatized" to meaning the addition of a substance to an explosive to enhance its safety in handling and transport. One commenter indicated support for adoption of the proposed definition of "phlegmatized," therefore, in this final rule PHMSA is adopting the definition in the HMR as proposed.

Section 173.63

Section 173.63 specifies packaging exceptions for limited quantities of certain Division 1.4S explosive articles authorized for reclassification and transport as ORM–D material. Prior to offering for transportation by aircraft, "Cartridges, power devices, ORM–D–AIR" (UN0323), must have been successfully tested in accordance with the new UN Test Series Type 6(d) test beginning July 1, 2011. See the Section 172.102, Special Provision 347 discussion. This requirement is a condition for the continuation of a Division 1.4S classification and for reclassification to ORM–D for limited quantities of such articles intended for transportation by international highway, rail and vessel and domestic vessel effective January 1, 2012. Limited quantities of such articles approved as

Division 1.4S prior to January 1, 2012, may continue to be reclassified as ORM–D and offered for domestic highway and rail transportation only until January 1, 2014.

Section 173.120

Section 173.120 defines Class 3 (flammable liquid) material. PHMSA is revising paragraph (c) to add new testing methods for determining the flash point of a liquid. See Section 171.7 for a listing of materials incorporated by reference pertaining to § 173.120.

Section 173.121

Section 173.121 prescribes the packing group assignment for flammable liquids. The HMR do not specify a test method for determining the boiling point of a liquid which may be necessary for liquids with very low flash points. PHMSA is revising paragraph (a) to add new testing methods for determining the boiling point of a liquid. See Section 171.7 for a listing of materials incorporated by reference pertaining to § 173.121.

Section 173.124

Section 173.124 defines Class 4 material. For consistency with a revision adopted in the UN Model Regulations, PHMSA is amending the definition of "self-heating" in § 173.124(b)(2) of the HMR to read: "Self-heating of a substance is a process where the gradual reaction of that substance with oxygen (in air) generates heat. If the rate of heat production exceeds the rate of heat loss, then the temperature of the substance will rise which, after an induction time, may lead to self-ignition and combustion."

Section 173.137

Section 173.137 establishes test criteria and packing group assignments for Class 8 (corrosive) material. Since 1993, PHMSA has authorized under the terms of a special permit (i.e., DOT–SP 10904) an *in vitro* test method (available commercially as Corrositex®) as an alternative form of testing to that specified in the HMR, which is based on live animal test results, to determine the corrosivity of certain materials. Materials authorized for analysis using the alternative test method include acids (and their derivatives), acyl halides, alkylamines and polyalkylamines, bases, chlorosilanes, metal halides, and oxyhalides.

The UN COE recently recognized and adopted *in vitro* test methods in the UN Model Regulations as an alternative form of testing to that specified in OECD Guideline for Testing of Chemicals, Number 404, "Acute Dermal Irritation/

Corrosion.” The following alternative *in vitro* test methods include OECD Guidelines for the Testing of Chemicals:

- No. 430, “*In Vitro* Skin Corrosion: Transcutaneous Electrical Resistance Test (TER)” (2004);
- No. 431, “*In Vitro* Skin Corrosion: Human Skin Model Test” (2004); and
- No. 435, “*In Vitro* Membrane Barrier Test Method for Skin Corrosion” (2006).

A positive test result under *in vitro* methods 430 and 431 may be used to determine corrosivity for transportation purposes but cannot be used to determine the PG assignment. A negative result for corrosivity under *in vitro* methods 430 and 431 can preclude further testing to determine PG assignment using method 404, the current OECD Guideline involving *in vivo* testing, or method 435, the newly adopted OECD Guideline involving *in vitro* testing.

Based on the adoption of three new OECD guidelines for the *in vitro* testing of materials for corrosivity in the UN Model Regulations and through encouragement from PETA to adopt these new test methods in a petition for rulemaking (P–1550), we proposed to adopt such guidelines as matter incorporated by reference (IBR) in §§ 171.7 and 173.137 of the HMR.

In response to our proposal to incorporate several *in vitro* test methods for determination of corrosivity, PHMSA has received over 900 comments supporting the proposal, including a comment from PETA. We received no opposition. Therefore, we are adopting the OECD Guideline Test Nos. 430, 431, and 435, and revising Test No. 404 as proposed. Further, PETA urged PHMSA to facilitate access to DOT–SP 10904 through our Web site until such a time that this final rule becomes effective, and requested that PHMSA remove letters of interpretation that they believe recommend the use of *in vivo* testing even though alternative *in vitro* testing is available.

With regard to PETA’s additional requests, they are beyond the scope of this rulemaking. However, we note that in prior correspondence with PETA, PHMSA has indicated that information about DOT–SP 10904 can be obtained by entering “Corrositex” in the search feature of the PHMSA Office of Hazmat Safety Web site. Also, the special permit may be accessed by entering “10904” in the search feature on our special permits Web site or by conducting a group number search.

We agree with PETA that non-live animal testing should be used where available and encourage shippers to use the *in vitro* test methods to determine the classification of a material as

corrosive and assignment of a packing group. We also remind shippers that historical data may also be used to classify a material in accordance with § 173.136(c). Thus, in this final rule we are revising § 173.136(a) to codify the authorization to use *in vitro* test methods and to highlight the availability of classifying a material based on historical data.

Sections 173.150, 173.151, 173.152, 173.153, 173.154 and 173.155

Sections 173.150 through 173.155 prescribe the exceptions for certain Class 3, 8 and 9 and Division 4.1, 4.2, 4.3, 5.1, 5.2, 6.1 hazardous materials under the HMR. In this final rule, PHMSA is revising each of these sections to recognize the UN Model Regulations and IMDG Code package quantity limits for the highway, rail, and vessel transportation of limited quantities. No limited quantity limits decrease and two increase slightly to maintain alignment with the international standards for transport by other than aircraft. Additionally, the packaging provisions for “Polyester resin kits” are removed from § 173.152, as proposed, and placed in new § 173.165 for clarity.

When PHMSA lowered the quantity limits for Division 6.1 (poisonous) materials of PG II (primary or subsidiary) authorized as a limited quantity in a final rule published under Docket HM–215G (70 FR 34065, June 13, 2005), it did not authorize the labeling exception for such packages when intended for transportation by highway, rail and vessel, nor did it authorize renaming and reclassification as “Consumer commodity, ORM–D” for such materials. In this final rule, except for transportation by aircraft, we are authorizing the labeling exception for packages of limited quantity material with a Division 6.1, PG II primary or subsidiary hazard and, until December 31, 2013, we are authorizing renaming and reclassification as “Consumer commodity, ORM–D”. Additionally, until December 31, 2012, a consumer commodity as defined in § 171.8 in effect on October 1, 2010 may continue to be packaged, reclassified and marked “ORM–D–AIR” either in accordance with the new Table 3 of § 173.27(f) or §§ 173.150 through 173.155 and 173.306, as applicable. PHMSA fully believes this eventual alignment with international standards will improve clarity, promote regulatory compliance, reduce employee training costs and enhance safety overall.

Section 173.161

Section 173.161 prescribes packaging requirements for chemical kits and first aid kits containing small amounts of hazardous materials. In this final rule, PHMSA is editorially revising the section. In addition, PHMSA is authorizing transport of dry ice in accordance with § 173.217 in packaging authorized under this section when used as a refrigerant for the contents of a kit.

Section 173.165

A new section 173.165 is added to prescribe packaging and other requirements for “Polyester resin kits, UN3269” formerly contained in § 172.102, special provision 40 and § 173.152(b)(4) of the HMR. This amendment is intended to provide clarification of existing requirements while also harmonizing the HMR with international standards.

Section 173.167

A new section 173.167 is added to indicate authorized materials and quantity limits for articles and substances that may be described as “ID8000, Consumer commodity,” when intended for transportation by all modes of transport provided all or some of the transportation is by aircraft. Such articles and substances eligible for classification or reclassification to Class 9 are Class 2 materials (non-toxic aerosols only), Class 3 materials (Packing Group II and III only), Division 6.1 (Packing Group III only), UN/NA3077, UN/NA3082, and UN3175, provided such materials do not have a subsidiary risk and are authorized aboard a passenger-carrying aircraft. Inner and outer packaging quantity limits are based on Packing Instruction Y963 of the 2011–2012 ICAO TI. Specification outer packaging are not required under the conditions prescribed in this section. Additionally, the pressure differential capability of the inner packaging of a combination packaging intended to contain liquids is reduced from 95 kPa to 75 kPa for materials offered for transportation and transported by aircraft under the provisions of this section.

Section 173.220

Section 173.220 provides exceptions from regulation under the HMR for the transport of internal combustion engines, self-propelled vehicles, mechanical equipment containing internal combustion engines, and battery-powered vehicles or equipment. This section is revised to include engines, vehicles, and equipment powered by fuel cells consistent with

similar provisions under international standards.

Section 173.225

Section 173.225 specifies packaging requirements and other provisions for organic peroxides. When the § 172.101 HMT specifies this section, the organic peroxide must be packaged and offered for transportation in accordance with the provisions of this section. Each packaging must also conform to the general requirements of Subpart B of Part 173 and to the applicable requirements of Part 178 of the HMR. Specifically, organic peroxides that

require temperature control are subject to § 173.21(f). When an IBC or bulk packaging is authorized and meets the requirements of paragraph (f) or (h) of § 173.225, respectively, lower control temperatures than those specified for non-bulk packaging may be required. An organic peroxide not identified in paragraph (c), (e), or (g) of § 173.225 by technical name, or not assigned to a generic type in accordance with paragraph (b)(3) of this section, must conform to the requirements in paragraph (c) of § 173.128.

The Organic Peroxides Table specifies 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 the table. In this final rule, PHMSA is amending the Organic Peroxide Table in § 173.225(c)(8) by adding a new entry and revising current entries. We are revising an entry to the Organic Peroxide IBC Table in paragraph (e) of this section.

The following entries in the Organic Peroxide Table are being revised:

UN3106	Di-(2-tert-butylperoxyisopropyl) benzene(s).
Exempt	Di-(2-tert-butylperoxyisopropyl) benzene(s).
UN3105	2,5-Dimethyl-2, 5-di-(tert-butylperoxy) hexane.

The following entry is added to the Organic Peroxide Table:

UN3103	2,5-Dimethyl-2, 5-di-(tert-butylperoxy) hexane.
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One commenter (Arkema) requested that PHMSA provide a packing method exception for domestic transportation of greater than 90% concentrations of this material based on a history of safe transportation. The proposed revision to this entry changed the packing method for this material in concentrations of 90–100% from OP7 to OP5, reducing the maximum quantity per package from 60 L to 30 L per package. Arkema stated:

[We ship] a 97% solution in 100 pound drums. Since August 2005 we have shipped [approximately] 1,800,000 pounds. We have had only one incident in the 5 year time period. This incident was the result of a pallet nail puncture. We suggest that a note be added to column (8) for domestic shipments [that] OP7 is authorized.

We disagree. The UN Committee of Experts adopted the reclassification of 90–100% concentrations of 2, 5-Dimethyl-2, 5-di-(tert-butylperoxy)

hexane, which entails the more conservative packing method OP5, based on a proposal submitted by the German competent authority. Available industry test data from results on this material at concentrations greater than 90% using the E1 Koenen test in the UN Manual of Tests and Criteria varies from 1.5–2.0 mm. Based on differences in industry test results, the German competent authority conducted a number of E1 Koenen tests on various concentrations of 2, 5-Dimethyl-2, 5-di-(tert-butylperoxy) hexane exceeding 90%. Their conclusion was that the limiting diameter is 2.0 mm at concentrations above 90%, and therefore, they proposed a reclassification from an “Organic Peroxide, Type D, liquid, UN3105” to an “Organic Peroxide, Type C, liquid, UN3103” for 90–100% concentrations of

2, 5-Dimethyl-2, 5-di-(tert-butylperoxy) hexane to the UNSCOE (see UN working document ST/SG/AC.10/C.3/2008/66 available on the UNSCOE Web site).

We applaud Arkema’s safe record of transportation using packing method OP7 for a greater than 90% concentration of material. However, based on data provided by the German competent authority indicating a more conservative classification, in this final rule, we are keeping this entry as proposed. We invite Arkema to submit test results for their 97% solution of 2, 5-Dimethyl-2, 5-di-(tert-butylperoxy) hexane should the results indicate a classification that differs from the entry adopted in this final rule.

The following entry in the Organic Peroxide IBC Table is being revised to authorize a 31H2 freestanding, rigid plastic IBC:

UN3109	Peroxyacetic acid, stabilized, not more than 17%.
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Section 173.230

Section 173.230 prescribes the requirements for fuel cells offered for transportation by all modes. In paragraph (g), PHMSA proposed to allow only those fuel cells containing flammable liquids and corrosive materials to be transported as a limited quantity by aircraft. In paragraph (h), PHMSA also proposed prohibiting the reclassification to “Consumer commodity, ORM-D–AIR” for

transportation by aircraft. Several commenters (BIC, COSTHA, DGAC, IATA, LSI, Signa, Trulite, USFCC) expressed strong disapproval to not extending the limited quantity provisions to fuel cell cartridges containing either Division 2.1 (flammable) gas or water-reactive solids. They noted that the only difference between authorizing and not authorizing these materials as limited quantities is the required use of UN specification packaging and that

PHMSA offers no safety rationale for this exclusion as the fuel cell cartridges themselves are subject to much more stringent construction, testing, and packaging requirements than for similar articles (e.g., aerosols).

We agree. In this final rule, based on comments received, we are authorizing the transportation of flammable gas and water-reactive solid fuel cell cartridges as limited quantities in addition to authorizing their transport as consumer commodities (except for transportation

by aircraft) if all conditions for limited quantity provisions are met.

Section 173.301b

Section 173.301b prescribes general requirements for shipment of UN pressure receptacles. PHMSA is revising paragraph (c)(2)(iii) to indicate that valve protection requirements for metal hydride storage systems are specified in ISO 16111. Additionally, we are revising paragraph (e) regarding the integrity of UN pressure receptacles used for pyrophoric gases or flammable mixtures of gases containing more than 1% pyrophoric compounds in accordance with the sixteenth revised edition of the UN Model Regulations.

Section 173.306

Section 173.306 prescribes the requirements for limited quantities of compressed gases. PHMSA is revising paragraph (h) to clarify that, except for transportation by aircraft, lighter refills in the ORM-D hazard class are eligible for the exceptions in paragraph (i) of this section and in § 173.156. Additionally, PHMSA is revising paragraph (i) of the section to recognize the new marking for limited quantities of such materials and to provide a transitional period for the eventual elimination of the ORM-D hazard class. PHMSA is also editorially revising paragraph (l) for clarity.

Section 173.307

Section 173.307 establishes exceptions for compressed gases. In this final rule, PHMSA is adding certain types of light bulbs to the section provided they are packaged appropriately so that if a bulb ruptures all pieces are contained within the package.

Section 173.311

PHMSA is adding a new § 173.311 to prescribe the packaging requirements for "Metal hydride storage systems, UN3468" used for the transport of hydrogen as proposed. A metal hydride storage system is a single complete hydrogen storage system that includes a receptacle, metal hydride, a pressure relief device, a shut-off valve, service equipment and internal components.

The HMR do not prescribe specific packaging or shipping methods for metal hydride storage systems containing hydrogen. However, PHMSA has issued a number of special permits to allow the use of these systems for transport. The UN Model Regulations, in new Packing Instruction P205, prescribe standards for the construction, qualification, marking and requalification of such systems and are

the basis for the new HMR requirements. Some amendments in new § 173.311 include:

- Application to transportable metal hydride storage systems with pressure receptacles not exceeding 150 liters in water capacity and having a maximum developed pressure not exceeding 25 MPa.
- Requirement that transportable metal hydride storage systems be designed, constructed, initially inspected and tested in accordance with ISO standard 16111:2008, "Transportable gas storage devices—Hydrogen absorbed in reversible metal hydride," as authorized under § 173.71(f) (formerly reserved).
- Requirement that steel pressure receptacles or composite pressure receptacles with steel liners be marked in accordance with § 173.301b(f) of the HMR, which specifies that a steel UN pressure receptacle bearing an "H" mark must be used for hydrogen bearing gases or other gases that may cause hydrogen embrittlement.
- Requirement of a requalification interval of no more than five years as specified in § 180.207 of the HMR in accordance with the requalification procedures prescribed in ISO 16111.

Section 173.322

Section 173.322 prescribes various packaging methods for ethyl chloride. In this final rule, PHMSA is adopting the amended provisions from packaging instruction P200 of the UN Model Regulations for ethyl chloride in a new paragraph (e). This new packaging method authorizes ethyl chloride in capsules not exceeding 150 g of gas each, closed with a secondary means applied, and placed in a strong outer packaging not to exceed 75 kg gross mass.

Part 175

Section 175.8

Section 175.8 provides exceptions from certain regulations for air carrier operator equipment and items of replacement. PHMSA is revising paragraph (b)(3) to clarify that transportation of alcoholic beverages, perfumes, colognes, and liquefied gas lighters carried aboard a passenger-carrying aircraft by an operator must be for use or sale of those items on that specific aircraft.

Two commenters (AA, COSTHA) requested that PHMSA align paragraph (b)(3) with the ICAO TI to permit onboard use of aerosols. COSTHA noted:

A number of carriers currently are required to obtain a special permit to transport

aerosols in Division 2.2, specifically for the dispensing of whipped cream or other food products * * * We believe if this list was amended by including "aerosols" this issue would be resolved.

We agree. Therefore, in this final rule we are revising paragraph (b)(3) to authorize use of Division 2.2 aerosols to dispense food products.

Section 175.9

Section 175.9 prescribes the applicability of the HMR to special aircraft and rotocraft operations. This section also prescribes the conditions under which certain operations may be performed in accordance with 14 CFR and 49 CFR (*e.g.*, avalanche and weather control). In this final rule, PHMSA is emphasizing that rotocraft operations are fully subject to both sets of regulations.

One commenter suggested revising paragraph (b)(6) to provide clarity. IME stated:

This suggested language is consistent with [§] 177.835(g), which addressed the identical compatibility issue between explosives and detonators that are transported on the same conveyance. In addition, use of the terms "dynamite" and "blasting caps" without the additional reference to Division 1.1, 1.2, and 1.3 material could lead to the unintentional misinterpretation or misapplication of the rule.

We agree. Based on the comment provided, we are revising § 173.59(b)(6) to provide clarification.

Section 175.10

Section 175.10 specifies the conditions for which passengers, crew members or an operator may carry hazardous materials aboard an aircraft. PHMSA is adding a new paragraph (a)(17) to permit a mobility aid such as a wheelchair, containing a lithium ion battery, to be transported in accordance with the exceptions provided in this section. A wheelchair or other mobility aid that contains a lithium metal battery is not permitted aboard a passenger-carrying aircraft. As a result of this amendment, current paragraph (a)(17) is redesignated as paragraph (a)(18) and current paragraph (a)(18) is redesignated as paragraph (a)(19).

Three commenters (IATA, PRBA, Scoot) supported our proposal to add a new paragraph providing an exception for wheelchairs or other mobility aids containing a lithium ion battery, but requested that for consistency, we further align with the ICAO TI and accommodate carriage of these items by disabled passengers by allowing carriage in the aircraft cabin. For instance, Scoot shared:

Our mobility scooter [is] designed to fold up and be stowed in the passenger cabin

* * *. They are often small enough to fit in the overhead bin. [T]he lithium-ion batteries are removed and hand-carried by the passenger in the same manner as * * * lithium-ion batteries used for consumer electronics.

PRBA expressed disappointment that PHMSA did not address authorizing passenger transport of certain medical devices powered by lithium metal batteries in this final rulemaking. We recognize the need for persons with medical disabilities to be able to carry devices powered by lithium metal batteries aboard a passenger-carrying aircraft. However, such a provision will be addressed in a separate rulemaking.

Paragraph (a)(19) is being revised to allow passengers and crew members to place certain spare fuel cell cartridges in checked baggage. This exception currently does not apply to Divisions 2.1 or 4.3 materials contained in spare fuel cell cartridges. Although the ICAO TI only restricts spare fuel cell cartridges containing Division 4.3 liquid materials from checked baggage, PHMSA strongly believes that the restriction must also include spare cartridges containing Division 2.1 materials. Thus, PHMSA proposed to allow spare fuel cell cartridges containing flammable and corrosive liquids in checked baggage while continuing to require spare fuel cell cartridges containing Division 2.1 and 4.3 materials to be carried aboard an aircraft in carry-on baggage only.

One commenter (ALPA) supported our position while several commenters (COSTHA, DGAC, IATA, JEMA, PRBA, TAEC, Trulite, USFCC) voiced strong opposition to our proposal to limit fuel cell cartridges permitted in checked baggage to those with flammable liquid or corrosive liquid fuels. As several commenters indicated, PHMSA did not provide data or analysis supporting the proposal, while tests performed at the FAA Technical Center on fuel cell cartridges containing flammable liquid material indicated that in the case of a fire involving these materials, the fire can be readily extinguished with current fire suppression systems onboard an aircraft.

Because Division 2.1 flammable gases are generally prohibited in air transportation on a passenger-carrying aircraft as cargo and due to the questionable integrity of such articles when packed in a passenger's checked baggage, PHMSA is adopting the prohibition in checked baggage of fuel cell cartridges containing Division 2.1 flammable gases and Division 4.3 solid dangerous when wet materials as proposed.

Section 175.25

PHMSA currently requires operators to provide certain information to passengers regarding what hazardous materials they may check-in or carry-on a flight. Effective January 1, 2013, this information is to be provided at points of ticket sale and at automated or remote passenger check-in. Consistent with the ICAO TI, these amendments will require a passenger to acknowledge such limitations before a ticket purchase and automated or remote check-in can be finalized. PHMSA believes these amendments only clarify existing regulatory requirements in § 175.25 that have not been updated due to changing technologies used by air carriers to either sell tickets (Internet) or check-in passengers (automated kiosks). Additionally, these amendments provide air carriers greater flexibility in how the information they are required to provide passengers on hazardous materials is disseminated to them.

Section 175.30

Section 175.30 prescribes inspection procedures for operators. PHMSA is revising paragraph (e) regarding overpack marking requirements for packages of limited and excepted quantities offered for transportation by aircraft.

Section 175.75

Section 175.75 prescribes quantity limitations and cargo location requirements for hazardous materials transported by aircraft. PHMSA is revising paragraph (e) to correct an inadvertent cargo compartment restriction for passenger-authorized materials carried aboard a cargo-only aircraft published in a final rule under Docket HM-215J (74 FR 2267, January 14, 2009). PHMSA is also revising paragraph (f) Quantity and Loading Tables for clarity.

Several commenters (ALPA, COSTHA, PRBA, UPS) objected to our inclusion of limitations on the stowage of lithium batteries in § 175.75 of the HMR and strongly urged that the limitations be removed from this rulemaking and addressed in a separate lithium battery rulemaking such as HM-224F. We agree. All reference to lithium batteries in our revisions to § 175.75 are removed from this rulemaking.

One commenter (UPS) fully supported our proposed clarification of the use of the Class C cargo compartment for shipments of material eligible for passenger aircraft under § 175.75(d); however, UPS did recommend an additional revision for clarity. Therefore, in this final rule we are

revising paragraph (d) further to incorporate a second note into the table to clarify that for cargo-only aircraft, packages required to be loaded in a position considered accessible include those loaded into a Class C cargo compartment.

Several commenters requested that PHMSA offer the same exception from the loading restrictions in § 175.75 for limited quantity packages as are currently authorized for Class 9 and ORM-D-AIR materials. We agree that such packages should be afforded the same exceptions from the loading restrictions of § 175.75 as ORM-D-AIR materials and are revising the section accordingly.

Section 175.78

Section 175.78 prescribes the stowage compatibility of hazardous materials offered for transportation by aircraft. PHMSA is revising paragraph (c)(4)(iii) to specify that, except as provided in paragraph (c)(4)(iv) of § 175.78, Division 1.4B explosive materials may only be stowed together with Division 1.4S explosive materials. This revision is in accordance with an amendment made in the 2011-2012 ICAO Technical Instructions.

Part 176

Section 176.2

Section 176.2 establishes definitions specific to the transportation of hazardous materials by vessel. PHMSA is revising the definition for "Cargo transport unit" to include a multiple-element gas container or MEGC.

Section 176.63

Section 176.63 sets forth and describes the basic physical requirements for authorized stowage locations of hazardous materials on board vessels. PHMSA is amending paragraph (f)(2) by removing reference to the specific year of SOLAS, Chapter II-2/Regulation 19 (*i.e.*, 1974, as amended) for consistency with the manner in which IBR material is indicated throughout the HMR in outlying sections.

Section 176.76

Section 176.76 prescribes certain requirements for transport vehicles, freight containers, and portable tanks containing hazardous materials transported by vessel. In this final rule, we are revising paragraph (a)(9) to require that when security devices, beacons or other tracking or monitoring equipment are used, they must be securely installed and must be of a certified safe type for the hazardous

materials that will be carried within the freight container or transport vehicle.

Section 176.84

Section 176.84 outlines additional requirements for stowage and segregation of hazardous materials transported by cargo and passenger vessels. In this final rule, PHMSA is removing the redundant stowage code 143. This provision is currently assigned to UN1259, UN2845, UN3194, UN3392, and UN3394, and prohibits the carriage of the materials aboard a vessel transporting Class 1 (explosive) material (except for explosives of Division 1.4S). See Section 172.101 Hazardous Materials Table for the amendment that adds stowage code 78 to the above materials of extreme flammability. Such materials are now required to be “separated longitudinally by an intervening complete compartment or hold from explosives” based on amendments adopted in the IMDG Code.

Section 176.142

Section 176.142 prescribes the requirements for hazardous materials of extreme flammability transported on the same vessel as Class 1 (explosive) materials. In this final rule, PHMSA is deleting this section as the restriction no longer exists. Hazardous materials of extreme flammability are no longer prohibited from stowage on the same vessel as explosives. For entries previously affected by this section, the most restrictive stowage requirements are required.

Section 176.905

Section 176.905 prescribes specific requirements for motor vehicles or mechanical equipment powered by internal combustion engines that are offered for transportation and transported by vessel. For consistency with Amendment 35–10 of the IMDG Code, PHMSA is removing the signage requirement for such articles in paragraph (a)(5) and the ignition key removal provisions from paragraph (a)(6). Additionally, we are revising this section to account for modern designs of vehicles and equipment that are powered by engines other than internal combustion engines (e.g., electric engines powered by a fuel cell, hybrid vehicles). We are revising this section to include language applicable to address these new designs. We did not propose these changes in the August 24, 2010 NPRM, but we do not believe including language to account for new designs imposes new restrictions or any greater burdens than currently in the regulations.

Part 178

Section 178.71

Section 178.71 establishes the specifications for UN pressure receptacles. In this final rule, PHMSA is adopting the regulatory relief proposed in Docket HM–218F (75 FR 60017, 75 FR 60017) by revising the requirements in paragraph (c)(1) to allow the use of a proof pressure test in addition to the volumetric expansion test. The ISO 7866 and 9809 standards permit either the proof pressure test or volumetric expansion test to be used. The volumetric expansion test measures the cylinder’s elastic expansion and assures the cylinder received a proper heat treatment. However, the ISO standards also require each cylinder be subjected to a hardness test and a comprehensive shear wave ultrasonic examination (UE). PHMSA believes the combination of the proof pressure test, hardness test, and UE should provide adequate assurance that each cylinder received a proper heat treatment. This limitation (*i.e.*, volumetric expansion test only) is also removed from the test pressure marking requirement in the redesignated paragraph (p)(6).

In this final rule, PHMSA is also amending the cylinder bundle marking requirements in § 178.71(e) by adding a new paragraph (e)(8) specifying that pressure vessel markings only apply to the pressure vessel itself and not to the assembly structure of the bundle. Additionally, we are adding new paragraphs (f) and (m) that establish the design and construction requirements for UN metal hydride storage systems and refillable welded cylinders, respectively. To accomplish this, we are redesignating paragraphs (m) through (r) as paragraphs (n) through (s), and revising paragraphs (q) and (s) accordingly to correct paragraph references. Further, we are adding three ISO standards to the IBR table in § 171.7 of the HMR for UN refillable welded cylinders (ISO 4706, 18172–1 and 20703). Lastly, we are requiring that transportable metal hydride storage systems (*see* § 173.311) be designed, constructed, initially inspected and tested in accordance with ISO 16111:2008, “Transportable gas storage devices—Hydrogen absorbed in reversible metal hydride,” as authorized under § 178.71(m).

Section 178.275

Section 178.275 prescribes requirements for UN portable tanks intended for transportation of liquid and solid hazardous materials. Section 178.275(h) prohibits the use of fusible elements on portable tanks with a test

pressure which exceeds 2.65 bar (265 kPa). In § 172.102(c)(8), we are adding a new portable tank special provision TP36 authorizing the use of fusible elements in the vapor space of portable tanks with a gauge test pressure that exceeds 265 kPa (38.4 psig/2.65 bar) for certain organometallic substances. In this final rule, we are authorizing use of fusible elements based on a well-established history of safe transportation of these substances in portable tanks equipped with fusible elements capable of properly functioning at pressure of at least 1,000 kPa (145 psig/10 bar). Past experience of the use of fusible elements indicates reliability and a proper functioning even in the event of a release during loading or unloading. Additionally, for organometallic materials that are shipped in rigid portable tanks with a minimum test pressure of more than 265 kPa (38.4 psig/2.65 bar), the tanks are required to be equipped with a depressurizing system that releases the inside pressure to avoid rupturing the tank as a result of an inadvertent release or fire. Fusible elements are used by shippers as a secondary pressure relief device, in addition to a re-closing pressure relief device. Therefore, we are revising § 178.275(h) to reference special provision TP36 authorizing the use of fusible elements in the vapor space of a portable tank used for the transport of certain organometallic materials.

Section 178.347–1

Section 178.347–1 prescribes the general requirements for DOT Specification 407 cargo tank motor vehicles. Paragraph (d)(9) prescribes weld integrity, compliance and acceptance criteria for bulkheads.

The exception in § 178.347–1(d)(8) currently provides an unconditional exception from UW–12 for all joints. Section 178.347–1(d)(9) applies a condition to one particular joint configuration in a head. In petition P–1333, TTMA requested that we adopt a weld joint efficiency of 0.85 for head seams in bulkheads on DOT 407 cargo tanks. Based on review of the TTMA petition and additional information that was provided, we proposed in the HM–213 NPRM (66 FR 63095, December 4, 2001) that the strength of a weld seam in a bulkhead without radiographic examination of the weld must be 0.85 of the strength of the bulkhead. The welded seam must be a full penetration butt weld, no more than one seam may be used per bulkhead, and the welded seam must be completed before forming the dish radius and knuckle radius.

TTMA commented on the proposal stating, “[w]hile we agree with the

proposal to allow a provisional 85% weld joint efficiency for DOT 407 heads with butt-welded seams, we would like to see the requirements of UW-12 of the ASME Code specifically exempted for this welded joint. Even though this section implies an exemption, the exemption is not specific. We suggest the following wording, “[t]he strength of a weld seam in a bulkhead that has not been radiographically examined shall be 0.85 of the strength of the bulkhead and be exempted from the requirements of UW-12 of the ASME Code under the following condition”.

In the HM-213 final rule, we agreed with TTMA’s comment and agreed to make the change though the change occurred in a corrections document (68 FR 52363, September 3, 2003). The final rule stated: “[I]n its comments to the NPRM, TTMA agrees with the provisional 85% weld joint efficiency for DOT 407 heads with butt-welded seams. However, TTMA suggests that we include the requirements of Part UW-12 of the ASME Code to the list of excepted requirements in § 178.347-1(d)(8). We agree with TTMA. In this final rule, we are adding Part UW-12 of the ASME Code to the list of excepted requirements.”

In October 2004, we added an exception from the radiography/joint efficiency requirements of ASME VIII section UW-12 for DOT 407 cargo tanks with MAWP of 35 psig and less in § 178.347-1(d)(8) and (9). The intent was to provide a conditional alternate means of determining a joint efficiency for certain head welds. Listing UW-12 in § 178.347-1(d)(8) instead of (9), however, results in an unconditional exception from UW-12 in all welds on these tanks. Therefore, because we believe the revision is appropriate, we are revising § 178.347-1(d)(9), as proposed, by adding a new subparagraph (i) and renumbering the section accordingly.

Section 178.603

Section 178.603 prescribes the drop test requirements for non-bulk packagings in the HMR. In this final rule, PHMSA is revising paragraph (f)(4) to amend the criteria for passing the tests. The HMR require only that there is no leakage of filling substance from the inner packaging. In this final rule, we are also requiring that inner receptacles, inner packagings and articles remain completely within the outer package when drop tested.

Section 178.703

Section 178.703 prescribes the marking requirements for IBCs. PHMSA is aligning paragraph (a)(1)(viii) with the

UN Model Regulations by requiring the gross mass, in kilograms, to be marked on all IBC types. The HMR require a net mass to be marked on flexible IBCs which is inconsistent with international standards. PHMSA inadvertently did not revise the HMR under a previous harmonization rulemaking when the international standards were amended to specify that a maximum permissible gross mass be marked on all IBC types.

Section 178.955

Section 178.955 establishes definitions used with regard to subpart Q of part 178, which prescribes the design and testing criteria for Large Packagings. PHMSA is adding the following two new definitions, “Remanufactured Large Packaging” and “Reused Large Packaging,” in new paragraphs (c)(6) and (c)(7), respectively. A “remanufactured” large packaging is defined as a metal or rigid plastic large packaging that is produced as a UN type from a non-UN type or is converted from one UN design type to another UN design type. Remanufactured large packagings are subject to the same HMR requirements that apply to a new large packaging. A “reused” large packaging is defined as a large packaging to be refilled that has been examined and found free of defects affecting the ability to withstand the performance tests. The term includes those that are refilled with the same or similar compatible contents and are transported within distribution chains controlled by the consignor of the product.

Part 180

Section 180.207

Section 180.207 prescribes the requirements for the requalification of UN pressure receptacles. In this final rule, PHMSA is requiring that metal hydride storage systems be requalified every five years in accordance with ISO 16111:2008 and that the records of that requalification be retained in accordance with § 180.215 of the HMR.

Section 180.350

Section 180.350 prescribes applicability and defines certain terms regarding the qualification and maintenance of IBCs. PHMSA is revising paragraph (b) to indicate that the replacement of the inner receptacle of a composite IBC with one from the original manufacturer is considered a repair. This revision is consistent with the recent change in the definition of “repair” in the UN Model Regulations.

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, as discussed in detail above, the final rule amends the HMR to more fully align them with the biennial updates of the UN Model Regulations, the IMDG Code and the ICAO TI.

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 public. 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 TI. Moreover, we are maintaining a number of current exceptions for domestic transportation that should minimize the compliance burden on the regulated community.

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 rule amends 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 incorporates changes into the HMR based on the sixteenth revised edition of the UN Model Regulations and the 2011–2012 ICAO Technical Instructions, which become effective January 1, 2011, and Amendment 35–10 to the IMDG Code which becomes effective January 1, 2012. The continually increasing amount of hazardous materials transported in international commerce warrants the harmonization of domestic and international requirements to the greatest extent possible.

B. Executive Order 12866 and DOT Regulatory Policies and Procedures

This final rule is not considered a significant regulatory action under section 3(f) of Executive Order 12866 and, therefore, was not reviewed by the Office of Management and Budget. The final rule is not considered a significant rule under the Regulatory Policies and Procedures of the Department of Transportation (44 FR 11034). This final rule applies to offerors and carriers of hazardous materials, such as chemical manufacturers, chemical users and suppliers, packaging manufacturers, distributors, radiopharmaceutical companies, and training companies. Benefits resulting from the adoption of the amendments in this final rule include enhanced transportation safety resulting from the consistency of domestic and international hazard communications and continued access to foreign markets by U.S. manufacturers of hazardous materials.

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.

We authorize a one year transition period to allow for training of employees and to ease any burden on entities affected by the amendments. The total net increase in costs to businesses in implementing the final rule is considered to be minimal. Initial start-up and inventory costs will result from these changes. However, the costs are offset by greater long term savings of conformance with one set of regulations and a one-year transition period. A regulatory evaluation is available for review in the public docket for this rulemaking.

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 propose 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, 2011. If the changes in this final rule are not adopted into the HMR, U.S. companies, including numerous small entities competing in foreign markets, would be at an economic disadvantage. These companies would be forced to comply with a dual system of regulations. The changes in this final rulemaking 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 of Federal preemption is 90 days from publication of the final rule in this matter.

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, does not impose substantial direct compliance costs, and is required by statute, 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 competing in foreign markets, from the burden of complying with a dual system of regulations. Therefore, I certify that these amendments will not, if promulgated, 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 2137–0034, “Hazardous Materials Shipping Papers and Emergency Response Information,” with an expiration date of May 31, 2011, and OMB Control Number 2137–0557,

“Approvals for Hazardous Materials,” with an expiration date of June 30, 2011. This final rule may result in a decrease in the annual burden and costs of OMB Control Number 2137–0034 due to amendments to the exceptions for shipping paper requirements for limited quantities of Class 3, Division 4.1, Division 4.2, Division 4.3, Division 5.1, Division 5.2, Division 6.1, Class 8, and Class 9 materials for those limited quantities that are defined as consumer commodities. This final rule may result in an increase in the annual burden and

costs of OMB Control Number 2137–0557 due to amendments to the classification criteria for eight Division 1.4 explosive articles to add the Type 6(d) test as prescribed in the fifth revised edition of the UN Manual of Tests and Criteria.

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 final rule 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 as proposed in this rule to be as follows:

OMB Control No.	2137–0034
Annual Decrease in Number of Respondents	75,000,000
Annual Decrease in Annual Number of Responses	75,000,000
Annual Decrease in Annual Burden Hours	1,875,000
Annual Decrease in Annual Burden Costs	\$1,875,000.00
OMB Control No.	2137–0557
Annual Increase in Number of Respondents	465
Annual Increase in Annual Number of Responses	465
Annual Increase in Annual Burden Hours	2,325
Annual Increase in Annual Burden Costs	\$58,125

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 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 analyze proposed actions to determine whether the action will have a significant impact on the human environment. The Council on Environmental Quality (CEQ) regulations order Federal agencies to conduct an environmental review

considering (1) the need for the proposed action, (2) alternatives to the proposed action, (3) probable environmental impacts of the proposed action and alternatives, and (4) the agencies and persons consulted during the consideration process. 40 CFR 1508.9(b).

1. Purpose and Need

PHMSA proposed to amend 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 with recent changes to the International Maritime Dangerous Goods Code, the International Civil Aviation Organization’s Technical Instructions for the Transport of Dangerous Goods by Air, and the United Nations Recommendations on the Transport of Dangerous Goods. The amendments are intended to enhance the safety of international hazardous materials transportation through better understanding of the regulations, an increased level of industry 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.

The HMR regulate materials that meet the definition of a marine pollutant in all modes of transportation. The intended effect is to increase the level of safety associated with the transportation of substances hazardous to the marine environment by way of improved communication of their presence in transportation and establishing appropriate requirements for their packaging. The HMR uses a list-based system designed to help shippers determine if a material meets the definition of a marine pollutant. Recently, the IMO adopted a criteria based system for identification of materials hazardous to the marine environment based on the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

2. Alternatives

In developing this proposed 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 safety level. 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 through better understanding of the regulations, an increased level of industry 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 and economic 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. These actions will provide the greatest possible harmonization with international requirements without posing an undue increased cost burden on industry. For these reasons, Alternative 3 is our recommended alternative.

3. 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 (e.g., 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 its impact on transportation safety and the environment. Based on the lack of public comment on the issue, it is our conclusion that the amendments adopted in this final rule will have no adverse affect on the environment.

4. Consultations and Public Comment

On June 20, 2007, November 27, 2007, June 18, 2008, and November 19, 2008, PHMSA hosted public meetings with public and private stakeholders to discuss draft U.S. positions on the United Nation's Sub-Committee of Experts on the Transport of Dangerous Goods (UNSCOE) proposals for the sixteenth revised edition of the UN Recommendations on the Transport of Dangerous Goods Model Regulations. In addition, PHMSA and the U.S. Coast Guard hosted a public meeting on September 17, 2008, and hosted a second meeting on September 10, 2009, to discuss amendments to the IMDG Code. A public meeting was held on September 29, 2009 to discuss amendments to the ICAO Technical Instructions. During these public meetings, U.S. positions on proposed amendments to the UN Recommendations were considered and discussed. Positions were established based on input received during these meetings in conjunction with internal review, including thorough technical review.

We have identified a number of immediate and long-term actions that participants in the international community are taking or will take to enhance the safe transportation of hazardous materials. Through this integrated and cooperative approach, we believe we can be most successful in reducing incidents, enhancing safety, and protecting the public.

J. Privacy Act

Anyone is able to search the electronic form of any written communications and comments received into any of our dockets by the name of the individual submitting the document (or signing the document, 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 (65 FR 19477) or you may visit <http://www.dot.gov/privacy.html>.

K. International Trade Analysis

The Trade Agreements Act of 1979 (Pub. L. 96-39), as amended by the

Uruguay Round Agreements Act (Pub. L. 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 the proposed rule to ensure that it does not exclude imports that meet this objective. Accordingly, this rulemaking is consistent with 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 amends 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. In § 171.7, the paragraph (a)(3) table is amended as follows:

■ a. Under the entry “American Society for Testing and Materials (ASTM),” the entries “ASTM D56–05”, “ASTM D86–07a”, “ASTM D93–08”, “ASTM D1078–05”, “ASTM D3278–96(2004)e1”, and “ASTM D3828–07a” are added in alphanumerical order;

■ b. Under the entry “International Civil Aviation Organization (ICAO),” the

entry “Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO Technical Instructions)” is revised;

■ c. Under the entry “International Maritime Organization (IMO),” the entries “International Maritime Dangerous Goods Code (IMDG Code)” and “International Convention for the Safety of Life at Sea, 1974, as amended (SOLAS)” are revised;

■ d. Under the entry “International Organization for Standardization (ISO),” the entries “ISO 2592–1973(E)”, “ISO 10297:1999” and “ISO 10461:2005” are revised; and the entries “ISO 1516:2002”, “ISO 1523:2002”, “ISO 2719:2002”, “ISO 3405:2000”, “ISO 3679:2004”, “ISO 3680:2004”, “ISO 3924:1999”, “ISO 4626:1980”, “ISO 4706:2008”, “ISO 10692–2:2001”, “ISO 13736:2008”, “ISO 16111:2008”, “ISO 18172–1:2007” and “ISO 20703:2006” are added in alphanumerical order;

■ e. Under the entry “Organization for Economic Cooperation and Development (OECD),” the entry “OECD Guideline for the Testing of Chemicals, Number 404, “Acute Dermal Irritation/Corrosion (1992)” is revised and the entries “OECD (2004), Test No. 430: *In Vitro* Skin Corrosion: Transcutaneous

Electrical Resistance Test (TER), OECD Guidelines for the Testing of Chemicals, Section 4: Health Effects, OECD Publishing”, “OECD (2004), Test No. 431: *In Vitro* Skin Corrosion: Human Skin Model Test, OECD Guidelines for the Testing of Chemicals, Section 4: Health Effects, OECD Publishing” and “OECD (2006), Test No. 435: *In Vitro* Membrane Barrier Test Method for Skin Corrosion, OECD Guidelines for the Testing of Chemicals, Section 4: Health Effects, OECD Publishing” are added in appropriate numerical order;

■ f. Under the entry for “Transport Canada,” the entry “Transportation of Dangerous Goods Regulations (Transport Canada TDG Regulations)” is revised; and

■ g. Under the entry “United Nations”, the entries “UN Recommendations on the Transport of Dangerous Goods, Model Regulations” and “UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria” are revised.

The additions and revisions read as follows:

§ 171.7 Reference material.

- (a) * * *
- (3) * * *

Source and name of material	49 CFR reference
* * * * *	
<i>American Society for Testing and Materials (ASTM)</i>	
* * * * *	
ASTM D56–05, Standard Test Method for Flash Point by Tag Closed Cup Tester, approved May 1, 2005	173.120
ASTM D86–07a, Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure, approved April 1, 2007.	173.121
ASTM D93–08, Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester, approved October 15, 2008.	173.120
ASTM D1078–05, Standard Test Method for Distillation Range of Volatile Organic Liquids, approved May 15, 2005	173.121
* * * * *	
ASTM D3278–96 (Reapproved 2004) E1, Standard Test Methods for Flash Point of Liquids by Small Scale Closed-Cup Apparatus, approved November 1, 2004.	173.120
ASTM D3828–07a, Standard Test Methods for Flash Point by Small Scale Closed Cup Tester, approved July 15, 2007	173.120
* * * * *	
<i>International Civil Aviation Organization (ICAO),</i>	
* * * * *	
Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO Technical Instructions), 2011–2012 Edition.	171.8; 171.22; 171.23; 171.24; 172.101; 172.202; 172.401; 172.512; 172.519; 172.602; 172.704; 173.1; 173.56; 173.320; 175.33; 178.3.
* * * * *	
<i>International Maritime Organization (IMO),</i>	
* * * * *	
International Convention for the Safety of Life at Sea, 1974, as amended (SOLAS), Chapter II–2, Construction—Fire protection, fire detection and fire extinction, Regulation 19, Carriage of dangerous goods, Consolidated Edition 2009.	176.63, 176.84

Source and name of material	49 CFR reference
International Maritime Dangerous Goods Code (IMDG Code), 2010 Edition, Incorporating Amendment 35–10 (English Edition), Volumes 1 and 2.	171.22; 171.23; 171.25; 172.101 172.202; 172.203 172.401; 172.502; 172.519; 172.602; 172.704; 173.1; 173.21; 173.56; 173.320; 176.2; 176.5; 176.11; 176.27; 176.30; 176.83; 176.84; 176.140; 176.720; 178.3; 178.274.
<i>International Organization for Standardization</i>	
* * * * *	* * * * *
ISO 1516:2002(E), Determination of flash/no flash—Closed cup equilibrium method, Third Edition, 2002–03–01	173.120.
ISO 1523:2002(E), Determination of flash point—Closed cup equilibrium method, Third Edition, 2002–03–01	173.120.
* * * * *	* * * * *
ISO 2592:2000(E), Determination of flash and fire points—Cleveland open cup method, Second Edition, 2000–09–15 ..	173.120.
ISO 2719:2002(E), Determination of flash point—Pensky-Martens closed cup method, Third Edition, 2002–11–15	173.120.
* * * * *	* * * * *
ISO 3405:2000(E), Petroleum products—Determination of distillation characteristics at atmospheric pressure, Third Edition, 2000–03–01.	173.121.
* * * * *	* * * * *
ISO 3679:2004(E), Determination of flash point—Rapid equilibrium closed cup method, Third Edition, 2004–04–01	173.120.
ISO 3680:2004(E), Determination of flash/no flash—Rapid equilibrium closed cup method, Fourth Edition, 2004–04–01	173.120.
* * * * *	* * * * *
ISO 3924:1999(E), Petroleum products—Determination of boiling range distribution—Gas chromatography method, Second Edition, 1999–08–01.	173.121.
* * * * *	* * * * *
ISO 4626:1980(E), Volatile organic liquids—Determination of boiling range of organic solvents used as raw materials, First Edition, 1980–03–01.	173.121.
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.	178.71.
* * * * *	* * * * *
ISO 10297:2006(E), Transportable gas cylinders—Cylinder valves—Specification and type testing, Second Edition, 2006–01–15.	173.301b; 178.71.
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.	180.207.
* * * * *	* * * * *
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.	173.40.
* * * * *	* * * * *
ISO 13736:2008(E), Determination of flash point—Abel closed-cup method, Second Edition, 2008–09–15	173.120.
ISO 16111:2008(E), Transportable gas storage devices—Hydrogen absorbed in reversible metal hydride, First Edition, 2008–11–15.	173.301b; 173.311; 178.71.
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.	178.71.
ISO 20703:2006(E), Gas cylinders—Refillable welded aluminum-alloy cylinders—Design, construction and testing, First Edition, 2006–05–01.	178.71.
* * * * *	* * * * *
<i>Organization for Economic Cooperation and Development (OECD)</i>	
* * * * *	* * * * *
OECD (2002), Test No. 404: Acute Dermal Irritation/Corrosion, OECD Guidelines for the Testing of Chemicals, Section 4: Health Effects, OECD Publishing, adopted April 24, 2002.	173.137.
OECD (2004), Test No. 430: <i>In Vitro</i> Skin Corrosion: Transcutaneous Electrical Resistance Test (TER), OECD Guidelines for the Testing of Chemicals, Section 4: Health Effects, OECD Publishing, adopted April 13, 2004.	173.137.
OECD (2004), Test No. 431: <i>In Vitro</i> Skin Corrosion: Human Skin Model Test, OECD Guidelines for the Testing of Chemicals, Section 4: Health Effects, OECD Publishing, adopted April 13, 2004.	173.137.
OECD (2006), Test No. 435: <i>In Vitro</i> Membrane Barrier Test Method for Skin Corrosion, OECD Guidelines for the Testing of Chemicals, Section 4: Health Effects, OECD Publishing, adopted July 19, 2006.	173.137.

Source and name of material	49 CFR reference
* * * * *	* * * * *
<i>Transport Canada</i>	
* * * * *	* * * * *
Transportation of Dangerous Goods Regulations (Transport Canada TDG Regulations), August 2001 including Clear Language Amendments SOR 2001–286; SOR/2002–306 August 8, 2002; SOR/2003–273 July 24, 2003; SOR/2003–400 December 3, 2003; SOR/2005–216 July 13, 2005; SOR/2005–279 September 21, 2005; SOR/2008–34 February 7, 2008 and SOR/2007–179 July 31, 2007.	171.12; 171.22; 171.23; 172.401; 172.502; 172.519; 172.602; 173.31; 173.32; 173.33.
* * * * *	* * * * *
<i>United Nations</i>	
* * * * *	* * * * *
UN Recommendations on the Transport of Dangerous Goods, Model Regulations, sixteenth revised edition, Volumes I and II (2009).	171.8; 171.12; 172.202; 172.401; 172.407; 172.502; 173.1; 173.3; 173.22; 173.24; 173.24b; 173.40; 173.56; 173.192; 173.302b; 173.304b; 178.75; 178.274; 178.500; 178.700; 178.900.
* * * * *	* * * * *
UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, fifth revised edition (2009)	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.
* * * * *	* * * * *

■ 3. In § 171.8, the definitions for “Metal hydride storage system” and “Open cryogenic receptacle” are added and the definitions for “Oxidizing gas” and “UN Recommendations” are revised to read as follows:

§ 171.8 Definitions and abbreviations.

* * * * *

Metal hydride storage system means a single complete hydrogen storage system that includes a receptacle, metal hydride, pressure relief device, shut-off valve, service equipment and internal components used for the transportation of hydrogen only.

* * * * *

Open cryogenic receptacle means a transportable thermally insulated receptacle for refrigerated liquefied gases maintained at atmospheric pressure by continuous venting of the refrigerated gas.

* * * * *

Oxidizing gas means a gas that may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does.

Specifically, this means a pure gas or gas mixture with an oxidizing power greater than 23.5% as determined by a method specified in ISO 10156: or

10156–2: (IBR, *see* § 171.7 of this subchapter) (*see also* § 173.115(k)).

* * * * *

U.N. Recommendations means the U.N. Recommendations on the Transport of Dangerous Goods, Model Regulations (IBR, *see* § 171.7 of this subchapter).

* * * * *

§ 171.23 [Amended]

- 4. In § 171.23, paragraph (b)(9) is removed and reserved.
- 5. In § 171.25, the first sentence in paragraph (b)(1) is revised, paragraph (b)(4) is added, and paragraphs (c)(5) and (d)(3) are removed.

The revision and addition read as follows:

§ 171.25 Additional requirements for the use of the IMDG Code.

* * * * *

(b) * * *

(1) Unless specified otherwise in this subchapter, a shipment must conform to the requirements in part 176 of this subchapter. * * *

* * * * *

(4) Material consigned under UN3166 and UN3171 (*e.g.*, Engines, internal combustion, *etc.*, Vehicles, *etc.* and Battery-powered equipment) may be

prepared in accordance with the IMDG Code or this subchapter.

* * * * *

PART 172—HAZARDOUS MATERIALS TABLE, SPECIAL PROVISIONS, HAZARDOUS MATERIALS COMMUNICATIONS, EMERGENCY RESPONSE INFORMATION, TRAINING REQUIREMENTS, AND SECURITY PLANS

■ 6. The authority citation for part 172 continues to read as follows:

Authority: 49 U.S.C. 5101–5128; 44701; 49 CFR 1.53.

- 7. In § 172.101, the following amendments are made:
 - a. Paragraph (c)(10)(i) is revised;
 - b. Paragraph (e) is amended by adding a sentence at the end of the paragraph; and
 - c. The Hazardous Materials Table is amended by removing those entries under [REMOVE], adding entries under [ADD], and revising entries under [REVISE] as shown below.

The revisions and additions read as follows:

§ 172.101 Purpose and use of hazardous materials table.

* * * * *

(c) * * *
(10) * * *

(i) A mixture or solution 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—

(A) Except as provided in § 172.101(i)(4) the packaging specified in Column 8 is inappropriate to the physical state of the material;

(B) The shipping description indicates that the proper shipping name applies only to the pure or technically pure hazardous material;

(C) The hazard class, packing group, or subsidiary hazard of the mixture or solution is different from that specified for the entry;

(D) There is a significant change in the measures to be taken in emergencies;

(E) The material is identified by special provision in Column 7 of the § 172.101 Table as a material poisonous by inhalation; however, it no longer meets the definition of poisonous by inhalation or it falls within a different

hazard zone than that specified in the special provision; or

(F) The material can be appropriately described by a shipping name that describes its intended application, such as "Coating solution", "Extracts, flavoring" or "Compound, cleaning liquid."

* * * * *

(e) * * * Those preceded by the letters "ID" are associated with proper shipping names recognized by the ICAO Technical Instructions (IBR, see § 171.7 of this subchapter).

* * * * *

§ 172.101 HAZARDOUS MATERIALS TABLE

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class or division	(4) Identification numbers	(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 (8A)	Non-bulk (8B)	Bulk (8C)	Passenger aircraft/rail (9A)	Cargo aircraft only (9B)		Location (10A)	Other (10B)
	[REMOVE].												
D	sec-Butyl chloroformate.	* 6.1	NA2742	I	6.1, 3, 8	2, B9, B14, B32, B74, T20, TP4, TP13, TP38, TP45.	None	227	244	Forbidden	Forbidden	A	12, 13, 22, 25, 40, 48, 100
	Detonator, assemblies, non-electric, for blasting.	* 1.4S	UN0500	II	1.4S		63(f), 63(g)	62	None	25 kg	100 kg	05	
	Engines, internal combustion, flammable gas powered.	* 9	UN3166		9	135		220		Forbidden	No limit	A	
	Engines, internal combustion, flammable liquid powered.	9	UN3166		9	135	220	220	220	No limit	No limit	A	
	Formaldehyde, solutions, flammable.	* 3	UN1198	III	3, 8	B1, IB3, T4, TP1	150	203	242	5 L	60 L	A	40
	Formaldehyde, solutions, with not less than 25 percent formaldehyde.	8	UN2209	III	8	IB3, T4, TP1	154	203	241	5 L	60 L	A	
	1-Hydroxybenzotriazole, anhydrous, wetted with not less than 20 percent water, by mass.	* 4.1	UN3474	I	4.1	162, N90	None	211	None	0.5 kg	0.5 kg	D	28, 36
D	Isobutyl chloroformate	* 6.1	NA2742	I	6.1, 3, 8	2, B9, B14, B32, B74, T20, TP4, TP13, TP38, TP45.	None	227	244	Forbidden	Forbidden	A	12, 13, 22, 25, 40, 48, 100
	Lithium hypochlorite, dry with more than 39% available chlorine (8.8% available oxygen) or Lithium hypochlorite mixtures, dry with more than 39% available chlorine (8.8% available oxygen).	* 5.1	UN1471	II	5.1	A9, IB8, IP2, IP4, N34	152	212	240	5 kg	25 kg	A	4, 48, 52, 56, 58, 69, 106, 116

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class or division	(4) Identification numbers	(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
	Nitric acid other than red fuming, with less than 65 percent nitric acid.	* 8	UN2031 ...	II	8	A6, B2, B47, B53, IB2, IP15, T8, TP2	*	158	242	Forbidden	30 L	D	44, 66, 74, 89, 90
	Nitric acid other than red fuming, with more than 70 percent nitric acid.	* 8	UN2031 ...	I	8, 5.1	A3, B47, B53, T10, TP2, TP12, TP13	*	158	243	Forbidden	2.5 L	D	44, 66, 89, 90, 110, 111
	Tars, liquid including road asphalt and oils, bitumen and cut backs.	* 3	UN1999 ...	II	3	149, B13, IB2, T3, TP3, TP29	*	202	242	5 L	60 L	B	
	Trinitro-meta-cresol	* 1.1D	UN0216 ...	II	1.1D		*	62	None	Forbidden	Forbidden	10	5E
	Vehicle, flammable gas powered.	* 9	UN3166 ...		9	135, 157	*	220	220	Forbidden	No limit	A	
	Vehicle, flammable liquid powered.	* 9	UN3166 ...		9	135, 157	*	220	220	No limit	No limit	A	
	[ADD].						*						
	Alkali metal dispersions, flammable or Alkaline earth metal dispersions, flammable.	* 4.3	UN3482 ...	I	4.3, 3	A2, A3, A7	*	201	244	Forbidden	1 L	D	52
W	Batteries, nickel-metal hydride see Batteries, dry, sealed, n.o.s. for nickel-metal hydride batteries transported by modes other than vessel.	* 9	UN3496 ...		9	340	*					A	48

Calcium hypochlorite, dry, corrosive or Calcium hypochlorite mixtures, dry, corrosive with more than 39% available chlorine (8.8% available oxygen).	* 5.1	UN3485	....	II	.....	5.1, 8	.....	165, 166, A7, A9, IB8, IP2, IP4, IP13, N34, W9.	.....	152	.....	212	.....	None	.....	5 kg	.....	25 kg	.....	D	.....	4, 48, 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	.....	165, IB8, IP2, IP4, IP13, W9.	.....	152	.....	212	.....	240	.....	5 kg	.....	25 kg	.....	D	.....	4, 48, 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.	.....	152	.....	213	.....	240	.....	5 kg	.....	25 kg	.....	D	.....	4, 48, 52, 56, 58, 69, 142
Consumer commodity	* 9	ID8000	.....	*	.....	9	.....	.....	.....	167	.....	167	.....	None	.....	30 kg gross	.....	30 kg gross	.....	.....	.....	.....
Detonator assemblies, non-electric, for blasting.	* 1.4S	UN0500	....	II	.....	1.4S	.....	347	.....	63(f), 63(g)	.....	62	.....	None	.....	25 kg	.....	100 kg	.....	05	.....	.....
Engines, internal combustion, or Engines, fuel cell, flammable gas powered.	* 9	UN3166	....	*	.....	9	.....	135	.....	220	.....	220	.....	220	.....	Forbidden	.....	No limit	.....	A	.....	.....
Engines internal combustion, or Engines, fuel cell, flammable liquid powered.	9	UN3166	....	.....	.....	9	.....	135	.....	220	.....	220	.....	220	.....	No limit	.....	No limit	.....	A	.....	.....
Formaldehyde solutions, flammable.	* 3	UN1198	....	III	.....	3, 8	.....	B1, IB3, T4, TP1	.....	4b, 150	.....	203	.....	242	.....	5 L	.....	60 L	.....	A	.....	40
Formaldehyde solutions, with not less than 25 percent formaldehyde.	8	UN2209	....	III	.....	8	.....	IB3, T4, TP1	.....	154	.....	203	.....	241	.....	5 L	.....	60 L	.....	A	.....	.....
Hydrazine aqueous solution, flammable with more than 37% hydrazine, by mass.	* 8	UN3484	....	I	.....	8, 3, 6.1	....	B16, B53, T10, TP2, TP13.	.....	None	.....	201	.....	243	.....	Forbidden	.....	2.5 L	.....	D	.....	40, 52, 125

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class or division	(4) Identification numbers	(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 (8A)	Non-bulk (8B)	Bulk (8C)	Passenger aircraft/rail (9A)		Cargo aircraft only (9B)	Location (10A)	Other (10B)
*	1-Hydroxybenzotriazole, monohydrate.	4.1	UN3474	I	4.1	N90	None	211	None	0.5 kg	0.5 kg	D	28, 36
*	Iodine	8	UN3495	III	8, 6.1	IB8, IP3, T1, TP33	154	213	240	25 kg	100 kg	B	40, 55
*	Lithium hypochlorite, dry or Lithium hypochlorite mixture.	5.1	UN1471	II	5.1	A9, IB8, IP2, IP4, N34, T3, TP33.	152	212	240	5 kg	25 kg	A	4, 48, 52, 56, 58, 69, 106, 116
*				III	5.1	IB8, IP3, N34, T1, TP33.	152	213	240	25 kg	100 kg	A	4, 48, 52, 56, 58, 69, 106, 116
*	Motor fuel anti-knock mixture, flammable.	6.1	UN3483	I	6.1, 3	14, T14, TP2, TP13	None	201	244	Forbidden	Forbidden	D	25, 40
*	Nitric acid other than red fuming, with more than 20 percent and less than 65 percent nitric acid.	8	UN2031	II	8	A6, B2, B47, B53, IB2, IP15, T8, TP2.	None	158	242	Forbidden	Forbidden	D	44, 66, 74, 89, 90
*	Nitric acid other than red fuming, with more than 70 percent nitric acid.	8	UN2031	I	8, 5.1	A3, B47, B53, T10, TP2, TP12, TP13.	None	158	243	Forbidden	2.5 L	D	44, 66, 89, 90, 110, 111
*	Petroleum sour crude oil, flammable, toxic.	3	UN3494	I	3, 6.1	343, T14, TP2, TP13	None	201	243	Forbidden	30 L	D	40
				II	3, 6.1	343, IB2, T7, TP2	150	202	243	1 L	60 L	D	40
				III	3, 6.1	343, IB3, T4, TP1	150	203	242	60 L	220 L	C	40
*	Tars, liquid including road oils and cut-back bitumens.	3	UN1999	II	3	149, B13, IB2, T3, TP3, TP29.	150	202	242	5 L	60 L	B	
				III	3	B1, B13, IB3, T1, TP3	150	203	242	60 L	220 L	A	

G	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.	6.1	UN3492	.....	I	.....	6.1, 8, 3	.....	*	1, B9, B14, B30, B72, T22, TP2, TP13, TP27, TP38, TP44.	None	.....	226	.....	244	.....	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/m3 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	.....	D	.....	40, 125
G	Toxic by inhalation liquid, flammable, corrosive, 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.	6.1	UN3488	.....	I	.....	6.1, 3, 8	.....	*	1, B9, B14, B30, B72, T22, TP2, TP13, TP27, TP38, TP44.	None	.....	226	.....	244	.....	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/m3 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	.....	D	.....	40, 125
G	Toxic by inhalation liquid, water-reactive, 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.	6.1	UN3490	.....	I	.....	6.1, 4.3, 3	.....	*	1, B9, B14, B30, B72, T22, TP2, TP13, TP27, TP38, TP44.	None	.....	226	.....	244	.....	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/m3 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	.....	D	.....	21, 28, 40, 49

§ 172.101 HAZARDOUS MATERIALS TABLE

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class or division	(4) Identification numbers	(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 (8A)	Non-bulk (8B)	Bulk (8C)	Passenger aircraft/rail (9A)	Cargo aircraft only (9B)	Location (10A)		Other (10B)
*	Trinitro-m-cresol	1.1D	UN0216	II	1.1D	*	None	62	None	Forbidden	Forbidden	10	5E
*	Vehicle, flammable gas powered or Vehicle, fuel cell, flammable gas powered.	9	UN3166	*	9	135	220	220	220	Forbidden	No limit	A	
9	Vehicle, flammable liquid powered or Vehicle, fuel cell, flammable liquid powered.	9	UN3166		9	135	220	220	220	No limit	No limit	A	
*	[REVISE].	*	*	*	*	*	*	*	*	*	*	*	*
*	Alcohols, n.o.s.	3	UN1987	I	3	172, T11, TP1, TP8, TP27.	4b	201	243	1 L	30 L	E	
		II			3	172, IB2, T7, TP1, TP8, TP28.	4b, 150	202	242	5 L	60 L	B	
		III			3	172, B1, IB3, T4, TP1, TP29.	4b, 150	203	242	60 L	220 L	A	
*	Antimony compounds, inorganic, liquid, n.o.s.	6.1	UN3141	III	6.1	35, IB3, T7, TP1, TP28	153	203	241	60 L	220 L	A	
G	Antimony compounds, inorganic, solid, n.o.s.	6.1	UN1549	III	6.1	35, IB8, IP3, T1, TP33	153	213	240	100 kg	200 kg	A	
*	Argon, refrigerated liquid (cryogenic liquid).	2.2	UN1951	*	2.2	T75, TP5	320	316	318	50 kg	500 kg	D	
G	Arsenic compounds, liquid, n.o.s., inorganic, including arsenates, n.o.s.; arsenites, n.o.s.; arsenic sulfides, n.o.s.; and organic compounds of arsenic, n.o.s.	6.1	UN1556	I	6.1	T14, TP2, TP13, TP27	None	201	243	1 L	30 L	B	40, 137
		II			6.1	IB2, T11, TP2, TP13, TP27.	153	202	243	5 L	60 L	B	40, 137
		III			6.1	IB3, T7, TP2, TP28	153	203	241	60 L	220 L	B	40, 137

G	Arsenic compounds, solid, n.o.s. inorganic, including arsenates, n.o.s.; arsenites, n.o.s.; arsenic sulfides, n.o.s.; and organic compounds of arsenic, n.o.s.	6.1	UN1557	I	6.1	IB7, IP1, T6, TP33	None	211	242	5 kg	50 kg	A	137
				II	6.1	IB8, IP2, IP4, T3, TP33	153	212	242	25 kg	100 kg	A	137
				III	6.1	IB8, IP3, T1, TP33	153	213	240	100 kg	200 kg	A	137
*				*	*	*		*	*	*			
6.1	Barium compounds, n.o.s.	6.1	UN1564	II	6.1	IB8, IP2, IP4, T3, TP33	153	212	242	25 kg	100 kg	A	
				III	6.1	IB8, IP3, T1, TP33	153	213	240	100 kg	200 kg	A	
*				*	*	*		*	*	*			
6.1	Beryllium compounds, n.o.s.	6.1	UN1566	II	6.1	IB8, IP2, IP4, T3, TP33	153	212	242	25 kg	100 kg	A	
				III	6.1	IB8, IP3, T1, TP33	153	213	240	100 kg	200 kg	A	
*				*	*	*		*	*	*			
5.1	Bromates, inorganic, aqueous solution, n.o.s.	5.1	UN3213	II	5.1	350, IB2, T4, TP1	152	202	242	1 L	5 L	B	56, 58, 133
				III	5.1	350, IB2, T4, TP1	152	203	241	2.5 L	30 L	B	56, 58, 133
5.1	Bromates, inorganic, n.o.s.	5.1	UN1450	II	5.1	350, IB8, IP2, IP4, T3, TP33	152	212	242	5 kg	25 kg	A	56, 58
*				*	*	*		*	*	*			
6.1	tert-Butyl isocyanate	6.1, 3	UN2484	I	6.1, 3	1, B9, B14, B30, B72, T20, TP2, TP13, TP38, TP44	None	226	244	Forbidden	Forbidden	D	40
*				*	*	*		*	*	*			
6.1	Cadmium compounds	6.1	UN2570	I	6.1	IB7, IP1, T6, TP33	None	211	242	5 kg	50 kg	A	
				II	6.1	IB8, IP2, IP4, T3, TP33	153	212	242	25 kg	100 kg	A	
				III	6.1	IB8, IP3, T1, TP33	153	213	240	100 kg	200 kg	A	
*				*	*	*		*	*	*			
2.2	Carbon dioxide, refrigerated liquid.	2.2	UN2187		2.2	T75, TP5	306	304	314, 315	50 kg	500 kg	D	
9	Carbon dioxide, solid or Dry ice.	None	UN1845		None		217	217	240	200 kg	200 kg	C	40
3	Carbon disulfide	3, 6.1	UN1131	I	3, 6.1	B16, T14, TP2, TP7, TP13	None	201	243	Forbidden	Forbidden	D	40, 78, 115
*				*	*	*		*	*	*			
1.4S	Cartridges, power device.	1.4S	UN0323	II	1.4S	110, 347	63	62	62	25 kg	100kg	05	
*				*	*	*		*	*	*			
ORM-D	Cartridges power device (used to project fastening devices)..	None	None		None	347	63	None	None	30 kg gross	30 kg gross	A	
*				*	*	*		*	*	*			
1.4S	Charges, bursting, plastics bonded.	1.4S	UN0460	II	1.4S	347	None	62	None	25 kg	100 kg	05	

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class or division	(4) Identification numbers	(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 (8A)	Non-bulk (8B)	Bulk (8C)	Passenger aircraft/rail (9A)	Cargo aircraft only (9B)	Other (10B)	
	Charges, explosive, commercial <i>without</i> detonator.	* 1.4S	UN0445	II	1.4S	347	* None	* 62	* None	* 25 kg	* 100 kg	05	
	Charges, shaped, <i>without</i> detonator.	* 1.4S	UN0441	II	1.4S	347	* None	* 62	* None	* 25 kg	* 100 kg	05	
G	Chlorates, inorganic, aqueous solution, n.o.s.	* 5.1	UN3210	II	5.1	351, IB2, T4, TP1	* 152	* 202	* 242	* 1 L	* 5 L	B	56, 58, 133
G	Chlorates, inorganic, n.o.s.	5.1	UN1461	III	5.1	351, IB2, T4, TP1	152	203	241	2.5 L	30 L	B	56, 58, 133
		5.1	UN1461	II	5.1	351, A9, IB6, IP2, N34, T3, TP33.	152	212	242	5 kg	25 kg	A	56, 58
G	Chlorites, inorganic, n.o.s.	* 5.1	UN1462	II	5.1	352, A7, IB6, IP2, N34, T3, TP33.	152	212	242	5 kg	25 kg	A	56, 58
+	Chloroacetonitrile	* 6.1	UN2668	I	6.1, 3	2, B9, B14, B32, IB9, T20, TP2, TP13, TP38, TP45.	None	227	244	Forbidden	Forbidden	A	12, 40, 52
+	Chloropicrin	* 6.1	UN1580	I	6.1	2, B7, B9, B14, B32, B46, T22, TP2, TP13, TP38, TP45.	None	227	244	Forbidden	Forbidden	D	40
G	Chloropicrin mixtures, n.o.s.	* 6.1	UN1583	I	6.1	5	None	201	243	Forbidden	Forbidden	C	40
				II	6.1	IB2	153	202	243	Forbidden	Forbidden	C	40
				III	6.1	IB3	153	203	241	Forbidden	Forbidden	C	40
	Chlorosilanes, corrosive, flammable, n.o.s.	* 8	UN2986	II	8, 3	T14, TP2, TP7, TP13, TP27.	None	206	243	Forbidden	30 L	C	40
	Chlorosilanes, corrosive, n.o.s.	8	UN2987	II	8	B2, T14, TP2, TP7, TP13, TP27.	None	206	242	Forbidden	30 L	C	40
G	Chlorosilanes, toxic, corrosive, flammable, n.o.s.	* 6.1	UN3362	II	6.1, 3, 8	T14, TP2, TP7, TP13, TP27.	None	206	243	1 L	30 L	C	40, 125
G	Chlorosilanes, toxic, corrosive, n.o.s.	6.1	UN3361	II	6.1, 8	T14, TP2, TP7, TP13, TP27.	None	206	243	1 L	30 L	C	40
G	Compressed gas, n.o.s.	* 2.2	UN1956		2.2		306, 307	302, 305	314, 315	75 kg	150 kg	A	

G	Crotonaldehyde or Crotonaldehyde, stabilized.	*	6.1	UN1143	.....	I	.....	6.1, 3	.....	*	2, 175, B9, B14, B32, B77, T20, TP2, TP13, TP38, TP45.	None	.....	227	.....	244	.....	Forbidden	.....	*	Forbidden	.....	D	.....	40
G	Cyanide solutions, n.o.s.	*	6.1	UN1935	.....	I	.....	6.1	.....	*	B37, T14, TP2, TP13, TP27.	None	.....	201	.....	243	.....	1 L	.....	*	30 L	.....	B	.....	40, 52
					.....	II	.....	6.1	.....		IB2, T11, TP2, TP13, TP27.	153	.....	202	.....	243	.....	5 L	.....		60 L	.....	A	.....	40, 52
					.....	III	.....	6.1	.....		IB3, T7, TP2, TP13, TP28.	153	.....	203	.....	241	.....	60 L	.....		220 L	.....	A	.....	40, 52
	Detonators, electric for blasting.	*	1.4S	UN0456	.....	II	.....	1.4S	.....	*	347	.....	63(f), 63(g)	.....	62	.....	None	.....	25 kg	.....	*	100 kg	.....	05	.....
	Detonators for ammunition.	*	1.4S	UN0366	.....	II	.....	1.4S	.....	*	347	.....	None	.....	62	.....	None	.....	25 kg	.....	*	100 kg	.....	05	.....
	Detonators, non-electric for blasting.	*	1.4S	UN0455	.....	II	.....	1.4S	.....	*	347	.....	63(f), 63(g)	.....	62	.....	None	.....	25 kg	.....	*	100 kg	.....	05	.....
	Dibenzylchlorosilane	*	8	UN2434	.....	II	.....	8	.....	*	B2, T10, TP2, TP7, TP13.	154	.....	206	.....	242	.....	Forbidden	.....	*	30 L	.....	C	.....	40
G	Elevated temperature liquid, flammable, n.o.s., with flash point above 37.8 C, at or above its flash point.	*	3	UN3256	.....	III	.....	3	.....	*	IB1, T3, TP3, TP29	None	.....	None	.....	247	.....	Forbidden	.....	*	Forbidden	.....	A	.....	85
G	Elevated temperature liquid, n.o.s., at or above 100 C and below its flash point (including molten metals, molten salts, etc.)	*	9	UN3257	.....	III	.....	9	.....	*	IB1, T3, TP3, TP29	None	.....	None	.....	247	.....	Forbidden	.....	*	Forbidden	.....	A	.....	85
G	Elevated temperature solid, n.o.s., at or above 240 C, see § 173.247(h)(4).	*	9	UN3258	.....	III	.....	9	.....	*	247(h)(4)	247	.....	None	.....	247	.....	Forbidden	.....	*	Forbidden	.....	A	.....	85
G	Environmentally hazardous substance, solid, n.o.s.	*	9	UN3077	.....	III	.....	9	.....	*	8, 146, 335, A112, B54, IB8, IP3, N20, T1, TP33.	155	.....	213	.....	240	.....	No limit	.....	*	No limit	.....	A	.....	.....
	Ethanol or Ethyl alcohol or Ethanol solutions or Ethyl alcohol solutions.	*	3	UN1170	.....	II	.....	3	.....	*	24, IB2, T4, TP1	4b, 150	.....	202	.....	242	.....	5 L	.....	*	60 L	.....	A	.....	.....
					.....	III	.....	3	.....	*	24, B1, IB3, T2, TP1	4b, 150	.....	203	.....	242	.....	60 L	.....	*	220 L	.....	A	.....	.....
+	Ethyl isocyanate	*	6.1	UN2481	.....	I	.....	6.1, 3	.....	*	1, B9, B14, B30, T20, TP2, TP13, TP38, TP44.	None	.....	226	.....	244	.....	Forbidden	.....	*	Forbidden	.....	D	.....	40, 52

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class or division	(4) Identification numbers	(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 (8A)	Non-bulk (8B)	Bulk (8C)	Passenger aircraft/rail (9A)	Cargo aircraft only (9B)	Location (10A)		Other (10B)
	Ethylene oxide or Ethylene oxide with nitrogen up to a total pressure of 1 MPa (10 bar) at 50 degrees C.	* 2.3	UN1040	*	2.3, 2.1	* 4, 342, T50, TP20	None	323	*	Forbidden	Forbidden	D	40
G	Fluorosilicates, n.o.s.	* 6.1	UN2856	III	6.1	IB8, IP3, T1, TP33	153	213	*	100 kg	200 kg	A	52
	Helium, refrigerated liquid (cryogenic liquid).	* 2.2	UN1963	*	2.2	T75, TP5	320	316	*	50 kg	500 kg	D	
	Hydrogen in a metal hydride storage system or Hydrogen in a metal hydride storage system packed with equipment.	* 2.1	UN3468	*	2.1	167	None	311	*	Forbidden	100 kg gross.	D	
G	Hypochlorites, inorganic, n.o.s.	* 5.1	UN3212	II	5.1	349, A9, IB8, IP2, IP4, T3, TP33	152	212	*	5 kg	25 kg	D	4, 48, 52, 56, 58, 69, 106, 116, 118
+	Isobutyl isocyanate	* 6.1	UN2486	I	6.1, 3	1, B9, B14, B30, T20, TP2, TP13, TP27	None	226	*	Forbidden	Forbidden	D	40
	Isopropanol or isopropyl alcohol.	* 3	UN1219	II	3	IB2, T4, TP1	4b, 150	202	*	5 L	60 L	B	
+	Isopropyl isocyanate	* 6.1	UN2483	I	6.1, 3	1, B9, B14, B30, T20, TP2, TP13, TP38, TP44	None	226	*	Forbidden	Forbidden	D	40
	Krypton, refrigerated liquid (cryogenic liquid).	* 2.2	UN1970	*	2.2	T75, TP5	320	None	*	50 kg	500 kg	D	
G	Lead compounds, soluble, n.o.s.	* 6.1	UN2291	III	6.1	138, IB8, IP3, T1, TP33	153	213	*	100 kg	200 kg	A	

Medicine, liquid, flammable, toxic, n.o.s.	3	UN3248	II	*	3, 6.1	IB2	150	*	202	243	1 L	60 L	B	40
Medicine, liquid, toxic, n.o.s.	6.1	UN1851	II	*	3, 6.1	IB3	150	*	203	242	60 L	220 L	A	40
Medicine, solid, toxic, n.o.s.	6.1	UN3249	II	*	6.1	T3, TP33	153	*	203	243	5 L	60 L	C	40
Mercury compound, liquid, n.o.s.	6.1	UN2024	I	*	6.1	IB2	None	*	201	243	1 L	30 L	B	40
Mercury compound, solid, n.o.s.	6.1	UN2025	I	*	6.1	IB3	153	*	203	243	5 L	60 L	B	40
Metal catalyst, dry	4.2	UN2881	I	*	4.2	IB7, IP1, T6, TP33	None	*	211	242	5 kg	50 kg	A	40
Metal catalyst, wetted with a visible excess of liquid.	4.2	UN1378	II	*	4.2	IB8, IP2, IP4, T3, TP33	153	*	212	242	25 kg	100 kg	A	40
Methacrylonitrile, stabilized.	6.1	UN3079	I	*	6.1, 3	IB8, IP3, T1, TP33	153	*	213	240	100 kg	200 kg	A	40
Methoxymethyl isocyanate.	6.1	UN2605	I	*	6.1, 3	N34, T21, TP7, TP33	None	*	187	None	Forbidden	Forbidden	C	40
Methyl bromide and ethylene dibromide mixtures, liquid.	6.1	UN1647	I	*	6.1	IB6, IP2, N34, T3, TP33	None	*	187	242	Forbidden	50 kg	C	40
Methyl iodide	6.1	UN2644	I	*	6.1	IB8, IP3, N34, T1, TP33	None	*	187	241	25 kg	100 kg	C	40
Methyl isothiocyanate	6.1	UN2477	I	*	6.1, 3	A2, A8, IB1, N34, T3, TP33	None	*	212	None	Forbidden	50 kg	C	40
Methyl orthosilicate	6.1	UN2606	I	*	6.1, 3	2, B9, B14, B32, T20, TP2, TP13, TP38, TP45	None	*	227	244	Forbidden	Forbidden	D	12, 40, 48
Methylphenyldichlorosilane.	8	UN2437	II	*	8	1, B9, B14, B30, T20, TP2, TP13, TP38, TP44	None	*	226	244	Forbidden	Forbidden	D	40
				*		2, B9, B14, B32, N65, T20, TP2, TP13, TP38, TP44	None	*	227	244	Forbidden	Forbidden	D	40
				*		2, B9, B14, B32, T20, TP2, TP13, TP38, TP45	None	*	227	244	Forbidden	Forbidden	D	12, 40
				*		2, B9, B14, B32, T20, TP2, TP13, TP38, TP45	None	*	227	244	Forbidden	Forbidden	D	40
				*		2, B9, B14, B32, T20, TP2, TP13, TP38, TP45	None	*	227	244	Forbidden	Forbidden	D	40
				*		T10, TP2, TP7, TP13	None	*	206	242	Forbidden	30 L	C	40

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class or division	(4) Identification numbers	(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
							(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
+	Motor fuel anti-knock mixtures.	* 6.1	UN1649 ...	I	6.1	* 14, B9, B90, T14, TP2, TP13.	None	201	244	Forbidden	30 L	D	25, 40
*	Neon, refrigerated liquid (<i>cryogenic liquid</i>).	* 2.2	UN1913 ...	I	2.2	* T75, TP5	320	316	None	50 kg	500 kg	D	
*	Nickel carbonyl	* 6.1	UN1259 ...	I	6.1, 3	* 1	None	198	None	Forbidden	Forbidden	D	40, 78
*	Nicotine compounds, liquid, n.o.s. or Nicotine preparations, liquid, n.o.s.	* 6.1	UN3144 ...	I	6.1	* A4	None	201	243	1 L	30 L	B	40
G	Nicotine compounds, solid, n.o.s. or Nicotine preparations, solid, n.o.s.	II	.....	II	6.1	IB2, T11, TP2, TP27 ...	153	202	243	5 L	60 L	B	40
G	Nitrites, inorganic, aqueous solution, n.o.s.	III	.....	III	6.1	IB3, T7, TP1, TP28 ...	153	203	241	60 L	220 L	B	40
G	Nitrites, inorganic, n.o.s.	I	UN1655 ...	I	6.1	IB7, IP1, T6, TP33	None	211	242	5 kg	50 kg	B	
G	Nitrogen, refrigerated liquid <i>cryogenic liquid</i> .	* 5.1	UN3219 ...	II	5.1	* IB1, T4, TP1	152	202	242	1 L	5 L	B	46, 56, 58, 133
G	Nitrogen, refrigerated liquid <i>cryogenic liquid</i> .	III	.....	III	5.1	IB2, T4, TP1	152	203	241	2.5 L	30 L	B	46, 56, 58, 133
G	Nitrogen oxide, refrigerated liquid.	* 5.1	UN2627 ...	II	5.1	33, IB8, IP2, IP4, T3, TP33.	152	212	None	5 kg	25 kg	A	46, 56, 58, 133
*	Nitrogen, refrigerated liquid <i>cryogenic liquid</i> .	* 2.2	UN1977 ...	I	2.2	* 345, 346, T75, TP5	320	316	318	50 kg	500 kg	D	
*	Nitrogen oxide, refrigerated liquid.	* 2.2	UN2201 ...	I	2.2, 5.1	* B6, T75, TP5, TP22 ...	None	304	314, 315	Forbidden	Forbidden	D	40
*	Organometallic substance, liquid, pyrophoric.	* 4.2	UN3392 ...	I	4.2	* B11, T21, TP2, TP7, TP36.	None	181	244	Forbidden	Forbidden	D	78
G	Organometallic substance, liquid, pyrophoric, water-reactive.	4.2	UN3394 ...	I	4.2, 4.3	B11, T21, TP2, TP7, TP36.	None	181	244	Forbidden	Forbidden	D	78
G	Organometallic substance, liquid, water-reactive.	4.3	UN3398 ...	I	4.3	T13, TP2, TP7, TP36	None	201	244	Forbidden	1 L	E	40, 52

G	Organometallic substance, liquid, water-reactive, flammable.	4.3	IB1, T7, TP2, TP7, TP36.	None	202	243	1 L	5 L	E	40, 52
		4.3	IB2, T7, TP2, TP7, TP36.	None	203	242	5 L	60 L	E	40, 52
4.3	UN3399	4.3, 3	T13, TP2, TP7, TP36	None	201	244	Forbidden	1 L	D	40, 52
G	Organometallic substance, solid, pyrophoric.	4.3, 3	IB1, IP2, T7, TP2, TP7, TP36.	None	202	243	1 L	5 L	D	40, 52
		4.3, 3	IB2, IP4, T7, TP2, TP7, TP36.	None	203	242	5 L	60 L	E	40, 52
4.2	UN3391	4.2	T21, TP7, TP33, TP36	None	187	244	Forbidden	Forbidden	D	
G	Organometallic substance, solid, pyrophoric, water-reactive.	4.2, 4.3	B11, T21, TP7, TP33, TP36.	None	187	244	Forbidden	Forbidden	D	52
G	Organometallic substance, solid, self-heating.	4.2	IB6, T3, TP33, TP36	None	212	242	15 kg	50 kg	C	
G	Organometallic substance, solid, water-reactive.	4.2	IB8, T1, TP33, TP36	None	213	242	25 kg	100 kg	C	
4.3	UN3395	4.3	N40, T9, TP7, TP33, TP36.	None	211	242	Forbidden	15 kg	E	40, 52
G	Organometallic substance, solid, water-reactive, flammable.	4.3	IB4, T3, TP33, TP36	151	212	242	15 kg	50 kg	E	40, 52
		4.3	IB6, T1, TP33, TP36	151	213	241	25 kg	100 kg	E	40, 52
4.3	UN3396	4.3, 4.1	N40, T9, TP7, TP33, TP36.	None	211	242	Forbidden	15 kg	E	40, 52
G	Organometallic substance, solid, water-reactive, self-heating.	4.3, 4.1	IB4, T3, TP33, TP36	151	212	242	15 kg	50 kg	E	40, 52
		4.3, 4.1	IB6, T1, TP33, TP36	151	213	241	25 kg	100 kg	E	40, 52
4.3	UN3397	4.3, 4.2	N40, T9, TP7, TP33, TP36.	None	211	242	Forbidden	15 kg	E	40, 52
G	Organometallic substance, solid, water-reactive, self-heating.	4.3, 4.2	IB4, T3, TP33, TP36	None	212	242	15 kg	50 kg	E	40, 52
		4.3, 4.2	IB6, T1, TP33, TP36	None	213	241	25 kg	100 kg	E	40, 52
*	2.2	UN1072	2.2, 5.1	110, A14	306	314, 315	75 kg	150 kg	A	
*	5.1	UN3214	5.1	26, 363, IB2, T4, TP1	152	242	1 L	5 L	D	56, 58, 133, 138
G	Permanganates, inorganic, aqueous solution, n.o.s.	5.1	26, 363, A30, IB6, IP2, T3, TP33.	152	212	242	5 kg	25 kg	D	56, 58, 138
G	Permanganates, inorganic, n.o.s.	5.1	26, 363, A30, IB8, IP3, T1, TP33.	152	213	240	25 kg	100 kg	D	56, 58, 138
*	1.1D	UN0411	1.1D	120	None	None	Forbidden	Forbidden	10	
*	3	UN1267	3	144, 357, T11, TP1, TP8.	150	201	1 L	30 L	E	
			3	144, 357, IB2, T4, TP1, TP8.	150	202	242	5 L	B	
			3	144, 357, B1, IB3, T2, TP1.	150	203	242	60 L	A	

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class or division	(4) Identification numbers	(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
	Phenyl mercaptan	* 6.1	UN2337	I	6.1, 3	* 2, B9, B14, B32, B77, T20, TP2, TP13, TP38, TP45.	* None	227	* Forbidden	* Forbidden	D	40, 52
G	Phenylmercuric compounds, n.o.s.	6.1	UN2026	I	6.1	IB7, IP1, T6, TP33	None	211	5 kg	50 kg	A	
				II	6.1	IB8, IP2, IP4, T3, TP33.	153	212	25 kg	100 kg	A	
				III	6.1	IB8, IP3, T1, TP33	153	213	100 kg	200 kg	A	
+	Phosphorous oxychloride.	* 6.1	UN1810	I	6.1, 8	* 2, B9, B14, B32, B77, N34, T20, TP2, TP13, TP38, TP45.	None	227	* Forbidden	* Forbidden	D	40
	Polyester resin kit	* 3	UN3269	*	3	40, 149	165	165	5 kg	5 kg	B	
	Potassium nitrate	* 5.1	UN1486	III	5.1	A1, A29, IB8, IP3, T1, TP33, W1.	152	213	25 kg	100 kg	A	
	Powder, smokeless	* 1.4C	UN0509	*	1.4C	*	None	62	* Forbidden	75 kg	06	
	n-Propyl isocyanate	* 6.1	UN2482	I	6.1, 3	* 1, B9, B14, B30, T20, TP2, TP13, TP38, TP44.	None	226	* Forbidden	* Forbidden	D	40
G	Pyrophoric liquid, inorganic, n.o.s.	* 4.2	UN3194	I	4.2	*	None	181	* Forbidden	* Forbidden	D	78
G	Pyrophoric liquids, organic, n.o.s.	4.2	UN2845	I	4.2	B11, T22, TP2, TP7	None	181	244	244	D	78
G	Selenates or Selenites	* 6.1	UN2630	I	6.1	IB7, IP1, T6, TP33	None	211	* 5 kg	* 50 kg	E	
G	Selenium compound, liquid, n.o.s.	* 6.1	UN3440	I	6.1	T14, TP2, TP27	None	201	* 1 L	* 30 L	B	
				II	6.1	IB2, T11, TP2, TP27	153	202	243	60 L	B	
				III	6.1	IB3, T7, TP1, TP28	153	203	241	60 L	A	
G	Selenium compound, solid, n.o.s.	6.1	UN3283	I	6.1	IB7, IP1, T6, TP33	None	211	242	50 kg	B	
				II	6.1	IB8, IP2, IP4, T3, TP33.	153	212	242	25 kg	B	
				III	6.1	IB8, IP3, T1, TP33	153	213	240	100 kg	A	
	Silicon tetrachloride	* 8	UN1818	II	8	A3, A6, B2, B6, T10, TP2, TP7, TP13.	None	202	* Forbidden	30 L	C	40

* * * * *

- 8. In § 172.102, the following amendments are made:
- a. In paragraph (c)(1), special provisions 77 and 157 are removed; special provisions 15, 40, 78, 110, 130, 134, 135, 149, 167 and 198 are revised; and special provisions 340, 342, 343, 345, 346, 347, 349, 350, 351, 352, 353, and 357 are added;
- b. In paragraph (c)(2), special provision A59 is removed and special provision A112 is added;
- c. In paragraph (c)(4), Table 1—IBC Codes (IBC Codes) is revised;
- d. Paragraph (c)(7)(ii) is revised and entries for “T9” and “T21” in the “Table of Portable Tank T Codes T1–T22” are revised;
- d. In paragraph (c)(8), special provision TP36 is added; and
- e. In paragraph (c)(9), special provision W1 is added.

The revisions and additions read as follows:

§ 172.102 Special provisions.

* * * * *
(c) * * *
(1) * * *

Code/Special Provisions

* * * * *

15 This entry applies to “Chemical kits” and “First aid kits” containing one or more compatible items of hazardous materials in boxes, cases, *etc.* that, for example, are used for medical, analytical, diagnostic, testing, or repair purposes. Kits that are carried on board transport vehicles for first aid or operating purposes are not subject to the requirements of this subchapter.

* * * * *

40 Polyester resin kits consist of two components: A base material (Class 3, Packing Group II or III) and an activator (organic peroxide), each separately packed in an inner packaging. The organic peroxide must be type D, E, or F, not requiring temperature control. The components may be placed in the same outer packaging provided they will not interact dangerously in the event of leakage. The Packing Group assigned will be II or III, according to the classification criteria for Class 3, applied to the base material. Additionally, unless otherwise excepted in this subchapter, polyester resin kits must be packaged in specification combination packagings based on the performance level of the base material contained within the kit.

* * * * *

78 This entry may not be used to describe compressed air which contains more than 23.5 percent oxygen. Compressed air containing greater than

23.5 percent oxygen must be shipped using the description “Compressed gas, oxidizing, n.o.s., UN3156.”

* * * * *

110 Fire extinguishers transported under UN1044 and oxygen cylinders transported for emergency use under UN1072 may include installed actuating cartridges (cartridges, power device of Division 1.4C or 1.4S), without changing the classification of Division 2.2, provided the aggregate quantity of deflagrating (propellant) explosives does not exceed 3.2 grams per cylinder. Oxygen cylinders with installed actuating cartridges as prepared for transportation must have an effective means of preventing inadvertent activation.

* * * * *

130 “Batteries, dry, sealed, n.o.s.” commonly referred to as dry batteries, are hermetically sealed and generally utilize metals (other than lead) and/or carbon as electrodes. These batteries are typically used for portable power applications. The rechargeable (and some non-rechargeable) types have gelled alkaline electrolytes (rather than acidic) making it difficult for them to generate hydrogen or oxygen when overcharged and therefore, differentiating them from non-spillable batteries. Dry batteries specifically covered by another entry in the § 172.101 Table must be transported in accordance with the requirements applicable to that entry. For example, nickel-metal hydride batteries transported by vessel in certain quantities are covered by another entry (*see* Batteries, nickel-metal hydride, UN3496). Dry batteries not specifically covered by another entry in the § 172.101 Table are covered by this entry (*i.e.*, Batteries, dry, sealed, n.o.s.) and are not subject to requirements of this subchapter except for the following:

(a) *Incident reporting.* For transportation by aircraft, a telephone report in accordance with § 171.15(a) is required if a fire, violent rupture, explosion or dangerous evolution of heat (*i.e.*, an amount of heat sufficient to be dangerous to packaging or personal safety to include charring of packaging, melting of packaging, scorching of packaging, or other evidence) occurs as a direct result of a dry battery. For all modes of transportation, a written report submitted, retained, and updated in accordance with § 171.16 is required if a fire, violent rupture, explosion or dangerous evolution of heat occurs as a direct result of a dry battery or battery-powered device.

(b) *Preparation for transport.* Batteries and battery-powered device(s)

containing batteries must be prepared and packaged for transport in a manner to prevent:

- (1) A dangerous evolution of heat;
 - (2) Short circuits, including but not limited to the following methods:
 - (i) Packaging each battery or each battery-powered device when practicable, in fully enclosed inner packagings made of non-conductive material;
 - (ii) Separating or packaging batteries in a manner to prevent contact with other batteries, devices or conductive materials (*e.g.*, metal) in the packagings; or
 - (iii) Ensuring exposed terminals or connectors are protected with non-conductive caps, non-conductive tape, or by other appropriate means; and
 - (3) Damage to terminals. If not impact resistant, the outer packaging should not be used as the sole means of protecting the battery terminals from damage or short circuiting. Batteries must be securely cushioned and packed to prevent shifting which could loosen terminal caps or reorient the terminals to produce short circuits. Batteries contained in devices must be securely installed. Terminal protection methods include but are not limited to the following:
 - (i) Securely attaching covers of sufficient strength to protect the terminals;
 - (ii) Packaging the battery in a rigid plastic packaging; or
 - (iii) Constructing the battery with terminals that are recessed or otherwise protected so that the terminals will not be subjected to damage if the package is dropped.
- (c) *Additional air transport requirements.* For a battery whose voltage (electrical potential) exceeds 9 volts—
- (1) When contained in a device, the device must be packaged in a manner that prevents unintentional activation or must have an independent means of preventing unintentional activation (*e.g.*, packaging restricts access to activation switch, switch caps or locks, recessed switches, trigger locks, temperature sensitive circuit breakers, *etc.*); and
 - (2) An indication of compliance with this special provision must be provided by marking each package with the words “not restricted” or by including the words “not restricted” on a transport document such as an air waybill accompanying the shipment.
 - (d) *Used or spent battery exception.* Used or spent dry batteries of both non-rechargeable and rechargeable designs, with a marked rating up to 9-volt that are combined in the same package and

transported by highway or rail for recycling, reconditioning, or disposal are not subject to this special provision or any other requirement of the HMR. Note that batteries utilizing different chemistries (*i.e.*, those battery chemistries specifically covered by another entry in the § 172.101 Table) as well as dry batteries with a marked rating greater than 9-volt may not be combined with used or spent batteries in the same package. Note also that this exception does not apply to batteries that have been reconditioned for reuse.

* * * * *

134 This entry only applies to vehicles, machinery and equipment powered by wet batteries, sodium batteries, or lithium batteries that are transported with these batteries installed. Examples of such items are electrically-powered cars, lawn mowers, wheelchairs, and other mobility aids. Self-propelled vehicles or equipment 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.

135 Internal combustion engines installed in a vehicle must be consigned under the entries "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 wet, sodium or lithium batteries installed. If a fuel cell engine is installed in a vehicle, the vehicle must be consigned using the entries "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, an internal combustion engine, and wet, sodium or lithium batteries installed.

* * * * *

149 Except for transportation by aircraft, when transported as a limited quantity or a consumer commodity, the maximum net capacity specified in § 173.150(b)(2) of this subchapter for inner packagings may be increased to 5 L (1.3 gallons).

* * * * *

167 These storage systems must always be considered as containing hydrogen. A metal hydride storage system installed in or intended to be installed in a vehicle or equipment or in vehicle or equipment components must be approved for transport by the Associate Administrator. A copy of the approval must accompany each shipment.

* * * * *

198 Nitrocellulose solutions containing not more than 20% nitrocellulose may be transported as paint, perfumery products, or printing ink, as applicable, provided the nitrocellulose contains no more 12.6% nitrogen (by dry mass). See UN1210, UN1263, UN1266, UN3066, UN3469, and UN3470.

* * * * *

340 This entry applies only to the vessel transportation of nickel-metal hydride batteries as cargo. Nickel-metal hydride button cells or nickel-metal hydride cells or batteries packed with or contained in battery-powered devices transported by vessel are not subject to the requirements of this special provision. See "Batteries, dry, sealed, n.o.s." in the § 172.101 Hazardous Materials Table (HMT) of this part for transportation requirements for nickel-metal hydride batteries transported by other modes and for nickel-metal hydride button cells or nickel-metal hydride cells or batteries packed with or contained in battery-powered devices transported by vessel. Nickel-metal hydride batteries subject to this special provision are subject only to the following requirements: (1) The batteries must be prepared and packaged for transport in a manner to prevent a dangerous evolution of heat, short circuits, and damage to terminals; and are subject to the incident reporting in accordance with § 171.16 of this subchapter if a fire, violent rupture, explosion or dangerous evolution of heat (*i.e.*, an amount of heat sufficient to be dangerous to packaging or personal safety to include charring of packaging, melting of packaging, scorching of packaging, or other evidence) occurs as a direct result of a nickel metal hydride battery; and (2) when loaded in a cargo transport unit in a total quantity of 100 kg gross mass or more, the shipping paper requirements of Subpart C of this

part, the manifest requirements of § 176.30 of this subchapter, and the vessel stowage requirements assigned to this entry in Column (10) of the § 172.101 Hazardous Materials Table.

* * * * *

342 Glass inner packagings (such as ampoules or capsules) intended only for use in sterilization devices, when containing less than 30 mL of ethylene oxide per inner packaging with not more than 300 mL per outer packaging, may be transported in accordance with § 173.4a of this subchapter, irrespective of the restriction of § 173.4a(b) provided that:

a. After filling, each glass inner packaging must be determined to be leak-tight by placing the glass inner packaging in a hot water bath at a temperature and for a period of time sufficient to ensure that an internal pressure equal to the vapor pressure of ethylene oxide at 55 °C is achieved. Any glass inner packaging showing evidence of leakage, distortion or other defect under this test must not be transported under the terms of this special provision;

b. In addition to the packaging required in § 173.4a, each glass inner packaging must be placed in a sealed plastic bag compatible with ethylene oxide and capable of containing the contents in the event of breakage or leakage of the glass inner packaging; and

c. Each glass inner packaging is protected by a means of preventing puncture of the plastic bag (*e.g.*, sleeves or cushioning) in the event of damage to the packaging (*e.g.*, by crushing).

343 A bulk packaging that emits hydrogen sulfide in sufficient concentration that vapors evolved from the crude oil can present an inhalation hazard must be marked as specified in § 172.327 of this part.

345 "Nitrogen, refrigerated liquid (*cryogenic liquid*), UN1977" transported in open cryogenic receptacles with a maximum capacity of 1 L are not subject to the requirements of this subchapter. The receptacles must be constructed with glass double walls having the space between the walls vacuum insulated and each receptacle must be transported in an outer packaging with sufficient cushioning and absorbent materials to protect the receptacle from damage.

346 "Nitrogen, refrigerated liquid (*cryogenic liquid*), UN1977" transported in accordance with the requirements for open cryogenic receptacles in § 173.320 and this special provision are not subject to any other requirements of this subchapter. The receptacle must contain no hazardous materials other than the

liquid nitrogen which must be fully absorbed in a porous material in the receptacle.

347 Effective July 1, 2011, for transportation by aircraft, this entry may only be used if the results of Test series 6(d) of Part I of the UN Manual of Tests and Criteria (IBR, see § 171.7 of this subchapter) have demonstrated that any hazardous effects from accidental functioning are confined to within the package. Effective January 1, 2012, for transportation by vessel, this entry may only be used if the results of Test Series 6(d) of Part I of the UN Manual of Tests and Criteria (IBR, see § 171.7 of this subchapter) have demonstrated that any hazardous effects from accidental functioning are confined to within the package. Effective January 1, 2014, for transportation domestically by highway or rail, this entry may only be used if the results of Test Series 6(d) of Part I of the UN Manual of Tests and Criteria (IBR, see § 171.7 of this subchapter) have demonstrated that any hazardous effects from accidental functioning are confined to within the package. Testing must be performed or witnessed by a person who is approved by the Associate Administrator (see § 173.56(b) of this subchapter). All successfully

conducted tests or reassignment to another compatibility group require the issuance of a new or revised approval by the Associate Administrator prior to transportation on or after the dates specified for each authorized mode of transport in this special provision.

349 Mixtures of hypochlorite with an ammonium salt are forbidden for transport. A hypochlorite solution, UN1791, is a Class 8 corrosive material.

350 Ammonium bromate, ammonium bromate aqueous solutions, and mixtures of a bromate with an ammonium salt are forbidden for transport.

351 Ammonium chlorate, ammonium chlorate aqueous solutions, and mixtures of a chlorate with an ammonium salt are forbidden for transport.

352 Ammonium chlorite, ammonium chlorite aqueous solutions, and mixtures of a chlorite with an ammonium salt are forbidden for transport.

353 Ammonium permanganate, ammonium permanganate aqueous solutions, and mixtures of a permanganate with an ammonium salt are forbidden for transport.

357 A bulk packaging that emits hydrogen sulfide in sufficient

concentration that vapors evolved from the crude oil can present an inhalation hazard must be marked as specified in § 172.327 of this part.

(2) * * *

Code/Special Provisions

* * * * *

A112 Notwithstanding the quantity limits shown in Column (9A) and (9B) for this entry, the following IBCs are authorized for transportation aboard passenger and cargo-only aircraft. Each IBC may not exceed a maximum net quantity of 1,000 kg:

a. Metal: 11A, 11B, 11N, 21A, 21B and 21N

b. Rigid plastics: 11H1, 11H2, 21H1 and 21H2

c. Composite with plastic inner receptacle: 11HZ1, 11HZ2, 21HZ1 and 21HZ2

d. Fiberboard: 11G

e. Wooden: 11C, 11D and 11F (with inner liners)

f. Flexible: 13H2, 13H3, 13H4, 13H5, 13L2, 13L3, 13L4, 13M1 and 13M2 (flexible IBCs must be sift-proof and water resistant or must be fitted with a sift-proof and water resistant liner).

* * * * *

(4) * * *

TABLE 1—IB CODES (IBC CODES)

IBC code	Authorized IBCs
IB1	<i>Authorized IBCs:</i> Metal (31A, 31B and 31N). <i>Additional Requirement:</i> Only liquids with a vapor pressure less than or equal to 110 kPa at 50 °C (1.1 bar at 122 °F), or 130 kPa at 55 °C (1.3 bar at 131 °F) are authorized.
IB2	<i>Authorized IBCs:</i> Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1). <i>Additional Requirement:</i> Only liquids with a vapor pressure less than or equal to 110 kPa at 50 °C (1.1 bar at 122 °F), or 130 kPa at 55 °C (1.3 bar at 131 °F) are authorized.
IB3	<i>Authorized IBCs:</i> Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1 and 31HA2, 31HB2, 31HN2, 31HD2 and 31HH2). <i>Additional Requirement:</i> Only liquids with a vapor pressure less than or equal to 110 kPa at 50 °C (1.1 bar at 122 °F), or 130 kPa at 55 °C (1.3 bar at 131 °F) are authorized, except for UN2672 (also see Special Provision IP8 in Table 2 for UN2672).
IB4	<i>Authorized IBCs:</i> Metal (11A, 11B, 11N, 21A, 21B and 21N).
IB5	<i>Authorized IBCs:</i> Metal (11A, 11B, 11N, 21A, 21B and 21N); Rigid plastics (11H1, 11H2, 21H1, 21H2, 31H1 and 31H2); Composite (11HZ1, 21HZ1 and 31HZ1).
IB6	<i>Authorized IBCs:</i> Metal (11A, 11B, 11N, 21A, 21B and 21N); Rigid plastics (11H1, 11H2, 21H1, 21H2, 31H1 and 31H2); Composite (11HZ1, 11HZ2, 21HZ1, 21HZ2, 31HZ1 and 31HZ2). <i>Additional Requirement:</i> Composite IBCs 11HZ2 and 21HZ2 may not be used when the hazardous materials being transported may become liquid during transport.
IB7	<i>Authorized IBCs:</i> Metal (11A, 11B, 11N, 21A, 21B and 21N); Rigid plastics (11H1, 11H2, 21H1, 21H2, 31H1 and 31H2); Composite (11HZ1, 11HZ2, 21HZ1, 21HZ2, 31HZ1 and 31HZ2); Wooden (11C, 11D and 11F). <i>Additional Requirement:</i> Liners of wooden IBCs must be sift-proof.
IB8	<i>Authorized IBCs:</i> Metal (11A, 11B, 11N, 21A, 21B and 21N); Rigid plastics (11H1, 11H2, 21H1, 21H2, 31H1 and 31H2); Composite (11HZ1, 11HZ2, 21HZ1, 21HZ2, 31HZ1 and 31HZ2); Fiberboard (11G); Wooden (11C, 11D and 11F); Flexible (13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 or 13M2).
IB9	IBCs are only authorized if approved by the Associate Administrator.

* * * * *

(7) * * *

(ii) The following table specifies the portable tank requirements applicable to “T” Codes T1 through T22. Column 1 specifies the “T” Code. Column 2 specifies the minimum test pressure, in

bar (1 bar = 14.5 psig), at which the periodic hydrostatic testing required by § 180.605 of this subchapter must be conducted. Column 3 specifies the section reference for minimum shell thickness or, alternatively, the minimum shell thickness value. Column

4 specifies the applicability of § 178.275(g)(3) of this subchapter for the pressure relief devices. When the word “Normal” is indicated, § 178.275(g)(3) of this subchapter does not apply. Column 5 references applicable requirements for bottom openings in part 178 of this

subchapter. "Prohibited" means bottom openings are prohibited, and "Prohibited for liquids" means bottom openings are authorized for solid material only. The table follows:

TABLE OF PORTABLE TANK T CODES T1–T22

[Portable tank codes T1–T22 apply to liquid and solid hazardous materials of Classes 3 through 9 which are transported in portable tanks.]

Portable tank instruction	Minimum test pressure (bar)	Minimum shell thickness (in mm-reference steel) (See § 178.274(d))	Pressure relief requirements (See § 178.275(g))	Bottom opening requirements (See § 178.275(d))
(1)	(2)	(3)	(4)	(5)
T9	4	6 mm	Normal	Prohibited for liquids. § 178.275(d)(2)
T21	10	10 mm	Normal	Prohibited for liquids. § 178.275(d)(2)

* * * * *

Code/Special Provisions

* * * * *

TP36 For material assigned this portable tank special provision, portable tanks used to transport such material may be equipped with fusible elements in the vapor space of the portable tank.

* * * * *

(9) * * *

Code/Special Provisions

W1 This substance in a non friable prill or granule form is not subject to the requirements of this subchapter when tested in accordance with the UN Manual of Test and Criteria (IBR, see § 171.7 of this subchapter) and is found to not meet the definition or criteria for inclusion in Division 5.1.

* * * * *

■ 9. In § 172.200, paragraph (b)(3) is revised to read as follows:

§ 172.200 Applicability.

* * * * *

(b) * * *

(3) A limited quantity package unless the material is offered or intended for transportation by air or vessel and, until December 31, 2013, a package of ORM–D material authorized by this subchapter in effect on October 1, 2010 when offered for transportation by highway or rail.

* * * * *

■ 10. In § 172.203, paragraph (b) is revised to read as follows:

§ 172.203 Additional description requirements.

* * * * *

(b) *Limited quantities.* When a shipping paper is required by this subchapter, the description for a material offered for transportation as "limited quantity," as authorized by this subchapter, must include the words "Limited Quantity" or "Ltd Qty" following the basic description.

* * * * *

■ 11. In § 172.300, paragraph (c) is added to read as follows:

§ 172.300 Applicability.

* * * * *

(c) Unless otherwise provided in a specific rule, stocks of preprinted packagings marked in accordance with this subpart prior to the effective date of a final rule may be continued in use, in the manner previously authorized, until depleted or for a one-year period subsequent to the compliance date of the marking amendment, whichever is less.

■ 12. 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 Table.

* * * * *

■ 13. In § 172.312, paragraph (c)(5) is revised to read as follows:

§ 172.312 Liquid hazardous materials in non-bulk packagings.

* * * * *

(c) * * *

(5) A non-bulk package with hermetically sealed inner packagings not exceeding 500 mL each.

* * * * *

■ 14. Section 172.315 is revised to read as follows:

§ 172.315 Limited quantities.

(a) Except for transportation by aircraft or as otherwise provided in this subchapter, a package containing a limited quantity of hazardous material is not required to be marked with the proper shipping name and identification (ID) number when marked in accordance with the white square-on-point limited quantity marking as follows:

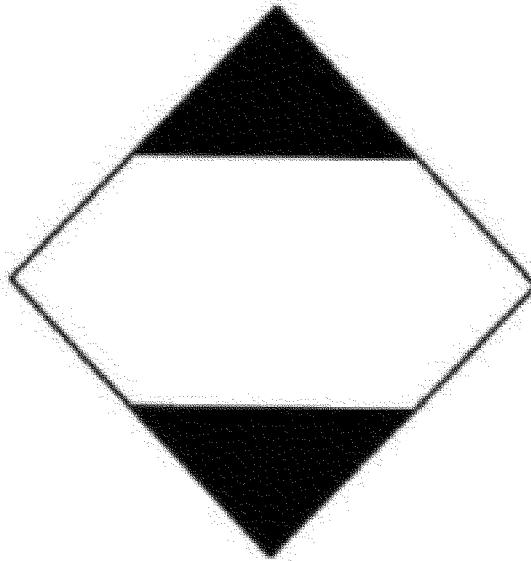
(1) The limited quantity marking must be durable, legible and of a size relative to the package that is readily visible. The marking must be applied on at least one side or one end of the outer packaging. The width of the border forming the square-on-point must be at least 2 mm and the minimum dimension of each side must be 100 mm unless the package size requires a reduced size marking that must be no less than 50 mm on each side. When intended for transportation by vessel, a cargo transport unit (see § 176.2 of this

subchapter) containing only limited quantity material must be suitably marked on one side or end of the exterior of the unit with an identical

mark except that it must have minimum dimensions of 250 mm on each side.

(2) The top and bottom portions of the square-on-point and the border forming

the square-on-point must be black and the center white or of a suitable contrasting background as follows:



(b) For transportation by aircraft, a limited quantity package conforming to Table 3 of § 173.27(f) of this subchapter must be marked as follows:

(1) The marking must be durable, legible and of a size relative to the package as to be readily visible. The marking must be applied on at least one

side or one end of the outer packaging. The width of the border forming the square-on-point must be at least 2 mm and the minimum dimension of each side must be 100 mm unless the package size requires a reduced size marking that must be no less than 50 mm on each side.

(2) The top and bottom portions of the square-on-point and the border forming the square-on-point must be black and the center white or of a suitable contrasting background and the symbol "Y" must be black and located in the center of the square-on-point and be clearly visible as follows:



(c) As applicable, package markings required by this subpart (*e.g.*, technical name, "RQ") must be in association with the marking required by paragraph (a) or (b) of this section.

(d) *Transitional exception.* Except for transportation by aircraft, until

December 31, 2013, a package properly marked in accordance with § 172.316 is not required to be marked with the limited quantity marking required by this section. For transportation by aircraft, until December 31, 2012, a package properly marked in accordance

with § 172.316 is not required to be marked with the limited quantity marking required by this section.

■ 15. In § 172.316, paragraphs (a)(1) and (2) are revised to read as follows:

§ 172.316 Packagings containing materials classed as ORM-D.

(a) * * *

(1) Until December 31, 2012, ORM-D-AIR for an ORM-D that is prepared for air shipment and packaged in accordance with §§ 173.63, 173.150 through 173.155, 173.306 and the applicable requirements in § 173.27.

(2) Until December 31, 2013, ORM-D for an ORM-D that is packaged in accordance with §§ 173.63, 173.150 through 173.155 and 173.306.

* * * * *

■ 16. In § 172.322, paragraph (d)(4) is added to read as follows:

§ 172.322 Marine pollutants.

* * * * *

(d) * * *

(4) On a package of limited quantity material marked in accordance with § 172.315 of this part.

* * * * *

■ 17. In § 172.324,

■ a. The first sentence in paragraph (a) is revised;

■ b. Paragraph (b) is revised; and

■ c. Paragraph (c) is added.

The revisions and addition read as follows:

§ 172.324 Hazardous substances in non-bulk packagings.

* * * * *

(a) Except for packages of radioactive material labeled in accordance with § 172.403, if the proper shipping name of a material that is a hazardous substance does not identify the hazardous substance by name, the name of the hazardous substance must be marked on the package, in parentheses, in association with the proper shipping name. * * *

(b) The letters “RQ” must be marked on the package in association with the proper shipping name.

(c) A package of limited quantity material marked in accordance with § 172.315 must also be marked in accordance with the applicable requirements of this section.

■ 18. In § 172.326, in paragraph (a), a second sentence is added to read as follows:

§ 172.326 Portable tanks.

(a) *Shipping name.* * * * For transportation by vessel, the minimum height for a proper shipping name marked on a portable tank is 65 mm (2.5 inches).

* * * * *

■ 19. In Subpart D, § 172.327 is added to read as follows:

§ 172.327 Petroleum sour crude oil in bulk packaging.

A Bulk packaging used to transport petroleum crude oil containing hydrogen sulfide (*i.e.*, sour crude oil) in sufficient concentration that vapors evolved from the crude oil may present an inhalation hazard must include a marking, label, tag, or sign to warn of the toxic hazard as follows:

(a) The marking must be durable, legible and of a size relative to the package as to be readily visible and similar to the illustration shown in this paragraph with the minimum dimension of each side of the marking at least 100 mm (3.9 inches). The width of the border forming the square-on-point marking must be at least 5 mm. The marking must be displayed at each location (*e.g.*, manhole, loading head) where exposure to hydrogen sulfide vapors may occur.

(b) The border of the square-on-point must be black or red on a white or other suitable contrasting background. The symbol must be black and located in the center of the square-on-point and be clearly visible as follows:



(c) As an alternative to the marking required in (a) and (b) of this section, a label, tag, or sign may be displayed at each location (*e.g.*, manhole, loading head) where exposure to hydrogen sulfide vapors may occur. The label, tag, or sign must be durable, in English, and printed legibly and of a size relative to the package with a warning statement such as “Danger, Possible Hydrogen Sulfide Inhalation Hazard” to communicate the possible risk of

exposure to harmful concentrations of hydrogen sulfide gas.

■ 20. In § 172.500, paragraph (b)(3) is revised to read as follows:

§ 172.500 Applicability of placarding requirements.

* * * * *

(b) * * *

(3) Hazardous materials authorized by this subchapter to be offered for transportation as a limited quantity when identified as such on a shipping

paper in accordance with § 172.203(b) or when marked as such in accordance with § 172.315.

■ 21. In § 172.502, paragraph (b)(2) is revised to read as follows:

§ 172.502 Prohibited and permissive placarding.

* * * * *

(b) * * *

(2) The restrictions of paragraph (a) of this section do not apply to the display of a BIOHAZARD marking, a “HOT”

marking, a sour crude oil hazard marking, or an identification number on a white square-on-point configuration in accordance with §§ 172.323(c), 172.325(c), 172.327(a), or 172.336(b) of this part, respectively.

PART 173—SHIPPERS—GENERAL REQUIREMENTS FOR SHIPMENTS AND PACKAGINGS

■ 22. 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.

■ 23. In § 173.4, paragraphs (a) introductory text and (c) are revised and paragraph (a)(1)(v) is added to read as follows:

§ 173.4 Small quantities for highway and rail.

(a) When transported domestically by highway or rail in conformance with this section, quantities of Division 2.2 (except aerosols with no subsidiary hazard), Class 3, Division 4.1, Division 4.2 (PG II and III), Division 4.3 (PG II and III), Division 5.1, Division 5.2, Division 6.1, Class 7, Class 8, and Class 9 materials are not subject to any other requirements when—

(1) * * *

(v) Thirty (30) mL water capacity (1.8 cubic inches) for authorized Division 2.2 materials.

(c) Packages which contain a Class 2 (other than those authorized in paragraph (a) of this section), Division 4.2 (PG I), or Division 4.3 (PG I) material conforming to paragraphs (a)(1) through (10) of this section may be offered for transportation or transported if approved by the Associate Administrator.

■ 24. In § 173.4a, paragraphs (a)(4) and (g)(3) are added and paragraphs (b)(1), (b)(5), and (d)(3) are revised to read as follows:

§ 173.4a Excepted quantities.

(a) * * *

(4) Packagings for which retention of liquid is a basic function must be capable of withstanding without leakage the pressure differential specified in § 173.27(c) of this part.

(b) * * *

(1) Division 2.2 material with no subsidiary hazard. An aerosol is not included as authorized Division 2.2 material;

* * * * *

(5) Division 5.2 materials only when contained in a chemical kit, first aid kit or a polyester resin kit;

* * * * *

(d) * * *

(3) For Division 5.2 material, 500 g (1.1 pounds) for solids or 500 mL (0.1 gallons) for liquids.

* * * * *

(g) * * *

(3) When packages of excepted quantities are contained in an overpack, and the package marking required by this section is not visible inside the overpack, the excepted quantities marking must also be placed on the overpack. Additionally, an overpack containing packages of excepted quantities is not required to be marked with the word “OVERPACK.”

* * * * *

■ 25. In § 173.4b, paragraph (b) is added to read as follows:

§ 173.4b De minimis exceptions.

* * * * *

(b) Non-infectious specimens, such as specimens of mammals, birds, amphibians, reptiles, fish, insects and other invertebrates containing small quantities of Ethanol (UN1170), Formaldehyde solution, flammable (UN1198), Alcohols, n.o.s. (UN1987) and Isopropanol (UN1219) are not subject to the requirements of this subchapter provided the following packaging, marking and documentation provisions, as applicable, are met:

(1) The specimens are:

(i) Wrapped in a paper towel or cheesecloth moistened with alcohol or an alcohol solution and placed in a plastic bag that is heat-sealed. Any free liquid in the bag must not exceed 30 mL; or

(ii) Placed in vials or other rigid containers with no more than 30 mL of alcohol or alcohol solution. The containers are placed in a plastic bag that is heat-sealed;

(2) The bagged specimens are placed in another plastic bag with sufficient absorbent material to absorb the entire liquid contents inside the primary receptacle. The outer plastic bag is then heat-sealed;

(3) The completed bag is placed in a strong outer packaging with sufficient cushioning material that conforms to subpart B of part 173;

(4) The aggregate net quantity of flammable liquid in one outer packaging may not exceed 1 L; and

(5) The outer package must be legibly marked “Scientific research specimens, 49 CFR 173.4b applies.”

(6) *Documentation.* (i) For transportation by highway or rail, no shipping paper is required.

(ii) For transport by air, a shipping paper is not required, except that, if a document such as an air waybill accompanies a shipment of specimens containing hazardous materials excepted under the terms of this section, the document must include the statement “Scientific research specimens, 49 CFR 173.4b applies” and the number of packages indicated.

(iii) For transport by vessel, a shipping paper is not required; however, the Dangerous Cargo Manifest must include the statement “Scientific research specimens, 49 CFR 173.4b applies” and the number of packages indicated. Vessel stowage is the same as for hazardous materials in excepted quantities.

(7) *Training.* Each person who offers or transports excepted quantities of hazardous materials must know about the requirements of this section.

(8) *Restrictions.* 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.

■ 26. In § 173.25, paragraph (a)(6) is added to read as follows:

§ 173.25 Authorized packagings and overpacks.

(a) * * *

(6) Where packages of limited quantity materials are overpacked and, until December 31, 2012 or December 31, 2013, packages bearing the ORM–D AIR or ORM–D marking, respectively, must be marked “OVERPACK” unless all marking required by this section are visible. Where packages of excepted quantities (see § 173.4a of this part) are overpacked and all required markings are not visible through the overpack, they must be repeated on the overpack. An overpack containing packages of excepted quantities is not required to be marked “OVERPACK.”

* * * * *

■ 27. In § 173.27, remove paragraph (f) introductory text and add paragraphs (f)(1) through (3) and table 3 to read as follows:

§ 173.27 General requirements for transportation by aircraft.

* * * * *

(f) *Combination packagings.* (1) *Excepted quantities.* For authorized materials and inner and outer package quantity limits for combination packages of *excepted quantities* intended for transportation by aircraft, see § 173.4a of this part. Unless otherwise specified in this part, or in Subpart C of part 171 of this subchapter, when combination packagings are intended for transportation aboard an

aircraft, inner packagings must conform to the quantity limitations set forth in table 1 of this paragraph for transport aboard passenger-carrying aircraft and table 2 of this paragraph for transport aboard cargo-only aircraft.

(2) *Limited quantities.* (i) Unless otherwise specified in this part, or in Subpart C of Part 171 of this subchapter, when a limited quantity of authorized hazardous material packaged in a combination packaging is intended for transportation aboard an aircraft, the inner packagings must conform to the quantity limitations set forth in table 3 of this paragraph. Materials must be authorized for transportation aboard a passenger-carrying aircraft (see Column (9A) of the § 172.101 Hazardous Materials Table). Substances or articles not authorized as limited quantity by aircraft are:

- (A) Those in Packing Group I;
- (B) Class 1 (explosive) and Class 7 (radioactive) material;
- (C) Divisions 2.1 (flammable gas) (except Aerosols (UN1950) and Receptacles, small (UN2037) without subsidiary risk) and Division 2.3 (toxic gas);
- (D) Divisions 4.1 (self-reactive), 4.2 (spontaneously combustible) (primary

or subsidiary risk), and 4.3 (dangerous when wet) (liquids);

(E) Division 5.2 (organic peroxide) (except when contained in a Chemical or First aid kit (UN3316) or Polyester resin kit (UN3269) (Types D, E and F non-temperature controlled only));

(F) Class 8 (corrosive) materials UN2794, UN2795, UN2803, UN2809, 3028; and

(G) All Class 9 (miscellaneous) materials *except for* UN1941, UN1990, UN2071, UN3077, UN3082, UN3316.

(ii) Effective January 1, 2012, packages must be marked with the limited quantity “Y” mark as prescribed in § 172.315 of this part when conforming to Table 3 of this paragraph. Until December 31, 2012, a package may instead be marked with the proper shipping name “Consumer commodity” and “ORM–D–AIR” (including “Charcoal, NA1361) if it contains a consumer commodity, as authorized by this subchapter in effect on October 1, 2010.

(iii) Strong outer packagings are required and a completed package may not exceed 30 kg (66 lbs) gross weight.

(iv) A secondary means of closure required for all liquids contained in inner packagings. If this requirement

cannot be satisfied, the use of an intermediate and leakproof form of containment, such as a liner, is required.

(v) Packages must be capable of passing a 1.2 m drop test on to a rigid, non-resilient, flat and horizontal surface, in the position most likely to cause damage. The criteria for passing the test is that the outer packaging must not exhibit any damage affecting safety in transport and there must be no leakage from the inner packagings.

(vi) Each package must be capable of withstanding, without breakage or leakage of any inner packaging, 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 m (including the test sample).

(vii) Except for UN3082, inner packagings of combination packagings containing liquids must be capable of passing the appropriate pressure differential test prescribed in paragraph (c) of this section.

(3) The tables are as follows:

* * * * *

TABLE 3—MAXIMUM NET QUANTITY OF EACH INNER PACKAGING FOR MATERIALS AUTHORIZED FOR TRANSPORTATION AS LIMITED QUANTITY BY AIRCRAFT

Hazard class or division	Maximum authorized net quantity of each inner packaging		Maximum authorized net quantity of each outer package	Notes
	Glass, earthenware or fiber inner packagings	Metal or plastic inner packagings		
Class 1			30 kg Gross	Forbidden. See § 173.63. <i>Authorized materials:</i> Aerosols (UN1950) in Divisions 2.1 and 2.2, and Receptacles, small (UN2037) in Divisions 2.1 and 2.2 without subsidiary risk and Fuel cells cartridges (UN3478, UN3479), see § 173.230 of this part.
Class 2				
Class 3	PG I: Forbidden.		PG II: 1L*	*Maximum net quantity per outer package with corrosive subsidiary risk (e.g., UN2924, UN3286) is 0.5L. For Class 3 materials contained in a Polyester resin kit (UN3269), see § 173.165 of this part. For Fuel cell cartridges containing flammable liquids (UN3473), see § 173.230 of this part.
	PG II: 0.5L	PG II: 0.5L		
Division 4.1 (does not include self-reactive material).	PG III: 2.5L*	PG III: 5.0L*	PG III: 10L*	*Maximum net quantity per outer package with corrosive subsidiary risk (e.g., UN2924) is 1L and toxic subsidiary risk (e.g., UN1992) is 2L.
	*Corrosive subsidiary risk (e.g., UN2924) or toxic (e.g., UN1992) is 1L.	*Corrosive subsidiary risk (e.g., UN2924) or toxic (e.g., UN1992) is 1L.		
	PG I: Forbidden.		PG II: 5 kg*	*Maximum net quantity per outer package with toxic subsidiary risk (e.g., UN3179) is 1 kg.
	PG II: 0.5 kg	PG II: 0.5 kg	PG III: 10 kg*	*Maximum net quantity per outer package with corrosive subsidiary risk (e.g., UN3180) is 5 kg.
	PG III: 1 kg	PG III: 1 kg		

TABLE 3—MAXIMUM NET QUANTITY OF EACH INNER PACKAGING FOR MATERIALS AUTHORIZED FOR TRANSPORTATION AS LIMITED QUANTITY BY AIRCRAFT—Continued

Hazard class or division	Maximum authorized net quantity of each inner packaging		Maximum authorized net quantity of each outer package	Notes
	Glass, earthenware or fiber inner packagings	Metal or plastic inner packagings		
Division 4.2 (Primary or subsidiary).	Forbidden*	.....	25 kg (net mass)*	*Until December 31, 2012, Charcoal (NA1361), PG III, may be transported as a limited quantity and may be renamed Consumer commodity and reclassified ORM-D-AIR, if eligible.
Division 4.3 (solid material only).	PG I solids and all liquids regardless of Packing Group: Forbidden.			
	PG II: 0.5 kg	PG II: 0.5 kg	PG II: 5 kg*	*Maximum net quantity per outer package with toxic subsidiary risk (e.g., UN3134) is 1 kg. For fuel cell cartridges containing water reactive substances (UN3476), see § 173.230 of this part.
	PG III: 1 kg	PG III: 1 kg	PG III: 10 kg*	*Maximum net quantity per outer package with corrosive or flammable subsidiary risk (e.g., UN3131 or UN3132, respectively) is 5 kg.
Division 5.1 (Liquid or solid material).	PG I: Forbidden.			
Division 5.1 (liquid material).	PG II: 0.1L	PG II: 0.1L	PG II: 0.5L.	
	PG III: 0.5L	PGIII: 0.5L	PG III: 1.0L.	
Division 5.1 (solid material).	PG II: 0.5 kg	PG II: 0.5 kg	PG II: 2.5 kg*	*Maximum net quantity per outer package with toxic subsidiary risk (e.g., UN3087) is 1 kg.
	PG III: 1.0 kg	PG III: 1.0 kg	PG III: 10 kg*	*Maximum net quantity per outer package with corrosive subsidiary risk (e.g., UN3085) is 1 kg.
Division 5.2 (liquid material).	30 mL	30 mL	1 kg	<i>Authorized materials:</i> Types D, E and F are authorized only as part of a Chemical or First aid kit (UN3316) in accordance with § 173.161 of this part or a Polyester resin kit (UN3269) in accordance with § 173.165 of this part.
Division 5.2 (solid material).	100g	100g	1 kg.	
Division 6.1	PG I (Inhalation or otherwise): Forbidden.			
Division 6.1 (liquid material).	PG II: 0.1L	PG II: 0.1L	PG II: 1.0L*	*Maximum net quantity per outer package with corrosive subsidiary risk (e.g., UN3289) is 0.5L.
	PG III: 0.5L	PGIII: 0.5L	PG III: 2.0L.	
Division 6.1 (solid material).	PG II: 0.5 kg	PG II: 0.5 kg	PG II: 1.0 kg.	
	PG III: 1.0 kg	PG III: 1.0 kg	PG III: 10 kg.	
Class 7	Forbidden.			
Class 8	PG I: Forbidden.			
Class 8 (liquid material).	PG II: 0.1L	PG II: 0.1L	PG II: 0.5L	For “Fuel cell cartridges containing corrosive substances” (UN3477), see § 173.230 of this part.
	PG III: 0.5L	PGIII: 0.5L	PG III: 1.0L.	
Class 8 (solid material).	PG II: 0.5 kg	PG II: 0.5 kg	PG II: 5.0 kg*	*Maximum net quantity per outer package for UN2430 is 1.0 kg. UN2794, UN2795, UN2803, UN2809, UN3028 are not authorized as limited quantity.
	PG III: 1.0 kg	PG III: 1.0 kg	PG III: 5.0 kg.	
Class 9 (liquid material).	30 mL (UN3316); 5.0L (UN1941, UN1990, UN3082) 100 g (UN3316); 5.0 kg (UN2071, UN3077).	30 mL (UN3316); 5.0L (UN1941, UN1990, UN3082) 100 g (UN3316); 5.0 kg (UN2071, UN3077).	1 kg (UN3316); 30 kg (all other authorized Class 9 material).	<i>Authorized materials:</i> UN1941, UN1990, UN2071, UN3077, UN3082, and UN3316 only. Additionally, Consumer commodity (ID8000) in accordance with § 173.167 of this part and Chemical kit or First aid kit (UN3316) in accordance with § 173.161 of this part are authorized.

TABLE 3—MAXIMUM NET QUANTITY OF EACH INNER PACKAGING FOR MATERIALS AUTHORIZED FOR TRANSPORTATION AS LIMITED QUANTITY BY AIRCRAFT—Continued

Hazard class or division	Maximum authorized net quantity of each inner packaging		Maximum authorized net quantity of each outer package	Notes
	Glass, earthenware or fiber inner packagings	Metal or plastic inner packagings		
Class 9 (solid material).	100 g (UN3316); 5.0 kg (UN2071, UN3077).	100 g (UN3316); 5.0 kg (UN2071, UN3077).		

* * * * *

■ 28. In § 173.40, in paragraph (c)(1), a second sentence is added to read as follows:

§ 173.40 General packaging requirements for toxic materials packaged in cylinders.

* * * * *

(c) * * *
 (1) * * * For UN pressure receptacles, each valve must be capable of withstanding the test pressure of the pressure receptacle and be connected directly to the pressure receptacle by either a taper thread or other means which meets the requirements of ISO 10692-2: (IBR, see § 171.7 of this subchapter).

* * * * *

■ 29. In § 173.58, paragraph (a)(5) is revised to read as follows:

§ 173.58 Assignment of class and division for new explosives.

(a) * * *

(5) Division 1.4 Compatibility Group S (1.4S) if the hazardous effects are confined within the package or the blast and projection effects do not significantly hinder emergency response efforts. The UN Test Type 6(d) is used to determine whether a Division 1.4S classification is appropriate for an item assigned a proper shipping name to which special provision 347 (see § 172.102 of this subchapter) applies; or

* * * * *

■ 30. In § 173.59, a definition for “Phlegmatized” is added in alphabetical order to read as follows:

§ 173.59 Description of terms for explosives.

* * * * *

Phlegmatized. The term means that a substance (or “phlegmatizer”) has been added to an explosive to enhance its safety in handling and transport. The phlegmatizer renders the explosive insensitive, or less sensitive, to the following actions: heat, shock, impact, percussion or friction. Typical phlegmatizing agents include, but are not limited to: wax, paper, water, polymers (such as

chlorofluoropolymers), alcohol and oils (such as petroleum jelly and paraffin).

* * * * *

■ 31. In § 173.63, paragraph (b) is revised to read as follows:

§ 173.63 Packaging exceptions.

* * * * *

(b) *Limited quantities of Cartridges, small arms, and cartridges power devices.* (1)(i) Cartridges, small arms, and Cartridges power device (used to project fastening devices), 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. For transportation by aircraft, the package must conform to the applicable requirements of § 173.27 of this part and, effective July 1, 2011, Cartridge, power devices must be successfully tested under the UN Test Series 6(d) criteria for reclassification as limited quantity material. Effective January 1, 2012, Cartridge, power devices must be successfully tested under the UN Test Series 6(d) criteria for reclassification as limited quantity material for transportation by highway, rail or vessel. Packages containing such articles must be marked as prescribed in § 172.315. 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 these 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, power device (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, Cartridge, 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, 2013, 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 power devices 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; and
- (E) Cartridges, power devices which are used to project fastening devices.

(2) Packaging for Cartridges, small arms and eligible Cartridge, power devices as limited quantity or ORM–D material must be as follows:

- (i) Ammunition must be packed in inside boxes, or in partitions which fit snugly in the outside packaging, or in metal clips;
- (ii) Primers must be protected from accidental initiation;
- (iii) Inside boxes, partitions or metal clips must be packed in securely-closed strong outside packagings;
- (iv) Maximum gross weight is limited to 30 kg (66 pounds) per package; and
- (v) Cartridges, power devices which are used to project fastening devices and 22 caliber rim-fire cartridges may be packaged loose in strong outside packagings.

* * * * *

■ 32. In § 173.120, paragraphs (c)(1)(i) and (ii) are revised to read as follows:

§ 173.120 Class 3—Definitions.

* * * * *

(c) * * *
(1) * * *
(i) For a homogeneous, single-phase, liquid having a viscosity less than 45 S.U.S. at 38 °C (100 °F) that does not form a surface film while under test, one of the following test procedures shall be used:

(A) Standard Method of Test for Flash Point by Tag Closed Cup Tester, (ASTM D 56) (IBR; see § 171.7 of this subchapter);

(B) Standard Test Methods for Flash Point of Liquids by Small Scale Closed-Cup Apparatus, (ASTM D 3278) (IBR; see § 171.7 of this subchapter); or

(C) Standard Test Methods for Flash Point by Small Scale Closed Tester, (ASTM D 3828) (IBR; see § 171.7 of this subchapter).

(ii) For a liquid other than one meeting all the criteria of paragraph (c)(1)(i) of this section, one of the following test procedures must be used:

(A) Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester, (ASTM D 93) (IBR; see § 171.7 of this subchapter). For cutback asphalt, use Method B of ASTM D 93 or alternative tests authorized in this standard;

(B) Standard Test Methods for Flash Point of Liquids by Small Scale Closed-Cup Apparatus (ASTM D 3278) (IBR; see § 171.7 of this subchapter);

(C) Determination of Flash/No Flash—Closed Cup Equilibrium Method (ISO 1516) (IBR; see § 171.7 of this subchapter);

(D) Determination of Flash point—Closed Cup Equilibrium Method (ISO 1523) (IBR; see § 171.7 of this subchapter);

(E) Determination of Flash Point—Pensky-Martens Closed Cup Method (ISO 2719) (IBR; see § 171.7 of this subchapter);

(F) Determination of Flash Point—Rapid Equilibrium Closed Cup Method (ISO 3679) (IBR; see § 171.7 of this subchapter);

(G) Determination of Flash/No Flash—Rapid Equilibrium Closed Cup Method (ISO 3680) (IBR; see § 171.7 of this subchapter); or

(H) Determination of Flash Point—Abel Closed-Cup Method (ISO 13736) (IBR; see § 171.7 of this subchapter).

* * * * *

■ 33. In § 173.121, paragraph (a) is revised to read as follows:

§ 173.121 Class 3—Assignment of packing group.

(a)(1) The packing group of a Class 3 material is as assigned in column 5 of the § 172.101 Table. When the § 172.101

Table provides more than one packing group for a hazardous material, the packing group must be determined by applying the following criteria:

Packing group	Flash point (closed-cup)	Initial boiling point
I .....	.....	≤35°C (95 °F)
II	<23°C (73 °F)	>35 °C (95 °F)
III	≥23 °C, ≤60 °C (≥73 °F, ≤140 °F)	>35 °C (95 °F)

(2) The initial boiling point of a Class 3 material may be determined by using one of the following test methods:

(i) Standard Test Method for Distillation of Petroleum Products at Atmospheric Pressure (ASTM D 86) (IBR; see § 171.7 of this subchapter);

(ii) Standard Test Method for Distillation Range of Volatile Organic Liquids (ASTM D 1078) (IBR; see § 171.7 of this subchapter);

(iii) Petroleum Products—Determination of Distillation Characteristics at Atmospheric Pressure (ISO 3405) (IBR; see § 171.7 of this subchapter);

(iv) Petroleum Products—Determination of Boiling Range Distribution—Gas Chromatography Method (ISO 3924) (IBR; see § 171.7 of this subchapter); or

(v) Volatile Organic Liquids—Determination of Boiling Range of Organic Solvents Used as Raw Materials (ISO 4626) (IBR; see § 171.7 of this subchapter).

* * * * *

■ 34. In § 173.124, paragraph (b)(2) is revised to read as follows:

§ 173.124 Class 4, Divisions 4.1, 4.2 and 4.3—Definitions.

* * * * *

(b) * * *

(2) A self-heating material. A self-heating material is a material that through a process where the gradual reaction of that substance with oxygen (in air) generates heat. If the rate of heat production exceeds the rate of heat loss, then the temperature of the substance will rise which, after an induction time, may lead to self-ignition and combustion. A material of this type which exhibits spontaneous ignition or if the temperature of the sample exceeds 200 °C (392 °F) during the 24-hour test period when tested in accordance with UN Manual of Tests and Criteria (IBR; see § 171.7 of this subchapter), is classed as a Division 4.2 material.

* * * * *

■ 35. In § 173.136, paragraph (a) is revised to read as follows:

§ 173.136 Class 8—Definitions.

(a) For the purpose of this subchapter, “corrosive material” (Class 8) means a liquid or solid that causes full thickness destruction of human skin at the site of contact within a specified period of time. A liquid, or a solid which may become liquid during transportation, that has a severe corrosion rate on steel or aluminum based on the criteria in § 173.137(c)(2) is also a corrosive material. Whenever practical, *in vitro* test methods authorized in § 173.137 of this part or historical data authorized in paragraph (c) of this section should be used to determine whether a material is corrosive.

* * * * *

■ 36. In § 173.137, in the introductory text, the second sentence is revised and a third, fourth, and fifth sentence are added to read as follows:

§ 173.137 Class 8—Assignment of packing group.

* * * * * When the § 172.101 Table provides more than one packing group for a Class 8 material, the packing group must be determined using data obtained from tests conducted in accordance with the OECD Guideline for the Testing of Chemicals, Number 435, “*In Vitro* Membrane Barrier Test Method for Skin Corrosion” (IBR, see § 171.7 of this subchapter) or Number 404, “Acute Dermal Irritation/Corrosion” (IBR, see § 171.7 of this subchapter). A material that is determined not to be corrosive in accordance with OECD Guideline for the Testing of Chemicals, Number 430, “*In Vitro* Skin Corrosion:

Transcutaneous Electrical Resistance Test (TER)” (IBR, see § 171.7 of this subchapter) or Number 431, “*In Vitro* Skin Corrosion: Human Skin Model Test” (IBR, see § 171.7 of this subchapter) may be considered not to be corrosive to human skin for the purposes of this subchapter without further testing. However, a material determined to be corrosive in accordance with Number 430 or Number 431 must be further tested using Number 435 or Number 404. The packing group assignment using data obtained from tests conducted in accordance with OECD Guideline Number 404 or Number 435 must be as follows:

* * * * *

■ 37. Section 173.144 is revised to read as follows:

§ 173.144 Other Regulated Materials (ORM)—Definitions.

Until December 31, 2013 and for the purposes of this subchapter, “ORM—D material” means a material such as a consumer commodity, cartridges, small

arms or cartridges, power devices which, although otherwise subject to the regulations of this subchapter, presents a limited hazard during transportation due to its form, quantity and packaging. It must be a material for which exceptions are provided in Column (8A) of the § 172.101 Hazardous Materials Table.

■ 38. In § 173.150, paragraphs (b) and (c) are revised to read as follows:

§ 173.150 Exceptions for Class 3 (flammable and combustible liquids).

* * * * *

(b) *Limited quantities.* Limited quantities of flammable liquids (Class 3) and combustible liquids 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, the package must also conform to applicable requirements of § 173.27 of this part (e.g., authorized materials, inner packaging quantity limits and closure securement) and 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 packaging requirements of subpart B of this part and may not exceed 30 kg (66 pounds) gross weight. Except for transportation by aircraft, the following combination packagings are authorized:

(1) For flammable liquids in Packing Group I, inner packagings not over 0.5 L (0.1 gallon) net capacity each, packed in a strong outer packaging;

(2) For flammable liquids in Packing Group II, inner packagings not over 1.0 L (0.3 gallons) net capacity each, packed in a strong outer packaging.

(3) For flammable liquids in Packing Group III and combustible liquids, inner packagings not over 5.0 L (1.3 gallons) net capacity each, packed in a strong outer packaging.

(c) *Consumer commodities.* Until December 31, 2013, a limited quantity

package containing a “consumer commodity” as defined in § 171.8 of this subchapter, may be renamed “Consumer commodity” and reclassified as ORM–D or, until December 31, 2012, 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.

* * * * *

■ 39. In § 173.151, paragraphs (b), (c), and (d) are revised to read as follows:

§ 173.151 Exceptions for Class 4.

* * * * *

(b) *Limited quantities of Division 4.1.* (1) Limited quantities of flammable solids (Division 4.1) in Packing Groups II and III and, where authorized by this section, charcoal briquettes (Division 4.2) in Packing Group III, 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, the package must also conform to applicable requirements of § 173.27 of this part (e.g., authorized materials, inner packaging quantity limits and closure securement) and 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 packaging requirements of subpart B of this part and may not exceed 30 kg (66 pounds) gross weight. Except for transportation by aircraft, the following combination packagings are authorized:

(i) For flammable solids in Packing Group II, inner packagings not over 1.0 kg (2.2 pounds) net capacity each, packed in a strong outer packaging.

(ii) For flammable solids in Packing Group III, inner packagings not over 5.0 kg (11 pounds) net capacity each, packed in a strong outer packaging.

(2) For transportation by highway or rail, Charcoal briquettes (NA1361) may be packaged as a limited quantity in

accordance with paragraph (b) of this section in packagings not exceeding 30 kg gross weight and are eligible for the exceptions provided in § 173.156.

(c) *Consumer commodities.* Until December 31, 2013, a limited quantity package (including Charcoal briquettes (NA1361)) containing a “consumer commodity” as defined in § 171.8 of this subchapter, may be renamed “Consumer commodity” and reclassified as ORM–D or, until December 31, 2012, 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. For transportation by aircraft, the maximum net mass for Charcoal briquettes (NA1361) is 25 kg per package.

(d) *Limited quantities of Division 4.3.* Limited quantities of dangerous when wet solids (Division 4.3) in Packing Groups II and III 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, the package must also conform to applicable requirements of § 173.27 of this part (e.g., authorized materials, inner packaging quantity limits and closure securement) and 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 packaging requirements of subpart B of this part and may not exceed 30 kg (66 pounds) gross weight. Except for transportation by aircraft, the following combination packagings are authorized:

(1) For dangerous when wet solids in Packing Group II, inner packagings not over 0.5 kg (1.1 pounds) net capacity each, packed in a strong outer packaging.

(2) For dangerous when wet solids in Packing Group III, inner packagings not over 1.0 kg (2.2 pounds) net capacity

each, packed in a strong outer packaging.

■ 40. In § 173.152, paragraphs (b) and (c) are revised to read as follows:

§ 173.152 Exceptions for Division 5.1 (oxidizers) and Division 5.2 (organic peroxides).

* * * * *

(b) *Limited quantities.* Limited quantities of oxidizers (Division 5.1) in Packing Group II and III and organic peroxides (Division 5.2) 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, the package must also conform to applicable requirements of § 173.27 of this part (e.g., authorized materials, inner packaging quantity limits and closure securement) and 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 packaging requirements of subpart B of this part and may not exceed 30 kg (66 pounds) gross weight. Except for transportation by aircraft, the following combination packagings are authorized:

(1) For oxidizers in Packing Group II, inner packagings not over 1.0 L (0.3 gallon) net capacity each for liquids or not over 1.0 kg (2.2 pounds) net capacity each for solids, packed in a strong outer packaging.

(2) For oxidizers in Packing Group III, inner packagings not over 5 L (1.3 gallons) net capacity each for liquids or not over 5.0 kg (11 lbs) net capacity each for solids, packed in a strong outer packaging.

(3) For organic peroxides that do not require temperature control during transportation—

(i) Except for transportation by aircraft, for Type B or C organic peroxides, inner packagings not over 25 mL (0.845 ounces) net capacity each for liquids or 100 g (3.528 ounces) net

capacity for solids, packed in a strong outer packaging.

(ii) For Type D, E, or F organic peroxides, inner packagings not over 125 mL (4.22 ounces) net capacity each for liquids or 500 g (17.64 ounces) net capacity for solids, packed in a strong outer packaging.

(c) *Consumer commodities.* Until December 31, 2013, a limited quantity package containing a “consumer commodity” as defined in § 171.8 of this subchapter, may be renamed “Consumer commodity” and reclassified as ORM–D or, until December 31, 2012, 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.

■ 41. In § 173.153, paragraphs (b) and (c) are revised to read as follows:

§ 173.153 Exceptions for Division 6.1 (poisonous material).

* * * * *

(b) *Limited quantities.* The exceptions in this paragraph do not apply to poison-by-inhalation materials. Limited quantities of poisonous material (Division 6.1) in Packing Groups II and III are excepted from the 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, the package must also conform to applicable requirements of § 173.27 of this part (e.g., authorized materials, inner packaging quantity limits and closure securement) and 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 packaging requirements of subpart B of this part and may not exceed 30 kg (66 pounds) gross weight. Except for transportation by aircraft, the following combination packagings are authorized:

(1) For poisonous materials in Packing Group II, inner packagings not over 100

mL (3.38 ounces) each for liquids or 0.5 kg (1.1 pounds) each for solids, packed in a strong outer packaging. Inner packagings containing a liquid poisonous material which is also a drug or medicine in Packing Group II may be increased to not over 250 mL (8 ounces) each and packed in a strong outer packaging.

(2) For poisonous materials in Packing Group III, inner packagings not over 5 L (1.3 gallons) each for liquids or 5.0 kg (11 pounds) each for solids, packed in a strong outer packaging.

(c) *Consumer commodities.* Until December 31, 2013, a limited quantity package of poisonous material in Packing Group III or a drug or medicine in Packing Group II and III that is also a “consumer commodity” as defined in § 171.8 of this subchapter, may be renamed “Consumer commodity” and reclassified as ORM–D or, until December 31, 2012, 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.

■ 42. In § 173.154, paragraphs (b) and (c) are revised to read as follows:

§ 173.154 Exceptions for Class 8 (corrosive material).

* * * * *

(b) *Limited quantities.* Limited quantities of corrosive material (Class 8) in Packing Groups II and III 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, the package must also conform to the applicable requirements of § 173.27 of this part (e.g., authorized materials, inner packaging quantity limits and closure securement) and 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 packaging requirements of

subpart B of this part and may not exceed 30 kg (66 pounds) gross weight. Except for transportation by aircraft, the following combination packagings are authorized:

(1) For corrosive materials in Packing Group II, inner packagings not over 1.0 L (0.3 gallon) net capacity each for liquids or not over 1.0 kg (2.2 pounds) net capacity each for solids, packed in a strong outer packaging.

(2) For corrosive materials in Packing Group III, inner packagings not over 5.0 L (1.3 gallons) net capacity each for liquids or not over 5.0 kg (11 lbs) net capacity each for solids, packed in a strong outer packaging.

(c) *Consumer commodities*. Until December 31, 2013, a limited quantity package containing a “consumer commodity” as defined in § 171.8 of this subchapter, may be renamed “Consumer commodity” and reclassified as ORM–D or, until December 31, 2012, 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.

* * * * *

■ 43. In § 173.155, paragraphs (b) and (c) are revised to read as follows:

§ 173.155 Exceptions for Class 9 (miscellaneous hazardous materials).

* * * * *

(b) *Limited quantities of Class 9 materials*. Limited quantities of miscellaneous hazardous materials in Packing Groups II and III 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. Unless otherwise specified in paragraph (c) of this section, packages of limited quantities intended for transportation by aircraft must conform to the applicable requirements (*e.g.*, authorized materials, inner packaging quantity limits and closure securement) of § 173.27 of this part. 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, packages of limited quantities are not subject to subpart F (Placarding) of part 172 of this subchapter. Each package must conform

to the packaging requirements of subpart B of this part and may not exceed 30 kg (66 pounds) gross weight. Except for transportation by aircraft, the following combination packagings are authorized:

(1) For miscellaneous materials in Packing Group II, inner packagings not over 1.0 L (0.3 gallon) net capacity each for liquids or not over 1.0 kg (2.2 pounds) net capacity each for solids, packed in a strong outer packaging.

(2) For miscellaneous materials in Packing Group III, inner packagings not over 5.0 L (1.3 gallons) net capacity each for liquids or not over 5.0 kg (11 lbs) net capacity each for solids, packed in a strong outer packaging.

(c) *Consumer commodities*. Until December 31, 2013, a limited quantity package containing a “consumer commodity” as defined in § 171.8 of this subchapter, may be renamed “Consumer commodity” and reclassified as ORM–D or, until December 31, 2012, 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.

■ 44. Section 173.156 is revised to read as follows:

§ 173.156 Exceptions for limited quantity and ORM.

(a) Exceptions for hazardous materials shipments in the following paragraphs are permitted only if this section is referenced for the specific hazardous material in the § 172.101 Table or in a packaging section in this part.

(b) Packagings for limited quantity and ORM–D are specified according to hazard class in §§ 173.150 through 173.155 and in § 173.306. In addition to other exceptions provided for limited quantity and ORM–D materials in this part:

(1) Strong outer packagings as specified in this part, marking requirements specified in subpart D of part 172 of this subchapter, and the 30 kg (66 pounds) gross weight limitation are not required for packages of limited quantity materials marked in accordance with § 172.315 of this subchapter, or, until December 31, 2013, materials classed and marked as ORM–D and described as a Consumer commodity, as defined in § 171.8 of this subchapter, when—

(i) Unitized in cages, carts, boxes or similar overpacks;

(ii) Offered for transportation or transported by:

(A) Rail;

(B) Private or contract motor carrier;

or

(C) Common carrier in a vehicle under exclusive use for such service; and

(iii) Transported to or from a manufacturer, a distribution center, or a retail outlet, or transported to a disposal facility from one offeror.

(2) The 30 kg (66 pounds) gross weight limitation does not apply to packages of limited quantity materials marked in accordance with § 172.315 of this subchapter, or, until December 31, 2013, materials classed and marked as ORM–D and described as a Consumer commodity, as defined in § 171.8 of this subchapter, when offered for transportation or transported by highway or rail between a manufacturer, a distribution center, and a retail outlet provided—

(i) Inner packagings conform to the quantity limits for inner packagings specified in §§ 173.150(b), 173.152(b), 173.154(b), 173.155(b) and 173.306 (a) and (b), as appropriate;

(ii) The inner packagings are packed into corrugated fiberboard trays to prevent them from moving freely;

(iii) The trays are placed in a fiberboard box which is banded and secured to a wooden pallet by metal, fabric, or plastic straps, to form a single palletized unit;

(iv) The package conforms to the general packaging requirements of subpart B of this part;

(v) The maximum net quantity of hazardous material permitted on one palletized unit is 250 kg (550 pounds); and

(vi) The package is properly marked in accordance with § 172.315 or, until December 31, 2013, § 172.316 of this subchapter.

■ 45. Section 173.161 is revised to read as follows:

§ 173.161 Chemical kits and first aid kits.

(a) *Applicability*. Chemical kits and first aid kits contain one or more compatible items of hazardous materials in boxes, cases, *etc.* that, for example, are used for medical, analytical, diagnostic, testing, or repair purposes.

(b) *Authorized materials*. (1) The kits may only contain hazardous materials for which packaging exceptions are provided in column 8(A) of the § 172.101 Hazardous Materials Table in this subchapter. For transportation by aircraft, the kits may only contain quantities of hazardous materials authorized as excepted quantities or as limited quantities in §§ 173.4a and 173.27(f) of this part, respectively. Materials forbidden for transportation by passenger aircraft or cargo aircraft may not be included in the kits.

(2) The packing group assigned to the chemical kit and first aid kit as a whole must be the most stringent packing group assigned to any individual

substance in the kit and must be shown on the shipping paper, if applicable, in accordance with subpart C of Part 172 of this subchapter.

(c) *Packaging.* Except for transportation by aircraft or vessel, chemical kits and first aid kits must be packaged in combination packagings conforming to the packaging requirements of subpart B of this part. For transportation by aircraft or vessel, chemical kits and first aid kits must be packaged in specification combination packagings based on the performance level of the most stringent packing group of material contained within the kit. For transportation by aircraft, friction-type closures must be secured by secondary means and inner packagings intended to contain liquids must be capable of meeting the pressure differential requirements prescribed in § 173.27(c) of this subchapter. Inner and outer packaging quantity limits for packages are as follows:

(1) Except for liquids of Division 5.2 (organic peroxide), inner packagings containing not more than 250 mL. Except for transportation by aircraft, for Division 5.2 (organic peroxide) liquids of Type B and C, inner packagings containing not more than 25 mL and for Division 5.2 (organic peroxide) liquids of Type D, E and F, inner packagings containing not more than 125 mL. For transportation by aircraft, for Division 5.2 (organic peroxide) liquids of Type D, E and F (only), inner packagings containing not more than 125 mL;

(2) Except for solids of Division 5.2 (organic peroxide) of Type B and C, inner packagings containing not more than 250 g. Except for transportation by aircraft, for a Division 5.2 (organic peroxide) solid of Type B and C, inner packagings containing not more than 100 g. For transportation by aircraft, for a Division 5.2 (organic peroxide) solid of Type D, E and F (only), inner packagings containing not more than 250 g;

(3) No more than 10 L or 10 kg of hazardous material may be contained in one outer package (excluding dry ice). For transportation by aircraft, no more than 1 L or 1 kg of hazardous material may be contained in one kit (excluding dry ice);

(4) Each package must conform to the packaging requirements of subpart B of this part and may not exceed 30 kg (66 pounds) gross weight;

(5) Except for Carbon dioxide, solid (Dry ice), UN1845, no other hazardous materials may be packed within the same outer packaging as the kits. Dry ice must be packaged in accordance with § 173.217 of this subchapter;

(6) The kits must include sufficient absorbent material to completely absorb the contents of any liquid hazardous materials contained in the kits. The contents must be separated, placed, or packed, and closed with cushioning material to protect them from damage; and

(7) The contents of the kits must be packed so there will be no possibility of the mixture of contents causing dangerous evolution of heat or gas.

(d) *Exceptions.* (1)(i) Chemical kits and first aid kits are eligible for the excepted quantity exceptions provided in §§ 173.4 and 173.4a of this part. For transportation by aircraft, chemical kits and first aid kits are eligible for the limited quantity provisions provided in § 173.27(f) of this part. For inner packaging quantity limits, see § 173.27(f), Table 3.

(ii) A package conforming 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. Chemical kits and First aid kits conforming to this section may be marked as a limited quantity as prescribed in § 172.315 of this subchapter and, if applicable, are eligible for the exceptions provided in § 173.156 of this part. Additionally, chemical and first aid kits conforming to this section are not subject to part 174 (carriage by rail) or part 177 (carriage by highway) of this subchapter when marked in accordance with § 172.315 of this subchapter.

(2) Consumer commodities. Until December 31, 2013, a limited quantity package containing a “consumer commodity” as defined in § 171.8 of this subchapter may be renamed “Consumer commodity” and reclassified as ORM–D or, until December 31, 2012, 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.

(3) Kits that are carried on board transport vehicles for first aid or operating purposes are not subject to the requirements of this subchapter.

■ 46. Section 173.165 is added to read as follows:

§ 173.165 Polyester resin kits.

(a) Except for transportation by aircraft, 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 which does not require temperature control)—

(1) The organic peroxide component must be packed in inner packagings not over 125 mL (4.22 ounces) net capacity each for liquids or 500 g (17.64 ounces) net capacity each for solids;

(2) The flammable liquid component must be packed in inner packagings not over 5 L (1.3 gallons) net capacity each for Packing Group II or III liquid; and

(3) The flammable liquid component and the organic peroxide component may be packed in the same strong outer packaging provided they will not interact dangerously in the event of leakage.

(b) For transportation by aircraft, 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 which does not require temperature control)—

(1) The organic peroxide component is limited to a quantity of 125 mL (4.22 ounces) per inner packaging if liquid, and 500 g (1 pound) if solid. The 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;

(2) The components may be placed in the same outer packaging provided they will not interact dangerously in the event of leakage;

(3) Packing group will be II or III, according to the criteria for Class 3, applied to the base material. Additionally, unless otherwise excepted in this subchapter, 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;

(4) Closures must be secured by secondary means;

(5) Inner packagings intended to contain liquids must be capable of meeting the pressure differential requirements prescribed in § 173.27(c) of this part; and

(6) Except as provided in paragraph (b) of this section, exceptions for polyester resin kits intended for transportation by aircraft are provided in §§ 173.4a (excepted quantities) and 173.27(f) (limited quantities) of this part.

(c) Consumer commodities. Until December 31, 2013, a limited quantity package containing a “consumer commodity” as defined in § 171.8 of this subchapter may be renamed “Consumer commodity” and reclassified as ORM–D or, until December 31, 2012, 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.

■ 47. Section § 173.167 is added to read as follows:

§ 173.167 Consumer commodities.

(a) Effective January 1, 2013, a “consumer commodity” (see § 171.8 of this subchapter) when intended for transportation by aircraft may only include articles or substances of Class 2 (non-toxic aerosols only), Class 3 (Packing Group II and III only), Division 6.1 (Packing Group III only), UN3077, UN3082, and UN3175, provided such materials do not have a subsidiary risk and are authorized aboard a passenger-carrying aircraft. Friction-type closures must be secured by secondary means. Inner packagings intended to contain liquids must be capable of meeting the pressure differential requirements (75 kPa) prescribed in § 173.27(c) of this part. Consumer commodities are excepted from the specification packaging requirements of this subchapter and each completed package must conform to subpart B of part. Packages of consumer commodities must also be capable of withstanding a 1.2 m drop on solid concrete in the position most likely to cause damage and a 24-hour stack test. Inner and outer packaging quantity limits for consumer commodities are as follows:

(1) Non-toxic aerosols, as defined in § 171.8 of this subchapter and constructed in accordance with § 173.306 of this part, in non-refillable, non-metal containers not exceeding 120 mL (4 fluid ounces) each, or in non-refillable metal containers not exceeding 820 mL (28 ounces) each, except that flammable aerosols may not exceed 500 mL (16.9 ounces) each; or

(2) Liquids, in inner packagings not exceeding 500 mL (16.9 ounces) each; or

(3) Solids, in inner packagings not exceeding 500 g (1.0 pounds) each; or

(4) Any combination thereof.

(b) Inner packagings are to be placed in an outer packaging not to exceed 30 kg (66 pounds) gross weight as prepared for shipment.

■ 48. Section 173.220 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.

(a) *Applicability.* An internal combustion engine, self-propelled vehicle, mechanized equipment containing an internal combustion engine, a battery-powered vehicle or equipment, or a fuel cell-powered

vehicle or equipment, or any combination thereof, is subject to the requirements of this subchapter when transported as cargo on a transport vehicle, vessel, or aircraft if—

(1) The engine contains a 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;

(2) The fuel tank contains a 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;

(3) It is equipped with a wet battery (including a non-spillable battery), a sodium battery or a lithium battery; or

(4) Except as provided in paragraph (f)(1) of this section, it contains other hazardous materials subject to the requirements of this subchapter.

(b) *Requirements.* Unless otherwise excepted in paragraph (b)(4) of this section, vehicles, engines, and equipment are subject to the following requirements:

(1) *Flammable liquid fuel.* A fuel tank containing a flammable liquid fuel must be drained and securely closed, except that up to 500 mL (17 ounces) of residual fuel may remain in the tank, engine components, or fuel lines provided they are securely closed to prevent leakage of fuel during transportation. Self-propelled vehicles containing diesel fuel are excepted from the requirement to drain the fuel tanks, provided that sufficient ullage space has been left inside the tank to allow fuel expansion without leakage, and the tank caps are securely closed.

(2) *Flammable liquefied or compressed gas fuel.* (i) For transportation by motor vehicle, rail car or vessel, fuel tanks and fuel systems containing flammable liquefied or compressed gas fuel must be securely closed. For transportation by vessel, the requirements of §§ 176.78(k) and 176.905 of this subchapter apply.

(ii) For transportation by aircraft:

(A) Flammable gas-powered vehicles, machines, equipment or cylinders containing the flammable gas must be completely emptied of flammable gas. Lines from vessels to gas regulators, and gas regulators themselves, must also be drained of all traces of flammable gas. To ensure that these conditions are met, gas shut-off valves must be left open and connections of lines to gas regulators

must be left disconnected upon delivery of the vehicle to the operator. Shut-off valves must be closed and lines reconnected at gas regulators before loading the vehicle aboard the aircraft; or alternatively;

(B) Flammable gas powered vehicles, machines or equipment, which have cylinders (fuel tanks) that are equipped with electrically operated valves, may be transported under the following conditions:

(1) The valves must be in the closed position and in the case of electrically operated valves, power to those valves must be disconnected;

(2) After closing the valves, the vehicle, equipment or machinery must be operated until it stops from lack of fuel before being loaded aboard the aircraft;

(3) In no part of the closed system shall the pressure exceed 5% of the maximum allowable working pressure of the system or 290 psig (2000 kPa), whichever is less; and

(4) There must not be any residual liquefied gas in the system, including the fuel tank.

(3) *Truck bodies or trailers on flat cars—flammable liquid or gas powered.* Truck bodies or trailers with automatic heating or refrigerating equipment of the flammable liquid type may be shipped with fuel tanks filled and equipment operating or inoperative, when used for the transportation of other freight and loaded on flat cars as part of a joint rail and highway movement, provided the equipment and fuel supply conform to the requirements of § 177.834(l) of this subchapter.

(4) *Modal exceptions.* Quantities of flammable liquid fuel greater than 500 mL (17 ounces) may remain in the fuel tank in self-propelled vehicles and mechanical equipment only under the following conditions:

(i) For transportation by motor vehicle or rail car, the fuel tanks must be securely closed.

(ii) For transportation by vessel, the shipment must conform to § 176.905 of this subchapter.

(iii) For transportation by aircraft, when carried in aircraft designed or modified for vehicle ferry operations when all the following conditions must be met:

(A) Authorization for this type operation has been given by the appropriate authority in the government of the country in which the aircraft is registered;

(B) Each vehicle is secured in an upright position;

(C) Each fuel tank is filled in a manner and only to a degree that will

preclude spillage of fuel during loading, unloading, and transportation; and

(D) Each area or compartment in which a self-propelled vehicle is being transported is suitably ventilated to prevent the accumulation of fuel vapors.

(c) *Battery-powered or installed.* Batteries must be securely installed, and wet batteries must be fastened in an upright position. Batteries must be protected against a dangerous evolution of heat, short circuits, and damage to terminals in conformance with § 173.159(a) and leakage; or must be removed and packaged separately under § 173.159. Battery-powered vehicles, machinery or equipment including battery-powered wheelchairs and mobility aids are not subject to any other requirements of this subchapter except § 173.21 of this subchapter when transported by rail, highway or vessel.

(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 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.

(e) *Fuel cells.* A fuel cell must be secured and protected in a manner to

prevent damage to the fuel cell. Equipment (other than vehicles, engines or mechanical equipment) such as consumer electronic devices containing fuel cells (fuel cell cartridges) must be described as “Fuel cell cartridges contained in equipment” and transported in accordance with § 173.230 of this subchapter.

(f) *Other hazardous materials.* (1) Items containing hazardous materials, such as fire extinguishers, compressed gas accumulators, safety devices and other hazardous materials that are integral components of the motor vehicle, engine or mechanical equipment and that are necessary for the operation of the vehicle, engine or mechanical equipment, or for the safety of its operator or passengers, must be securely installed in the motor vehicle, engine or mechanical equipment. Such items are not otherwise subject to the requirements of this subchapter. Equipment (other than vehicles, engines or mechanical equipment) containing lithium batteries must be described as “Lithium batteries contained in equipment” and transported in accordance with § 173.185 of this subchapter and applicable special provisions. Equipment (other than vehicles, engines or mechanical equipment) such as consumer electronic devices containing fuel cells (fuel cell cartridges) must be described as “Fuel cell cartridges contained in equipment” and transported in accordance with § 173.230 of this subchapter.

(2) Other hazardous materials must be packaged and transported in accordance with the requirements of this subchapter.

(g) *Additional requirements for internal combustion engines and vehicles with certain electronic equipment when transported by aircraft or vessel.* When an internal combustion engine that is not installed in a vehicle or equipment is offered for transportation by aircraft or vessel, all fuel, coolant or hydraulic systems remaining in the engine must be drained as far as practicable, and all disconnected fluid pipes that previously

contained fluid must be sealed with leak-proof caps that are positively retained. When offered for transportation by aircraft, vehicles equipped with theft-protection devices, installed radio communications equipment or navigational systems must have such devices, equipment or systems disabled.

(h) *Exceptions.* Except as provided in paragraph (f)(2) of this section, shipments made under the provisions of this section—

(1) Are not subject to any other requirements of this subchapter for transportation by motor vehicle or rail car; and

(2) Are not subject to the requirements of subparts D, E and F (marking, labeling and placarding, respectively) of part 172 of this subchapter or § 172.604 of this subchapter (emergency response telephone number) for transportation by vessel or aircraft. For transportation by aircraft, the provisions of § 173.159(b)(2) of this part as applicable, the provisions of § 173.230(f), as applicable, other applicable requirements of this subchapter, including shipping papers, emergency response information, notification of pilot-in-command, general packaging requirements, and the requirements specified in § 173.27 of this subchapter must be met. For transportation by vessel, additional exceptions are specified in § 176.905 of this subchapter.

■ 49. In § 173.225:

■ a. In paragraph (c)(8), the Organic Peroxide Table is amended by removing the entries under the [REMOVE] heading and adding entries under the [ADD] heading in the table below.

■ b. In paragraph (e), the Organic Peroxide IBC Table is amended by revising the entry for “Peroxyacetic acid, stabilized, not more than 17%” under “3109 ORGANIC PEROXIDE, TYPE F, LIQUID”.

§ 173.225 Packaging requirements and other provisions for organic peroxides.

*	*	*	*	*
(c)	*	*	*	
(8)	*	*	*	

ORGANIC PEROXIDE TABLE

Technical name	ID No.	Concent. (mass %)	Diluent (mass %) A	Diluent (mass %) B	Diluent (mass %) I	Water (mass %)	Packing method	Temp control	Temp emergency	Notes
(1)	(2)	(3)	(4a)	(4b)	(4c)	(5)	(6)	(7a)	(7b)	(8)
[REMOVE]										
Di-(2-tert-butylperoxyisopropyl) benzene(s).	UN3106	> 42–100			≤ 57		OP7			1, 9

ORGANIC PEROXIDE TABLE—Continued

Technical name (1)	ID No. (2)	Concent. (mass %) (3)	Diluent (mass %) A (4a)	Diluent (mass %) B (4b)	Diluent (mass %) I (4c)	Water (mass %) (5)	Packing method (6)	Temp control (7a)	Temp emer- gency (7b)	Notes (8)
Di-(2-tert-butylperoxyisopropyl) benzene(s).	Exempt	≤ 42	.....	.....	≥ 58	.....	Exempt	.....	.....	.....
*	*	*	*	*	*	*	*	*	*	*
2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexane.	UN3105	> 52–100	.....	.....	.....	.....	OP7	.....	.....	.....
[ADD] .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Di-(tert-butylperoxyisopropyl) benzene(s).	UN3106	> 42–100	.....	.....	≤ 57	.....	OP7	.....	.....	1, 9
Di-(tert-butylperoxyisopropyl) benzene(s).	Exempt	≤ 42	.....	.....	≥ 58	.....	Exempt	.....	.....	.....
2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexane.	UN3103	> 90–100	.....	.....	.....	.....	OP5	.....	.....	.....
2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexane.	UN3105	> 52–90	≥ 10	.....	.....	.....	OP7	.....	.....	.....
*	*	*	*	*	*	*	*	*	*	*

(e) * * *

ORGANIC PEROXIDE IBC TABLE

UN No.	Organic peroxide	Type of IBC	Maximum quantity (liters)	Control temperature	Emer- gency tem- perature
3109	ORGANIC PEROXIDE, TYPE F, LIQUID	.....	.....	.....	.....
	Peroxyacetic acid, stabilized, not more than 17%	31A 31H1 31H2 31HA1	1500 1500 1500 1500	.....	.....

■ 50. In § 173.230, paragraphs (g) and (h) are revised to read as follows:

§ 173.230 Fuel cell cartridges containing hazardous material.

(g) *Limited quantities.* Limited quantities of hazardous materials contained in fuel cell cartridges are excepted from the labeling requirements, unless the cartridges are offered for transportation or transported by aircraft, and from the placarding and specification packaging requirements of this subchapter when packaged according to this section. Each package

must conform to the packaging requirements of subpart B of this part and may not exceed 30 kg (66 pounds) gross weight. Except as authorized in paragraph (h) of this section, a package containing a limited quantity of fuel cell cartridges must be marked as specified in § 172.315 of this subchapter and, for transportation by highway or rail, 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, or marine pollutant, and are eligible for the exceptions provided in § 173.156 of part. For transportation by highway, rail

and vessel, the following combination packagings are authorized:

(1) For flammable liquids, in fuel cell cartridges containing not more than 1.0 L (0.3 gallon) per cartridge, packed in strong outer packaging.

(2) For water-reactive substances (Division 4.3 Dangerous when wet material), in fuel cell cartridges containing not more than 0.5 L (16.9 fluid ounces) for liquids or not over 0.5 kg (1.1 pound) for solids per cartridge, packed in strong outer packaging.

(3) For corrosive materials, in fuel cell cartridges containing not more than 1.0 L (0.3 gallon) for liquids or not more than 1.0 kg (2.2 pounds) for solids per

cartridge, packed in strong outer packaging.

(4) For liquefied (compressed) flammable gas, in fuel cell cartridges not over 120 mL (4 fluid ounces) net capacity per cartridge, packed in strong outer packaging.

(5) For hydrogen in metal hydride, in fuel cell cartridges not over 120 mL (4 fluid ounces) net capacity per cartridge, packed in strong outer packaging.

(6) For transportation by aircraft, the following combination packagings are authorized:

(i) For flammable liquids, in fuel cell cartridges containing not more than 0.5 L (16.9 fluid ounces) per cartridge, packed in strong outer packaging. Additionally, each package may contain no more than 2.5 kg (net mass) of fuel cell cartridges.

(ii) For water-reactive substances (Division 4.3 Dangerous when wet material), in fuel cell cartridges containing not more than 200 g (0.4 pounds) of solid fuel per cartridge, packed in strong outer packaging. Additionally, each package may contain no more than 2.5 kg (net mass) of fuel cell cartridges.

(iii) For corrosive materials, in fuel cell cartridges containing not more than 200 mL (6.7 fluid ounces) for liquids or not more than 200 g (0.4 pounds) for solids per cartridge packed in strong outer packaging. Additionally, each package may contain no more than 2.5 kg (net mass) of fuel cell cartridges.

(iv) For liquefied (compressed) flammable gas, in fuel cell cartridges not over 120 mL (4 fluid ounces) net capacity per cartridge, packed in strong outer packaging. Additionally, each package may contain no more than 0.5 kg (net mass) of fuel cell cartridges.

(v) For hydrogen in metal hydride, in fuel cell cartridges not over 120 mL (4 fluid ounces) net capacity per cartridge, packed in strong outer packaging. Additionally, each package may contain no more than 0.5 kg (net mass) of fuel cell cartridges.

(h) *Consumer commodities.* Until December 31, 2013, except for transportation by aircraft, a limited quantity that conforms to the provisions of paragraph (g) of this section and is also a "consumer commodity" as defined in § 171.8 of this subchapter on October 1, 2010 may be renamed "Consumer commodity" and reclassified as ORM-D. Shipments of ORM-D materials 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, and are eligible for the

exceptions provided in § 173.156 of this part.

■ 51. In § 173.301b, paragraphs (c)(2)(iii) and (e) are revised to read as follows:

§ 173.301b Additional general requirements for shipment of UN pressure receptacles.

* * * * *

(c) * * *

(2) * * *

(iii) By protecting the valves by shrouds or guards conforming to the requirements in ISO 11117 (IBR; see § 171.7 of this subchapter). For metal hydride storage systems, by protecting the valves in accordance with the requirements in ISO 16111 (IBR; see § 171.7 of this subchapter).

* * * * *

(e) *Pyrophoric gases.* A UN pressure receptacle must have valve outlets equipped with gas-tight plugs or caps when used for pyrophoric or flammable mixtures of gases containing more than 1% pyrophoric compounds. When UN pressure receptacles are manifolded in a bundle, each of the pressure receptacles must be equipped with an individual valve that must be closed while in transportation, and the outlet of the manifold valve must be equipped with a pressure retaining gas-tight plug or cap. Gas-tight plugs or caps must have threads that match those of the valve outlets.

* * * * *

■ 52. In § 173.306, paragraphs (h)(2), (i), and (l) are revised to read as follows:

§ 173.306 Limited quantities of compressed gases.

* * * * *

(h) * * *

(2) *Exceptions.* (i) For other than transportation by aircraft, special exceptions for shipment of lighter refills in the ORM-D class are provided in paragraph (i) of this section.

(ii) For highway transportation, when no more than 1,500 lighter refills covered by this paragraph are transported in one motor vehicle, the requirements of subparts C through H of part 172, and Part 177 of this subchapter do not apply. Lighter refills covered under this paragraph must be packaged in rigid, strong outer packagings meeting the general packaging requirements of subpart B of this part. Outer packagings must be plainly and durably marked on two opposing sides or ends with the words "LIGHTER REFILLS" and the number of devices contained therein in letters measuring at least 20 mm (0.79 in) in height. No person may offer for transportation or transport the lighter refills or prepare the lighter refills for shipment unless

that person has been specifically informed of the requirements of this section.

(i) *Limited quantities.* (1) A limited quantity that conforms to the provisions of paragraph (a)(1), (a)(3), (a)(5), (b) or, except for transportation by aircraft, paragraph (h) of this section is excepted from labeling requirements, unless the material is offered for transportation or transported by aircraft, and the specification packaging requirements of this subchapter when packaged in combination packagings according to this paragraph. Packages must be marked in accordance with § 172.315(a) or (b), as appropriate, or as authorized in paragraph (i)(2) of this section.

Unless otherwise specified in paragraph (i)(2) of this section, packages of limited quantities intended for transportation by aircraft must conform to the applicable requirements (e.g., authorized materials, inner packaging quantity limits and closure securement) of § 173.27 of this part. 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. Outside packagings conforming to this paragraph are not required to be marked "INSIDE CONTAINERS COMPLY WITH PRESCRIBED REGULATIONS." In addition, packages of limited quantities are not subject to subpart F (Placarding) of part 172 of this subchapter. Each package must conform to the packaging requirements of subpart B of this part and may not exceed 30 kg (66 pounds) gross weight.

(2) Until December 31, 2013, a limited quantity package containing a "consumer commodity" as defined in § 171.8 of this subchapter may be renamed "Consumer commodity" and reclassified as ORM-D or 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.

* * * * *

(l) For additional exceptions, see § 173.307.

■ 53. In § 173.307, paragraph (a)(6) is added to read as follows:

§ 173.307 Exceptions for compressed gases.

(a) * * *

(6) Light bulbs, provided they are packaged so that the projectile effects of

any rupture of the bulb will be contained within the package.

* * * * *

■ 54. Section 173.311 is added to read as follows:

§ 173.311 Metal hydride storage systems.

The following packing instruction is applicable to transportable UN Metal hydride storage systems (UN3468) with pressure receptacles not exceeding 150 liters (40 gallons) in water capacity and having a maximum developed pressure not exceeding 25 MPa. Metal hydride storage systems must be designed, constructed, initially inspected and tested in accordance with ISO 16111 (IBR, *see* § 171.7 of this subchapter) as authorized under § 178.71(f) of this subchapter. Steel pressure receptacles or composite pressure receptacles with steel liners must be marked in accordance with § 173.301b(f) of this part which specifies that a steel UN pressure receptacle bearing an "H" mark must be used for hydrogen bearing gases or other gases that may cause hydrogen embrittlement. Requalification intervals must be no more than every five years as specified in § 180.207 of this subchapter in accordance with the requalification procedures prescribed in ISO 16111.

■ 55. In 173.322, paragraph (e) is added to read as follows:

§ 173.322 Ethyl chloride.

* * * * *

(e) In capsules under the following conditions:

(1) The mass of gas must not exceed 150 g (5.30 ounces) per capsule;

(2) The capsule must be free of faults liable to impair its strength;

(3) The leakproofness integrity of the closure must be maintained by a secondary means (*e.g.*, cap, crown, seal, binding, *etc.*) capable of preventing any leakage of the closure while in transportation; and

(4) The capsules must be placed in a strong outer packaging suitable for the contents and may not exceed a gross mass of 75 kg (165 pounds).

PART 175—CARRIAGE BY AIRCRAFT

■ 56. 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.

■ 57. In § 175.8, in paragraph (b)(3), the first sentence 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, and perfumes carried aboard a passenger-carrying aircraft by the operator for use or sale on that specific aircraft. * * *

* * * * *

■ 58. Section 175.9 is revised to read as follows:

§ 175.9 Special aircraft operations.

(a) This subchapter applies to rotorcraft external load operations transporting hazardous material on board, attached to, or suspended from an aircraft. Operators must have all applicable requirements prescribed in 14 CFR Part 133 approved by the FAA Administrator prior to accepting or transporting hazardous material. In addition, rotorcraft external load operations must be approved by the Associate Administrator prior to the initiation of such operations.

(b) *Exceptions.* This subchapter does not apply to the following materials used for special aircraft operations when applicable FAA operator requirements have been met, including training operator personnel on the proper handling and stowage of the hazardous materials carried:

(1) Hazardous materials loaded and carried in hoppers or tanks of aircraft certificated for use in aerial seeding, dusting spraying, fertilizing, crop improvement, or pest control, to be dispensed during such an operation.

(2) Parachute activation devices, lighting equipment, oxygen cylinders, flotation devices, smoke grenades, flares, or similar devices carried during a parachute operation.

(3) Smoke grenades, flares, and pyrotechnic devices affixed to aircraft during any flight conducted as part of a scheduled air show or exhibition of aeronautical skill. The aircraft may not carry any persons other than required flight crewmembers. The affixed installation accommodating the smoke grenades, flares, or pyrotechnic devices on the aircraft must be approved for its intended use by the FAA Flight Standards District Office having responsibility for that aircraft.

(4) Hazardous materials are carried and used during dedicated air ambulance, fire fighting, or search and rescue operations.

(5) A transport incubator unit necessary to protect life or an organ preservation unit necessary to protect human organs, carried in the aircraft cabin, provided:

(i) The compressed gas used to operate the unit is in an authorized DOT specification cylinder and is marked,

labeled, filled, and maintained as prescribed by this subchapter;

(ii) Each battery used is of the nonspillable type;

(iii) The unit is constructed so that valves, fittings, and gauges are protected from damage;

(iv) The pilot-in-command is advised when the unit is on board, and when it is intended for use;

(v) The unit is accompanied by a person qualified to operate it;

(vi) The unit is secured in the aircraft in a manner that does not restrict access to or use of any required emergency or regular exit or of the aisle in the passenger compartment; and,

(vii) Smoking within 3 m (10 feet) of the unit is prohibited.

(6) Hazardous materials that are loaded and carried on or in cargo only aircraft, and that are to be dispensed or expended during flight for weather control, environmental restoration or protection, forest preservation and protection, fire fighting and prevention, flood control, or avalanche control purposes, when the following requirements are met:

(i) Operations may not be conducted over densely populated areas, in a congested airway, or near any airport where carrier passenger operations are conducted.

(ii) Each operator must prepare and keep current a manual containing operational guidelines and handling procedures, for the use and guidance of flight, maintenance, and ground personnel concerned in the dispensing or expending of hazardous materials. The manual must be approved by the FAA Principal Operations Inspector assigned to the operator.

(iii) No person other than a required flight crewmember, FAA inspector, or person necessary for handling or dispensing the hazardous material may be carried on the aircraft.

(iv) The operator of the aircraft must have advance permission from the owner of any airport to be used for the dispensing or expending operation.

(v) When Division 1.1, 1.2, and 1.3 materials (except detonators and detonator assemblies) and detonators or detonator assemblies are carried for avalanche control flights, the explosives must be handled by, and at all times be under the control of, a qualified blaster. When required by a State or local authority, the blaster must be licensed and the State or local authority must be identified in writing to the FAA Principal Operations Inspector assigned to the operator.

■ 59. In § 175.10:

- a. Paragraphs (a)(17) and (18) are redesignated as paragraphs (a)(18) and (19), respectively;
- b. New paragraph (a)(17) is added; and
- c. Newly redesignated paragraph (a)(19) is revised.

The addition and revision read as follows:

§ 175.10 Exceptions for passengers, crewmembers, and air operators.

(a) * * *

(17) A lithium ion battery-powered wheelchair or other mobility aid as follows:

(i) A wheelchair or other mobility aid equipped with a lithium ion battery, when carried as checked baggage, provided—

(A) The lithium ion battery must be of a type that successfully passed each test in the UN Manual of Tests and Criteria as specified in § 173.185 of this subchapter, unless approved by the Associate Administrator;

(B) 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);

(C) Battery terminals must be protected from short circuits (*e.g.*, by being enclosed within a battery container that is securely attached to the mobility aid);

(D) The pilot-in-command is advised, either orally or in writing, prior to departure, as to the location of the wheelchair or mobility aid aboard the aircraft; and

(E) The wheelchair or mobility aid is loaded, stowed, secured and unloaded in an upright position and in a manner that prevents unintentional activation and protects it from damage.

(F) A lithium metal battery is forbidden aboard a passenger-carrying aircraft.

(ii) A wheelchair or other mobility aid when carried as checked or carry-on baggage, provided—

(A) The wheelchair or other mobility aid is designed and constructed in a manner to allow for stowage in either a cargo compartment or in the passenger cabin;

(B) The lithium ion battery is removed; and

(C) The lithium ion battery and any spare batteries are carried in the same manner as spare batteries in paragraph (a)(18) of this section.

* * * * *

(19) Portable electronic devices (*e.g.*, cellular phones, laptop computers, and camcorders) powered by fuel cell systems, and not more than two spare fuel cell cartridges per passenger or

crew member, when transported in carry-on baggage for personal use under the following conditions:

(i) Fuel cell cartridges may contain only Division 2.1 liquefied flammable gas, or hydrogen in a metal hydride, Class 3 flammable liquids (including methanol), Division 4.3 water reactive substances, or Class 8 corrosive materials;

(ii) The maximum water capacity of a fuel cell cartridge for hydrogen in a metal hydride may not exceed 120 mL (4 fluid ounces). The maximum quantity of fuel in all other fuel cell cartridge types may not exceed:

(A) 200 mL (6.76 ounces) for liquids;

(B) 120 mL (4 fluid ounces) for liquefied gases in non-metallic fuel cell cartridges, or 200 mL (6.76 ounces) for liquefied gases in metal fuel cell cartridges; or

(C) 200 g (7 ounces) for solids.

(iii) No more than two spare fuel cell cartridges may be carried by a passenger;

(iv) Fuel cells containing fuel are permitted in carry-on baggage only;

(v) Fuel cell cartridges containing hydrogen in a metal hydride must meet the requirements in § 173.230(d);

(vi) Fuel cell cartridges may not be refillable by the user. Refueling of fuel cell systems is not permitted except that the installation of a spare cartridge is allowed. Fuel cell cartridges that are used to refill fuel cell systems but that are not designed or intended to remain installed (fuel cell refills) in a portable electronic device are not permitted;

(vii) Fuel cell systems and fuel cell cartridges must conform to IEC/PAS 62282-6-1 (IBR; *see* § 171.7 of this subchapter);

(viii) Interaction between fuel cells and integrated batteries in a device must conform to IEC/PAS 62282-6-1 (IBR, *see* § 171.7 of this subchapter). Fuel cell systems for which the sole function is to charge a battery in the device are not permitted;

(ix) Fuel cell systems must be of a type that will not charge batteries when the consumer electronic device is not in use; and

(x) Each fuel cell cartridge and system that conforms to the requirements in this paragraph (a)(18) must be durably marked by the manufacturer with the wording: "APPROVED FOR CARRIAGE IN AIRCRAFT CABIN ONLY" to certify that the fuel cell cartridge or system meets the specifications in IEC/PAS 62282-6-1 (IBR, *see* § 171.7 of this subchapter) and with the maximum quantity and type of fuel contained in the cartridge or system.

(xi) Spare fuel cell cartridges containing a flammable liquid (Class 3)

or corrosive material (Class 8) may be transported in checked baggage.

(xii) Spare fuel cell cartridges containing liquefied flammable gas (Division 2.1), hydrogen in a metal hydride (Division 2.1) or water reactive material (Division 4.3) may only be transported in carry-on baggage.

* * * * *

■ 60. Section 175.25 is revised to read as follows:

§ 175.25 Notification at air passenger facilities of hazardous materials restrictions.

(a) Each person who engages in for-hire air transportation of passengers must display notices of the requirements applicable to the carriage of hazardous materials aboard aircraft, and the penalties for failure to comply with those requirements in accordance with this section. Each notice must be legible, and be prominently displayed so it can be seen by passengers in locations where the aircraft operator issues tickets, checks baggage, and maintains aircraft boarding areas. At a minimum, each notice must communicate the following information:

(1) Federal law forbids the carriage of hazardous materials aboard aircraft in your luggage or on your person. A violation can result in five years' imprisonment and penalties of \$250,000 or more (49 U.S.C. 5124). Hazardous materials include explosives, compressed gases, flammable liquids and solids, oxidizers, poisons, corrosives and radioactive materials. Examples: Paints, lighter fluid, fireworks, tear gases, oxygen bottles, and radio-pharmaceuticals.

(2) There are special exceptions for small quantities (up to 70 ounces total) of medicinal and toilet articles carried in your luggage and certain smoking materials carried on your person. For further information contact your airline representative.

(b) *Ticket purchase.* An aircraft operator must ensure that information on the types of hazardous materials specified in paragraph (a) of this section a passenger is permitted and forbidden to transport aboard an aircraft is provided at the point of ticket purchase. During the purchase process, regardless if the process is completed remotely (*e.g.*, via the Internet or phone) or when completed at the airport, with or without assistance from another person (*e.g.*, automated check-in facility), the aircraft operator must ensure that information on the types of hazardous materials a passenger is forbidden to transport aboard an aircraft is provided to passengers. Information may be in text or in pictorial form and, effective

January 1, 2013, must be such that the final ticket purchase cannot be completed until the passenger or a person acting on the passenger's behalf has indicated that it understands the restrictions on hazardous materials in baggage.

(c) *Check-in.* An aircraft operator must ensure that information on the types of hazardous materials specified in paragraph (a) of this section a passenger is permitted and forbidden to transport aboard an aircraft is provided during the flight check-in process.

(1) Effective January 1, 2013, when the flight check-in process is conducted remotely (e.g., via the Internet or phone) or when completed at the airport, without assistance from another person (e.g., automated check-in kiosk), the aircraft operator must ensure that information on the types of hazardous materials a passenger is forbidden to transport aboard an aircraft is provided to passengers. Information may be in text or in pictorial form and should be such that the check in process cannot be completed until the passenger or a person acting on the passenger's behalf has indicated that it understands the restrictions on hazardous materials in baggage.

(2) When the check in process is not conducted remotely (e.g., at the airport with the assistance of an airline representative), passenger notification of permitted and forbidden hazardous materials may be completed through signage (electronic or otherwise), provided it is legible and prominently displayed.

■ 61. In § 175.30, paragraph (e)(3) is revised to read as follows:

§ 175.30 Inspecting shipments.

* * * * *

(e) * * *

(3) The word "OVERPACK" appears on the outside of the overpack when specification packagings are required.

■ 62. Section 175.75 is revised to read as follows:

§ 175.75 Quantity limitations and cargo location.

(a) No person may carry on an aircraft a hazardous material except as permitted by this subchapter.

(b) Except as otherwise provided in this subchapter, no person may carry a hazardous material in the cabin of a passenger-carrying aircraft or on the flight deck of any aircraft, and the hazardous material must be located in a place that is inaccessible to persons other than crew members. Hazardous materials may be carried in a main deck cargo compartment of a passenger aircraft provided that the compartment is inaccessible to passengers and that it meets all certification requirements for a Class B aircraft cargo compartment in 14 CFR 25.857(b) or for a Class C aircraft cargo compartment in 14 CFR 25.857(c). A package bearing a "KEEP AWAY FROM HEAT" handling marking must be protected from direct sunshine and stored in a cool and ventilated place, away from sources of heat.

(c) For each package containing a hazardous material acceptable for carriage aboard passenger-carrying aircraft, no more than 25 kg (55 pounds) net weight of hazardous material may be loaded in an inaccessible manner. In addition to the 25 kg limitation, an additional 75 kg (165 pounds) net weight of Division 2.2 (non-flammable compressed gas) may be loaded in an inaccessible manner. The requirements of this paragraph do not apply to Class 9, ORM-D-AIR and Limited or Excepted Quantity material.

(d) For the purposes of this section—

(1) *Accessible* means, on passenger-carrying or cargo-only aircraft that each package is loaded where a crew member or other authorized person can access, handle and, when size and weight permit, separate such packages from other cargo during flight including a freight container in an accessible cargo compartment when packages are loaded in an accessible manner. Additionally, a package is considered accessible when transported on a cargo-only aircraft if it is:

(i) In a cargo compartment certified by FAA as a Class C aircraft cargo compartment as defined in 14 CFR 25.857(c); or

(ii) In an FAA-certified freight container that has an approved fire or smoke detection system and fire suppression system equivalent to that

required by the certification requirements for a Class C aircraft cargo compartment.

(2) *Inaccessible* means all other configurations including a freight container in an accessible compartment when packages are loaded inaccessibly.

(e) For transport aboard cargo-only aircraft, the requirements of paragraphs (c) and (d) of this section do not apply to the following hazardous materials:

(1) Class 3, Packing Group III (that does not meet the definition of another hazard class except CORROSIVE), Division 6.1 ((primary) except those also labeled FLAMMABLE LIQUID), Division 6.2, Class 7, Class 9, and those marked as ORM-D-AIR, Limited Quantity or Excepted Quantity material.

(2) Packages of hazardous materials transported aboard a cargo aircraft, when other means of transportation are impracticable or not available, in accordance with procedures approved in writing by the FAA Regional or Field Security Office in the region where the operator is located.

(3) Packages of hazardous materials carried on small, single pilot, cargo aircraft if:

(i) No person is carried on the aircraft other than the pilot, an FAA inspector, the shipper or consignee of the material, a representative of the shipper or consignee so designated in writing, or a person necessary for handling the material;

(ii) The pilot is provided with written instructions on the characteristics and proper handling of the materials; and

(iii) Whenever a change of pilots occurs while the material is on board, the new pilot is briefed under a hand-to-hand signature service provided by the operator of the aircraft.

(f) At a minimum, quantity limits and loading instructions in the following quantity and loading table must be followed to maintain acceptable quantity and loading between packages containing hazardous materials. The quantity and loading table is as follows:

QUANTITY AND LOADING TABLE

Applicability	Forbidden	Quantity Limitation: 25 kg net weight of hazardous material plus 75 kg net weight of Division 2.2 (non-flammable compressed gas)	No limit
Passenger-carrying aircraft	Cargo Aircraft Only labeled packages.	Inaccessible	Accessible.

QUANTITY AND LOADING TABLE—Continued

Applicability	Forbidden	Quantity Limitation: 25 kg net weight of hazardous material plus 75 kg net weight of Division 2.2 (non-flammable compressed gas)	No limit
Cargo-only aircraft—Packages authorized aboard a passenger-carrying aircraft.	Not applicable	Inaccessible (See Note 1)	Accessible (See Note 2).
Cargo-only aircraft—Packages not authorized aboard a passenger-carrying aircraft and displaying a Cargo Aircraft Only label.	Inaccessible (See Note 1)	Not applicable	Accessible (See Note 2).

Note 1: The following materials are not subject to this loading restriction—

- a. Class 3, PG III (unless the hazardous material meets the definition of another hazard class, except CORROSIVE).
- b. Primary Class 6 (unless also labeled as a flammable liquid).
- c. Class 7 (unless the hazardous material meets the definition of another hazard class).
- d. Class 9, ORM-D—AIR and Limited Quantity or Excepted Quantity material.

Note 2: Aboard cargo-only aircraft, packages required to be loaded in a position that is considered to be accessible include those loaded in a Class C cargo compartment.

■ 63. In § 175.78, paragraph (c)(4)(iii) is revised to read as follows:

§ 175.78 Stowage compatibility of cargo.

* * * * *

- (c) * * *
- (4) * * *

(iii) Except for Division 1.4B explosives and as otherwise provided in this Note, explosives of different compatibility groups may be stowed together whether or not they belong to the same division. Division 1.4B explosives must not be stowed together with any other explosive permitted aboard aircraft except Division 1.4S, unless segregated as prescribed in paragraph (c)(4)(iv) of this section (“Note 1”).

* * * * *

PART 176—CARRIAGE BY VESSEL

■ 64. The authority citation for part 176 continues to read as follows:

Authority: 49 U.S.C. 5101–5128; 49 CFR 1.53.

■ 65. In § 176.2, in the definition for “Cargo transport unit,” the first sentence is revised to read as follows:

§ 176.2 Definitions.

* * * * *

Cargo transport unit means a transport vehicle, a freight container, a portable tank or a multiple element gas container (MEGC). * * *

* * * * *

■ 66. In § 176.63, paragraph (f)(2) is revised to read as follows:

§ 176.63 Stowage locations.

* * * * *

- (f) * * *

(2) The hatchless container hold is in full compliance with the provisions of SOLAS, Chapter II–2/Regulation 19

(IBR; see § 171.7 of this subchapter), applicable to enclosed container cargo spaces, as appropriate for the cargo transported.

■ 67. In § 176.76, paragraph (a)(9) is added to read as follows:

§ 176.76 Transport vehicles, freight containers, and portable tanks containing hazardous materials.

(a) * * *

(9) When security devices, beacons or other tracking or monitoring equipment are used, they must be securely installed and must be of a certified safe type for the hazardous materials that will be carried within the freight container or transport vehicle in which such as device or equipment is installed.

* * * * *

§ 176.84 [Amended]

■ 68. In § 176.84, in paragraph (b) Table of provisions, Code Number “143” and its corresponding provision are removed.

§ 176.142 [Removed and Reserved]

■ 69. Section 176.142 is removed and reserved.

■ 70. Section 176.905 is revised to read as follows:

§ 176.905 Stowage of motor vehicles or mechanical equipment.

(a) A vehicle or any mechanical equipment powered by an internal combustion engine, a fuel cell, batteries or a combination thereof, is subject to the following requirements when carried as cargo on a vessel:

(1) Before being loaded on a vessel, each vehicle or mechanical equipment must be inspected for fuel leaks and identifiable faults in the electrical system that could result in short circuit or other unintended electrical source of

ignition. A vehicle or mechanical equipment showing any signs of leakage or electrical fault may not be transported.

(2) The fuel tank of a vehicle or mechanical equipment powered by liquid fuel may not be more than one-fourth full.

(3) Whenever possible, each vehicle or mechanical equipment must be stowed to allow for its inspection during transportation.

(4) Vehicles or mechanical equipment may be refueled when necessary in the hold of a vessel in accordance with § 176.78 of this part.

(b) All equipment used for handling vehicles or mechanical equipment must be designed so that the fuel tank and the fuel system of the vehicle or mechanical equipment are protected from stress that might cause rupture or other damage incident to handling.

(c) Two hand-held, portable, dry chemical fire extinguishers of at least 4.5 kg (10 pounds) capacity each must be separately located in an accessible location in each hold or compartment in which any vehicle or mechanical equipment is stowed.

(d) “NO SMOKING” signs must be conspicuously posted at each access opening to the hold or compartment.

(e) Each portable electrical light, including a flashlight, used in the stowage area must be an approved, explosion-proof type. All electrical connections for any light must be made to outlets outside the space in which any vehicle or mechanical equipment is stowed.

(f) Each hold or compartment must be ventilated and fitted with an overhead water sprinkler system or fixed fire extinguisher system.

(g) Each hold or compartment must be equipped with a smoke or fire detection

system capable of alerting personnel on the bridge.

(h) All electrical equipment in the hold or compartment other than fixed explosion-proof lighting must be disconnected from its power source at a location outside the hold or compartment during the handling and transportation of any vehicle or mechanical equipment. Where the disconnecting means is a switch or circuit breaker, it must be locked in the open position until all vehicles have been removed.

(i) Exceptions—A vehicle or mechanical equipment is excepted from the requirements of this subchapter if the following requirements are met:

(1) *Internal combustion engines liquid fuel powered.* (i) The vehicle or mechanical equipment has an internal combustion engine using liquid fuel that has a flashpoint less than 38°C (100°F), the fuel tank is empty, and the engine is run until it stalls for lack of fuel; or

(ii) The vehicle or mechanical equipment has an internal combustion engine using liquid fuel that has a flashpoint of 38°C (100°F) or higher, the fuel tank contains 418 L (110 gallons) of fuel or less, and there are no fuel leaks in any portion of the fuel system.

(2) *Vehicle ferry operations.* The vehicle or mechanical equipment is stowed in a hold or compartment designated by the administration of the country in which the vessel is registered as specially designed and approved for vehicles and mechanical equipment and there are no signs of leakage from the battery, engine, fuel cell, compressed gas cylinder or accumulator, or fuel tank, as appropriate. For vehicles with batteries connected and fuel tanks containing gasoline transported by U.S. vessels, see 46 CFR 70.10–1 and 90.10–38.

(3) *Battery-powered.* The vehicle or mechanical equipment is electrically powered solely by wet electric storage batteries (including nonspillable batteries) or sodium batteries;

(4) *Flammable gas powered.* The vehicle or mechanical equipment is equipped with liquefied petroleum gas or other compressed gas fuel tanks, the tanks are completely emptied of liquefied or compressed gas and the positive pressure in the tank does not exceed 2 bar (29 psig), the line from the fuel tank to the regulator and the regulator itself is drained of all traces of liquefied or compressed gas, and the fuel shut-off valve is closed.

(j) Except as provided in § 173.220(d) of this subchapter, the provisions of this subchapter do not apply to items of equipment such as fire extinguishers, compressed gas accumulators, airbag

inflators and the like which are installed in the vehicle or mechanical equipment if they are necessary for the operation of the vehicle or equipment, or for the safety of its operator or passengers.

PART 178—SPECIFICATIONS FOR PACKAGINGS

■ 71. The authority citation for part 178 continues to read as follows:

Authority: 49 U.S.C. 5101–5128; 49 CFR 1.53.

■ 72. Section 178.71 is revised to read as follows:

§ 178.71 Specifications for UN pressure receptacles.

(a) *General.* Each UN pressure receptacle must meet the requirements of this section. Requirements for approval, qualification, maintenance, and testing are contained in § 178.70, and subpart C of part 180 of this subchapter.

(b) *Definitions.* The following definitions apply for the purposes of design and construction of UN pressure receptacles under this subpart:

Alternative arrangement means an approval granted by the Associate Administrator for a MEGC that has been designed, constructed or tested to the technical requirements or testing methods other than those specified for UN pressure receptacles in part 178 or part 180 of this subchapter.

Bundle of cylinders. See § 171.8 of this subchapter.

Design type means a pressure receptacle design as specified by a particular pressure receptacle standard.

Design type approval means an overall approval of the manufacturer's quality system and design type of each pressure receptacle to be produced within the manufacturer's facility.

UN tube. See § 171.8 of this subchapter.

(c) *General design and construction.* UN pressure receptacles and their closures must be designed, manufactured, tested and equipped in accordance with the requirements contained in this section. The ISO standard requirements applicable to UN pressure receptacles may be varied only if approved in writing by the Associate Administrator.

(d) *Service equipment.* (1) Except for pressure relief devices, UN pressure receptacle equipment, including valves, piping, fittings, and other equipment subjected to pressure must be designed and constructed to withstand at least 1.5 times the test pressure of the pressure receptacle.

(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) and be protected as specified in § 173.301b(f) of this subchapter.

(3) UN pressure receptacles that cannot be handled manually or rolled, must be equipped with devices (e.g., skids, rings, straps) ensuring that they can be safely handled by mechanical means and so arranged as not to impair the strength of, nor cause undue stresses, in the pressure receptacle.

(4) Pressure receptacles filled by volume must be equipped with a level indicator.

(e) *Bundles of cylinders.* UN pressure receptacles assembled in bundles must be structurally supported and held together as a unit and secured in a manner that prevents movement in relation to the structural assembly and movement that would result in the concentration of harmful local stresses. The frame design must ensure stability under normal operating conditions.

(1) The frame must securely retain all the components of the bundle and must protect them from damage during conditions normally incident to transportation. The method of cylinder restraint must prevent any vertical or horizontal movement or rotation of the cylinder that could cause undue strain on the manifold. The total assembly must be able to withstand rough handling, including being dropped or overturned.

(2) The frame must include features designed for the handling and transportation of the bundle. The lifting rings must be designed to withstand a design load of 2 times the maximum gross weight. Bundles with more than one lifting ring must be designed such that a minimum sling angle of 45 degrees to the horizontal can be achieved during lifting using the lifting rings. If four lifting rings are used, their design must be strong enough to allow the bundle to be lifted by two rings. Where two or four lifting rings are used, diametrically opposite lifting rings must be aligned with each other to allow for correct lifting using shackle pins. If the bundle is filled with forklift pockets, it must contain two forklift pockets on each side from which it is to be lifted. The forklift pockets must be positioned

symmetrically consistent with the bundle center of gravity.

(3) The frame structural members must be designed for a vertical load of 2 times the maximum gross weight of the bundle. Design stress levels may not exceed 0.9 times the yield strength of the material.

(4) The frame must not contain any protrusions from the exterior frame structure that could cause a hazardous condition.

(5) The frame design must prevent collection of water or other debris that would increase the tare weight of bundles filled by weight.

(6) The floor of the bundle frame must not buckle during normal operating conditions and must allow for the drainage of water and debris from around the base of the cylinders.

(7) If the frame design includes movable doors or covers, they must be capable of being secured with latches or other means that will not become dislodged by operational impact loads. Valves that need to be operated in normal service or in an emergency must be accessible.

(8) For bundles of cylinders, pressure receptacle marking requirements only apply to the individual cylinders of a bundle and not to any assembly structure.

(f) *Design and construction requirements for UN refillable welded cylinders.* In addition to the general requirements of this section, UN refillable welded cylinders must conform to the following ISO standards, as applicable:

(1) ISO 4706: Gas cylinders—Refillable welded steel cylinders—Test pressure 60 bar and below (IBR, *see* § 171.7 of this subchapter).

(2) ISO 18172-1: Gas cylinders—Refillable welded stainless steel cylinders—Part 1: Test pressure 6 MPa and below (IBR, *see* § 171.7 of this subchapter).

(3) ISO 20703: Gas cylinders—Refillable welded aluminum-alloy cylinders—Design, construction and testing (IBR, *see* § 171.7 of this subchapter).

(g) *Design and construction requirements for UN refillable seamless steel cylinders.* In addition to the general requirements of this section, UN refillable seamless steel cylinders must conform to the following ISO standards, as applicable:

(1) ISO 9809-1: Gas cylinders—Refillable seamless steel gas cylinders—Design, construction and testing—Part 1: Quenched and tempered steel cylinders with tensile strength less than 1 100 MPa. (IBR, *see* § 171.7 of this subchapter).

(2) ISO 9809-2: 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 1 100 MPa. (IBR, *see* § 171.7 of this subchapter).

(3) ISO 9809-3: Gas cylinders—Refillable seamless steel gas cylinders—Design, construction and testing—Part 3: Normalized steel cylinders. (IBR, *see* § 171.7 of this subchapter).

(h) *Design and construction requirements for UN refillable seamless aluminum alloy cylinders.* In addition to the general requirements of this section, UN refillable seamless aluminum cylinders must conform to ISO 7866: Gas cylinders—Refillable seamless aluminum alloy gas cylinders—Design, construction and testing. (IBR, *see* § 171.7 of this subchapter). The use of Aluminum alloy 6351-T6 or equivalent is prohibited.

(i) *Design and construction requirements for UN non-refillable metal cylinders.* In addition to the general requirements of this section, UN non-refillable metal cylinders must conform to ISO 11118: Gas cylinders—Non-refillable metallic gas cylinders—Specification and test methods. (IBR, *see* § 171.7 of this subchapter.)

(j) *Design and construction requirements for UN refillable seamless steel tubes.* In addition to the general requirements of this section, UN refillable seamless steel tubes must conform to ISO 11120: Gas cylinders—Refillable seamless steel tubes of water capacity between 150 L and 3000 L—Design, construction and testing. (IBR, *see* § 171.7 of this subchapter).

(k) *Design and construction requirements for UN acetylene cylinders.* In addition to the general requirements of this section, UN acetylene cylinders must conform to the following ISO standards, as applicable:

(1) For the cylinder shell:
(i) ISO 9809-1: Gas cylinders—Refillable seamless steel gas cylinders—Design, construction and testing—Part 1: Quenched and tempered steel cylinders with tensile strength less than 1 100 MPa.

(ii) ISO 9809-3: Gas cylinders—Refillable seamless steel gas cylinders—Design, construction and testing—Part 3: Normalized steel cylinders.

(2) The porous mass in an acetylene cylinder must conform to ISO 3807-2: Cylinders for acetylene—Basic requirements—Part 2: Cylinders with fusible plugs. (IBR, *see* § 171.7 of this subchapter).

(l) *Design and construction requirements for UN composite cylinders.* (1) In addition to the general

requirements of this section, UN composite cylinders must be designed for unlimited service life and conform to the following ISO standards, as applicable:

(i) ISO 11119-1: Gas cylinders of composite construction—Specification and test methods—Part 1: Hoop-wrapped composite gas cylinders. (IBR, *see* § 171.7 of this subchapter).

(ii) ISO 11119-2: Gas cylinders of composite construction—Specification and test methods—Part 2: Fully-wrapped fibre reinforced composite gas cylinders with load-sharing metal liners. (IBR, *see* § 171.7 of this subchapter).

(iii) ISO 11119-3: 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. (IBR, *see* § 171.7 of this subchapter).

(2) ISO 11119-2 and ISO 11119-3 gas cylinders of composite construction manufactured in accordance with the requirements for underwater use must bear the “UW” mark.

(m) *Design and construction requirements for UN metal hydride storage systems.* In addition to the general requirements of this section, metal hydride storage systems must conform to the following ISO standards, as applicable: ISO 16111: Transportable gas storage devices—Hydrogen absorbed in reversible metal hydride (IBR, *see* § 171.7 of this subchapter).

(n) *Material compatibility.* In addition to the material requirements specified in the UN pressure receptacle design and construction ISO standards, and any restrictions specified in part 173 for the gases to be transported, the requirements of the following standards must be applied with respect to material compatibility:

(1) ISO 11114-1: Transportable gas cylinders—Compatibility of cylinder and valve materials with gas contents—Part 1: Metallic materials. (IBR, *see* § 171.7 of this subchapter).

(2) ISO 11114-2: Transportable gas cylinders—Compatibility of cylinder and valve materials with gas contents—Part 2: Non-metallic materials. (IBR, *see* § 171.7 of this subchapter).

(o) *Protection of closures.* Closures and their protection must conform to the requirements in § 173.301(f) of this subchapter.

(p) *Marking of UN refillable pressure receptacles.* UN refillable pressure receptacles must be marked clearly and legibly. The required markings must be permanently affixed by stamping, engraving, or other equivalent method, on the shoulder, top end or neck of the pressure receptacle or on a permanently

affixed component of the pressure receptacle, such as a welded collar. Except for the "UN" mark, the minimum size of the marks must be 5 mm for pressure receptacles with a diameter greater than or equal to 140 mm, and 2.5 mm for pressure receptacles with a

diameter less than 140 mm. The minimum size of the "UN" mark must be 5 mm for pressure receptacles with a diameter less than 140 mm, and 10 mm for pressure receptacles with a diameter of greater than or equal to 140 mm. The depth of the markings must not create

harmful stress concentrations. A refillable pressure receptacle conforming to the UN standard must be marked as follows:

- (1) The UN packaging symbol.



(2) The ISO standard, for example ISO 9809-1, used for design, construction and testing. Acetylene cylinders must be marked to indicate the porous mass and the steel shell, for example: "ISO 3807-2/ISO 9809-1."

(3) The mark of the country where the approval is granted. The letters "USA" must be marked on UN pressure receptacles approved by the United States. The manufacturer must obtain an approval number from the Associate Administrator. The manufacturer approval number must follow the country of approval mark, separated by a slash (for example, USA/MXXXX). Pressure receptacles approved by more than one national authority may contain the mark of each country of approval, separated by a comma.

(4) The identity mark or stamp of the IIA.

(5) The date of the initial inspection, the year (four digits) followed by the month (two digits) separated by a slash, for example "2006/04".

(6) The test pressure in bar, preceded by the letters "PH" and followed by the letters "BAR".

(7) The rated charging pressure of the metal hydride storage system in bar, preceded by the letters "RCP" and followed by the letters "BAR."

(8) The empty or tare weight. Except for acetylene cylinders, empty weight is the mass of the pressure receptacle in kilograms, including all integral parts (e.g., collar, neck ring, foot ring, etc.), followed by the letters "KG". The empty weight does not include the mass of the

valve, valve cap or valve guard or any coating. The empty weight must be expressed to three significant figures rounded up to the last digit. For cylinders of less than 1 kg, the empty weight must be expressed to two significant figures rounded down to the last digit. For acetylene cylinders, the tare weight must be marked on the cylinders in kilograms. The tare weight is the sum of the empty weight, mass of the valve, any coating and all permanently attached parts (e.g., fittings and accessories) that are not removed during filling. The tare weight must be expressed to two significant figures rounded down to the last digit. The tare weight does not include the cylinder cap or any outlet cap or plug not permanently attached to the cylinder.

(9) The minimum wall thickness of the pressure receptacle in millimeters followed by the letters "MM". This mark is not required for pressure receptacles with a water capacity less than or equal to 1.0 L or for composite cylinders.

(10) For pressure receptacles intended for the transport of compressed gases and UN 1001 acetylene, dissolved, the working pressure in bar, preceded by the letters "PW".

(11) For liquefied gases, the water capacity in liters expressed to three significant digits rounded down to the last digit, followed by the letter "L". If the value of the minimum or nominal water capacity is an integer, the digits after the decimal point may be omitted.

(12) Identification of the cylinder thread type (e.g., 25E).

(13) The country of manufacture. The letters "USA" must be marked on cylinders manufactured in the United States.

(14) The serial number assigned by the manufacturer.

(15) For steel pressure receptacles, the letter "H" showing compatibility of the steel, as specified in ISO 11114-1.

(16) Identification of aluminum alloy, if applicable.

(17) Stamp for nondestructive testing, if applicable.

(18) Stamp for underwater use of composite cylinders, if applicable.

(19) For metal hydride storage systems having a limited life, the date of expiration indicated by the word "FINAL," followed by the year (four digits), the month (two digits) and separated by a slash.

(q) *Marking sequence.* The marking required by paragraph (p) of this section must be placed in three groups as shown in the example below:

(1) The top grouping contains manufacturing marks and must appear consecutively in the sequence given in paragraphs (p)(13) through (19) of this section.

(2) The middle grouping contains operational marks described in paragraphs (p)(6) through (11) of this section.

(3) The bottom grouping contains certification marks and must appear consecutively in the sequence given in paragraphs (p)(1) through (5) of this section.

(12) (13) (14) (15) (16) (17) (18) (19)

25E USA 765432 H UW FINAL 2XXX/XX

(10) (6) (7) (8) (11) (9)

PW200 PH300BAR RCPXXXBAR 62.1 KG 50L 5.8MM

(1) (2) (3) (4) (5)



ISO 9809-1 USA/MXXXX IB 2005/12

(r) Other markings. Other markings are allowed in areas other than the side wall, provided they are made in low stress areas and are not of a size and depth that will create harmful stress concentrations. Such marks must not conflict with required marks.

(s) Marking of UN non-refillable pressure receptacles. Unless otherwise specified in this paragraph, each UN non-refillable pressure receptacle must be clearly and legibly marked as prescribed in paragraph (p) of this section. In addition, permanent stenciling is authorized. Except when stenciled, the marks must be on the shoulder, top end or neck of the pressure receptacle or on a permanently affixed component of the pressure receptacle (e.g., a welded collar).

(1) The marking requirements and sequence listed in paragraphs (p)(1) through (19) of this section are required, except the markings in paragraphs (p)(8), (9), (12) and (18) are not applicable. The required serial number marking in paragraph (p)(14) may be replaced by the batch number.

(2) Each receptacle must be marked with the words "DO NOT REFILL" in letters of at least 5 mm in height.

(3) A non-refillable pressure receptacle, because of its size, may substitute the marking required by this paragraph with a label. Reduction in marking size is authorized only as prescribed in ISO 7225, Gas cylinders—Precautionary labels. (IBR, see § 171.7 of this subchapter).

(4) Each non-refillable pressure receptacle must also be legibly marked by stenciling the following statement: "Federal law forbids transportation if

refilled—penalty up to \$500,000 fine and 5 years in imprisonment (49 U.S.C. 5124)."

(5) No person may mark a non-refillable pressure receptacle as meeting the requirements of this section unless it was manufactured in conformance with this section.

■ 73. In § 178.275, paragraph (h) is revised to read as follows:

§ 178.275 Specification for UN Portable Tanks intended for the transportation of liquid and solid hazardous materials.

* * * * *

(h) Fusible elements. Fusible elements must operate at a temperature between 110 °C (230 °F) and 149 °C (300.2 °F), provided that the pressure in the shell at the fusing temperature will not exceed the test pressure. They must be placed at the top of the shell with their inlets in the vapor space and in no case may they be shielded from external heat. Fusible elements must not be utilized on portable tanks with a test pressure which exceeds 2.65 bar (265.0 kPa); however, fusible elements are authorized on portable tanks for the transportation of certain organometallic materials in accordance with § 172.102, special provision TP36 of this subchapter. Fusible elements used on portable tanks intended for the transport of elevated temperature hazardous materials must be designed to operate at a temperature higher than the maximum temperature that will be experienced during transport and must be designed to the satisfaction of the approval agency.

* * * * *

■ 74. In § 178.347–1, paragraph (d)(9) is revised to read as follows:

§ 178.347–1 General requirements.

* * * * *

(d) * * *

(9) UW–12 in Section VIII of the ASME Code does not apply to a weld seam in a bulkhead that has not been radiographically examined, under the following conditions:

(i) The strength of the weld seam is assumed to be 0.85 of the strength of the bulkhead.

(ii) The welded seam must be a full penetration butt weld.

(iii) No more than one seam may be used per bulkhead.

(iv) The welded seam must be completed before forming the dish radius and knuckle radius.

(v) Compliance test: Two test specimens of materials representative of those to be used in the manufacture of a cargo tank bulkhead must be tested to failure in tension. The test specimen must be of the same thickness and joined by the same welding procedure. The test specimens may represent all the tanks that are made in the same facility within 6 months after the tests are completed. Before welding, the fit-up of the joints on the test specimens must represent production conditions that would result in the least joint strength. Evidence of joint fit-up and test results must be retained at the manufacturer's facility for at least 5 years.

(vi) Acceptance criteria: The ratio of the actual tensile stress at failure to the actual tensile strength of the adjacent

The test specimens may represent all the tanks that are made in the same facility within 6 months after the tests are completed. Before welding, the fit-up of the joints on the test specimens must represent production conditions that would result in the least joint strength. Evidence of joint fit-up and test results must be retained at the manufacturer's facility for at least 5 years.

(vi) Acceptance criteria: The ratio of the actual tensile stress at failure to the actual tensile strength of the adjacent material of all samples of a test lot must be greater than 0.85.

■ 75. In § 178.603, paragraph (f)(4) is revised to read as follows:

§ 178.603 Drop test.

* * * * *

(f) * * *

(4) The packaging or outer packaging of a composite or combination packaging must not exhibit any damage likely to affect safety during transport. Inner receptacles, inner packagings, or articles must remain completely within the outer packaging and there must be no leakage of the filling substance from the inner receptacles or inner packagings;

* * * * *

■ 76. In § 178.703, paragraph (a)(1)(viii) is revised to read as follows:

§ 178.703 Marking of IBCs.

(a) * * *

(1) * * *

(viii) The maximum permissible gross mass in kg.

* * * * *

■ 77. In § 178.955, paragraphs (c)(6) and (7) are added to read as follows:

§ 178.955 General requirements.

* * * * *

(c) * * *

(6) *Remanufactured Large Packaging* is a metal or rigid Large Packaging that is produced as a UN type from a non-UN type or is converted from one UN design type to another UN design type. Remanufactured Large Packagings are subject to the same requirements of this subchapter that apply to new Large Packagings of the same type.

(7) *Reused Large Packaging* is a Large Packaging intended to be refilled and has been examined and found free of defects affecting its ability to withstand the performance tests. *See also* § 173.36(c) of this subchapter.

* * * * *

PART 180—CONTINUING QUALIFICATION AND MAINTENANCE OF PACKAGINGS

■ 78. The authority citation for part 180 continues to read as follows:

Authority: 49 U.S.C. 5101–5128; 49 CFR 1.53.

§ 180.207 [Amended]

■ 79. In § 180.207, in paragraph (c), in Table 1, between the right-hand columns entries “Composite pressure receptacles” and “Pressure receptacles used for,” a new entry “Metal hydride storage systems” is added in the right-hand column and the number “5” is added for the entry in the left-hand column.

■ 80. In § 180.350, in paragraph (b), the second sentence is revised to read as follows:

§ 180.350 Applicability and definitions.

* * * * *

(b) * * * For the purposes of this subchapter, the replacement of the rigid inner receptacle of a composite IBC with one from the original manufacturer is considered a repair. * * *

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Cynthia L. Quarterman,
Administrator.

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