

DEPARTMENT OF TRANSPORTATION**Research and Special Programs Administration**

49 CFR Parts 171, 172, 173, 175, 176, 177, 178, 179 and 180

[Docket No. RSPA-2000-7702 (HM-215D)]

RIN 2137-AD41

Harmonization with the United Nations Recommendations, International Maritime Dangerous Goods Code, and International Civil Aviation Organization's Technical Instructions

AGENCY: Research and Special Programs Administration (RSPA), DOT.

ACTION: Final rule.

SUMMARY: This final rule amends the Hazardous Materials Regulations (HMR) to maintain alignment with international standards by incorporating various changes to proper shipping names, hazard classes, packing groups, special provisions, packaging authorizations, air transport quantity limitations and vessel stowage requirements. In addition, this final rule revises the requirements for intermediate bulk containers and UN portable tanks for alignment with international requirements. Because of recent changes to the International Maritime Dangerous Goods Code (IMDG Code), the International Civil Aviation Organization's Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO Technical Instructions), and the United Nations Recommendations on the Transport of Dangerous Goods (UN Recommendations), these revisions are necessary to facilitate the transport of hazardous materials in international commerce.

DATES: *Effective Date:* The effective date of these amendments is October 1, 2001.

Voluntary Compliance Date: With the exceptions of the ICAO Technical Instructions, 2001-2002 Edition and the International Atomic Energy Agency's (IAEA) Regulations for the Safe Transport of Radioactive Material, No. TS-R-1, which are authorized for use on July 1, 2001, RSPA is authorizing immediate voluntary compliance. However, persons voluntarily complying with these regulations should be aware that petitions for reconsideration may be received and as a result of RSPA's evaluation of those petitions, the amendments adopted in this final rule could be subject to further revision.

Delayed Compliance Date: Unless otherwise specified, compliance with

the amendments adopted in this final rule is required beginning on October 1, 2002.

Incorporation by Reference Date: The incorporation by reference of publications listed in these amendments in § 171.7 has been approved by the Director of the Federal Register as of October 1, 2001.

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SUPPLEMENTARY INFORMATION:

I. Background

On October 23, 2000, the Research and Special Programs Administration (RSPA) (hereafter, "we" and "our" means "RSPA") published a notice of proposed rulemaking (NPRM) (65 FR 63294) under Docket HM-215D. The NPRM proposed changing the Hazardous Materials Regulations (HMR), 49 CFR parts 171-180, based on the UN Recommendations, the IMDG Code and the ICAO Technical Instructions with respect to hazard communication, classification, and packaging requirements. The intended effect of the rule was to facilitate the international transportation of hazardous materials by ensuring a basic consistency between the HMR and international regulations, while at the same time ensuring the safe transportation of hazardous materials.

On February 1, 2001, we published a final rule under Docket HM-215D (66 FR 8644) authorizing the use of the updated editions of the IMDG Code, the UN Recommendations and the UN Recommendations Manual of Tests and Criteria as proposed in the October 23, 2000 NPRM. This final rule addresses all other proposals published in the NPRM.

The UN Recommendations are not regulations, but are recommendations issued by the UN Committee of Experts on the Transport of Dangerous Goods. These recommendations are amended and updated biennially by the UN Committee of Experts. They serve as the basis for national, regional, and international modal regulations (specifically, the IMDG Code, issued by the International Maritime Organization (IMO), and the ICAO Technical Instructions, issued by the ICAO Dangerous Goods Panel). In 49 CFR 171.12, the HMR authorize hazardous

materials shipments prepared in accordance with the IMDG Code if all or part of the transportation is by vessel, subject to certain conditions and limitations. In § 171.11, subject to certain conditions and limitations, the HMR authorizes the offering, acceptance and transport of hazardous materials by aircraft, in conformance with the ICAO Technical Instructions, and by motor vehicle either before or after being transported by aircraft.

On December 21, 1990, we published a final rule based on the UN Recommendations (Docket HM-181; 55 FR 52402) which comprehensively revised the Hazardous Materials Regulations (HMR), 49 CFR parts 171 to 180, for harmonization with international standards. Since publication of the 1990 final rule, we have issued three additional international harmonization final rules, (Dockets HM-215A, 59 FR 67390; HM-215B, 62 FR 24690; and HM-215C, 64 FR 10742). The rules provided additional harmonization with international air and sea transportation requirements by more fully aligning the HMR with the corresponding biennial updates of the UN Recommendations, the IMDG Code and the ICAO Technical Instructions.

The continually increasing amount of hazardous materials transported in international commerce warrants the harmonization of domestic and international requirements to the greatest extent possible. According to the American Chemistry Council, exports of chemicals totaled almost \$80 billion in the year 2000, while imports totaled nearly \$74 billion. Harmonization serves to facilitate international transportation and at the same time ensures the safety of people, property and the environment.

While the intent of the harmonization rulemakings is to align the HMR with international standards, we review and consider each amendment on its own merit. Each amendment is considered on the basis of the 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.

In our efforts to continue the alignment of the HMR with international requirements, this final rule makes changes to the HMR based on the eleventh revised edition of the UN Recommendations, Amendment 30 to the IMDG Code, which became effective January 1, 2001; and, the 2001-2002 ICAO Technical Instructions

which becomes effective July 1, 2001. Petitions for rulemaking pertinent to harmonization with international standards and the facilitation of international transportation are also addressed in this final rule and serve as the basis of certain amendments. Other amendments are based on feedback from the regulated industry, other DOT modal administrations and our initiative. Included are a few editorial clarifications. Certain commenters raised nonregulatory issues, issues that are beyond the scope of this rulemaking or suggested revisions that are now impractical (such as correcting the spelling of an entry that we removed). Such comments will not be addressed. Unless otherwise stated, the revisions are for harmonization with international standards.

II. Overview of Changes in This Final Rule

(See specific section for discussion of comments.)

Amendments to the HMR in this final rule include:

- Incorporation by reference of the updated ICAO Technical Instructions and addition of incorporation by reference of five current standards which include an International Atomic Energy Agency (IAEA) safety standard, three International Organization for Standardization (ISO) standards and one American Society for Testing Materials (ASTM) standard.
- Amendments to the Hazardous Materials Table (HMT) which add, revise or remove certain proper shipping names, hazard classes, packing groups, special provisions, packaging authorizations, bulk packaging requirements, and passenger and cargo aircraft maximum quantity limitations. Proper shipping name amendments include replacing the word “inhibited” with “stabilized.” Entry removals include certain domestic entries for which corresponding UN entries are currently included in the HMT.
- Revision of vessel stowage category definitions and codes for Class 1 (explosive) materials.
- Revision of shipping paper requirements for sea transport.
- Addition, removal and revision of certain entries to the List of Marine Pollutants.
- Addition, removal and revision of special provisions, including removal of current T codes and IBC bulk provisions, and addition of UN portable tank codes and IBC special packing provisions consistent with those in the UN Recommendations.

- Removal of the requirement to distinguish between primary and subsidiary risk labels and placards.
- Addition and revision to the list of organic peroxides and the list of self-reactive substances.
- Revision of the requirements pertaining to the transportation of samples.
- Revision of intermediate bulk container (IBC) requirements including amendments to the IBC commodity sections in §§ 173.240, 173.241, 173.242, 173.243 and 173.247, and addition of UN IBC packing instructions and special IBC packing provisions in part 172.
- Incorporation of the design, construction and use requirements for UN portable tanks.
- Consolidation of current portable tank maintenance, approval and use requirements.
- Inclusion of flexible grandfather provisions for the continued use of IM 101, IM 102, DOT 51, DOT 57 and DOT 60 portable tanks.
- Removal of specifications for DOT 52 and 53 portable tanks and the provisions for their continued use.
- Incorporation of a provision for the use of the “W” mark for IBCs.
- Revision of minimum thickness requirements for metal IBCs.
- Revision of several explosive packing methods to allow a broader selection of authorized packagings.
- Revision of provisions for cigarette lighters and alcoholic beverages carried aboard aircraft.
- Revision of the segregation table for hazardous materials stowed on aircraft.
- Allowance of the display of only one placard when certain explosive compatibility groups are transported together.
- Revision of lithium battery requirements.

III. Summary of Regulatory Changes by Section

Part 171

Section 171.7. We are updating the incorporation by reference for the ICAO Technical Instructions, and adding an ASTM standard, the current edition of the IAEA safety standard and three ISO standards as specified below. Amendment 30 to the IMDG Code, the eleventh revised edition of the UN Recommendations and the third revised edition of the UN Recommendations Manual of Tests and Criteria were incorporated into the HMR in a final rule under Docket HM-215D published February 1, 2001 (66 FR 8644) with a voluntary compliance date authorized

as of January 1, 2001. One commenter opposed incorporation by reference of ASTM’s E-112-96 Standard for Test Methods for Determining Average Grain Size,” and ISO’s 1496-3 “Series 1 freight containers—Specification and testing,” 1996 edition; 4126-1 “Safety valves-Part 1: General Requirements,” 1991 edition, and 6892 “Metallic materials—Tensile testing,” 1984 edition. According to the commenter, the industry supports the use of voluntary consensus standards in commercial applications, however, because of the “frequency of change” and because industry does not adopt the standards verbatim, the commenter suggests that these standards be used as guidance. We disagree. The “National Technology Transfer and Advancement Act of 1995” 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. Furthermore, requirements in the industry consensus standards are not required to be applied on a mandatory basis unless specifically referenced as such. When incorporating standards in the HMR, we typically specify the specific requirements in the standard that must be met. Requirements that are not mandated in adopted standards are rarely imposed on a mandatory basis in RSPA rulemaking initiatives. On this basis, we are incorporating the standards as proposed.

For international shipments of radioactive material, we are adopting the International Atomic Energy Agency (IAEA) safety standards, “Regulations for the Safe Transport of Radioactive Material, No. TS-R-1” with restrictions for its use for the domestic portion of the transport. Additionally, we are retaining Safety Series No. 6 with the same restrictions. As explained previously, TS-R-1 is the updated edition of the current Safety Series No. 6. Under this final rule, domestic shipments remain subject to the HMR requirements which are based on Safety Series No. 6. For domestic use, a proposal to adopt some or all of the TS-

R-1 standards will be addressed under a separate rulemaking, Docket HM-230, which will provide discussion and opportunity for comment.

As discussed in the final rule under Docket HM-215D published on February 1, 2001, we received comments supporting and opposing the incorporation by reference of TS-R-1 into the HMR. We received several comments from industry supporting the incorporation of TS-R-1 including requests for expedited publication of this final rule. Shippers will be required to comply with the TS-R-1 standards for export shipments and failure to comply would result in foreign authorities refusing to accept hazardous materials shipments prepared in accordance with the HMR. Several commenters stressed the importance of a timely compliance date to allow for a reasonable period to implement the TS-R-1 standards and the ICAO Technical Instructions, which both become effective on July 1, 2001. One commenter pointed out that not only does the time element greatly inhibit the preparation of packagings when nearing the July 1, 2001 effective date, but it will also have an impact on packagings already in transit. One commenter stated that failure to adopt TS-R-1 for international shipments will result in serious health treatment implications because radioisotope pharmaceutical products that are necessary for such treatment would be frustrated in transportation.

As discussed in the February 1, 2001 final rule, we received many comments from private citizens and local citizen groups opposing the incorporation of TS-R-1. Some of these commenters also opposed the adoption of the updated editions of the IMDG Code and the ICAO Technical Instructions because both incorporate TS-R-1. (The IMDG Code was adopted in the February 1, 2001 final rule.) Most of the commenters stated that TS-R-1 lowers the level of safety for the transportation of radioactive materials and thereby poses hazards to the public, however many of these commenters did not provide any technical basis for their opposition. The comments included claims that the TS-R-1 standards for Type B packagings are "weakened." As discussed in the February 1, 2001 final rule, the commenters are incorrect. The TS-R-1 standards strengthen Type B packagings by adding immersion and crush testing to the previously required performance tests. Furthermore, the standards also add limits on the contents of Type B packaging when being transported by aircraft. Some commenters claimed that uranium hexafluoride packaging

requirements are "weakened" in TS-R-1. These commenters are also incorrect. The criticality requirements for packages containing uranium hexafluoride did not change.

Many of the commenters stated that TS-R-1's revised definition of radioactive material lowers the level of safety by changing the 70Bq/g activity concentration threshold. The revised radioactive material definition will be addressed under Docket HM-230 and is not adopted in this final rule. We are adding a paragraph to §§ 171.11 and 171.12 to clarify that only the current definition of radioactive material applies. In addition, we are maintaining the current provisions in §§ 171.11 and 171.12, including the values for Type A packaging contents. Shippers using TS-R-1 under the ICAO Technical Instructions or the IMDG Code must conform to the provisions and restrictions as set forth in §§ 171.11 and 171.12, respectively.

Based on the above, the incorporation by reference materials adopted in this final rule are as follows:

- The ICAO Technical Instructions—2001–2002 edition.
- ASTM's "E 112–96 Standard for Test Methods for Determining Average Grain Size" is added to define "fine grain steel" as included in the proposed incorporation of the UN portable tank specifications in § 178.274.
- IAEA's current "Regulations for the Safe Transport of Radioactive Material, No. TS-R-1," 1996 edition is added while retaining the previous edition entitled, "Regulations for the Safe Transport of Radioactive Material, Safety Series No. 6." The TS-R-1 requirements were incorporated into the IMDG Code which became effective on a voluntary basis on January 1, 2001 and the ICAO Technical Instructions which will be effective July 1, 2001.
- Finally, we are adding three ISO standards to coincide with the incorporation of the UN portable tank requirements. The standards are as follows: "ISO 1496–3 Series 1 freight containers—Specification and testing," 199 edition; "ISO 4126–1 Safety valves—Part 1: General Requirements," 1991 edition; and, "ISO 6892 Metallic materials—Tensile testing," 1984 edition.

In the NPRM, we proposed to add IMO'S current "International Code for the Safe Carriage of Packaged Irradiated Nuclear Fuel, Plutonium and High-Level Radioactive Wastes on Board Ships" (INF Code). Because the IMO Maritime Safety Committee adopted the

INF Code for incorporation into the 2000 edition of the IMDG Code, which we authorized under Docket HM-215D (66 FR 8644) on February 1, 2001, we are not adding the INF Code separately under § 171.7. Also see §§ 176.2 and 176.720.

Section 171.8. We are adding four new definitions to § 171.8. "Large packaging" is added to correspond with the addition of an approval provision that allows the use of large packagings which comply with requirements in the UN Recommendations (see § 178.801(i)). Large packagings are UN-marked bulk packagings which are very similar to IBCs, with the exception that they contain inner packagings. In the NPRM, we proposed to add a definition for "Liner." After reconsideration, we believe that this definition is overly restrictive because it would preclude the use of liners such as those used in portable tanks, (for example, lead or rubber liner materials), bulk bins, IBCs and other types of packagings and the proposed definition would limit liners to bags and tubes. Plastic sheeting, rotationally molded rubber lining and other types of liners that are not bags or tubes would be excluded because the proposed definition limited liners to bags and tubes. On this basis, we are not incorporating the definition for "Liner." "Stabilized" is added in conjunction with the proposal to replace the word "inhibited" with "stabilized" in proper shipping names (see § 172.101). Finally, "UN portable tank" is added in conjunction with the requirements for the design, construction and use of UN portable tanks (see §§ 178.274, 178.275, 178.276 and 178.277).

Section 171.10. To correspond with the incorporation of the UN portable tank specifications, we are adding the unit of measure for "Newton" into the Table of Conversion Factors in paragraph (c)(2).

Section 171.11. We are adding a new paragraph (d)(6)(vi) to limit the radioactive material definition to § 173.403. We are also adding a new paragraph (d)(17) to ensure conformance with the current approval provision in § 173.128(d) which requires an approval from the Associate Administrator for the offering for transportation or transport of organic peroxides that are not identified by technical name in the § 173.225(b) Organic Peroxide Table.

Section 171.12. In the NPRM, we proposed to revise paragraph(b)(3) by adding a limitation to the use of the IMDG Code, 2000 edition that became effective January 1, 2001. The limitation which regulates certain viscous flammable liquids that are excepted from the IMDG Code was incorporated

into the HMR on February 1, 2001 (66 FR 8646). One commenter stated that we should revise paragraph (b)(5) by removing the reference to Section 26 of the General Introduction to the IMDG Code because it will become obsolete January 1, 2002 (66 FR 8645) due to the extensive reformatting. We agree and are making the revision accordingly. We are also revising the paragraph to allow for the use of IBCs and UN portable tanks intended for liquids and solids that conform to the requirements of the IMDG Code. We are adding a new paragraph (b)(19) to ensure conformance with the current approval provision in § 173.128(d), which requires an approval from the Associate Administrator for the offering for transportation or transport of organic peroxides that are not identified by technical name in the § 173.225(b) Organic Peroxide Table. In addition, we are revising paragraph (d) to reflect the addition of the current edition of the IAEA "Regulations for the Safe Transport of Radioactive Material, No. TS-R-1," 1996 edition. (See § 171.7 for discussion concerning the addition of the updated TS-R-1 standards) to ensure that radioactive material is defined in accordance with § 173.403.

Section 171.12a. We are adding a new paragraph (b)(18) to ensure conformance with the current approval provision in § 173.128(d) which requires an approval from the Associate Administrator for the offering for transportation or transport of organic peroxides that are not identified by technical name in the § 173.225(b) Organic Peroxide Table.

Section 171.14. We are revising paragraphs (d) and (d)(1) to authorize a delayed implementation date for the amendments adopted in the HM-215D final rule. The effective date of this final rule is October 1, 2001. However, we are authorizing immediate voluntary compliance. This authorization will allow shippers to prepare their international shipments in accordance with the new ICAO Technical Instructions, the IMDG Code and the HMR provisions. We also are authorizing a delayed mandatory compliance date of October 1, 2002 which is comparable to the transition provision provided in the final rule under Docket HM-215C. The delayed mandatory compliance date will offer sufficient time to implement the new provisions and deplete current stocks of shipping papers, labels, placards and packagings affected by the new requirements.

We are revising paragraph (d)(2) to permit intermixing of old and new (HM-215D) hazard communication requirements until October 1, 2002.

We are adding a new paragraph (d)(4) to allow the use of the T code special provisions (assigned to certain hazardous materials in Column (7) of the HMT) in effect on December 31, 2000 until January 1, 2010 for hazardous materials offered for transportation in IM, DOT Specification 51 and IMO portable tanks. This amendment is consistent with the IMDG Code grandfather provisions for portable tank requirements and will minimize any undue regulatory burden.

We are adding a new paragraph (d)(5) to allow continued display of proper shipping names with the word "inhibited" on packagings until October 1, 2005. (See § 172.101, HMT for further discussion.)

Part 172

Section 172.101. Paragraph (b)(1) is being revised for clarification of the use of the plus (+) sign. (See preamble discussion later in this section under the Hazardous Materials Table (HMT). We are revising paragraph (c)(11) for materials transported as samples which are assigned a tentative proper shipping name, hazard class, identification number and packing group. We are adding provisions based on the eleventh revised edition of the UN Recommendations to include requiring the word "SAMPLE" to appear in the proper shipping name, requiring a combination packaging, limiting the packaging size to 2.5 kg and allowing an exception from including the technical name when the constituents are not known. We also are adding a new paragraph (c)(16) to allow for the inclusion of the qualifying words "liquid," "solid" or "molten," as applicable, to a proper shipping name.

We received several comments concerning our proposal to revise hazardous materials transported as samples. Some commenters stated that prohibiting samples from being packed together with other hazardous materials would be overly restrictive and impose an undue burden. Commenters presented examples to demonstrate their argument, including one scenario in which a hazardous material is transported on dry ice. Our intention for revising this paragraph is to prevent the dangerous mixing of materials as prohibited in § 173.24 and to prevent the production of a mixture that would result in violation of § 173.21. Because the HMR requires samples to meet the requirements in §§ 173.21, 173.24, 173.24a and 173.24b, we agree that it is not necessary to prohibit samples from being shipped in the same packaging with other hazardous materials and are revising the paragraph accordingly. We

are also removing proposed paragraph (c)(11)(i) in response to commenters' objections to the proposal prohibiting an explosive, infectious substance or radioactive material from being shipped as a sample. Provisions for transporting samples of such materials are currently authorized in the HMR and we agree that incorporation of the proposed paragraph (c)(11)(i) would be contrary to the current provisions. It was not our intention to remove the authorization to transport these materials as samples. As a result of these changes, certain proposed paragraphs are renumbered.

One commenter requested that the word "SAMPLE" be allowed to be shown on the shipping paper in association with the basic description. That is our intent, and although we proposed to require the word "SAMPLE" to appear in association with the basic description in the NPRM's preamble, the regulatory text wording required the "SAMPLE" to be shown before the basic description. The commenter is correct and we are revising the regulatory text accordingly.

One commenter requested that we change the term "hazardous waste" to "waste" because in accordance with § 171.8 the term "hazardous waste" applies only to those materials subject to the EPA manifest requirements under 40 CFR part 262. The commenter is concerned that generators of waste not subject to the EPA manifest requirements would be restricted from transporting their materials as samples. The commenter is incorrect by misapplying the use of the term "generators of waste" and "hazardous waste." Under the CFR, the term "hazardous waste" does not apply to hazardous materials that are not subject to the EPA manifest requirements. Such materials are considered "a sample of material" in the context of paragraph (c)(11) and are not considered "waste" under the 49 CFR.

Finally, based on comments recommending various revisions to clarify the intent of the paragraph (c)(11), we made certain editorial amendments, including clarifying that technical descriptions do not apply when the primary constituents for which the tentative classification is based are not known.

In paragraph (k) for vessel stowage requirements in Column (10) of the HMT, we are adding new paragraphs (k)(6) through (k)(20) to include the IMDG Code vessel stowage category definitions for Class 1 (explosive) materials. This action is consistent with the new stowage categories and terminology contained in Amendment 30 of the IMDG Code. (Also see

preamble discussion under “The Hazardous Materials Table” and § 176.63.)

The Hazardous Materials Table (HMT). Amendments to the HMT include the following:

- Several commenters noted minor editorial errors in the HMT and we made the appropriate changes to correct these entries.
- For the entries, “Other regulated substances, liquid, n.o.s.” and “Other regulated substances, solid, n.o.s.,” we are adding the letter “G” to Column (1). The letter “G,” which denotes the n.o.s. and generic proper shipping names which are required to be supplemented with the technical names of the hazardous material (in parentheses and in association with the basic description), was inadvertently omitted in Docket HM–215C (64 FR 10742).

One commenter requested that we allow marine pollutants to alternatively be described using the proper shipping names “Other regulated substances, liquid, n.o.s.” or “Other regulated substances, solid, n.o.s.,” as appropriate. We are not adopting this requested amendment because the shipping names “Environmentally hazardous substances, liquid, n.o.s.” and “Environmentally hazardous substances, solid, n.o.s.” more accurately describe marine pollutants as posing an environmental risk and are, therefore, more appropriate proper shipping names as required by the HMR.
- We are adding the following new entries: “Nitroglycerin mixture, desensitized, liquid, n.o.s. with not more than 30% nitroglycerin by mass,” UN3357; “Propellant, solid,” UN0501; “Refrigerating machines containing flammable, non-toxic, liquefied gas,” UN3358; “Rockets with inert head,” UN0502; and “1H–Tetrazole,” UN0504.
- We are revising the entry, “Dangerous Goods in Machinery or Dangerous Goods in Apparatus” by replacing the identification number NA8001 with UN3363, designating a Class 9 assignment and revising Special Provision 136 (see § 172.102). These changes reflect the adoption of the entry by the UN Committee of Experts and amendments agreed to by the ICAO Dangerous Goods Panel. The entry was added to the HMT under Docket HM–215C as NA8001 and assigned Special Provision 136 to prescribe the appropriate hazard class assignment. As explained in HM–215C, the entry was adopted in the ICAO Technical Instructions to provide an exception from the UN

packaging performance tests for equipment, machinery or apparatus containing small quantities of hazardous materials. For machinery or apparatus not specifically listed in the HMT, the entry provides a practical means of describing and transporting machinery or apparatus containing small quantities of hazardous materials. In HM–215C, we stated that upon the assignment of a UN identification number, we would revise the entry accordingly. This was accomplished in the eleventh revised edition of the UN Recommendations in which UN3363 was assigned and this entry was assigned to Class 9. The ICAO Technical Instructions were amended consistent with this UN decision. Therefore, based on the above discussion, we are revising the entry, “Dangerous Goods in Machinery or Dangerous Goods in Apparatus” by assigning it to Class 9, replacing the domestic identification number with an international identification number, and revising Special Provision 136.

- We are adding the entry “Air bag inflators, pyrotechnic or Air bag modules, pyrotechnic or seat-belt pretensioners, pyrotechnic,” UN0503 for air bags that are classified as Division 1.4G. We inadvertently omitted this entry in the NPRM. While we are not considering changing our policy or procedures for the classification of air bags as articles of Class 9, on the basis of the UN Manual of Tests and Criteria, 6c test, we believe that other competent authorities may assign a classification of 1.4G for some air bags. Incorporation of this entry is necessary to preclude the potential for frustrated shipments, the need to remark certain packagings or to change shipping papers for these air bags, when they are classified as 1.4G by other competent authorities and are being transported to or from the United States.
- We are revising all proper shipping names containing the word “inhibited” by replacing “inhibited” with the word “stabilized.” (Also, see the added definition for “stabilized” in § 171.8.) One commenter opposed the proposal to replace the word “inhibited” with “stabilized” and suggested that, instead, we clarify that monomers can be properly inhibited through means other than the addition of an inhibitor. The commenter stated that the words “inhibited” and “stabilized” have the same meaning for the purpose of transportation and expressed concern that we do not understand the

distinction between the two words. The commenter also requested that we add several generic n.o.s. entries that include the word “inhibited” in the proper shipping names. We are not convinced of the merits of either request. The word “stabilized” introduces internationally accepted and standardized hazard communication wording and conveys that the addition of a stabilizing compound or other means of stabilization such as temperature control measures, have been implemented to prevent an unwanted reaction of a hazardous material. The word “stabilized” conveys a broader meaning of inhibiting uncontrolled reaction of a hazardous material (see § 171.8) by different methods. The continued use of the word “inhibited” would lead to a dual system of hazard communication that would be burdensome to shippers and carriers. In addition, the word “stabilized” is more adequately descriptive from the emergency responders’ perspective. Adopting the word “stabilized” will also alleviate the necessity of issuing numerous exemptions for the variety of methods or combination of methods used to inhibit uncontrolled reactions without the use of inhibiting chemicals. Based on these reasons, we are adopting the amendment as proposed.

One commenter requested that we extend the proposed transition period for this amendment to provide sufficient relief from remarking all affected bulk packagings. The commenter stated that an extended transition period would allow the remarking to be accomplished during routine maintenance and periodic inspection cycles. In the NPRM, we proposed a transition period until October, 2002. We agree that a longer transition period for domestic transportation would help relieve any undue burden associated with this amendment without having a significant impact on safety. We are including a transitional provision in § 171.14 to allow the use of the word “inhibited” to be shown on packagings until October 1, 2005.

The allowance of additional means of stabilization and the removal of certain domestic entries from the HMT (see domestic entry removals later in this section) also addresses a petition for rulemaking (P–1304) requesting that we add a new domestic entry, “Methyl methacrylate monomer, uninhibited,” Class 3, NA1247, PG II to the HMT. As we stated, with respect to the request that we add generic n.o.s. entries that include the word “inhibited,” such an

action would also be contrary to the intent of global harmonization and would be beyond the scope of this rule. We are not adopting the request. Commenters having an interest in developing generic names for inclusion into the UN Recommendations should provide more specific information and examples of materials that require stabilization and are not covered by existing entries.

—We are revising the following proper shipping names: “Lithium hypochlorite, dry or Lithium hypochlorite mixtures, dry,” UN1471; “Printing ink, flammable,” UN1210; and “Nitrocellulose membrane filters,” UN3270.

—For the entry, “Methacrylic acid, stabilized,” UN2531, we are replacing Packing Group III with Packing Group II.

—We are removing various domestic entries that have “NA” identification number assignments. As discussed in the NPRM, after reviewing the domestic entries, we determined that the HMR includes “UN” identification numbers assigned to entries that are equally appropriate in a number of instances, and in these instances the NA numbers are no longer necessary. In the NPRM, the revision of “Diesel fuel” with the identification number NA1883 was a printing error which we are correcting in this final rule. “Diesel fuel,” NA1993 is retained and we are adding “Diesel fuel, UN1202.” This amendment will allow flexibility of choice in the use of proper shipping names for domestic transportation. In addition, for the convenience of the HMT users, we are separating the entry “Gas oil or Diesel fuel or Heating oil, light” by giving each name a separate line entry in appropriate alphabetical order. In response to comments requesting that we reconsider the proposed removal of “Gasohol,” we are not removing the entry from the HMT.

One commenter recommended that we provide T codes and IBC codes (see § 172.102, Special Provisions) for the entry “Combustible liquid, n.o.s.,” NA 1993. We agree with the commenter and are adding portable tank instruction T1, portable tank Special Provision TP1 and IBC code IB3. However, we did not assign IB6 to this entry, as requested by the commenter, because § 173.150(f) currently allows for the use of non-specification bulk packagings.

Included in the proposed removals are seven domestic pesticide proper shipping names identified by the pesticide industry as no longer being

used. These entries are: “Aldrin, liquid,” NA2762; “Aldrin, solid,” NA2761; “Dieldrin,” NA2761; “Methyl parathion liquid,” NA3018; “Methyl parathion solid,” NA2783; “Parathion,” NA2783 and “Tetraethyl pyrophosphate solid,” NA3018.

—We are adding radioactive material (Class 7) entries consistent with new entries introduced in the UN Recommendations and IAEA’s “Regulations for the Safe Transport of Radioactive Material, No. TS-R-1.” In addition, we are revising the current radioactive material entries in the HMR to indicate that these entries may be used for domestic shipments, but may be inappropriate for international transportation.

—For Class 1 (explosive) entries, we are revising Columns (10A) and (10B) to reflect the vessel stowage codes as they are presented in Amendment 30 to the IMDG Code. (See § 172.101(k) and § 176.63.)

—For the international entry “Methanol,” we proposed adding a plus sign (+) in Column (1) of the HMT to indicate that this entry is classified with a subsidiary hazard of Class 6.1 on the basis of human experience consistent with the UN Recommendations. One commenter objected to this proposal by stating that the action would unnecessarily restrict the shipment of dilute solutions of methanol. The commenter presented diluted methanol meeting the criteria for PG III as an example. In previous preamble discussions (see HM-215C Final Rule—**Federal Register**: March 5, 1999 (Volume 64, Number 43)) we indicated that a mixture or solution containing a hazardous material where the hazard is significantly different from that of the pure material should be evaluated on the basis of classification criteria. If such a mixture or solution does not meet the corresponding hazard class, a different proper shipping name may be used. Our position remains that when a mixture or solution of a material that is assigned a plus sign in column 1 of the HMT, no longer exhibits a hazard to humans, the material need not be described using a proper shipping name with a plus sign assignment. We recognize the need to clarify the intent of the plus sign in paragraph (b)(1). We are adding a sentence to paragraph (b)(1) to clarify the applicable requirements when the plus (+) sign is assigned to a proper shipping name.

—We are removing the entry “Isobutyric anhydride,” UN2530.

—For the entry “Morpholine,” UN2054, we are replacing Class 3 with Class 8, replacing Packing Group III with Packing Group I, and adding Class 3 as the subsidiary hazard.

—For “Organic peroxide type F, solid, temperature controlled,” (UN3120), we are removing the Packing Group III entry that was due to a printing error in 49 CFR. The PG II entry remains.

—For approximately 14 Zone A and B toxic-by-inhalation entries, we are revising the quantity limits for transport by air to “forbidden.” These revisions are consistent with other toxic-by-inhalation entries in the HMT and with the requirements of the ICAO Technical Instructions.

—For the entry “Fire extinguishers containing compressed or liquefied gas” we are adding Special Provision 110 to Column (7).

—We received a comment stating that our proposal to add Special Provisions 128 and B115 to the entry, “Magnesium granules, coated, particle size not less than 149 microns,” UN2950 (PG III only) was not reflected in the HMT and should also apply to “Water-reactive solid, n.o.s.,” UN2813. After re-evaluation, we do not consider that it is appropriate to apply Special Provision 128 to “Magnesium granules, coated,” UN2950, because we are not convinced that these materials pose a Class 8 risk. As explained in the NPRM, this action is based on a petition for rulemaking (P-1338) that we received from the Aluminum Company of America (Alcoa). Special Provision 128 allows material meeting the Class 8 definition to be classed as a Division 4.3 with a Class 8 subsidiary hazard. Special Provision B115 authorizes the use of certain non-specification sift-proof bulk packagings when the material is loaded dry, precautions are taken to prevent liquid from reaching the hazardous materials and the bulk packagings are appropriately vented. However, UN2950 is assigned to bulk packaging § 173.240 which already allows non-specification bulk packagings and, therefore, we are not applying Special Provision 128 or B115 to UN2950 in this final rule. In response to the comment that Special Provisions 128 and B115 should apply to “Water-reactive solid, n.o.s.,” UN2813, we note that exemption DOT E-11602 only applies to one specific material containing magnesium or magnesium nitrides that is described using a technical name in association with “Water reactive solid, n.o.s.” We do not agree that broad application of Special Provisions 128 and B115 to all

PG II or III water-reactive solids is appropriate or necessary.

—We received a comment stating that we did not include IBC and portable tank assignments for the PG II entry for “Extracts, flavoring, liquid,” UN1197. The oversight is corrected in this final rule.

—Several commenters noted minor editorial errors in the HMT and we made the changes as appropriate.

—For approximately 1,600 entries, we are revising Column (7) by harmonizing the HMR authorizations for IBCs with those contained in the UN Recommendations. As discussed in the NPRM, in most cases the UN Recommendations provide for greater flexibility in the use of different types of IBCs. However, for certain hazardous materials, the incorporation of the UN IBC requirements further restricts the types of IBCs that were authorized prior to this final rule for certain hazardous materials. For example, some Packing Group II liquid hazardous materials of Class 3, Division 6.1 and Class 8 that were previously authorized to be transported in composite IBCs with flexible inner receptacles (such as 31HZ2) are no longer authorized. For the benefit of the reader and to facilitate a review of the proposed amendments, in the NPRM, we included a table identifying all of the affected hazardous materials and indicated the current bulk assignments and the proposed IBC assignments.

The IBC packaging requirements are included in a newly-created IBC Table under the Special Provisions section in § 172.102(c)(4). The table consists of IBC Codes (using the designations IB1–IB99) corresponding to the UN IBC packing instructions, and BB Codes corresponding to the UN IBC special packing provisions. We assigned the IBC packing instructions and the BB codes to specific hazardous materials in Column (7) of the § 172.101 HMT consistent with assignments in the UN Recommendations. In addition, we believe that consolidating the IBC requirements into one table makes it easier for readers to identify the authorized IBCs for specific hazardous materials. As a result of this amendment, we are revising the bulk special provisions in § 172.102(c)(3) to remove the previously authorized bulk codes relevant to the use of IBCs. We are also revising the current IBC packaging authorizations under §§ 173.240(d), 173.241(d), 173.242(d) and 173.243(d).

This revision also addresses a petition we received from the Rigid Intermediate

Bulk Container Association (RIBCA) (P-1395) requesting that we amend the HMR to expand the use of IBCs consistent with new UN provisions. Specifically, the petitioner requested that we allow the use of rigid plastic IBCs and composite IBCs with a rigid plastic inner receptacle for certain liquids. We agree with RIBCA’s request, however, as discussed in the NPRM, in the interest of harmonization, we believe it is more beneficial to adopt the UN Recommendations’ IBC packing instructions in totality, and, as such, are amending the HMR accordingly.

One commenter stated that under the new IBC packing instructions, sodium cyanide and potassium cyanide would no longer be permitted in fiberboard or flexible IBCs. The commenter states that they are currently shipped this way according to B69. Although the UN Recommendations do not allow these types of IBCs for such materials, we are maintaining authorization for the use of fiberboard IBCs in domestic transportation. We will pursue the amendment to IB7 to allow the use of fiberboard (11G) IBCs through a proposal to the UN Transport Committee. However, we do not agree that flexible IBCs should be authorized for these hazardous materials.

The commenter also stated that large packagings should be authorized for sodium cyanide and potassium cyanide. Assignment of large packaging authorizations to specific substances is beyond the scope of this final rule. Currently, the UN Recommendations do not authorize large packagings for these substances. Large packagings are limited primarily to Packing Group III hazardous materials in the UN Recommendations. We plan to work through the UN Transport Subcommittee to address the commenter’s concerns and depending on the outcome, we will address this issue in a future rulemaking.

Appendix B to § 172.101. In Appendix B to 172.101, List of Marine Pollutants, we are revising paragraph “1” by referencing § 171.4, which contains the applicability and exceptions for offering for transportation or transporting marine pollutants. We are revising paragraph “2” to reflect the IMDG Code’s provision for the use of two Class 9 proper shipping names when a marine pollutant is not listed by name in the HMT and does not meet the definitions of Class 1 through 8. In addition, a number of materials are added, removed or amended in the List of Marine Pollutants. The entry “EPTC (ISO)” is removed. The entry was also the subject of a petition for rulemaking (P-1360) requesting removal of the entry based on

its removal from the IMDG Code. Various other entries no longer identified as marine pollutants are also removed. Consistent with the proper shipping name revisions to replace the word “inhibited” with “stabilized,” we are making the change to five entries in the List of Marine Pollutants. All of the amendments to the List of Marine Pollutants are consistent with the marine pollutants provided in Amendment 30 of the IMDG Code. (Also see § 172.101, HMT for comment on use of proper shipping names for certain marine pollutants.)

One commenter stated that the proposal to remove the entry “Dichlorobenzenes (meta, ortho and para)” from Appendix B and replace it with the entry “Dichlorobenzene (para)” will result in an inappropriate listing of entries in Appendix B of the HMT for dichlorobenzene isomers. The commenter stated that the changes in Amendment 30 of the IMDG Code only delist “1,2 Dichlorobenzene (ortho)” as a marine pollutant and that the appropriate dichlorobenzene entry, in addition to existing “1,3 Dichlorobenzene,” and “1,4 Dichlorobenzene,” should be “Dichlorobenzene (meta; para).” We agree with the commenter and are revising the entry accordingly.

Section 172.102. We are revising, adding and removing special provisions as follows:

- Special Provision 43 is revised to include a provision which excepts “Nitrocellulose membrane filters,” UN3270 from the HMR requirements if shown not to meet the criteria for a Division 4.1 hazardous material, according to burn rate tests in Subsection 33.2.1. of the UN Manual of Tests and Criteria, Part III.
- Special Provision 110 is revised to more fully identify fire extinguishers that may be assigned to certain proper shipping names. The revision also provides for harmonization with the ICAO Technical Instructions. (We also are adding the special provision to the entry, “Fire extinguishers *containing compressed or liquefied gas.*” See § 172.101 HMT amendments.)
- Special Provision 128 is revised based on the amendment to assign it to “Magnesium granules, coated, *particle size not less than 149 microns.*” (See § 172.101 HMT changes.)
- Special Provision 136 is revised to reflect the changes adopted by the UN Committee of Experts and the ICAO Dangerous Goods Panel for the entry “Dangerous Goods in Machinery or Dangerous Goods in Apparatus.” (Also see § 172.101 HMT changes.)

We are revising the special provision by removing the text specific to the determination of the hazard class based on the UN Committee of Experts' decision that items under this entry should be assigned to Class 9.

- A new Special Provision 139 is added for two new entries, "Radioactive material, transported under special arrangement, fissile" and "Radioactive material, transported under special arrangement *non-fissile or fissile-excepted*." The special provision requires international shipments using the two entries to be made under an IAEA Certificate of Competent Authority to be issued by the U.S. Competent Authority. Domestic shipments transported under the two entries would be allowed only under a DOT exemption.
- A new Special Provision 142 is assigned for the new entry "Nitroglycerin mixture, desensitized, liquid, n.o.s." The special provision requires the material to be approved by the Associate Administrator.
- A new Special Provision 143 is added for the entry "Life-saving appliances, not self-inflating, *containing dangerous goods as equipment*." The special provision clarifies which articles may be transported under this entry.
- A new Special Provision A53 is added for the entry "Refrigerating machines," UN2857 and contains the exceptions from the HMR for certain refrigerating machines. The exceptions are currently in § 173.307.
- In conjunction with the amendment to revise and consolidate the IBC requirements (see § 172.101, Column (7) changes), we are adopting the following changes: revising the special provisions for bulk packagings in paragraph (c)(3) to exclude IBCs by revising Special Provisions B53 and B69 and removing Special Provisions B100, B101, B103 through B106 and B108 through B110, adding a new paragraph (c)(4) for special provisions specific to IBCs (IP Codes). IP codes are used to describe the IBC packing instructions. We redesignated the term "BB" Codes, as named in the NPRM, to "IP" Codes in this final rule in order to make it easier for the HMR user to locate the Special Provisions. By redesignating the "BB" Codes, the IB the IP Codes will be listed together in alphabetical order in § 172.102.
- The current T codes in paragraph (c)(7) are revised to reflect the incorporation of requirements for UN portable tanks and apply to hazardous materials of Classes 2 through 9. The revised T codes are consistent with

those in the UN Recommendations and the IMDG Code and supersede the current HMR IM portable tank T codes. The T code provisions are required in addition to the requirements in part 178. The codes specify the types of authorized portable tanks according to the specific hazardous material transported in the portable tank. Portable tank assignments for Zone A and Zone B toxic-by-inhalation liquids remain consistent with their current assignments in the HMR. In instances where the UN requires a competent authority approval for transportation in portable tanks (such as when TP9 is assigned in the UN Recommendations), we have removed the approval provision. A transition period is provided for the continued use of the existing T codes for IM and DOT 51 portable tanks (see § 171.14(d)(5)).

One commenter stated that we did not provide for filling limits for portable tanks used to transport refrigerated liquefied gases. To correct this oversight, we are including filling limits that are similar to those applicable to cryogenic cargo tanks authorized under the HMR to transport refrigerated liquified gases. The filling limits will be contained in new Special Provision TP5 which was previously reserved. TP5 is assigned to all refrigerated liquified gases with a tank code T75 assignment.

A commenter stated that fittings were not defined for TP22 which states that lubricants for portable tank fittings must be oxygen compatible. We do not believe that it is necessary to define "fittings" other than to require that they must be oxygen compatible. Our basic intent is that no incompatible materials or lubricants be used on fittings such as fasteners, valves, gauges, pipe thread or other fittings that may come into contact with the oxygen and cause an unsafe condition in transport.

- We are removing proposed TP47 because it is not currently necessary. It is not assigned to any entries and the present requirements are addressed in the applicable packaging sections.
- In paragraph (c)(7)(iv), we are adding definitions for "small," "bare," "sunshield" and "insulated" as they apply to T50.
- A new Special Provision W7 is added for seven new Class 7 entries and assigned the vessel stowage category "D," as defined in § 172.101(k)(4), to uranyl nitrate hexahydrate solution.
- A new Special Provision W8 is added for four new Class 7 entries and assigned the vessel stowage category

"D," as defined in § 172.101(k)(4), to pyrophoric thorium metal or pyrophoric uranium metal.

- Finally, a new Special Provision W9 is added for assignment to the entries, "Calcium hypochlorite, dry or Calcium hypochlorite mixtures dry *with more than 39 percent available chlorine (8.8 percent available oxygen)*," UN1748; "Calcium hypochlorite, hydrated or Calcium hypochlorite, hydrated mixtures *with not less than 5.5 percent but not more than 10 percent water*," UN2880; and "Calcium hypochlorite mixtures, dry, *with more than 10 percent but not more than 39 percent available chlorine*." UN2208. This action aligns the packaging requirements for these entries with those contained in Amendment 30 to the IMDG Code by authorizing certain packagings only when approved by the Associate Administrator.

Section 172.202. We are revising paragraph (a)(4) based on a comment requesting that we eliminate the shipping paper requirement for inclusion of the packing group (PG II) for Class 1 (explosives) because the requirement conflicts with the UN Recommendations, the ICAO Technical Instructions and the IMDG Code, all of which do not require the inclusion of PG II on shipping papers. We agree with the commenter. The packing group does not indicate the degree of risk for explosives and does not aid emergency responders and we are providing an exception from this requirement. Based on the same reasoning, we are including in paragraph (a)(4) an exception from the packing group notation for organic peroxides and self-reactive materials.

Section 172.203. We are revising paragraphs(d)(11), (i) and (n). In paragraph (d)(11), we are allowing an exception from the requirement to add the appropriate group notation to the shipping description for a shipment of low specific activity material or surface contaminated objects provided the group notation is contained in the proper shipping name. Based on a commenter's request for clarification, we are making editorial revisions to this paragraph to improve the clarity of the additional description requirements applicable to low specific activity (LSA) materials and surface contaminated objects (SCO). We are changing the wording "unless these symbols are" to "unless the group notation is," and adding the wording "as described in the § 172.101 Hazardous Materials Table" after the wording "proper shipping name."

In paragraph (i), we are adding two shipping paper description requirements for transportation by vessel. The first amendment is added as new paragraph (i)(5) and requires the flash point for a liquid hazardous material with a flash point of 61 °C or below to be included on shipping papers when transported by water.

One commenter objected to the proposed requirement that for materials having a flash point of 61 °C or less (closed cup c.c.), the flash point must be included on shipping papers. The commenter questioned the value of this requirement. We submit that knowledge of the flash point of a material is a requirement for vessel operators under the requirements of SOLAS Chapter II-2, Regulation 54. The SOLAS requirement imposes cargo hold, electrical, ventilation, fire protection and bilge pump requirements on hazard classes 3, 6.1 and 8, having a flash point of 61 °C or less. In order to ensure that vessel operators have this information, the IMDG Code requires a shipper to include the flash point of such materials on shipping papers. Although for most hazardous materials this information may be derived from the classification and packing group, for some hazardous materials this is not possible. To ensure that the flash point information is readily available, and to harmonize the HMR with the IMDG Code, we are adopting the requirement as proposed.

As discussed in the NPRM, we received a petition (P-1402) from the Vessel Operators Hazardous Materials Association (VOHMA) requesting that we add an additional shipping paper description requirement to include the minimum flash point in degrees Celsius for Class 3 (flammable) or combustible liquid hazardous materials. VOHMA stated that the amendment would help support compliance with the current stowage requirements in § 176.305(c) and the segregation requirements (Code 22 and 23, see § 176.84) as designated in Column (10B) of the § 172.101 Hazardous Materials Table. We agree with the petitioner's reasoning, however, for consistency with the IMDG Code, we are adding the requirement to specify the flash point when it is 61 °C or below for all such liquid hazardous materials whether or not the primary hazard is Class 3. The second amendment to the shipping paper description requirements for transportation by vessel is added as new paragraph (i)(6) and is based on comments from the USCG regarding further harmonization with the IMDG Code. The amendment requires subsidiary risks of a hazardous material that are not reflected in the proper

shipping name to be included on shipping papers.

In paragraph (n), we are clarifying that the shipping paper requirement for the word "HOT" to be placed immediately preceding the proper shipping names of hazardous materials that are transported as elevated temperature materials, is not required for proper shipping names containing the words "Molten" or "Elevated temperature."

Section 172.330. Consistent with the proper shipping name revisions that replace the word "inhibited" with "stabilized" (see § 172.101), we are revising three such proper shipping names in paragraph (a)(1)(ii).

Sections 172.402, 172.405 and 172.411. We received several comments concerning the proposal to remove the requirement to differentiate between primary and subsidiary labels. One commenter opposed the requirement with no elaboration. A second commenter stated that it would lower the level of safety. A third commenter opposed the adoption of the requirement stating that as an emergency responder, vital information necessary to respond to an incident would be lost. We disagree with this commenter. When a hazardous material has two or more hazards, each hazard must be considered in determining the appropriate response to an incident. The commenter also pointed out that the subsidiary risk is not required on shipping papers which would be another method for emergency responders to obtain the information. Under a separate rulemaking and consistent with the 12th edition of the UN Recommendations, we plan to propose a requirement to identify the subsidiary risks on shipping papers for all modes. In addition, for vessel only, we are adopting a requirement in this final rule for mandatory notation of subsidiary hazards on shipping papers, unless the subsidiary hazard is reflected in the proper shipping name. Consistent with the eleventh revised edition of the UN Recommendations, we are removing the requirement to differentiate between primary and subsidiary labels. Prior to this final rule, primary labels were required to display the hazard class or division number in the lower corner of the label, while subsidiary labels could not display these numbers. We believe the display of the hazard class and division on all labels will enhance safety and hazard communication. We are amending the requirement which provides for two label specifications (one for primary hazards and one for subsidiary hazards) by removing the subsidiary hazard label specification. This change also provides relief by

eliminating the need for shippers to stock two sets of labels.

Another commenter stated that the proposed 5 year transition period for continued use of subsidiary risk label requirements in effect prior to this final rule, is too lengthy and could cause problems in domestic transportation for multimodal shipments. The commenter stated that the proposed transition period is not necessary because the ICAO Technical Instructions and the IMDG Code have much shorter transition periods in place, and that it seems unlikely that shippers would stock 5 year supplies of subsidiary risk labels. Based on feedback from industry, we believe that a 5 year transition period is warranted to allow sufficient time for filled packagings that are pre-labeled to complete their cycle out of transportation. We are not convinced that the 5 year transition period will cause problems in domestic transportation. Also, based on feedback from industry, we maintain that many shippers stock 5 year supplies of subsidiary risk labels. Therefore, in order to provide a reasonable transition period, we are allowing labels meeting the label specifications in place prior to this final rule to continue to be displayed until October 1, 2005, at which time labels used to convey both primary and subsidiary hazards must display the appropriate hazard class or division number at the bottom of the label. (See § 171.14 for transition provisions.) The same amendment also applies to placards (see § 172.519).

Section 172.502. In paragraph (b), we are correcting an error that was published in the February 1, 2001 final rule under Docket HM-215D. Based on a request from the **Federal Register**, we added a reference to "see § 171.7." During the typesetting process, the ICAO Technical Instructions were mistakenly added and the TDG Regulations were mistakenly omitted. We are correcting this error by removing the ICAO Technical Instructions and reinstating the TDG Regulations.

Section 172.504. Based on comments and our own initiative, we are revising paragraph (g) by allowing the display of only one placard bearing one compatibility letter when certain Class 1 materials (explosives) of different compatibility groups are transported together in a single transport vehicle or container. This amendment is consistent with the mixed packaging provisions in § 173.61.

Section 172.519. Consistent with the amendment to eliminate the distinction between primary and subsidiary labels, we are revising paragraph (b)(4) to eliminate the requirement to distinguish

between primary and subsidiary placards. In addition, we are incorporating a new paragraph (b)(4)(i) to permit subsidiary placards meeting the current placarding specifications (such as placards without the hazard class or division number displayed in the lower corner of the placard) to continue to be displayed in domestic transportation provided they were permanently affixed before October 1, 2001. Non-permanently affixed subsidiary placards meeting the current placarding specifications are allowed to be displayed until October 1, 2005. (See § 171.14 for transition provisions.)

Part 173

Section 173.2a. Consistent with the eleventh revised edition of the UN Recommendations, in the paragraph (b) Precedence of Hazard Table, we are revising Footnote 2 to exclude liquid and solid desensitized explosives. In addition, we are adding the revised Footnote 2 to Class 3, PG I, II and III in the paragraph (b) Precedence of Hazard Table.

Section 173.4. Based on a request for clarification, we are revising paragraph (a) to clarify that the small quantity exceptions apply to packagings containing articles, as well as inner receptacles.

Section 173.24b. We are adding a new paragraph (e) to address acceptance of foreign manufactured UN portable tanks that conform to the applicable provisions in the UN Recommendations on the Transport of Dangerous Goods and are manufactured in countries that provide reciprocal treatment for UN portable tanks manufactured in the United States.

Section 173.29. One commenter requested that two petitions for rulemaking be addressed in this final rule. The petitions request that IBCs meeting the Environmental Protection Agency's empty container rule in 40 CFR 261.7 be allowed to be transported without vehicle placarding and shipping papers. We are not addressing this issue under HM-215D because it is beyond the scope of this rulemaking.

Section 173.31. Consistent with the proper shipping name revisions that replace the word "inhibited" with "stabilized" (see § 172.101), we are revising one such proper shipping name in § 173.31(b)(2)(ii).

Section 173.32. One commenter stated that the consolidation of §§ 173.32, 173.32b and 173.32c would impose requirements for DOT Specification 57 portable tanks that previously did not apply. The commenter provided specific recommendations for ensuring that new requirements for the maintenance and

continued use of DOT Specification 57 portable tanks are not introduced. We did not intend to impose new requirements for DOT Specification 57 portable tanks. We considered the recommendations of the commenter and revised § 173.32(d), (f) and (h) to address these recommendations.

One commenter suggested that we incorporate certain editorial changes in § 173.32 and part 180, subpart G, to clarify that not all portable tanks have a maximum allowable working pressure (MAWP) and that some requirements do not apply to all portable tanks, such as DOT Specification 56 and 57 portable tanks. The commenter stated that DOT Specification 57 portable tanks, for example, have a design pressure, but not a MAWP. The commenter also noted that when we consolidated the repair, inspection, test and maintenance requirements for portable tanks in the NPRM, we applied requirements to DOT Specification portable tanks that currently are not applicable under the HMR. We agree with the commenter's suggestions and are incorporating the suggested editorial corrections.

One commenter stated that one of its members maintains and operates a large fleet of ICC Specification portable tanks and they requested that we maintain the current grandfather provisions for these portable tanks. As stated in the NPRM, our intent with removing the provisions was based on whether these portable tanks were being used. With receipt of this comment, we are retaining the provisions currently in 173.32(b) and (c) of the HMR by incorporating them into § 173.32(c)(4) and (c)(5) in this final rule.

The commenter also stated that DOT Specification 60 and marine portable tanks were not addressed in the NPRM and requested that these portable tanks be authorized for continued use. We did not propose any changes in the NPRM that would prevent continued use of these portable tanks.

Another commenter expressed concern regarding our proposal to allow UN portable tanks to be designed and constructed to pressure vessel design codes other than the ASME Code. The commenter asked which codes would be acceptable and expressed concern that we would allow codes that are "less stringent" than the ASME Code. In response to this comment, we wish to advise the commenter that codes other than ASME will only be authorized if approved by the Associate Administrator for Hazardous Materials Safety, and only for UN portable tanks intended for the transport of liquid and solid hazardous materials. No approval provision was proposed for use of

alternative design codes for portable tanks intended for the transport of liquefied gases. Because alternative codes are only allowed if approved by the Associate Administrator, applications for use of other design codes will be reviewed on a case by case basis. It is not our intention to allow the use of design codes that will not provide an equivalent level of safety as afforded in the ASME Code. We did not include a list of potential alternative codes because we have not considered which codes we will accept and because other factors, in addition to the design code, will be considered in each case.

One commenter stated that it is unclear whether the grandfather provision for DOT Specification 56 and 57 portable tanks manufactured after October 1, 1996 provides for such portable tanks to continue in service. We note that DOT Specification 56 and 57 portable tanks were not authorized to be manufactured after October 1, 1996. On October 1, 1996, the UN IBC requirements were introduced which replaced DOT Specification 56 and 57 portable tanks.

Because paragraphs (c)(3) and (g) concerning pressure relief valves for DOT specification portable tanks are duplicative, we are removing paragraph (g). With this action the paragraphs following the removed paragraph (g) are renumbered.

As proposed in the NPRM, we are revising § 173.32 to provide requirements for all portable tanks by consolidating the requirements for the use of IM portable tanks currently in § 173.32c into a single section and moving them to part 180, subpart G, with the qualification and maintenance requirements for IBCs, cargo tanks and tank cars. We are also including a grandfather clause in § 173.32 to allow IM 101, 102 and DOT 51 portable tanks to continue to be constructed in accordance with the HMR until January 1, 2003. IM 101, 102 and DOT 51 portable tanks which are certified and approved prior to this date are authorized for continued use provided they meet the applicable periodic inspection and test requirements in part 180, subpart G. These requirements were previously in § 173.32b. On January 1, 2003, all newly manufactured portable tanks will be required to conform to the requirements for the design, construction and approval of UN portable tanks (see §§ 178.274, 178.275, 178.276 and 178.277). Finally, we are removing the provisions for the continued use of DOT Specification 52 and 53 portable tanks based on our view that these portable tanks are no longer

in use and the lack of comments to the contrary.

Section 173.32a. We are removing § 173.32a and moving its approval requirements for specification portable tanks to § 178.273. We believe that part 178 is a more appropriate location for these requirements and that the new section will prove to be more convenient for users of the HMR. We also are including similar requirements for the incorporation of requirements for UN portable tanks.

Section 173.32b. We are removing § 173.32b and relocating the test requirements to part 180, subpart G, as discussed in § 173.32.

Section 173.32c. We are removing § 173.32c. The requirements for the use of all specification portable tanks are now included in § 173.32, thereby precluding the need for § 173.32c.

Section 173.34. Consistent with the proper shipping name revisions that replace the word "inhibited" with "stabilized" (see § 172.101), we are revising two such proper shipping names in § 173.34(e)(13).

Section 173.61. Based on our own initiative, for Class 1 (explosives) mixed packaging requirements, we are revising paragraph (e)(3) to allow explosives of compatibility group S that are allowed to be packaged with explosives of all other compatibility groups, except A and L, to be treated as belonging to any of the packaged compatibility groups except S. In addition, we are adding a new paragraph (e)(8) to allow explosive articles in compatibility group G, except for fireworks and articles requiring special packaging, to be packaged with articles of compatibility groups C, D and E, and the combined package may be treated as belonging to compatibility group E. This revision corresponds with the previous allowance contained in § 177.848(g).

Section 173.62. Consistent with adding the entries "Rockets with inert head," UN0502 and "1H-Tetrazole," UN0504 to the § 172.101 Table, we are adding them to the paragraph (b) Explosives Table which specifies the Packing Instructions assigned to each explosive. In paragraph (c), we are revising the Explosives Packing Instructions Table to authorize additional types of outer packagings in the following packing instructions: 112(a), 112(b), 112(c), 113, 115, 116, 130, 131, 134, 135, 136, 138, 140, 141, 142 and 144.

Section 173.150. We are revising paragraph (d) by clarifying that alcoholic beverages containing over 24% alcohol by volume are not excepted from regulation when transported by a passenger or

crewmember on passenger-carrying aircraft except as provided in § 175.10(a)(17). (See preamble discussion under § 175.10.)

Section 173.162. We are revising paragraph (a)(1) by clarifying that the types of packagings specified in the paragraph are combination packagings and that the glass, earthenware or rigid plastic packagings are authorized as inner packagings only. In addition, for these packagings, we are increasing the net mass of 10 kg (22 pounds) for each packaging to 15 kg (33 pounds). This is consistent with Packing Instruction 800 in the UN Recommendations.

Section 173.185. We are revising § 173.185 to include a definition for equivalent lithium content for lithium ion cells and batteries and to provide the applicable aggregate lithium quantities relevant to excepting lithium ion cells and batteries from the requirements of the HMR consistent with the eleventh edition of the UN Recommendations. The definition of lithium content was revised in this final rule to make it consistent with a minor editorial clarification adopted by the Committee of Experts in its report of the 21st session (see section 38.3.2.2 in the amendments to the UN Manual of Tests and Criteria, report number ST/SG/AC.10/27/Add.2). This clarification was included based on a comment that we received. We adopted this clarification in order to prevent possible confusion about the lithium-equivalent content of lithium-ion battery packs that are currently used in many portable devices. For the readers' information, we plan to issue an NPRM under a separate rulemaking initiative to address the 12th edition amendments to the UN Recommendations that require all lithium batteries, regardless of the lithium content, to be subject to the lithium battery tests in Section 38 of the UN Manual of Tests and Criteria. The lithium battery amendments and revised test methods are available in the report of the UN Committee of Experts and may be downloaded at <http://www.unece.org/trans/main/dgdb/dgcomm/ac10rep.html>.

Several commenters stated that we did not include the revised requirements applicable to large lithium batteries used for electric and hybrid vehicles and requested that we make the correction in the final rule. Although we discussed the amendment in the NPRM's preamble, the revised requirements were inadvertently omitted from the regulatory text. This error is corrected in this final rule.

Section 173.224. Consistent with the UN Recommendations, we are adding the entry "2,2'-Azodi(isobutyronitrile)

as a water-based paste" to the Self-Reactive Substances Table for substances that are not subject to the approval provisions of § 173.124(a)(2)(iii), provided all applicable provisions in the table are met. Finally, we are revising paragraph (b)(4) and removing paragraph (d) to allow Type F self-reactive substances to be transported in portable tanks under conditions specified in § 173.225(e) (see preamble discussion under § 173.225).

Section 173.225. We are amending the paragraph (b) Organic Peroxide Table by making various changes, such as revising several technical names, packing method authorizations and control temperatures. These changes are consistent with the UN Recommendations. We are removing Notes "7" and "10" consistent with the adoption of UN IBC 520 and adding Note "26" to specify the available oxygen content limitation for certain new organic peroxide formulations. We are revising paragraph (e) to incorporate the requirements from the eleventh revised edition of the UN Recommendations relevant to the emergency venting devices for portable tanks and IBCs used for the transportation of organic peroxides and self-reactive substances. This responds to NTSB recommendation (I-92-2) that asked us to "revise the requirements for pressure relief venting on DOT Specification 57 portable tanks used to transport dicumyl peroxides and other products with similar rapid decomposition characteristics to ensure that the pressure relief systems prevent overpressure rupture of tanks from a rapid product decomposition reaction." We are applying the recommended venting requirements to all portable tanks and IBCs, rather than just DOT Specification portable tanks. Additionally, the types of portable tanks authorized for type F organic peroxide and self-reactive substances are expanded to include UN portable tanks. We are adopting the requirements in Portable Tank Instruction T23 and IBC Special Provision, IBC 520.

A commenter brought to our attention that Note 26 as proposed would conflict with the § 173.21 restriction for ketone peroxides which limits oxygen content to 9% or less. We agree and are removing the proposed Note 26 text and renumbering the proposed Note 27 to Note 26. In addition, based on a comment, we are adding an organic peroxide formulation for 2,5 Dimethyl 2,5 di-2-ethylhex anoylperoxy hexane, UN3113. The entry was adopted in the UN Recommendations and inadvertently omitted in the NPRM.

We understand that the current Organic Peroxide Table includes a number of formulations that are no longer used. We encourage users of the Organic Peroxide Table to provide us with comments in this regard, as well as suggestions for improving the Organic Peroxide Table.

Sections 173.240, 173.241, 173.242 and 173.243. In each section's paragraph (c), we are removing Specification DOT 52 and 53 portable tanks as authorized packagings (see § 173.32) because we believe that these portable tanks are no longer used. In addition, we are authorizing UN portable tanks. In conjunction with the revision to the requirements for IBCs, for alignment with international standards, we are revising paragraph (d) which specifies authorized IBCs in §§ 173.240, 173.241, 173.242 and 173.243 to reflect the proposed incorporation of IBC packing instructions and IP codes (see § 172.101, Column (7)). Based on a comment that we received, we are not requiring temperature sensing devices or reclosing pressure relief devices for DOT Specification 57 portable tanks. We agree with the commenter that such portable tanks have limited use and are very similar to IBCs.

We also received a comment stating that § 173.240 should be amended to allow the use of non-specification flexible ("supersacks") IBCs for hazardous materials such as "Environmentally hazardous substances, solid, n.o.s." Specifically, the commenter requested that we authorize the use of non-specification "supersacks" in § 173.240. The commenter questioned the omission by asking why we do not authorize non-specification IBCs, yet we provide for the use of other non-specification bulk packagings. While it is our intent at this time to maintain authorization for use of non-specification portable tanks and bulk bins in § 173.240(c), we do not agree that non-specification IBCs should be authorized. The only non-specification bulk packagings authorized in § 173.240 are portable tanks and bulk bins which are rigid packagings of a higher integrity when compared to a 2,000 pound non-specification bag. Neither the current HMR nor the UN Recommendations authorize the use of non-specification IBCs for environmentally hazardous substances. We believe that authorization of the non-specification "supersacks" would be detrimental to safety and, therefore, we are not incorporating it into the HMR.

Section 173.247. In paragraph (c), we are removing Specification DOT 52 and

53 portable tanks as authorized packagings (see § 173.32).

Sections 173.301, 173.304, 173.314, 173.315 and 172.330. Consistent with the proper shipping name revisions that replace the word "inhibited" with "stabilized" (see § 172.101), we are revising all such proper shipping names in these sections.

Section 173.306. Consistent with Packing Instruction P201 in the UN Recommendations, we are amending the paragraph (a)(4)(iii) conditions for transporting flammable, non-pressurized gas samples by revising the inner packagings limit from 2.5 L (0.66 gallons) to 5 L (1.3 gallons).

Sections 173.314 and 173.315. Consistent with the proper shipping name revisions that replace the word "inhibited" with "stabilized" (see § 172.101), we are revising one such proper shipping name in § 173.314(c) and (g) and two such proper shipping names in § 173.315(a), (b) and (h).

Section 173.315. As proposed in the NPRM, we are revising paragraphs (a) and (i)(1)(iii) to incorporate provisions for the use of UN portable tanks for the transportation of liquefied compressed gases and the requirements for DOT Specification 51 portable tanks. In paragraph (a), we are incorporating a reference to new tank instruction T50 (see UN T Codes under § 172.102) for the transportation of liquefied compressed gases in UN portable tanks. In paragraph (i)(1)(iii), we are including the pressure relief device requirements applicable to UN portable tanks.

We received a comment questioning the intent in paragraph (a)(1)(iii) concerning the insulation requirements. The commenter was concerned that the paragraph prevents the use of mylar, other low melting films and aluminum for jacket materials. We note that the paragraph does not prohibit the use of jackets constructed of materials other than steel, except in the case when the portable tank manufacturer is attempting to lower the required relieving capacity of the relief devices by taking into account the thermal protection afforded by the insulation. The UN portable tank requirements intentionally restrict the jacketing material to steel when using the insulation as a means for reducing the required relieving capacity of the pressure relief devices, because jacket materials with lower melting temperatures, such as aluminum, would not provide adequate fire damage protection for the inner vessel, or for the vacuum insulation in the case of a vacuum insulated tank to justify allowing a lower overall relieving capacity for the pressure relief system.

We agree with the UN reasoning for limiting jacket material to steel, and, therefore, we are adopting the paragraph as proposed.

Section 173.320. For transportation by air for cryogenic liquids exceptions, we are making an editorial clarification in paragraph (c) to refer readers to the specific cites in the ICAO Technical Instructions rather than stating "see § 171.11 of this subchapter."

Part 175

Section 175.10. For consistency with the ICAO Technical Instructions, we are revising paragraph (a)(10) to clarify that lighters containing "unabsorbed liquid fuel" are prohibited on one's person or in checked or carry-on baggage. We are revising exclusions for alcoholic beverages as carry-on and checked baggage to impose a per passenger quantity limit and to restrict the exceptions to alcoholic beverages in retail packagings containing not more than 70% alcohol. We are revising paragraph (a)(16) to exclude alcoholic beverages. Also, we are adding new paragraph (a)(17) to specify that alcoholic beverages containing more than 24% and not more than 70% alcohol by volume, when carried by passengers or crew in checked or carry-on baggage, are not subject to the HMR if in retail packagings not exceeding 5 liters (1.3 gallons) with a total net quantity per person of 5 liters (1.3 gallons). These changes are consistent with the ICAO Technical Instructions.

Section 175.33. For harmonization with the ICAO Technical Instructions, we are revising paragraph (a) introductory text to add a requirement that the written pilot notification must be accurate and legible.

Section 175.78. We are revising this section to update and align segregation requirements with recent changes adopted in the ICAO Technical Instructions which were based on a UN decision to remove the distinction between primary and subsidiary risk labels. Separate rows and columns are provided for Divisions 5.1 and 5.2. We are adding a new provision to clarify that packages with multiple risks do not need to be segregated from other packages bearing the same UN number. The ICAO Technical Instructions currently require segregation of Divisions 5.1 and 4.3 hazardous materials and we have revised the entry to reflect the change.

Section 175.85. Consistent with a new provision adopted in the ICAO Technical Instructions, we are revising paragraph (a) to authorize use of main deck Class C cargo compartments for the transport of hazardous materials. Prior

to this final rule, hazardous materials were allowed to be carried in a main deck cargo compartment of a passenger aircraft provided the compartment was inaccessible to passengers and it met certification requirements for a Class B cargo compartment. (Class C cargo compartments differ from Class B cargo compartments in that Class C compartments are required to have a built-in fire extinguishing system, in addition to smoke or fire detection systems.)

Part 176

Section 176.2. In conjunction with incorporating a requirement for vessel cargo to be in compliance with the INF Code (see § 176.720), we are adding a definition for “INF cargo” under the § 176.2 definitions.

Section 176.63. For the stowage of Class 1 (explosive) materials on board a vessel, we are adding a stowage location definition for “closed cargo transport unit.” This addition coincides with the addition of the vessel stowage category definitions contained in Amendment 30 to the IMDG Code. (See § 172.101(k).)

Section 176.84. Consistent with the IMDG Code we are revising paragraph (b) Table of provisions and paragraph (c)(2) stowage provisions. In the paragraph (b) Table of provisions, we are adding two new stowage provisions for assignment to the entries: “Calcium hypochlorite, dry or Calcium hypochlorite mixtures dry with more than 39 percent available chlorine (8.8 percent available oxygen),” “Calcium hypochlorite, hydrated or Calcium hypochlorite, hydrated mixtures, with not less than 5.5 percent but not more than 10 percent water,” and “Calcium hypochlorite mixtures, dry with more than 10 percent but not more than 39 percent available chlorine.” In the paragraph (c)(2), we are revising the list of notes for the stowage of Class 1 (explosive) material provisions.

Section 176.128. We are making an editorial change in § 176.128(c) by correcting an identification number.

Section 176.136. We are making an editorial change in § 176.136 by removing the word “portable.”

Section 176.142. Based on a comment from the National Cargo Bureau, Inc., in § 176.142, paragraph (a), we are revising the list of hazardous materials that may not be transported in a vessel carrying Class 1 (explosive) materials to reflect the most current proper shipping names and add one extremely flammable material, “Methyl phosphorous dichloride, pyrophoric liquid,” NA2845.

Section 176.720. We are adding a new section to require a vessel carrying INF cargo in international transportation to

comply with the “International Code for the Safe Carriage of Packaged Irradiated Nuclear Fuel, Plutonium and High-Level Radioactive Wastes on Board Ships,” (INF Code, 2000, English edition). The INF Code was adopted by the International Maritime Safety Committee and became effective January 1, 2001 in the IMDG Code.

Part 177

Section 177.848. In paragraph (g)(3)(vi), we inadvertently added the terms “special stowage” and “stowed” from the corresponding vessel section of the HMR (§ 174.81) under HM–215C (64 FR 10742). We are correcting the wording by removing “special stowage,” which is not applicable to this section, and replacing “stowed” with “loaded, transported and stored.” We received a joint petition from the American Trucking Associations (ATA) and the Institute of Makers of Explosives (IME) (P–1396) requesting additional clarification of this paragraph. Prior to this rule, the paragraph read:

“(vi) “6” means explosive articles in compatibility group G, other than fireworks and those requiring special stowage, may be stowed with other explosive articles of compatibility groups C, D and E, provided no explosive substances (for example, those not contained in articles) are carried in the same vehicle.”

In this paragraph and the corresponding paragraph in § 174.81, the petitioners request that the words “other explosives” be inserted before the wording “explosive substances.” The petitioners are incorrect in their interpretation of the wording of this paragraph. Explosive *articles* in compatibility group G may be stowed with certain other explosive *articles* (C, D and E compatibility groups), provided no explosive *substances* that are not contained within articles are carried in the same vehicle. We point out that there is a distinction between the words “articles” and “substances.” To take advantage of this paragraph, explosive substances that are not contained in articles may not be carried on the vehicle. We are revising the paragraph to clarify that substances are prohibited when not contained in articles.

Part 178

Section 178.273. We are adding a new section by moving the current requirements for the approval of portable tanks from § 173.32a to § 178.273. This new section will include approval provisions for all portable tanks, including “UN portable tanks.” These current approval provisions will precede the requirements for UN

portable tanks (§§ 178.274 through 178.277). Approval agencies that have an interest in approving UN portable tanks must send a request to DHM–32, Office of Hazardous Materials Approvals, in accordance with the requirements in part 107, subpart E of this subchapter.

Sections 178.274, 178.275, 178.276 and 178.277. Based on the eleventh revised edition of the UN Recommendations, we are incorporating four new sections into the HMR for the UN portable tank requirements. This action is based on our own initiative and a petition for rulemaking (P–1373) and is consistent with our international harmonization objectives. The requirements apply to the design and construction of portable tanks. The IMO Dangerous Goods, Solid Cargoes and Containers (DSC) Sub-Committee incorporated the new harmonized UN multimodal portable tank requirements into the reformatted IMDG Code, Amendment 30. The reformatted IMDG Code became effective on January 1, 2001. The IMDG Code also includes a provision to allow for the continued use of portable tanks designed and constructed under the current requirements (those in Amendment 29 or previous amendments to the IMDG Code as applicable, depending on the date of construction).

The IMO allows construction under the new requirements on January 1, 2001, on a voluntary compliance basis, with a mandatory compliance date of January 1, 2003. On January 1, 2003, all new portable tanks will be required to be manufactured in accordance with the new requirements. For purposes of harmonization, we are incorporating the corresponding design, construction and use requirements for UN portable tanks in the HMR. In addition, in § 173.32 we are providing for the continued use of IM 101, 102 and DOT Specification 51 portable tanks, which is consistent with the provisions adopted in the IMDG Code.

The design and construction requirements for UN portable tanks do not differ significantly from the previous IM 101 and 102 portable tanks and the DOT Specification 51 requirements. In general, the UN requirements are less restrictive. For example, 6 mm (0.2 inches) minimum thickness is required for most portable tanks, as opposed to the current minimum thickness of 6.35 mm (0.3 inches) for IM 101 and 102 portable tanks. As discussed in the NPRM, while the majority of the changes involve relaxations of the regulatory requirements, there will be implications for portable tank manufacturers,

shippers and operators who transport hazardous materials in portable tanks. For example, we are requiring UN portable tanks used for the transportation of liquefied compressed gases to be approved by a DOT-designated approval agency, and we are requiring all UN portable tanks to meet a 4 g impact test. In addition to portable tanks for liquids and liquefied compressed gases, we are incorporating requirements for portable tanks that are used to transport refrigerated liquefied gases (cryogenic liquids). Previous to this final rule, requirements for portable tanks used for refrigerated liquefied gases were not specified in the HMR, and we authorized their use only under DOT exemptions. The differences between UN portable tanks and the previous portable tank requirements include, but are not limited to the following:

—The new definition for portable tank includes multimodal tanks with a capacity of more than 450 liters (118.9 gallons).

—The new design temperature range is defined as $-40\text{ }^{\circ}\text{C}$ to $50\text{ }^{\circ}\text{C}$ ($-40\text{ }^{\circ}\text{F}$ to $122.0\text{ }^{\circ}\text{F}$). This final rule includes the requirement that design temperatures must be considered for portable tanks subjected to severe climatic conditions. Previous to this final rule, regulations specified a range of $-20\text{ }^{\circ}\text{C}$ to $50\text{ }^{\circ}\text{C}$ ($-4.0\text{ }^{\circ}\text{F}$ to $122.0\text{ }^{\circ}\text{F}$).

—The new UN leakage test for portable tanks intended for the transport of liquids specifies a test pressure not less than 25% of Maximum Allowable Working Pressure (MAWP). The previous HMR requirements specified an internal pressure equivalent to MAWP, but not less than 0.2 bar (20.0 kPa) for liquids.

—The new test requires that the design and construction of portable tanks must take into account the effects of fatigue during normal conditions of transport. Previously, this was not required in the HMR.

—The new requirements specify an absolute minimum thickness of 3 mm (0.1 inches), regardless of the material used and regardless of whether additional protection is provided.

—Under the new requirements, a rail impact test of 4 g is required for all portable tanks meeting the definition of "Container" in the International Convention for Safe Containers (CSC).

—The new requirements specify that the test pressure be 1.3 times the design pressure for portable tanks intended for the transport of liquefied gases. Previously, under the HMR, DOT 51 portable tanks used for the transportation of liquefied gases were

required to have a test pressure of 1.5 times the design pressure; however, this is based on the vapor pressure of the hazardous material at $115\text{ }^{\circ}\text{F}$ ($46.1\text{ }^{\circ}\text{C}$), whereas the UN calculates the vapor pressure at $65\text{ }^{\circ}\text{C}$ ($149\text{ }^{\circ}\text{F}$). The differences between 1.5 at $46\text{ }^{\circ}\text{C}$ and 1.3 at $65\text{ }^{\circ}\text{C}$, therefore, would not be significant. (Although one commenter stated that they disagreed with this statement, our view is explained further in the preamble discussion under § 178.274.)

—The new requirements include a figure for thermal conductance for the thermal insulation systems of shells intended for the transport of liquefied compressed gases.

—The new requirements include a definition for "Holding time" relevant to portable tanks used for the transportation of refrigerated liquefied gases. This is consistent with current HMR requirements in § 178.338–9 for cargo tanks.

—The new requirements specify the effectiveness of the insulation system (heat influx in watts) based on a test using the portable tank.

—The new requirements allow the specified minimum values of material strength for austenitic steels to be increased by 15% according to recognized material standards when greater values are provided in the material inspection certificates.

—The new requirements allow the combined capacity of all pressure relief devices to be sufficient to limit the pressure to 120% of the MAWP for liquefied compressed gases.

Section 178.274. One commenter stated that the required test pressure for UN portable tanks used for the transportation of propane would increase from 320 psig to 400 psig. We believe that the values cited by the commenter are not accurate. Based on the Fourth Edition of the Compressed Gas Association Handbook of Compressed Gases, the vapor pressure of propane is approximately 220–230 psia at a reference temperature of $115\text{ }^{\circ}\text{F}$ ($46.1\text{ }^{\circ}\text{C}$) and approximately 270–275 psia at $130\text{ }^{\circ}\text{F}$ ($54.4\text{ }^{\circ}\text{C}$). The required MAWP according to § 173.315 is 250 psi. The test pressure for a UN portable tank would be approximately the same as that for a DOT 51 portable tank and in some cases may be slightly less. In this case, it would not be in the interest of harmonization to vary from the internationally agreed design pressure formulas. Based on the above, we are adopting the requirement as proposed.

One commenter stated that aluminum should be authorized as a material for portable tank shell construction. The

UN Recommendations allows aluminum only for portable tanks intended for liquid and solid materials when approved by the competent authority. Aluminum is not authorized for portable tank shells intended for non-refrigerated liquefied gases, however, aluminum is authorized for shells of portable tanks intended for the transportation of refrigerated liquefied gases. Based on the merits of these comments and to be consistent with the UN Recommendations, we are amending paragraph (b) accordingly.

Also regarding paragraph (b), some commenters requested background information explaining the justification and application of the proposed $-40\text{ }^{\circ}\text{C}$ lower range for the design temperature applicable to UN portable tanks. This lower temperature was adopted because the UN working group recognized that $-20\text{ }^{\circ}\text{C}$ was not sufficient to represent temperatures that UN portable tanks may experience in certain parts of the world. One commenter stated that it was not clear whether the requirement was applicable to all portable tank components or only to the shell. In response to this comment, we point out that the design temperature range applies to the shell which is the primary pressure and lading retention component of the portable tank. The general requirements for design and construction state that "Portable tank materials must be suitable for the external environment where they will be transported taking into account the determined design temperature range." This provision requires service equipment to be suitable for the climatic conditions to which it will be exposed. For these reasons, we are not amending the proposed language.

One commenter stated that the change from the very prescriptive relief device location for IM portable tanks in § 178.270–11(b)(1)(i) to the less specific requirement is "too open to interpretation" and requested clarification. We do not agree with the commenter. The main safety concern is that when the tank is filled to its maximum filling condition, the relief device is located in the vapor space and will ensure that escaping vapor can be discharged free from any obstruction. The text accomplishes this objective and is more flexible and performance-oriented. Specifically limiting the location by specifying exact tolerances forces us to issue exemptions and approvals when the location varies from these specific parameters. In addition, the text as proposed in this section is consistent with how the HMR specifies pressure relief device location for DOT specification 400 series cargo tanks

(see 178.345–10(c)). We are adopting the text as proposed.

One commenter stated that the proposed requirement to group outlet openings in paragraph § 178.274(e)(7) of the NPRM should not apply to portable tanks used for refrigerated liquified gases due to their unique design. The commenter explained that this requirement does not currently apply to exemption cryogenic portable tanks or MC 338 Specification cargo tanks (see § 178.338–7), nor is it a requirement under the UN Recommendations. We agree with this commenter and are amending the paragraph to reflect that the external fitting grouping requirement applies only to portable tanks intended for the transportation of non-refrigerated liquefied gases. This amendment is consistent with the current requirement that applies to DOT Specification 51 portable tanks in § 178.245–1(c). We agree that the additional exceptions applicable to locating openings in other locations in § 178.245–1(d)(1), (2) and (3) should also apply and, therefore, we are revising the text accordingly. Because these requirements are applicable only to portable tanks intended for the transport of non-refrigerated liquified gases, we are moving the text to the more appropriate location of § 178.276.

We received two comments concerning the proposed requirements for the internal valve emergency shut-off device in paragraph (e)(7). One commenter stated that there is no requirement in the UN Recommendations nor the IMDG Code for a thermally activated closure. Our intent with this paragraph is consistency with a requirement that was published under a final rule (Docket HM–166Y; 63 FR 37453) on July 10, 1998, requiring an IM portable tank to be retrofitted if unloaded while it remained on a transport vehicle with the power unit attached. The commenter stated that we proposed to expand the concept by making a thermally activated device part of the service equipment for all UN portable tanks and that the requirement would be contrary to harmonization because UN portable tanks are used worldwide. They suggested that the requirement should first be introduced at the UN Committee of Experts for consideration. Although the requirement is only a condition for unloading IM portable tanks from vehicles while the motor unit is attached, we were informed through meetings with portable tank users and manufacturers that it is not feasible to determine which IM portable tanks would be offloaded in this manner and that all IM portable tanks would

need to be retrofitted with thermally activated closure devices (fusible links) in order to comply with the requirement in § 177.834(o). In a request for an interim final rule concerning the retrofitting requirement published in HM–166Y final rule, the Hazardous Materials Advisory Council (HMAC) stated “For commercial and economic reasons, it is not practical to remove all tanks from service at once to retrofit the bottom outlet valves with thermally activated closure devices. Tanks are either in a transport cycle, in storage, or in repair/maintenance shops. If all of the portable tanks were taken out of service at the same time to complete this retrofit, many industrial operations would be severely disrupted.” DOT 51 portable tanks are required to be fitted with these closures (see § 178.245–1(d)(iii)) and in the HM–215D NPRM we proposed that UN portable tanks used for non-refrigerated liquified gases be fitted with these devices consistent with paragraph 6.7.3.5.4 of the UN Recommendations. The UN Recommendations require “quick closing” shut-off devices that close automatically in the event of fire engulfment and unintended movement of the portable tank for portable tanks used to transport flammable refrigerated and flammable and toxic non-refrigerated liquified gases. We are removing the requirements for these shut-off devices to operate based on unintended movement because we believe it is not practical. We believe that even though this is not a requirement under the UN Recommendations for liquid materials, it is a domestic requirement and from the safety perspective, as discussed under Docket HM–166Y, it should be applied to U.S. manufactured UN portable tanks intended for the transportation of liquid hazardous materials which are flammable, pyrophoric, oxidizing or toxic. We believe it would be in the best interest of safety to fit these portable tanks with thermally activated closures. We estimate that the cost of installing a fusible link will be approximately \$40.00 to \$70.00 per portable tank based on information provided by tank and tank valve and component manufacturers. Installation at the time of manufacture will avoid downstream retrofitting costs, costs associated with shipping delays and logistical problems at a later date. In previous discussions with the Hazardous Materials Advisory Council and the Tank Container Association, we were informed that retrofitting of portable tanks would cost approximately \$200.00 to \$250.00 per

portable tank. On the basis of these costs, it makes economic sense to install the devices at the time of manufacture. We agree that this requirement should be proposed to the UN Committee of Experts and will follow-up accordingly. On the basis of enhanced safety, minimal cost at the time of manufacture, shipping delays and logistics, we are requiring U.S. manufactured UN portable tanks intended for transporting certain liquids to be fitted with thermally activated closures (fusible links). The internal valve shut-off requirements are revised for consistency in §§ 178.275(d)(3), 178.276(c)(4) and 178.277(d).

Concerning paragraph (i), one commenter stated that markings such as maximum allowable working pressure, test pressure, maximum gross mass and the applicable T Code should be marked on the tanks following the “UN” mark in order to convey that the cargo is authorized for that particular portable tank. We agree that a T marking on the tank may be advantageous, however, the UN Recommendations do not require a T mark and imposing such a requirement is beyond the scope of this final rule. Incorporation of a T code marking in this rule could lead to different requirements in domestic and international regulations if such a proposal is not adopted by the UN Transport Subcommittee. With regard to the other markings, the information is marked on a specification plate (see § 178.274(i) of the regulatory text). Finally, we moved the requirements for the initial inspection and test of portable tanks from § 180.605(d), as presented in the NPRM, to the more appropriate location § 178.274(j).

Sections 178.274 and 178.275. One commenter stated that although the term “fusible elements” is used in the UN Recommendations, the purpose of the devices and whether they are mandatory service equipment is unclear. The commenter stated that in the final rule it would be helpful to clarify the definition and use of these devices. We agree with the commenter and are adding a definition for “fusible elements” in § 178.274(a)(3) and are clarifying the use of “fusible elements” in § 178.275(f)(4).

A commenter requested that we allow UN portable tanks used for the transportation of refrigerated liquefied gases to be tested using an inert gas as an alternative to hydrostatic testing with water. The commenter explained that this is a common industry practice and is necessary because the saddle designs for these portable tanks are not designed to hold the associated weight of the water necessary to conduct the

hydrostatic test. The commenter further explained that the alternative method is necessary because it is difficult to entirely remove all of the water in the inner tank after the hydrostatic test is completed. In addition, the UN Recommendations authorize the pressure test using an inert gas. We accept this comment and are amending § 178.274(j)(2) to include a provision to allow, as an alternative to hydrostatic testing with water, testing with an inert gas for portable tanks used for the transportation of refrigerated liquefied gases.

Section 178.275. Regarding paragraph (c), a commenter stated that damage to the liner in a portable tank would be inevitable when welding a blind (blank) flange on the inside and outside of the portable tank shell. The commenter suggested a tamper proof flange as an alternative to the welded flange as proposed in the NPRM. The UN portable tank working group considered a number of alternate configurations or possibilities for closing bottom openings in portable tanks when they are retrofitted to remove bottom opening configurations. The working group was opposed to use of a bolted flange because of the possibility that it may leak during transportation. While inclusion of an alternative to welding is beyond the scope of this rule, a means of authorizing non-welded bottom flange configurations may be considered under the alternative arrangement approval provisions.

Another commenter stated that the presence of a liner in a portable tank should not be justification for authorizing the portable tank to be used without an internal shut-off valve. The commenter stated that internal shut-off valves can be fitted on lined portable tanks and that the proposed exception would result in a decrease in safety. We agree and based on the merits of the comment, we believe that a lined tank should have a internal shut-off and are removing the proposed exception in paragraph (c)(4) which states, "For a lined shell, the internal stop valve required by paragraph (c)(3)(i) of this section may be replaced by an additional external stop valve."

One commenter stated that the external design pressure should not be based on the internal pressure because, as proposed, the requirement would impose unrealistic external design pressure requirements. We agree with this commenter and are revising the wording in paragraph (e) to remove the reference to the internal pressure. On this basis, a shell that is to be equipped with a vacuum-relief device must be designed to withstand, without

permanent deformation, an external pressure of not less than 0.21 bar.

Section 178.276. See discussion under § 178.274 for discussion concerning the relocation of certain text.

We received a comment stating that § 178.276 should be revised to provide an exception from the internal stop valve requirement for portable tanks used for the transportation of chlorine. The commenter requested alternative wording to clarify whether a threaded cap or pipe plug can be used as the third means of closure on portable tank openings. We agree and are revising the text in § 178.276(c)(1) to state "* * * and the third being a blank flange, threaded cap, plug or equivalent liquid tight closure device." We are also revising § 178.276(c)(3) to indicate that this paragraph only applies to openings below the liquid level of the portable tank. This wording will eliminate the need for portable tanks used to transport chlorine from having to be fitted with internal stop valves because these portable tanks have loading and unloading fittings only at the top of the tank. We are also including a new paragraph (7) to address inlets and discharge outlets, internal excess flow valves on portable tanks used to transport chlorine.

Section 178.277. One commenter stated that the NPRM preamble included a new filling limit for helium, yet it was not contained in the regulatory text in § 178.277. We recognized the oversight and added a new tank provision, TP5 to address the filling limit. (See § 172.102, Special Provisions.)

Another commenter stated that it is not necessary to specify impact test requirements in paragraph § 178.277(b)(4) and that the proposed provision for conducting impact tests at 0 °F on materials to be used for refrigerated liquefied gases are not suitable because such portable tanks operate at much lower temperatures. The commenter went on to say that the ASME Code adequately addresses this issue. We agree with the commenter and have removed the proposed provision.

Another commenter stated that we overlooked the fact that the UN Recommendations do not require portable tanks used for the transportation of refrigerated liquefied gases to have an opening for inspection. The commenter stated that the internal inspection requirements for these portable tanks should be removed because: (1) The portable tanks are not currently fitted with inspection openings, (2) internal corrosion is not a factor for portable tanks used to transport refrigerated liquefied gases, (3)

the UN Recommendations do not require internal inspection for these portable tanks, and (4) fitting of inspection openings on these portable tanks does not enhance safety. We agree with the commenter and are including the exceptions for refrigerated liquefied gas portable tanks in paragraphs (d)(7) and § 180.605(e) and (f).

We are including the above discussed amendments and, as proposed in the NPRM, we are adding five new sections (§§ 178.273 through 178.277) to the HMR as follows: § 178.273 is added by moving the current requirements for the approval of Specification portable tanks from § 173.32a and introducing similar requirements for UN portable tanks; § 178.274 is added for the UN portable tank general design and construction requirements; § 178.275 is added for the additional specifications for UN portable tanks intended for the transportation of liquid and solid materials of Classes 3 through 9; § 178.276 is added for the additional requirements for UN portable tanks intended for the transportation of liquefied compressed gases; and § 178.277 is added for the additional requirements for the design, construction, inspection and testing of UN portable tanks intended for the transport of refrigerated liquefied gases.

Section 178.703. Consistent with § 178.3(a)(4), paragraph (a)(1) is revised by including a minimum height of 12 mm (0.5 inches) for IBC markings and by adding a requirement to allow use of the "W" mark for approval of equivalent IBC packagings, as provided for in § 178.801(i). Two commenters stated that while they support a minimum marking size of 12 mm for IBCs, it is not clear how this would apply to IBCs manufactured prior to the effective date of this final rule. In response to these commenters, we revised paragraph (a)(1) to clarify that the minimum marking size only applies to IBCs manufactured after the effective date of this final rule (October 1, 2001).

Section 178.705. We are revising the minimum wall thickness requirements to take into account the capacity in the case of metal IBCs.

Section 178.801. In paragraph (i), we are adding an approval provision for the use of large packagings, as defined in § 171.8 of this NPRM, provided the large packagings conform to the construction standards, performance testing and packaging marking as specified in UN Recommendations.

Section 178.812. Based on our initiative, we are revising paragraph (c)(1) and adding a new paragraph (c)(3) to include an alternate method for conducting the top lift test for flexible

IBCs. Prior to this final rule, the alternate method was authorized in several approvals issued by the Associate Administrator.

Part 179

Section 179.102-4. Consistent with the proper shipping name revisions that replace the word “inhibited” with “stabilized” (see § 172.101), we are revising one such proper shipping name in this section.

Part 180

Sections 180.601, 180.603, 180.605. We are moving the qualification and maintenance requirements for portable tanks from § 173.32(c) to part 180. As discussed in the NPRM, we believe that these requirements are more appropriately placed in part 180 along with the qualification and maintenance requirements for cargo tanks, IBCs and tank cars. Therefore, as proposed, we are adding new subpart G to part 180 for the qualification and maintenance of portable tanks. (Also see § 173.32.) One commenter suggested that we incorporate certain editorial changes to § 173.32 and part 180, subpart G, to clarify that not all portable tanks have a maximum allowable working pressure (MAWP) and that some requirements do not apply to all portable tanks, such as DOT Specification 56 and 57 portable tanks. We agree and have made the clarification revisions accordingly.

Section 180.603. A commenter requested that grandfather provisions be included in § 180.603 to recognize that portable tanks constructed and used in accordance with existing DOT exemptions are authorized for continued use provided they meet the applicable periodic inspection and test requirements. We do not agree with this request because such exemptions remain valid and their continued use are not affected by this final rule.

Section 180.605. Several commenters stated that the periodic inspection requirements for portable tanks proposed in the NPRM are not entirely consistent with those specified in the UN Recommendations. They quoted the UN Recommendations as stating: “A portable tank filled prior to the date of expiry of the last periodic inspection and test may be transported for a period not to exceed three months beyond the date of expiry of the last periodic test or inspection.” In addition, a portable tank may be transported after the date of expiry of the last periodic test and inspection after emptying but before cleaning, for purposes of performing the next required test or inspection prior to refilling and unless otherwise approved by the competent authority, for a period

not to exceed six months beyond the date of expiry of the last periodic test or inspection, in order to allow the return of dangerous goods for proper disposal or recycling. Reference to this exemption shall be mentioned in the transport document. The commenters requested that we adopt this text from the UN Recommendations in the final rule. We do not agree that the UN Recommendations’ text should be included in the HMR. We believe that the UN text imposes arbitrary limits on the length of time that a portable tank may be transported after expiration of the inspection and test date. The HMR text allows a portable tank to continue to be transported after the expiration of the test date while prohibiting filling of a tank once the periodic inspection and test dates have expired. We wish to clarify that the text as proposed was based on existing text for cargo tanks (see 173.33(a)(3)) and for portable tanks (see 173.32(e)(5)). The text in place prior to this final rule, as well as the text adopted in this final rule, allows portable tanks which contain a residue, or are being transported to a cleaning, testing or repair facility, to be transported after the inspection and test date expires. In the NPRM, we simply consolidated this requirement in a more appropriate section and applied it universally to all portable tanks. We are adopting the text as proposed, even though it is less restrictive than the UN Recommendations text, because it is practical and does not impose unnecessary burdens on the regulated public or government. On this basis, we are not adopting the suggestions of the commenters. We also wish to note that the text in § 180.605(b)(3), as proposed and adopted, requires a portable tank that has been out of service for more than one year to be periodically retested.

Several commenters stated that they support our efforts to adopt the UN portable tank requirements. The commenters support the requirement that DOT 51 Specification portable tanks not be allowed to be manufactured after January 1, 2003, however, they do not support the conditions for continued use of existing DOT 51 portable tanks as proposed in the NPRM. We did not introduce new requirements for periodically retesting DOT Specification 51 portable tanks in the NPRM nor was it our intention to do so. The retest provisions for DOT Specification 51 portable tanks are specified in § 180.605(c)(2) and requires that the portable tanks be retested at least once every 5 years.

For paragraphs (e) and (f), see § 178.277(d)(7) discussion regarding an

exception from the requirement for portable tanks used for the transportation of refrigerated liquefied gases to have an opening for inspection. We moved the initial inspection and test requirements from § 180.605(d), as proposed in the NPRM, to § 178.274(j) which we believe is a more appropriate location. For a comment on an alternative to hydrostatic testing with water, see § 178.274(j).

We also received a comment stating that we should have included an exception from the requirement for UN portable tanks intended for the transportation of “Helium refrigerated liquid (*cryogenic liquid*),” UN1963 and “Hydrogen, refrigerated liquid (*cryogenic liquid*),” UN1966 to be subjected to the 4 G rail impact test as prescribed in § 180.605(d)(6). The commenter reasoned that high thermal performance liquid hydrogen and helium containers are not transported on railroads due to the large impact loads experienced during coupling and that such UN portable tanks are marked with the words “NOT FOR RAIL TRANSPORTATION.” We agree with the commenter. When the requirements for UN portable tanks were developed, the UN working group agreed that portable tanks used for the transportation of refrigerated liquefied helium and hydrogen should be excepted from rail impact testing. A special provision was added allowing the transportation of these refrigerated liquefied gases under conditions specified by the competent authority. In this final rule, we are excepting portable tanks intended for the transport of refrigerated liquefied helium and hydrogen from the requirements of a rail impact test. Instead of requiring an approval provision, we are adding a sentence to § 180.605(d)(6) to except portable tanks from the 4 G impact test when the portable tanks are used in dedicated service for the transportation of “Helium, refrigerated liquid,” UN1963 and “Hydrogen, refrigerated liquid,” UN1966 and are marked “NOT FOR RAIL TRANSPORT” in letters of a minimum height of 20 cm (8 inches) on at least two sides of the portable tank.

Another commenter stated that the proposed marking size amendment in § 180.605(l) requires inspection and test markings that are not included on the specification plate of a portable tank to be 32 mm (1.25 inches) high, yet as the commenter points out, currently § 173.32(e)(3) allows markings for DOT Specifications 51, 56, 57 and 60 portable tanks to be a minimum height of 12 mm. We agree with the commenter and after considering the proposed amendment, we do not believe that a marking height

of 32 mm is necessary for these particular portable tanks. Therefore, we are adopting a minimum test and inspection marking height of 3 mm when the markings are on the specification plate, and a marking height of 12 mm when the markings are directly on the portable tank.

IV. Rulemaking Analyses and Notices

A. 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. This final rule is not considered a significant rule under the Regulatory Policies and Procedures of the Department of Transportation (44 FR 11034). Benefits resulting from this final rule include enhanced transportation safety resulting from the consistency of domestic and international hazard communications and continued access to foreign markets by domestic shippers of hazardous materials. Many companies involved in domestic, as well as global operations, will realize economic benefits as a result of the amendments in this rulemaking. The total net increase in costs to businesses in implementing this rulemaking is minimal and we have determined that the intended benefits of harmonizing the HMR with international standards outweigh the minimal increase in costs to industry. For interested parties, a regulatory analysis is available for review in the public docket.

B. 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 adopt 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. 5101–5127, contains an express preemption provision (49 U.S.C. 5125(b)) that preempts State, local, and Indian tribe requirements on certain covered subjects. Covered subjects are:

(1) The designation, description, and classification of hazardous materials;

(2) The packing, repacking, handling, labeling, marking, and placarding of hazardous materials;

(3) The preparation, execution, and use of shipping documents related to hazardous materials 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; or

(5) The design, manufacture, fabrication, marking, maintenance, recondition, repair, or testing of a packaging or container represented, marked, certified, or sold as qualified for use in transporting hazardous material.

This final rule addresses covered subject items (1), (2), (3), and (5) above and would preempt State, local, and Indian tribe requirements not meeting the "substantively the same" standard. This final rule is necessary to incorporate changes already adopted in international standards. If the changes in this final rule are not adopted in 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 regulation. The changes in this final rule are intended to avoid this result. Federal hazardous materials transportation law provides at section 5125(b)(2) that, if DOT issues a regulation concerning any of the covered subjects, DOT must determine and publish in the **Federal Register** the effective date of Federal preemption. The effective date may not be earlier than the 90th day following the date of issuance of the final rule and not later than two years after the date of issuance. Thus, RSPA lacks discretion in this area. The effective date of Federal preemption will be December 18, 2001.

C. Executive Order 13084

This final rule has been analyzed in accordance with the principles and criteria contained in Executive Order 13084 ("Consultation and Coordination with Indian Tribal Governments"). Because this final rule does not significantly or uniquely affect the communities of the Indian tribal governments and does not impose substantial direct compliance costs, the funding and consultation requirements of Executive Order 13084 do not apply.

D. Regulatory Flexibility Act

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 will serve to facilitate 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, chemical users and suppliers, packaging manufacturers, distributors, battery manufacturers, radiopharmaceutical companies and training companies. Based on our assessment in the regulatory analysis, which is available in the public docket, I hereby certify that this final rule will not have a significant economic impact on a substantial number of small entities.

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. For example, cost savings will be realized by shippers and carriers as a result of eliminating the differences between primary and subsidiary labels. As a result of this change, it will no longer be necessary to stock two sets of labels for each hazard class. To ease any burden associated with this change, we are incorporating a reasonable transition period where labels meeting requirements in effect immediately prior to this final rule and the requirements adopted in this final rule may be used.

Other cost savings include providing greater flexibility for the use of IBCs and portable tanks; retaining current IM 101, 102 and DOT Specification 51 portable tank requirements and providing authorizations for their use; deleting numerous entries from the marine pollutant list for consistency with the IMDG Code; authorizing greater flexibility for transporting samples of hazardous materials; authorizing the use of a single explosives placard when explosives of several compatibility groups are transported in a single freight container or vehicle; and revising requirements for large lithium batteries which will simplify the regulatory requirements applicable to batteries used in high energy efficient hybrid vehicles. Finally, we are authorizing immediate voluntary compliance, delayed effective dates and a one-year transition period to allow for training of employees and to ease any burden on entities affected by the amendments.

E. Paperwork Reduction Act

We have current information collection approvals under OMB No. 2137-0018, Inspection and Testing of Portable Tanks and Intermediate Bulk Containers, which expires March 31, 2002, with 51,340 burden hours and \$10,235,000 annual costs, and OMB No. 2137-0557, Approvals for Hazardous Materials, which expires March 31, 2002, with 18,302 burden hours and \$413,737.40 annual costs. We believe that this final rule may result in minor incremental increases in the annual burden hours and costs. The current approvals has been revised and resubmitted to OMB for extension and reapproval.

OMB No. 2137-0018 contains the information collection and recordkeeping requirements in current §§ 173.32, 173.32a, 173.32b, 178.245 and 178.801 for tests, inspections and related records related to the manufacture, qualification, repair or modification of portable tanks or intermediate bulk containers. This information is used to verify that portable tanks and intermediate bulk containers meet the required manufacturing standards prior to being authorized for initial use, and that once manufactured, the packagings are maintenance in conformance with the applicable HMR requirements. OMB No. 2137-0018 is revised to include UN portable tanks and to revise section references to the portable tank requalification requirements which are being relocated to subpart G in Part 180.

OMB No. 2137-0557 contains the information collection and recordkeeping requirements for packagings and hazardous materials approvals. This information is used to verify that portable tank designs meet the applicable standards. OMB No. 2137-0557 is revised to include UN portable tanks and to revise the section references to the portable tank design approval requirements which are being relocated to Part 178.

We estimate that the adjusted total information collection and recordkeeping burdens are as follows:

OMB No. 2137-0018:

Affected Public: Manufacturers, requalifiers, repairers and modifiers, and owners of certain DOT specification and exemption portable tanks and intermediate bulk containers.

Number of Respondents: 8,770.

Total Annual Responses: 86,100.

Total Annual Burden Hours: 66,390.

Total Annual Burden Cost: \$ 7,137,500.

One-time Annual Start Up Burden Hours: 350.

OMB No. 2137-0557:

Number of Respondents: 3,518.

Total Annual Responses: 3,869.

Total Annual Burden Hours: 18,381.

Total Annual Burden Cost: \$

413,737.40.

Requests for a copy of the information collection approvals, requests and data should be directed to Deborah Boothe, Office of Hazardous Materials Standards (DHM-10), Research and Special Programs Administration, Room 8102, 400 Seventh Street, SW, Washington, DC 20590-0001, Telephone (202) 366-8553.

F. 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 number contained in the heading of this document can be used to cross-reference this action with the Unified Agenda.

G. 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 \$100 million or more to either State, local or tribal governments, in the aggregate, or to the private sector, and is the least burdensome alternative that achieves the objective of the rule.

H. Environmental Assessment

The National Environmental Policy Act of 1969 (NEPA) requires Federal agencies to consider the consequences of major federal actions and prepare a detailed statement on actions significantly affecting the quality of the human environment. We developed an assessment to determine the effects of these revisions on the environment and whether a more comprehensive environmental impact statement may be required. Our findings conclude that there are no significant environmental impacts associated with this final rule. Consistency in regulations for the transportation of hazardous materials aids in the shipper's understanding of what is required and permits shippers to more easily comply with safety regulations and avoid the potential for environmental damage or contamination. For interested parties, an environmental assessment is available in the public docket.

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, Labeling, Markings, Packaging and containers, Reporting and recordkeeping requirements.

49 CFR Part 173

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

49 CFR Part 175

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

49 CFR Part 176

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

49 CFR Part 177

Hazardous materials transportation, Motor carriers, Radioactive materials, Reporting and recordkeeping requirements.

49 CFR Part 178

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

49 CFR Part 179

Hazardous materials transportation, Railroad safety, 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, 49 CFR Chapter I is amended 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. 5101-5127; 49 CFR 1.53.

2. In § 171.7, in paragraph (a)(1), the fourth sentence is revised and in the paragraph (a)(3) table:

a. Under the entry "American Society for Testing and Materials", a new entry is added in alpha-numeric order;

b. Under the entry “International Atomic Energy Agency (IAEA)”, a new entry is added in alpha-numeric order;
 c. Under the entry “International Civil Aviation Organization (ICAO)”, the existing entry is revised;
 d. Under the entry “International Maritime Organization (IMO)”, for the entry “International Maritime Dangerous Goods (IMDG) Code, 2000

edition”, in the second column, add “; 176.720” after “176.30”; and
 e. Under the entry “International Organization for Standardization”, three new entries are added in alpha-numeric order.
 The revisions and additions read as follows:

§ 171.7 Reference material.
 (a) *Matter incorporated by reference—*
 (1) * * * The material listed in paragraph (a)(3) has been approved for incorporation by reference by the Director of the Federal Register in accordance with 5 U.S.C 552(a) and 1 CFR part 51. * * *
 * * * * *
 (3) *Table of material incorporated by reference.* * * *

| Source and name of material | 49 CFR reference |
|---|--|
| * * * * * | * |
| <i>American Society for Testing and Materials</i> | |
| * * * * * | * |
| ASTM E 112-96 Standard Test Methods for Determining Average Grain Size, 1996 Edition | 178.274 |
| * * * * * | * |
| <i>International Atomic Energy Agency (IAEA)</i> | |
| * * * * * | * |
| IAEA, Regulations for the Safe Transport of Radioactive Material, No. TS-R-1, 1996 Edition | 171.12 |
| * * * * * | * |
| <i>International Civil Aviation Organization (ICAO)</i> | |
| * * * * * | * |
| Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO Technical Instructions), DOC 9284-AN/905, 2001-2002 Edition. | 171.11; 172.202; 172.401; 172.512; 172.602 |
| * * * * * | * |
| <i>International Organization for Standardization</i> | |
| * * * * * | * |
| ISO 1496-3 Series 1 freight containers—Specification and testing, Part 3: Tank containers for liquids, gases and pressurized dry bulk, March 1, 1995, Fourth Edition. | 178.274 |
| * * * * * | * |
| ISO 4126-1 Safety valves—Part 1: General Requirements, December 15, 1991, First Edition | 178.274 |
| * * * * * | * |
| ISO 6892 Metallic materials—Tensile testing, July 15, 1984, First Edition | 178.274 |
| * * * * * | * |

* * * * *
 3. In § 171.8, the following definitions are added in appropriate alphabetical order to read as follows:

§ 171.8 Definitions and abbreviations.

* * * * *
Large packaging means a packaging that—
 (1) Consists of an outer packaging which contains articles or inner packagings;
 (2) Is designated for mechanical handling;
 (3) Exceeds 400 kg net mass or 450 liters (118.9 gallons) capacity;
 (4) Has a volume of not more than 3 m³ (see § 178.801(i) of this subchapter); and

(5) Conforms to the requirements for the construction, testing and marking of large packagings as specified in the UN Recommendations.
 * * * * *

Stabilized means that the hazardous material is in a condition that precludes uncontrolled reaction. This may be achieved by methods such as adding an inhibiting chemical, degassing the hazardous material to remove dissolved oxygen and inerting the air space in the package, or maintaining the hazardous material under temperature control.
 * * * * *

UN portable tank means a intermodal tank having a capacity of more than 450 liters (118.9 gallons). It includes a shell fitted with service equipment and

structural equipment, including stabilizing members external to the shell and skids, mountings or accessories to facilitate mechanical handling. A UN portable tank must be capable of being filled and discharged without the removal of its structural equipment and must be capable of being lifted when full. Cargo tanks, rail tank car tanks, non-metallic tanks, non-specification tanks, bulk bins, and IBCs and packagings made to cylinder specifications are not UN portable tanks.
 * * * * *

4. In § 171.10, in paragraph (c)(2), the Table of Conversion Factors for SI Units, a unit of measure is added as the last entry, and in the abbreviation notes following the Table, in the (SI)

abbreviations, a new abbreviation “; Newton, N” is added after “mSv” to read as follows:

§ 171.10 Units of measure.

(2) * * *

* * * * *
(c) * * *

TABLE OF CONVERSION FACTORS FOR SI UNITS

Table with 3 columns: Measurement, SI to U.S. standard, U.S. standard to SI. Row 1: Force, 1 Newton = 0.2248 Pound-force, 1 Pound-force=4.483 N

5. In § 171.11, the introductory text is revised, the comma at the end of paragraphs (d)(6)(i) and (d)(6)(ii) are removed and a period is added in its place, “, and” at the end of paragraph (d)(6)(iv) is removed and a period is added in their place, and new paragraphs (d)(6)(vi) and (d)(17) are added to read as follows:

§ 171.11 Use of ICAO Technical Instructions.

Notwithstanding the requirements of parts 172 and 173 of this subchapter, a hazardous material may be transported by aircraft, and by motor vehicle either before or after being transported by aircraft, in accordance with the ICAO Technical Instructions (see § 171.7) if the hazardous material;

- (d) * * *
(6) * * *

(vi) The definition for “radioactive material” in § 173.403 of this subchapter applies to radioactive materials transported under the provisions of this section.

(17) An organic peroxide that is not identified by technical name in the Organic Peroxide Table in § 173.225(b) of this subchapter must be approved by the Associate Administrator in accordance with the requirements of § 173.128(d) of this subchapter.

6. In § 171.12, paragraph (b)(5) is revised, new paragraph (b)(20) is added, paragraphs (d) heading and introductory text and (d)(4) are revised, “and” at the end of paragraph (d)(5) is removed, the period at the end of paragraph (d)(6) is removed and “; and” is added in its place, and paragraph (d)(7) is added to read as follows:

§ 171.12 Import and export shipments.

* * * * *

- (b) * * *

(5) Except for IBCs and UN portable tanks intended for liquids or solids, hazardous materials that conform to the requirements of the IMDG Code, bulk packagings must conform to the requirements of this subchapter. For UN

portable tanks, Special Provisions TP37, TP38, TP44 and TP45 must be met when applicable. Except as specified in paragraph (b)(8) of this section for a material poisonous (toxic) by inhalation (see § 171.8 of this subchapter), the T Codes specified for specific hazardous materials in Column 13 of the Dangerous Goods List of the IMDG Code may be applied to the transportation of those materials in IM, IMO and DOT Specification 51 portable tanks.

* * * * *

(20) An organic peroxide that is not identified by technical name in the Organic Peroxide Table in § 173.225(b) of this subchapter must be approved by the Associate Administrator in accordance with the requirements of § 173.128(d) of this subchapter.

* * * * *

(d) Use of International Atomic Energy Agency (IAEA) regulations for Class 7 (radioactive) materials. Class 7 (radioactive) materials being imported into or exported from the United States, or passing through the United States in the course of being shipped between places outside the United States, may be offered and accepted for transportation when packaged, marked, labeled, and otherwise prepared for shipment in accordance with IAEA “Regulations for the Safe Transport of Radioactive Material,” Safety Series No. 6, 1985 edition, or TS-R-1, 1996 edition (see § 171.7), if—

* * * * *

(4) The country of origin for the shipment has adopted the corresponding edition (Safety Series No. 6, 1985 Edition, or TS-R-1, 1996 Edition) of the IAEA “Regulations for the Safe Transport of Radioactive Material”;

* * * * *

(7) The definition for “radioactive material” in § 173.403 of this subchapter is applied to radioactive materials transported under the provisions of this section.

7. In § 171.12a, a new paragraph (b)(18) is added to read as follows:

§ 171.12a Canadian shipments and packagings.

* * * * *

- (b) * * *

(18) An organic peroxide that is not identified by technical name in the Organic Peroxide Table in § 173.225(b) of this subchapter must be approved by the Associate Administrator in accordance with the requirements of § 173.128(d) of this subchapter.

8. In § 171.14, paragraphs (d) introductory text, (d)(1) and (d)(2) introductory text are revised and new paragraphs (d)(4) and (d)(5) are added to read as follows:

§ 171.14 Transitional provisions for implementing certain requirements.

* * * * *

(d) A final rule published in the Federal Register on June 21, 2001, effective October 1, 2001, resulted in revisions to this subchapter. During the transition period, until October 1, 2002, as provided in paragraph (d)(1) of this section, a person may elect to comply with either the applicable requirements of this subchapter in effect on September 30, 2001, or the requirements published in the June 21, 2001 final rule.

(1) Transition dates. The effective date of the June 21, 2001 final rule is October 1, 2001. A delayed compliance date of October 1, 2002 is authorized. On October 1, 2002, all applicable regulatory requirements adopted in the June 21, 2001 final rule in effect on October 1, 2001 must be met.

(2) Intermixing old and new requirements. Prior to October 1, 2002, it is recommended that the hazard communication requirements be consistent where practicable. Marking, labeling, placarding, and shipping paper descriptions should conform to either the old requirements of this subchapter in effect on September 30, 2001, or the new requirements of this subchapter in the June 21, 2001 final rule without intermixing communication elements. However, intermixing is permitted, during the applicable transition period,

for packaging, hazard communication, and handling provisions, as follows:

* * * * *

(4) Until January 1, 2010, a hazardous material may be transported in an IM or IMO portable tank in accordance with the T Codes (Special Provisions) assigned to a hazardous material in Column (7) of the HMT in effect on September 30, 2001.

(5) Until October 1, 2005, proper shipping names that included the word "inhibited" prior to the June 21, 2001 final rule in effect on October 1, 2001, may continue to be shown on packagings in place of "stabilized."

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

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

Authority: 49 U.S.C. 5101–5127; 49 CFR 1.53.

10–11. In § 172.101, paragraphs (b)(1) and (c)(11) are revised, new paragraphs (c)(16) and (k)(6) through (k)(20) are added, and the Hazardous Materials Table is revised to read as follows:

§ 172.101 Purpose and use of hazardous materials table.

* * * * *

(b) * * *

(1) The plus (+) sign fixes the proper shipping name, hazard class and packing group for that entry without regard to whether the material meets the definition of that class, packing group or any other hazard class definition. When the plus sign is assigned to a proper shipping name in Column (1) of the § 172.101 Table, it means that the material is known to pose a risk to humans. When a plus sign is assigned to mixtures or solutions containing a material where the hazard to humans is significantly different from that of the pure material or where no hazard to humans is posed, the material may be described using an alternative shipping name that represents the hazards posed by the material. An appropriate alternate proper shipping name and hazard class may be authorized by the Associate Administrator.

* * * * *

(c) * * *

(11) Except for a material subject to or prohibited by §§ 173.21, 173.54, 173.56(d), 173.56(e), 173.224(c) or 173.225(c) of this subchapter, a material that is considered to be a hazardous waste or a sample of a material for

which the hazard class is uncertain and must be determined by testing may be assigned a tentative proper shipping name, hazard class, identification number and packing group, if applicable, based on the shipper's tentative determination according to:

(i) Defining criteria in this subchapter;

(ii) The hazard precedence prescribed in § 173.2a of this subchapter;

(iii) The shippers knowledge of the material;

(iv) In addition to paragraphs (c)(11)(i) through (iii) of this section, for a sample of a material, other than a waste, the following must be met:

(A) Except when the word "Sample" already appears in the proper shipping name, the word "Sample" must appear in association with the basic description of a sample on the shipping paper;

(B) When the proper shipping description for a sample is assigned a "G" in Column (1) of the § 172.101 Table, and the primary constituent(s) for which the tentative classification is based are not known, the provisions requiring a technical name for the constituent(s) do not apply; and

(C) A sample must be transported in a combination packaging which conforms to the requirements of this subchapter that are applicable to the tentative packing group assigned, and may not exceed a net mass of 2.5 kg. (5.5 pounds) per package.

Note to Paragraph (c)(11): For the transportation of self-reactive, organic peroxide and explosive samples, see §§ 173.224(c)(3), 173.225(c)(2) and 173.56(d) of this subchapter, respectively.

* * * * *

(16) Unless it is already included in the proper shipping name in the § 172.101 Table, the qualifying words "liquid" or "solid" may be added in association with the proper shipping name when a hazardous material specifically listed by name in the § 172.101 Table may, due to the differing physical states of the various isomers of the material, be either a liquid or a solid (for example "Dinitrotoluenes, liquid" and "Dinitrotoluenes, solid"). Use of the words "liquid" or "solid" is subject to the limitations specified for the use of the words "mixture" or "solution" in paragraph (c)(10) of this section. The qualifying word "molten" may be added in association with the proper shipping name when a hazardous material, which is a solid in accordance with the definition in § 171.8 of this subchapter, is offered for transportation in the molten state (for example, "Alkylphenols, solid, n.o.s., molten").

* * * * *

(k) * * *

(6) Stowage category "01" means the material may be stowed "on deck" or "under deck" on a cargo vessel (up to 12 passengers) and on a passenger vessel.

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

(8) Stowage category "03" means the material may be stowed "on deck" or "under deck" on a cargo vessel (up to 12 passengers) and "on deck" in closed cargo transport units on a passenger vessel.

(9) Stowage category "04" means the material may be stowed "on deck" or "under deck" on a cargo vessel (up to 12 passengers) but the material is prohibited on a passenger vessel.

(10) Stowage category "05" means the material may be stowed "on deck" in closed cargo transport units or "under deck" on a cargo vessel (up to 12 passengers) and on a passenger vessel.

(11) Stowage category "06" means the material may be stowed "on deck" in closed cargo transport units or "under deck" on a cargo vessel (up to 12 passengers) and "on deck" in closed cargo transport units or "under deck" in closed cargo transport units on a passenger vessel.

(12) Stowage category "07" means the material may be stowed "on deck" in closed cargo transport units or "under deck" on a cargo vessel (up to 12 passengers) and "on deck" only in closed cargo transport units on a passenger vessel.

(13) Stowage category "08" means the material may be stowed "on deck" in closed cargo transport units or "under deck" on a cargo vessel (up to 12 passengers) but the material is prohibited on a passenger vessel.

(14) Stowage category "09" means the material may be stowed "on deck only" in closed cargo transport units or "under deck" in closed cargo transport units on a cargo vessel (up to 12 passengers) and on a passenger vessel.

(15) Stowage category "10" means the material may be stowed "on deck" in closed cargo transport units or "under deck" in closed cargo transport units on a cargo vessel (up to 12 passengers) and "on deck" only in closed cargo transport units on a passenger vessel.

(16) Stowage category "11" means the material may be stowed "on deck" in closed cargo transport units or "under deck" in magazine stowage type "c" on a cargo vessel (up to 12 passengers) and

“on deck” only in closed cargo transport units on a passenger vessel.

(17) Stowage category “12” means the material may be stowed “on deck” in closed cargo transport units or “under deck” in magazine stowage type “c” on a cargo vessel (up to 12 passengers) but the material is prohibited on a passenger vessel.

(18) Stowage category “13” means the material may be stowed “on deck” in

closed cargo transport units or “under deck” in magazine stowage type “A” on a cargo vessel (up to 12 passengers) and “on deck” only in closed cargo transport units on a passenger vessel.

(19) Stowage category “14” means the material may be stowed “on deck” in closed cargo transport units on a cargo vessel (up to 12 passengers) but the material is prohibited on a passenger vessel.

(20) Stowage category “15” means the material may be stowed “on deck” in closed cargo transport units or “under deck” in closed cargo transport units on a cargo vessel (up to 12 passengers) but the material is prohibited on a passenger vessel.

* * * * *

BILLING CODE 4910-60-P

§ 172.101 HAZARDOUS MATERIALS TABLE

| Sym-bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|----------|--|----------------------------|----------------------------|-----|-------------|---|--------------------------|----------|------|--------------------------|-----------------------|-----------------------|------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | <i>Accellerene, see p-Nitrosodimethylaniline.</i> | | | | | | | | | | | | |
| | <i>Accumulators, electric, see Batteries, wet etc.</i> | | | | | | | | | | | | |
| | Acetal | 3 | UN1088 | | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | E | |
| | Acetaldehyde | 3 | UN1089 | I | 3 | A3, B16, T11, TP2, TP7 | None | 201 | 243 | Forbidden | 30 L | E | |
| A | Acetaldehyde ammonia | 9 | UN1841 | III | 9 | IB8, IP6 | 155 | 204 | 240 | 200 kg | 200 kg | A | 34 |
| | Acetaldehyde oxime | 3 | UN2332 | III | 3 | B1, IB3, T4, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Acetic acid, glacial or Acetic acid solution, with more than 80 percent acid, by mass. | 8 | UN2789 | II | 8, 3 | A3, A6, A7, A10, B2, IB2, T7, TP2 | 154 | 202 | 243 | 1 L | 30 L | A | |
| | Acetic acid solution, not less than 50 percent but not more than 80 percent acid, by mass. | 8 | UN2790 | II | 8 | A3, A6, A7, A10, B2, IB2, T7, TP2 | 154 | 202 | 242 | 1 L | 30 L | A | |
| | Acetic acid solution, with more than 10 percent and less than 50 percent acid, by mass. | 8 | UN2790 | III | 8 | IB3, T4, TP1 | 154 | 203 | 242 | 5 L | 60 L | A | |
| | Acetic anhydride | 8 | UN1715 | II | 8, 3 | A3, A6, A7, A10, B2, IB2, T7, TP2 | 154 | 202 | 243 | 1 L | 30 L | A | 40 |
| | Acetone | 3 | UN1090 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | Acetone cyanohydrin, stabilized | 6.1 | UN1541 | I | 6.1 | 2, A3, B9, B14, B32, B76, B77, N34, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 25, 40, 49 |
| | Acetone oils | 3 | UN1091 | II | 3 | IB2, T4, TP1, TP8 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | Acetonitrile | 3 | UN1648 | II | 3 | IB2, T7, TP2 | 150 | 202 | 242 | 5L | 60 L | B | 40 |
| | Acetyl acetone peroxide with more than 9 percent by mass active oxygen. | Forbidden | | | | | | | | | | | |
| | Acetyl benzoyl peroxide, solid, or with more than 40 percent in solution. | Forbidden | | | | | | | | | | | |
| | Acetyl bromide | 8 | UN1716 | II | 8 | B2, IB2, T8, TP2, TP12 | 154 | 202 | 242 | 1 L | 30 L | C | 40 |
| | Acetyl chloride | 3 | UN1717 | II | 3, 8 | A3, A6, A7, IB1, N34, T8, TP2, TP12 | None | 202 | 243 | 1 L | 5 L | B | 40 |
| | Acetyl cyclohexanesulfonyl peroxide, with more than 82 percent wetted with less than 12 percent water. | Forbidden | | | | | | | | | | | |
| | Acetyl iodide | 8 | UN1898 | II | 8 | B2, IB2, T7, TP2, TP13 | 154 | 202 | 242 | 1 L | 30 L | C | 40 |
| | Acetyl methyl carbinol | 3 | UN2621 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Acetyl peroxide, solid, or with more than 25 percent in solution. | Forbidden | | | | | | | | | | | |
| | Acetylene, dissolved | 2.1 | UN1001 | | 2.1 | | None | 303 | None | Forbidden | 15 kg | D | 25, 40, 57 |
| | Acetylene (liquefied) | Forbidden | | | | | | | | | | | |
| | Acetylene silver nitrate | Forbidden | | | | | | | | | | | |
| | Acetylene tetrabromide, see Tetrabromoethane. | | | | | | | | | | | | |
| | Acid butyl phosphate, see Butyl acid phosphate. | | | | | | | | | | | | |
| | Acid, sludge, see Sludge acid | | | | | | | | | | | | |
| | Acridine | 6.1 | UN2713 | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | |
| | Acrolein dimer, stabilized | 3 | UN2607 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | 40 |
| | Acrolein, stabilized | 6.1 | UN1092 | I | 6.1, 3 | 1, B9, B14, B30, B42, B72, B77, T22, TP2, TP7, TP13, TP38, TP44 | None | 226 | 244 | Forbidden | Forbidden | D | 40 |
| | Acrylamide | 6.1 | UN2074 | III | 6.1 | IB8, IP3, T4, TP1 | 153 | 213 | 240 | 100 kg | 200 kg | A | 12 |
| | Acrylic acid, stabilized | 8 | UN2218 | II | 8, 3 | B2, IB2, T7, TP2 | 154 | 202 | 243 | 1 L | 30 L | C | 25, 40 |
| | Acrylonitrile, stabilized | 3 | UN1093 | I | 3, 6.1 | B9, T14, TP2, TP13 | None | 201 | 243 | Forbidden | 30 L | E | 40 |
| | Actuating cartridge, explosive, see Cartridges, power device. | | | | | | | | | | | | |
| | Adhesives, containing a flammable liquid. | 3 | UN1133 | I | 3 | B42, T11, TP1, TP8, TP27 | 150 | 201 | 243 | 1 L | 30 L | B | |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|--|----------------------------------|----------------------------------|-------|----------------|-------------------------------------|-----------------------------|----------|----------|-----------------------------|--------------------------|-----------------------------|------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
|  | ..... | ..... | ..... | II | 3 | B52, IB2, T4, TP1, TP8 | 150 | 173 | 242 | 5 L | 60 L | B | ..... |
|  | ..... | ..... | ..... | III | 3 | B1, B52, IB3, T2, TP1 | 150 | 173 | 242 | 60 L | 220 L | A | ..... |
| | Adiponitrile | 6.1 | UN2205 | III | 6.1 | IB3, T3, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | ..... |
| | Aerosols, corrosive, Packing Group II or III, (each not exceeding 1 L capacity). | 2.2 | UN1950 | ..... | 2.2, 8 | A34 | 306 | None | None | 75 kg | 150 kg | A | 40, 48, 85 |
| | Aerosols, flammable, (each not exceeding 1 L capacity). | 2.1 | UN1950 | ..... | 2.1 | N82 | 306 | None | None | 75 kg | 150 kg | A | 40, 48, 85 |
| | Aerosols, flammable, n.o.s. (engine starting fluid) (each not exceeding 1 L capacity). | 2.1 | UN1950 | ..... | 2.1 | N82 | 306 | None | None | Forbidden | 150 kg | A | 40, 48, 85 |
| | Aerosols, non-flammable, (each not exceeding 1 L capacity). | 2.2 | UN1950 | ..... | 2.2 | ..... | 306, 307 | None | None | 75 kg | 150 kg | A | 48, 85 |
| | Aerosols, poison, each not exceeding 1 L capacity. | 2.2 | UN1950 | ..... | 2.2 | ..... | 306 | None | None | Forbidden | Forbidden | A | 40, 48, 85 |
| | Air bag inflators, compressed gas or Air bag modules, compressed gas or Seat-belt pretensioners, compressed gas. | 2.2 | UN3353 | ..... | 2.2 | 133 | 166 | 166 | 166 | 75 kg | 150 kg | A | ..... |
| | Air bag inflators, pyrotechnic or Air bag modules, pyrotechnic or Seat-belt pretensioner, pyrotechnic. | 1.4G | UN0503 | II | 1.4G | ..... | 166 | 166 | 166 | Forbidden | 75 kg | 02 | 24E |
| | Air bag inflators, pyrotechnic or Air bag modules, pyrotechnic or Seat-belt pretensioner, pyrotechnic. | 9 | UN3268 | III | 9 | ..... | 166 | 166 | 166 | 25 kg | 100 kg | A | ..... |
| | Air, compressed | 2.2 | UN1002 | ..... | 2.2 | 78 | 306 | 302 | 302 | 75 kg | 150 kg | A | ..... |
| | Air, refrigerated liquid, (cryogenic liquid). | 2.2 | UN1003 | ..... | 2.2, 5.1 | T75, TP5, TP22 | 320 | 316 | 318, 319 | Forbidden | 150 kg | D | 51 |
| | Air, refrigerated liquid, (cryogenic liquid) non-pressurized. | 2.2 | UN1003 | ..... | 2.2, 5.1 | T75, TP5, TP22 | 320 | 316 | 318, 319 | Forbidden | Forbidden | D | 51 |
| | Aircraft engines (including turbines), see Engines, internal combustion. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Aircraft evacuation slides, see Life saving appliances etc. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Aircraft hydraulic power unit fuel tank (containing a mixture of anhydrous hydrazine and monomethyl hydrazine) (M86 fuel). | 3 | UN3165 | I | 3, 6.1, 8. | ..... | None | 172 | None | Forbidden | 42 L | E | ..... |
| | Aircraft survival kits, see Life saving appliances etc. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| G | Alcoholates solution, n.o.s., in alcohol. | 3 | UN3274 | II | 3, 8 | IB2 | None | 202 | 243 | 1 L | 5 L | B | ..... |
| | Alcoholic beverages | 3 | UN3065 | II | 3 | 24, B1, IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | A | ..... |
|  | ..... | ..... | ..... | III | 3 | 24, B1, IB3, N11, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Alcohols, n.o.s. | 3 | UN1987 | I | 3 | T11, TP1, TP8, TP27 | None | 201 | 243 | 1 L | 30 L | E | ..... |
|  | ..... | ..... | ..... | II | 3 | IB2, T7, TP1, TP8, TP28 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
|  | ..... | ..... | ..... | III | 3 | B1, IB3, T4, TP1, TP29 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| G | Alcohols, flammable, toxic, n.o.s. | 3 | UN1986 | I | 3, 6.1 | T14, TP2, TP13, TP27 | None | 201 | 243 | Forbidden | 30 L | E | 40 |
|  | ..... | ..... | ..... | II | 3, 6.1 | IB2, T11, TP2, TP27 | None | 202 | 243 | 1 L | 60 L | B | 40 |
|  | ..... | ..... | ..... | III | 3, 6.1 | B1, IB3, T7, TP1, TP28 | None | 203 | 242 | 60 L | 220 L | A | ..... |
| | Aldehydes, n.o.s. | 3 | UN1989 | I | 3 | T11, TP1, TP27 | None | 201 | 243 | 1 L | 30 L | E | ..... |
|  | ..... | ..... | ..... | II | 3 | IB2, T7, TP1, TP8, TP28 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
|  | ..... | ..... | ..... | III | 3 | B1, IB3, T4, TP1, TP29 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| G | Aldehydes, flammable, toxic, n.o.s. | 3 | UN1988 | I | 3, 6.1 | T14, TP2, TP13, TP27 | None | 201 | 243 | Forbidden | 30 L | E | 40 |
|  | ..... | ..... | ..... | II | 3, 6.1 | IB2, T11, TP2, TP27 | None | 202 | 243 | 1 L | 60 L | B | 40 |
|  | ..... | ..... | ..... | III | 3, 6.1 | B1, IB3, T7, TP1, TP28 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Aldol | 6.1 | UN2839 | II | 6.1 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | A | 12 |
| G | Alkali metal alcoholates, self-heating, corrosive, n.o.s. | 4.2 | UN3206 | II | 4.2, 8 | 64, IB5, IP2 | None | 212 | 242 | 15 kg | 50 kg | B | ..... |
|  | ..... | ..... | ..... | III | 4.2, 8 | 64, IB8, IP3 | None | 213 | 242 | 25 kg | 100 kg | B | ..... |
| | Alkali metal alloys, liquid, n.o.s. | 4.3 | UN1421 | I | 4.3 | A2, A3, B48, N34 | None | 201 | 244 | Forbidden | 1 L | D | ..... |
| | Alkali metal amalgam, liquid | 4.3 | UN1389 | I | 4.3 | A2, A3, N34 | None | 201 | 244 | Forbidden | 1 L | D | 40 |
| | Alkali metal amalgam, solid | 4.3 | UN1389 | I | 4.3 | IB4, IP1, N40 | None | 211 | 242 | Forbidden | 15 kg | D | ..... |
| | Alkali metal amides | 4.3 | UN1390 | II | 4.3 | A6, A7, A8, A19, A20, IB7, IP2 | 151 | 212 | 241 | 15 kg | 50 kg | E | 40 |
| | Alkali metal dispersions, or Alkaline earth metal dispersions. | 4.3 | UN1391 | I | 4.3 | A2, A3 | None | 201 | 244 | Forbidden | 1 L | D | ..... |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | | |
|--|--|----------------------------------|----------------------------------|-----|--------------------|---|------------------------------|----------|------|-----------------------------|--------------------------|-----------------------------|-------|----|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) | |
| G | <i>Alkaline corrosive liquids, n.o.s., see Caustic alkali liquids, n.o.s.</i> | 4.2 | UN3205 | II | 4.2 | 65, IB6, IP2 | None | 212 | 241 | 15 kg | 50 kg | B | | |
| | Alkaline earth metal alcoholates, n.o.s. | | | | 4.2 | 65, IB8, IP3 | None | 213 | 241 | 25 kg | 100 kg | B | | |
| | Alkaline earth metal alloys, n.o.s. | | | | 4.3 | A19, IB7, IP2 | 151 | 212 | 241 | 15 kg | 50 kg | E | | |
| G | Alkaline earth metal amalgams | 4.3 | UN1392 | I | 4.3 | A19, IB4, IP1, N34, N40 | None | 211 | 242 | Forbidden | 15 kg | D | | |
| | Alkaloids, liquid, n.o.s., or Alkaloid salts, liquid, n.o.s. | 6.1 | UN3140 | I | 6.1 | A4, T14, TP2, TP27 | None | 201 | 243 | 1 L | 30 L | A | | |
| | | | | | 6.1 | IB2, T11, TP2, TP27 | None | 202 | 243 | 5 L | 60 L | A | | |
| | 6.1 | | | | IB3, T7, TP1, TP28 | 153 | 203 | 241 | 60 L | 220 L | A | | | |
| G | Alkaloids, solid, n.o.s. or Alkaloid salts, solid, n.o.s. <i>poisonous.</i> | 6.1 | UN1544 | I | 6.1 | IB7, IP1 | None | 211 | 242 | 5 kg | 50 kg | A | | |
| | | 8 | UN2584 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | | |
| Alkyl sulfonic acids, liquid or Aryl sulfonic acids, liquid with more than 5 percent free sulfuric acid. | 8 | | | | 8 | B2, IB2, T8, TP2, TP12, TP13 | 153 | 213 | 240 | 100 kg | 200 kg | A | | |
| | Alkyl sulfonic acids, liquid or Aryl sulfonic acids, liquid with not more than 5 percent free sulfuric acid. | 8 | UN2586 | III | 8 | IB3, T4, TP1 | 154 | 203 | 241 | 5 L | 60 L | B | | |
| | Alkyl sulfonic acids, solid or Aryl sulfonic acids, solid, with more than 5 percent free sulfuric acid. | 8 | UN2583 | II | 8 | IB8, IP2, IP4 | 154 | 212 | 240 | 15 kg | 50 kg | A | | |
| | Alkyl sulfonic acids, solid or Aryl sulfonic acids, solid with not more than 5 percent free sulfuric acid. | 8 | UN2585 | III | 8 | IB8, IP3 | 154 | 213 | 240 | 25 kg | 100 kg | A | | |
| | Alkylphenols, liquid, n.o.s. (<i>including C2-C12 homologues.</i>) | 8 | UN3145 | I | 8 | T14, TP2 | None | 201 | 243 | 0.5 L | 2.5 L | B | | |
| | | | | | 8 | 8 | IB2, T11, TP2, TP27 | 154 | 202 | 242 | 1 L | 30 L | B | |
| | | | | | 8 | 8 | IB3, T7, TP1, TP28 | 154 | 203 | 241 | 5 L | 60 L | A | |
| | Alkylphenols, solid, n.o.s. (<i>including C2-C12 homologues.</i>) | 8 | UN2430 | I | 8 | IB7, IP1, T10, TP2, TP28 | None | 211 | 242 | 1 kg | 25 kg | B | | |
| | | 8 | UN2571 | II | 8 | IB8, IP2, IP4, T3, TP2 | 154 | 212 | 240 | 15 kg | 50 kg | B | | |
| | | | | | 8 | 8 | IB8, IP3, T3, TP1 | 154 | 213 | 240 | 25 kg | 100 kg | A | |
| | | | | | 8 | 8 | B2, IB2, T8, TP2, TP12, TP13 | 154 | 202 | 242 | 1 L | 30 L | C | 14 |
| | <i>Allethrin, see Pesticides, liquid, toxic, n.o.s.</i> | | | | | | | | | | | | | |
| | Allyl acetate | 3 | UN2333 | II | 3, 6.1 | IB2, T7, TP1, TP13 | None | 202 | 243 | 1 L | 60 L | E | 40 | |
| | Allyl alcohol | 6.1 | UN1098 | I | 6.1, 3 | 2, B9, B14, B32, B74, B77, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 40 | |
| | Allyl bromide | 3 | UN1099 | I | 3, 6.1 | T14, TP2, TP13 | None | 201 | 243 | Forbidden | 30 L | B | 40 | |
| | Allyl chloride | 3 | UN1100 | I | 3, 6.1 | T14, TP2, TP13 | None | 201 | 243 | Forbidden | 30 L | E | 40 | |
| | <i>Allyl chlorocarbonate, see Allyl chloroformate.</i> | | | | | | | | | | | | | |
| | Allyl chloroformate | 6.1 | UN1722 | I | 6.1, 3, 8 | 2, A3, B9, B14, B32, B74, N41, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 40 | |
| | Allyl ethyl ether | 3 | UN2335 | II | 3, 6.1 | IB2, T7, TP1, TP13 | None | 202 | 243 | 1 L | 60 L | E | 40 | |
| | Allyl formate | 3 | UN2336 | I | 3, 6.1 | T14, TP2, TP13 | None | 201 | 243 | Forbidden | 30 L | E | 40 | |
| | Allyl glycidyl ether | 3 | UN2219 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | | |
| | Allyl iodide | 3 | UN1723 | II | 3, 8 | A3, A6, IB1, N34, T7, TP2, TP13 | None | 202 | 243 | 1 L | 5 L | B | 40 | |
| | Allyl isothiocyanate, stabilized | 6.1 | UN1545 | II | 6.1, 3 | A3, A7, IB2, T7, TP2 | None | 202 | 243 | Forbidden | 60 L | D | 40 | |
| | Allylamine | 6.1 | UN2334 | I | 6.1, 3 | 2, B9, B14, B32, B74, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 40 | |
| | Allyltrichlorosilane, stabilized | 8 | UN1724 | II | 8, 3 | A7, B2, B6, IB2, N34, T7, TP2, TP13 | None | 202 | 243 | Forbidden | 30 L | C | 40 | |
| | Aluminum alkyl halides | 4.2 | UN3052 | I | 4.2, 4.3 | B9, B11, T21, TP2, TP7 | None | 181 | 244 | Forbidden | Forbidden | D | | |
| | Aluminum alkyl hydrides | 4.2 | UN3076 | I | 4.2, 4.3 | B9, B11, T21, TP2, TP7 | None | 181 | 244 | Forbidden | Forbidden | D | | |
| | Aluminum alkyls | 4.2 | UN3051 | I | 4.2, 4.3 | B9, B11, T21, TP2, TP7 | None | 181 | 244 | Forbidden | Forbidden | D | | |
| | Aluminum borohydride or Aluminum borohydride in devices. | 4.2 | UN2870 | I | 4.2, 4.3 | B11 | None | 181 | 244 | Forbidden | Forbidden | D | | |
| | Aluminum bromide, anhydrous | 8 | UN1725 | II | 8 | IB8, IP2, IP4 | 154 | 212 | 240 | 15 kg | 50 kg | A | 40 | |
| | Aluminum bromide, solution | 8 | UN2580 | III | 8 | IB3, T4, TP1 | 154 | 203 | 241 | 5 L | 60 L | A | | |
| | Aluminum carbide | 4.3 | UN1394 | II | 4.3 | A20, IB7, IP2, N41 | 151 | 212 | 242 | 15 kg | 50 kg | A | | |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--|--|----------------------------------|----------------------------------|--------|-------------------------------------|-------------------------------------|-----------------------------|----------|-----------|-----------------------------|--------------------------|-----------------------------|----------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| D | Aluminum chloride, anhydrous | 8 | UN1726 | II | 8 | IB8, IP2, IP4 | 154 | 212 | 240 | 15 kg | 50 kg | A | 40 |
| | Aluminum chloride, solution | 8 | UN2581 | III | 8 | IB3, T4, TP1 | 154 | 203 | 241 | 5 L | 60 L | A | |
| | Aluminum dross, wet or hot | Forbidden | | | | | | | | | | | |
| | Aluminum ferrosilicon powder | 4.3 | UN1395 | II | 4.3, 6.1 | A19, IB5, IP2 | 151 | 212 | 242 | 15 kg | 50 kg | A | 40, 85, 103 |
| | | | | III | 4.3, 6.1 | A19, A20, IB4 | 151 | 213 | 241 | 25 kg | 100 kg | A | 40, 85, 103 |
| | Aluminum hydride | 4.3 | UN2463 | I | 4.3 | A19, N40 | None | 211 | 242 | Forbidden | 15 kg | E | |
| | Aluminum, molten | 9 | NA9260 | III | 9 | IB3, T1, TP3 | None | None | 247 | Forbidden | Forbidden | D | |
| | Aluminum nitrate | 5.1 | UN1438 | III | 5.1 | A1, A29, IB8, IP3 | 152 | 213 | 240 | 25 kg | 100 kg | A | |
| | Aluminum phosphate solution, see Corrosive liquids, etc. | | | | | | | | | | | | |
| | Aluminum phosphide | 4.3 | UN1397 | I | 4.3, 6.1 | A8, A19, N40 | None | 211 | 242 | Forbidden | 15 kg | E | 40, 85 |
| | Aluminum phosphide pesticides .. | 6.1 | UN3048 | I | 6.1 | A8, IB7, IP1 | None | 211 | 242 | Forbidden | 15 kg | E | 40, 85 |
| | Aluminum powder, coated | 4.1 | UN1309 | II | 4.1 | IB8, IP2, IP4 | 151 | 212 | 240 | 15 kg | 50 kg | A | 13, 39, 101 |
| | | | | III | 4.1 | IB8, IP3 | 151 | 213 | 240 | 25 kg | 100 kg | A | 13, 39, 101 |
| | Aluminum powder, uncoated | 4.3 | UN1396 | II | 4.3 | A19, A20, IB7, IP2 | 151 | 212 | 242 | 15 kg | 50 kg | A | 39 |
| | | | | III | 4.3 | A19, A20, IB8, IP4 | 151 | 213 | 241 | 25 kg | 100 kg | A | 39 |
| Aluminum resinate | 4.1 | UN2715 | III | 4.1 | IB6 | 151 | 213 | 240 | 25 kg | 100 kg | A | | |
| Aluminum silicon powder, uncoated. | 4.3 | UN1398 | III | 4.3 | A1, A19, IB8, IP4 | 151 | 213 | 241 | 25 kg | 100 kg | A | 40, 85, 103 | |
| Aluminum smelting by-products or Aluminum remelting by-pro- ducts. | 4.3 | UN3170 | II | 4.3 | 128, B115, IB7, IP2 | None | 212 | 242 | 15 kg | 50 kg | B | 85, 103 | |
| ..... |  |  | III | 4.3 | 128, B115, IB8, IP4 | None | 213 | 241 | 25 kg | 100 kg | B | 85, 103 | |
| Amatols, see Explosives, blasting, type B. | | | | | | | | | | | | | |
| G Amines, flammable, corrosive, n.o.s. or Polyamines, flam- mable, corrosive, n.o.s.. | 3 | UN2733 | I | 3, 8 | T14, TP1, TP27 | None | 201 | 243 | 0.5 L | 2.5 L | D | 40 | |
| ..... |  |  | II | 3, 8 | IB2, T11, TP1, TP27 | None | 202 | 243 | 1 L | 5 L | B | 40 | |
| ..... |  |  | III | 3, 8 | B1, IB3, T7, TP1, TP28 | 150 | 203 | 242 | 5 L | 60 L | A | 40 | |
| G Amines, liquid, corrosive, flam- mable, n.o.s. or Polyamines, liquid, corrosive, flammable, n.o.s.. | 8 | UN2734 | I | 8, 3 | A3, A6, N34, T14, TP2, TP27 | None | 201 | 243 | 0.5 L | 2.5 L | A | | |
| ..... |  |  | II | 8, 3 | IB2, T11, TP2, TP27 | None | 202 | 243 | 1 L | 30 L | A | | |
| G Amines, liquid, corrosive, n.o.s. or Polyamines, liquid, corrosive, n.o.s.. | 8 | UN2735 | I | 8 | A3, A6, B10, N34, T14, TP2, TP27 | None | 201 | 243 | 0.5 L | 2.5 L | A | | |
| ..... |  |  | II | 8 | B2, IB2, T11, TP1, TP27 | 154 | 202 | 242 | 1 L | 30 L | A | | |
| ..... |  |  | III | 8 | IB3, T7, TP1, TP28 | 154 | 203 | 241 | 5 L | 60 L | A | | |
| G Amines, solid, corrosive, n.o.s., or Polyamines, solid, corrosive n.o.s.. | 8 | UN3259 | I | 8 | IB7, IP1 | None | 211 | 242 | 1 kg | 25 kg | A | | |
| ..... |  |  | II | 8 | IB8, IP2, IP4 | 154 | 212 | 240 | 15 kg | 50 kg | A | | |
| ..... |  |  | III | 8 | IB8, IP3 | 154 | 213 | 240 | 25 kg | 100 kg | A | | |
| 2-Amino-4-chlorophenol | 6.1 | UN2673 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | | |
| 2-Amino-5-diethylaminopentane .. | 6.1 | UN2946 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | | |
| 2-Amino-4,6-Dinitrophenol, wetted with not less than 20 percent water by mass. | 4.1 | UN3317 | I | 4.1 | 23, A8, A19, A20, N41 | None | 211 | None | 1 kg | 15 kg | E | 28, 36 | |
| 2-(2-Aminoethoxy) ethanol | 8 | UN3055 | III | 8 | IB3, T4, TP1 | 154 | 203 | 241 | 5 L | 60 L | A | | |
| N-Aminoethylpiperazine | 8 | UN2815 | III | 8 | IB3, T4, TP1 | 154 | 203 | 241 | 5 L | 60 L | A | 12 | |
| + Aminophenols (o-; m-; p-) | 6.1 | UN2512 | III | 6.1 | IB8, IP3, T4, TP1 | 153 | 213 | 240 | 100 kg | 200 kg | A | | |
| Aminopropylmethanamine, see Amines, etc. | | | | | | | | | | | | | |
| n-Aminopropylmorpholine, see Amines, etc. | | | | | | | | | | | | | |
| Aminopyridines (o-; m-; p-) | 6.1 | UN2671 | II | 6.1 | IB8, IP2, IP4, T7, TP2 | None | 212 | 242 | 25 kg | 100 kg | B | 12, 40 | |
| I Ammonia, anhydrous | 2.3 | UN1005 | | 2.3, 8 | 4, T50 | None | 304 | 314, 315 | Forbidden | 25 kg | D | 40, 57 | |
| D Ammonia, anhydrous | 2.2 | UN1005 | | 2.2 | 13, T50 | None | 304 | 314, 315 | Forbidden | 25 kg | D | 40, 57 | |
| D Ammonia solution, relative den- sity less than 0.880 at 15 de- grees C in water, with more than 50 percent ammonia. | 2.2 | UN3318 | | 2.2 | 13, T50 | None | 304 | 314, 315 | Forbidden | 25 kg | D | 40, 57 | |
| I Ammonia solution, relative den- sity less than 0.880 at 15 de- grees C in water, with more than 50 percent ammonia. | 2.3 | UN3318 | | 2.3, 8 | 4, T50 | None | 304 | 314, 315 | Forbidden | 25 kg | D | 40, 57 | |
| Ammonia solutions, relative den- sity between 0.880 and 0.957 at 15 degrees C in water, with more than 10 percent but not more than 35 percent ammonia. | 8 | UN2672 | III | 8 | IB3, T7, TP1 | 154 | 203 | 241 | 5 L | 60 L | A | 40, 85 | |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym-bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|----------|---|----------------------------|----------------------------|-------|-------------|-------------------------------|--------------------------|----------|----------|--------------------------|-----------------------|-----------------------|-----------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | Ammonia solutions, <i>relative density less than 0.880 at 15 degrees C in water, with more than 35 percent but not more than 50 percent ammonia.</i> | 2.2 | UN2073 | ..... | 2.2 | ..... | 306 | 304 | 314, 315 | Forbidden | 150 kg | E | 40, 57 |
| | Ammonium arsenate | 6.1 | UN1546 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | ..... |
| | Ammonium azide | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Ammonium bifluoride, solid, see Ammonium hydrogen difluoride, solid. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Ammonium bifluoride solution, see Ammonium hydrogen difluoride, solution. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Ammonium bromate | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Ammonium chlorate | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Ammonium dichromate | 5.1 | UN1439 | II | 5.1 | IB8, IP2, IP4 | 152 | 212 | 242 | 5 kg | 25 kg | A | ..... |
| | Ammonium dinitro-o-cresolate | 6.1 | UN1843 | II | 6.1 | IB8, IP2, IP4, T7, TP2 | None | 212 | 242 | 25 kg | 100 kg | B | 36, 65, 66, 77 |
| | Ammonium fluoride | 6.1 | UN2505 | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | 26 |
| | Ammonium fluorosilicate | 6.1 | UN2854 | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | 26 |
| | Ammonium fulminate | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Ammonium hydrogen sulfate | 8 | UN2506 | II | 8 | IB8, IP2, IP4 | 154 | 212 | 240 | 15 kg | 50 kg | A | 40 |
| | Ammonium hydrogendifluoride, solid. | 8 | UN1727 | II | 8 | IB8, IP2, IP4, N34 | 154 | 212 | 240 | 15 kg | 50 kg | A | 25, 26, 40 |
| | Ammonium hydrogendifluoride, solution. | 8 | UN2817 | II | 8, 6.1 | IB2, N34, T8, TP2, TP12, TP13 | None | 202 | 243 | 1 L | 30 L | B | 40 |
|  | ..... | ..... | ..... | III | 8, 6.1 | IB3, T4, TP1, TP12, TP13 | 154 | 203 | 241 | 5 L | 60 L | B | 40, 95 |
| | Ammonium hydrosulfide, solution, see Ammonium sulfide solution. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| D | Ammonium hydroxide, see Ammonia solutions, etc. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Ammonium metavanadate | 6.1 | UN2859 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | ..... |
| D | Ammonium nitrate fertilizers | 5.1 | NA2072 | III | 5.1 | 7, IB8 | 152 | 213 | 240 | 25 kg | 100 kg | B | 48, 59, 60, 117 |
| | Ammonium nitrate fertilizers; <i>uniform non-segregating mixtures of ammonium nitrate with added matter which is inorganic and chemically inert towards ammonium nitrate, with not less than 90 percent ammonium nitrate and not more than 0.2 percent combustible material (including organic material calculated as carbon), or with more than 70 percent but less than 90 percent ammonium nitrate and not more than 0.4 percent total combustible material.</i> | 5.1 | UN2067 | III | 5.1 | 52, IB8, IP3 | 152 | 213 | 240 | 25 kg | 100 kg | B | 48, 59, 60, 117 |
| A W | Ammonium nitrate fertilizers; <i>uniform non-segregating mixtures of nitrogen/phosphate or nitrogen/postash types or complete fertilizers of nitrogen/phosphate/postash type, with not more than 70 percent ammonium nitrate and not more than 0.4 percent total added combustible material or with not more than 45 percent ammonium nitrate with unrestricted combustible material.</i> | 9 | UN2071 | III | 9 | 132, IB8 | 155 | 213 | 240 | 200 kg | 200 kg | A | ..... |
| D | Ammonium nitrate-fuel oil mixture containing only prilled ammonium nitrate and fuel oil. | 1.5D | NA0331 | II | 1.5D | ..... | None | 62 | None | Forbidden | Forbidden | 10 | 19E |
| | Ammonium nitrate, liquid (<i>hot concentrated solution</i>). | 5.1 | UN2426 | ..... | 5.1 | B5, T7 | None | None | 243 | Forbidden | Forbidden | D | 59, 60 |
| D | Ammonium nitrate mixed fertilizers | 5.1 | NA2069 | III | 5.1 | 10, IB8 | 152 | 213 | 240 | 25 kg | 100 kg | B | 48, 59, 60, 117 |
| | Ammonium nitrate, <i>with more than 0.2 percent combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance.</i> | 1.1D | UN0222 | II | 1.1D | ..... | None | 62 | None | Forbidden | Forbidden | 10 | 19E |
| | Ammonium nitrate, <i>with not more than 0.2 percent of combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance.</i> | 5.1 | UN1942 | III | 5.1 | A1, A29, IB8, IP3 | 152 | 213 | 240 | 25 kg | 100 kg | A | 48, 59, 60, 116 |
| | Ammonium nitrite | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Ammonium perchlorate | 1.1D | UN0402 | II | 1.1D | 107 | None | 62 | None | Forbidden | Forbidden | 10 | 19E |
| | Ammonium perchlorate | 5.1 | UN1442 | II | 5.1 | 107, A9, IB6, IP2 | 152 | 212 | 242 | 5 kg | 25 kg | E | 58, 69, 106 |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|--|----------------------------------|----------------------------------|-----|----------------|-------------------------------------|-----------------------------|----------|------|-----------------------------|--------------------------|-----------------------------|----------------------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | <i>Ammonium permanganate</i> | Forbidden | | | | | | | | | | | |
| | <i>Ammonium persulfate</i> | 5.1 | UN1444 | III | 5.1 | A1, A29, IB8, IP3 | 152 | 213 | 240 | 25 kg | 100 kg | A | |
| | <i>Ammonium picrate, dry or wetted with less than 10 percent water, by mass.</i> | 1.1D | UN0004 | II | 1.1D | | None | 62 | None | Forbidden | Forbidden | 10 | 5E, 19E |
| | <i>Ammonium picrate, wetted with not less than 10 percent water, by mass.</i> | 4.1 | UN1310 | I | 4.1 | 23, A2, N41 | None | 211 | None | 0.5 kg | 0.5 kg | D | 28, 36 |
| | <i>Ammonium polysulfide, solution</i> .. | 8 | UN2818 | II | 8, 6.1 | IB2, T7, TP2, TP13 | None | 202 | 243 | 1 L | 30 L | B | 12, 26, 40 |
|  | ..... |  |  | III | 8, 6.1 | IB3, T4, TP1, TP13 | 154 | 203 | 241 | 5 L | 60 L | B | 12, 26, 40 |
| | <i>Ammonium polyvanadate</i> | 6.1 | UN2861 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | <i>Ammonium silicofluoride, see Am- monium fluorosilicate.</i> | | | | | | | | | | | | |
| | <i>Ammonium sulfide solution</i> | 8 | UN2683 | II | 8, 6.1, 3. | IB1, T7, TP2, TP13 | None | 202 | 243 | 1 L | 30 L | B | 12, 22, 26, 100 |
| | <i>Ammunition, blank, see Car- tridges for weapons, blank.</i> | | | | | | | | | | | | |
| | <i>Ammunition, illuminating with or without burster, expelling charge or propelling charge.</i> | 1.2G | UN0171 | II | 1.2G | | | 62 | None | Forbidden | Forbidden | 03 | |
| | <i>Ammunition, illuminating with or without burster, expelling charge or propelling charge.</i> | 1.3G | UN0254 | II | 1.3G | | | 62 | None | Forbidden | Forbidden | 03 | |
| | <i>Ammunition, illuminating with or without burster, expelling charge or propelling charge.</i> | 1.4G | UN0297 | II | 1.4G | | | 62 | None | Forbidden | 75 kg | 02 | |
| | <i>Ammunition, incendiary liquid or gel, with burster, expelling charge or propelling charge.</i> | 1.3J | UN0247 | II | 1.3J | | | 62 | None | Forbidden | Forbidden | 04 | 23E |
| | <i>Ammunition, incendiary (water-acti- vated contrivances) with burst- er, expelling charge or propel- ling charge, see Contrivances, water-activated, etc..</i> | | | | | | | | | | | | |
| | <i>Ammunition, incendiary, white phosphorus, with burster, ex- pelling charge or propelling charge.</i> | 1.2H | UN0243 | II | 1.2H | | | 62 | None | Forbidden | Forbidden | 08 | 8E, 14E, 15E, 17E |
| | <i>Ammunition, incendiary, white phosphorus, with burster, ex- pelling charge or propelling charge.</i> | 1.3H | UN0244 | II | 1.3H | | | 62 | None | Forbidden | Forbidden | 08 | 8E, 14E, 15E, 17E |
| | <i>Ammunition, incendiary with or without burster, expelling charge, or propelling charge.</i> | 1.2G | UN0009 | II | 1.2G | | | 62 | None | Forbidden | Forbidden | 03 | |
| | <i>Ammunition, incendiary with or without burster, expelling charge, or propelling charge.</i> | 1.3G | UN0010 | II | 1.3G | | | 62 | None | Forbidden | Forbidden | 03 | |
| | <i>Ammunition, incendiary with or without burster, expelling charge or propelling charge.</i> | 1.4G | UN0300 | II | 1.4G | | | 62 | None | Forbidden | 75 kg | 02 | |
| | <i>Ammunition, practice</i> | 1.4G | UN0362 | II | 1.4G | | | 62 | None | Forbidden | 75 kg | 02 | |
| | <i>Ammunition, practice</i> | 1.3G | UN0488 | II | 1.3G | | | 62 | None | Forbidden | Forbidden | 03 | |
| | <i>Ammunition, proof</i> | 1.4G | UN0363 | II | 1.4G | | | 62 | None | Forbidden | 75 kg | 02 | |
| | <i>Ammunition, rocket, see War- heads, rocket etc.</i> | | | | | | | | | | | | |
| | <i>Ammunition, SA (small arms), see Cartridges for weapons, etc.</i> | | | | | | | | | | | | |
| | <i>Ammunition, smoke (water-acti- vated contrivances), white phosphorus, with burster, ex- pelling charge or propelling charge, see Contrivances, water-activated, etc. (UN 0248).</i> | | | | | | | | | | | | |
| | <i>Ammunition, smoke (water-acti- vated contrivances), without white phosphorus or phosphides, with burster, expel- ling charge or propelling charge, see Contrivances, water-activated, etc. (UN 0249).</i> | | | | | | | | | | | | |
| | <i>Ammunition smoke, white phos- phorus with burster,expelling charge, or propelling charge.</i> | 1.2H | UN0245 | II | 1.2H | | | 62 | None | Forbidden | Forbidden | 08 | 8E, 14E, 15E, 17E |
| | <i>Ammunition, smoke, white phos- phorus with burster, expelling charge, or propelling charge.</i> | 1.3H | UN0246 | II | 1.3H | | | 62 | None | Forbidden | Forbidden | 08 | 8E, 14E, 15E, 17E |
| | <i>Ammunition, smoke with or with- out burster, expelling charge or propelling charge.</i> | 1.2G | UN0015 | II | 1.2G, 8 | | | 62 | None | Forbidden | Forbidden | | 8E, 17E, 20E |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|--|----------------------------------|----------------------------------|-----|---------------------|---|-----------------------------|-----------|------------|-----------------------------|--------------------------|-----------------------------|--------------------------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | Ammunition, smoke with or without burster, expelling charge or propelling charge. | 1.3G | UN0016 | II | 1.3G, 8 |  | ..... | 62 | None | Forbidden | Forbidden | | 8E, 17E, 20E |
| | Ammunition, smoke with or without burster, expelling charge or propelling charge. | 1.4G | UN0303 | II | 1.4G, 8 |  | ..... | 62 | None | Forbidden | 75 kg | | 7E, 8E, 14E, 15E, 17E |
| | Ammunition, sporting, see Cartridges for weapons, etc. (UN 0012; UN 0328; UN 0339). |  |  |  |  |  | ..... | ..... | ..... | ..... | ..... |  |  |
| | Ammunition, tear-producing, non-explosive, without burster or expelling charge, non-fuzed. | 6.1 | UN2017 | II | 6.1, 8 | | None | 212 | None | Forbidden | 50 kg | E | 13, 40 |
| | Ammunition, tear-producing with burster, expelling charge or propelling charge. | 1.2G | UN0018 | II | 1.2G, 8, 6.1. |  | ..... | 62 | None | Forbidden | Forbidden | | 8E, 17E, 20E |
| | Ammunition, tear-producing with burster, expelling charge or propelling charge. | 1.3G | UN0019 | II | 1.3G, 8, 6.1. |  | ..... | 62 | None | Forbidden | Forbidden | | 8E, 17E, 20E |
| | Ammunition, tear-producing with burster, expelling charge or propelling charge. | 1.4G | UN0301 | II | 1.4G, 8, 6.1. |  | ..... | 62 | None | Forbidden | 75 kg | | 7E, 8E, 14E, 15E, 17E |
| | Ammunition, toxic, non-explosive, without burster or expelling charge, non-fuzed. | 6.1 | UN2016 | II | 6.1 | | None | 212 | None | Forbidden | 100 kg | E | 13, 40 |
| | Ammunition, toxic (water-activated contrivances), with burster, expelling charge or propelling charge, see Contrivances, water-activated, etc. |  |  |  |  |  | ..... | ..... | ..... | ..... | ..... |  |  |
| G | Ammunition, toxic with burster, expelling charge, or propelling charge. | 1.2K | UN0020 | II | 1.2K, 6.1. |  | ..... | 62 | None | Forbidden | Forbidden | 08 | 8E, 14E, 15E, 17E |
| G | Ammunition, toxic with burster, expelling charge, or propelling charge. | 1.3K | UN0021 | II | 1.3K, 6.1. |  | ..... | 62 | None | Forbidden | Forbidden | 08 | 8E, 14E, 15E, 17E |
| | Amyl acetates | 3 | UN1104 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Amyl acid phosphate | 8 | UN2819 | III | 8 | IB3, T4, TP1 | 154 | 203 | 241 | 5 L | 60 L | A | |
| | Amyl butyrates | 3 | UN2620 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Amyl chlorides | 3 | UN1107 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | Amyl formates | 3 | UN1109 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Amyl mercaptans | 3 | UN1111 | II | 3 | A3, IB2, T4, TP1 | None | 202 | 242 | 5 L | 60 L | B | 95, 102 |
| | n-Amyl methyl ketone | 3 | UN1110 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Amyl nitrate | 3 | UN1112 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | 40 |
| | Amyl nitrites | 3 | UN1113 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | E | 40 |
| | Amylamines | 3 | UN1106 | II | 3, 8 | IB2, T7, TP1 | None | 202 | 243 | 1 L | 5 L | B | |
|  | ..... |  |  | III | 3, 8 | B1, IB3, T4, TP1 | 150 | 203 | 242 | 5 L | 60 L | A | |
| | Amyltrichlorosilane | 8 | UN1728 | II | 8 | A7, B2, B6, IB2, N34, T7, TP2, TP13 | None | 202 | 242 | Forbidden | 30 L | C | 40 |
| | Anhydrous ammonia, see Ammonia, anhydrous. |  |  |  |  |  | ..... | ..... | ..... | ..... | ..... |  |  |
| | Anhydrous hydrofluoric acid, see Hydrogen fluoride, anhydrous. |  |  |  |  |  | ..... | ..... | ..... | ..... | ..... |  |  |
| + | Aniline | 6.1 | UN1547 | II | 6.1 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | A | 40 |
| | Aniline hydrochloride | 6.1 | UN1548 | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | |
| | Aniline oil, see Aniline ..... |  |  |  |  |  | ..... | ..... | ..... | ..... | ..... |  |  |
| | Anisidines | 6.1 | UN2431 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | |
| | Anisole | 3 | UN2222 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Anisoyl chloride | 8 | UN1729 | II | 8 | B2, IB2, T7, TP2 | 154 | 202 | 242 | 1 L | 30 L | C | 40 |
| | Anti-freeze, liquid, see Flammable liquids, n.o.s.. |  |  |  |  |  | ..... | ..... | ..... | ..... | ..... |  |  |
| | Antimonous chloride, see Antimony trichloride. |  |  |  |  |  | ..... | ..... | ..... | ..... | ..... |  |  |
| | 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 | |
| | Antimony compounds, inorganic, solid, n.o.s.. | 6.1 | UN1549 | III | 6.1 | 35, IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | |
| | Antimony lactate | 6.1 | UN1550 | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | |
| | Antimony pentachloride, liquid | 8 | UN1730 | II | 8 | B2, IB2, T7, TP2 | None | 202 | 242 | 1 L | 30 L | C | 40 |
| | Antimony pentachloride, solutions | 8 | UN1731 | II | 8 | B2, IB2, T7, TP2 | 154 | 202 | 242 | 1 L | 30 L | C | 40 |
|  | ..... |  |  | III | 8 | IB3, T4, TP1 | 154 | 203 | 241 | 5 L | 60 L | C | 40 |
| | Antimony pentafluoride | 8 | UN1732 | II | 8, 6.1 | A3, A6, A7, A10, IB2, N3, T7, TP2 | None | 202 | 243 | Forbidden | 30 L | D | 40 |
| | Antimony potassium tartrate | 6.1 | UN1551 | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | |
| | Antimony powder | 6.1 | UN2871 | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | |
| | Antimony sulfide and a chlorate, mixtures of. | Forbidden |  |  |  |  | ..... | ..... | ..... | ..... | ..... |  |  |
| | Antimony sulfide, solid, see Antimony compounds, inorganic, n.o.s.. |  |  |  |  |  | ..... | ..... | ..... | ..... | ..... |  |  |
| | Antimony trichloride, liquid | 8 | UN1733 | II | 8 | B2, IB2 | 154 | 202 | 242 | 1 L | 30 L | C | 40 |
| | Antimony trichloride, solid | 8 | UN1733 | II | 8 | IB8, IP2, IP4 | 154 | 212 | 240 | 15 kg | 50 kg | A | 40 |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|--|----------------------------------|----------------------------------|-----|----------------|--|-----------------------------|----------|----------|-----------------------------|--------------------------|-----------------------------|----------------------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| | | | | | | | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | <i>Aqua ammonia, see Ammonia so- lution, etc.</i> | | | | | | | | | | | | |
| | Argon, compressed | 2.2 | UN1006 | | 2.2 | | 306 | 302 | 314, 315 | 75 kg | 150 kg | A | |
| | Argon, refrigerated liquid (<i>cry- ogenic liquid</i>). | 2.2 | UN1951 | | 2.2 | T75, TP5 | 320 | 316 | 318 | 50 kg | 500 kg | B | |
| | Arsenic | 6.1 | UN1558 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | Arsenic acid, liquid | 6.1 | UN1553 | I | 6.1 | T20, TP2, TP7, TP13 | None | 201 | 243 | 1 L | 30 L | B | 46 |
| | Arsenic acid, solid | 6.1 | UN1554 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | Arsenic bromide | 6.1 | UN1555 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | 12, 40 |
| | <i>Arsenic chloride, see Arsenic tri- chloride.</i> | | | | | | | | | | | | |
| | 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> | 6.1 | UN1556 | I | 6.1 | | None | 201 | 243 | 1 L | 30 L | B | 40 |
| | | | | II | 6.1 | IB2 | None | 202 | 243 | 5 L | 60 L | B | 40 |
| | | | | III | 6.1 | IB3 | 153 | 203 | 241 | 60 L | 220 L | B | 40 |
| | 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> | 6.1 | UN1557 | I | 6.1 | IB7, IP1 | None | 211 | 242 | 5 kg | 50 kg | A | |
| | | | | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | | | | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | |
| | Arsenic pentoxide | 6.1 | UN1559 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | <i>Arsenic sulfide and a chlorate, mixtures of.</i> | Forbidden | | | | | | | | | | | |
| | Arsenic trichloride | 6.1 | UN1560 | I | 6.1 | 2, B9, B14, B32, B74, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | B | 40 |
| | Arsenic trioxide | 6.1 | UN1561 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | <i>Arsenic, white, solid, see Arsenic trioxide.</i> | | | | | | | | | | | | |
| | Arsenical dust | 6.1 | UN1562 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | Arsenical pesticides, liquid, flam- mable, toxic, <i>flash point less than 23 degrees C.</i> | 3 | UN2760 | I | 3, 6.1 | T14, TP2, TP13, TP27 | None | 201 | 243 | Forbidden | 30 L | B | 40 |
| | | | | II | 3, 6.1 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 1 L | 60 L | B | 40 |
| | Arsenical pesticides, liquid, toxic | 6.1 | UN2994 | I | 6.1 | T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 40 |
| | | | | II | 6.1 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
| | | | | III | 6.1 | IB3, T7, TP2, TP28 | 153 | 203 | 241 | 60 L | 220 L | A | 40 |
| | Arsenical pesticides, liquid, toxic, <i>flammable flash point not less than 23 degrees C.</i> | 6.1 | UN2993 | I | 6.1, 3 | T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 40 |
| | | | | II | 6.1, 3 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
| | | | | III | 6.1, 3 | B1, IB3, T7, TP2, TP28 | 153 | 203 | 242 | 60 L | 220 L | A | 40 |
| | Arsenical pesticides, solid, toxic | 6.1 | UN2759 | I | 6.1 | IB7, IP1 | None | 211 | 242 | 5 kg | 50 kg | A | 40 |
| | | | | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | 40 |
| | | | | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | 40 |
| | <i>Arsenious acid, solid, see Arsenic trioxide.</i> | | | | | | | | | | | | |
| | <i>Arsenious and mercuric iodide solution, see Arsenic com- pounds, liquid, n.o.s..</i> | | | | | | | | | | | | |
| | Arsine | 2.3 | UN2188 | | 2.3, 2.1 | 1 | None | 192 | 245 | Forbidden | Forbidden | D | 40 |
| | Articles, explosive, extremely in- sensitive or Articles, EEL | 1.6N | UN0486 | II | 1.6N | 101 | None | 62 | None | Forbidden | Forbidden | 07 | |
| G | Articles, explosive, n.o.s. | 1.4S | UN0349 | II | 1.4S | 101 | None | 62 | None | 25 kg | 100 kg | 05 | |
| G | Articles, explosive, n.o.s. | 1.4B | UN0350 | II | 1.4B | 101 | None | 62 | None | Forbidden | Forbidden | 06 | |
| G | Articles, explosive, n.o.s. | 1.4C | UN0351 | II | 1.4C | 101 | None | 62 | None | Forbidden | 75 kg | 06 | |
| G | Articles, explosive, n.o.s. | 1.4D | UN0352 | II | 1.4D | 101 | None | 62 | None | Forbidden | 75 kg | 06 | |
| G | Articles, explosive, n.o.s. | 1.4G | UN0353 | II | 1.4G | 101 | None | 62 | None | Forbidden | 75 kg | 06 | |
| G | Articles, explosive, n.o.s. | 1.1L | UN0354 | II | 1.1L | 101 | None | 62 | None | Forbidden | Forbidden | 08 | 8E, 14E, 15E, 17E |
| G | Articles, explosive, n.o.s. | 1.2L | UN0355 | II | 1.2L | 101 | None | 62 | None | Forbidden | Forbidden | 08 | 8E, 14E, 15E, 17E |
| G | Articles, explosive, n.o.s. | 1.3L | UN0356 | II | 1.3L | 101 | None | 62 | None | Forbidden | Forbidden | 08 | 8E, 14E, 15E, 17E |
| G | Articles, explosive, n.o.s. | 1.1C | UN0462 | II | 1.1C | 101 | None | 62 | None | Forbidden | Forbidden | 07 | |
| G | Articles, explosive, n.o.s. | 1.1D | UN0463 | II | 1.1D | 101 | None | 62 | None | Forbidden | Forbidden | 07 | |
| G | Articles, explosive, n.o.s. | 1.1E | UN0464 | II | 1.1E | 101 | None | 62 | None | Forbidden | Forbidden | 07 | |
| G | Articles, explosive, n.o.s. | 1.1F | UN0465 | II | 1.1F | 101 | None | 62 | None | Forbidden | Forbidden | 08 | |
| G | Articles, explosive, n.o.s. | 1.2C | UN0466 | II | 1.2C | 101 | None | 62 | None | Forbidden | Forbidden | 07 | |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|--|----------------------------------|----------------------------------|-------|----------------|-------------------------------------|-----------------------------|-----------|-----------|-----------------------------|--------------------------|-----------------------------|-------------------------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| | | | | | | | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| G | Articles, explosive, n.o.s. | 1.2D | UN0467 | II | 1.2D ... | 101 | None ... | 62 ... | None ... | Forbidden | Forbidden | 07 | ..... |
| G | Articles, explosive, n.o.s. | 1.2E | UN0468 | II | 1.2E ... | 101 | None ... | 62 ... | None ... | Forbidden | Forbidden | 07 | ..... |
| G | Articles, explosive, n.o.s. | 1.2F | UN0469 | II | 1.2F ... | 101 | None ... | 62 ... | None ... | Forbidden | Forbidden | 08 | ..... |
| G | Articles, explosive, n.o.s. | 1.3C | UN0470 | II | 1.3C ... | 101 | None ... | 62 ... | None ... | Forbidden | Forbidden | 07 | ..... |
| G | Articles, explosive, n.o.s. | 1.4E | UN0471 | II | 1.4E ... | 101 | None ... | 62 ... | None ... | Forbidden | 75 kg | 06 | ..... |
| G | Articles, explosive, n.o.s. | 1.4F | UN0472 | II | 1.4F ... | 101 | None ... | 62 ... | None ... | Forbidden | Forbidden | 08 | ..... |
| | Articles, pressurized pneumatic or hydraulic containing non-flam- mable gas. | 2.2 | UN3164 | ..... | 2.2 ... | ..... | 306 ... | 302, 304 | None ... | No limit | No limit | A | ..... |
| | Articles, pyrophoric | 1.2L | UN0380 | II | 1.2L ... | ..... | None ... | 62 ... | None ... | Forbidden | Forbidden | 08 | 8E, 14E, 15E, 17E |
| | Articles, pyrotechnic for technical purposes. | 1.1G | UN0428 | II | 1.1G ... | ..... | None ... | 62 ... | None ... | Forbidden | Forbidden | 07 | ..... |
| | Articles, pyrotechnic for technical purposes. | 1.2G | UN0429 | II | 1.2G ... | ..... | None ... | 62 ... | None ... | Forbidden | Forbidden | 07 | ..... |
| | Articles, pyrotechnic for technical purposes. | 1.3G | UN0430 | II | 1.3G ... | ..... | None ... | 62 ... | None ... | Forbidden | Forbidden | 07 | ..... |
| | Articles, pyrotechnic for technical purposes. | 1.4G | UN0431 | II | 1.4G ... | ..... | None ... | 62 ... | None ... | Forbidden | 75 kg | 06 | ..... |
| | Articles, pyrotechnic for technical purposes. | 1.4S | UN0432 | II | 1.4S ... | ..... | None ... | 62 ... | None ... | 25 kg | 100 kg | 05 | ..... |
| D | Asbestos | 9 | NA2212 | III | 9 | IB8, IP2, IP4 | 155 | 216 | 240 | 200 kg | 200 kg | A | 34, 40 |
| D | Ascaridole (organic peroxide) | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| D | Asphalt, at or above its flash point. | 3 | NA1999 | III | 3 | IB3, T1, TP3 | 150 | 203 | 247 | Forbidden | Forbidden | D | ..... |
| D | Asphalt, cut back, see Tars, liq- uid, etc. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Automobile, motorcycle, tractor, other self-propelled vehicle, en- gine, or other mechanical appa- ratus, see Vehicles or Battery etc. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| A G | Aviation regulated liquid, n.o.s. | 9 | UN3334 | ..... | 9 | A35 | 155 | 204 ..... | ..... | No limit | No limit | A | ..... |
| A G | Aviation regulated solid, n.o.s. | 9 | UN3335 | ..... | 9 | A35 | 155 | 204 ..... | ..... | No limit | No limit | A | ..... |
| | Azaurolic acid (salt of) (dry) | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Azido guanidine picrate (dry) | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | 5-Azido-1-hydroxy tetrazole | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Azido hydroxy tetrazole (mercury and silver salts). | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | 3-Azido-1,2-Propylene glycol dinitrate. | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Azidodithiocarbonic acid | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Azidoethyl nitrate | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | 1-Aziridinylphosphine oxide-(tris), see Tris-(1-aziridinyl) phosphine oxide, solution. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Azodicarbonamide | 4.1 | UN3242 | II | 4.1 | 38, IB8 | 151 | 212 | 240 | Forbidden | Forbidden | D | 12, 61, 74 |
| | Azotetrazole (dry) | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Barium | 4.3 | UN1400 | II | 4.3 | A19, IB7, IP2 | 151 | 212 | 241 | 15 kg | 50 kg | E | ..... |
| | Barium alloys, pyrophoric | 4.2 | UN1854 | I | 4.2 ..... | ..... | None ... | 181 | None ... | Forbidden | Forbidden | D | ..... |
| | Barium azide, dry or wetted with less than 50 percent water, by mass. | 1.1A | UN0224 | II | 1.1A, 6.1. | 111, 117 | None ... | 62 | None ... | Forbidden | Forbidden | 12 | ..... |
| | Barium azide, wetted with not less than 50 percent water, by mass. | 4.1 | UN1571 | I | 4.1, 6.1 | A2 | None ... | 182 | None ... | Forbidden | 0.5 kg | D | 28 |
| | Barium bromate | 5.1 | UN2719 | II | 5.1, 6.1 | IB8, IP2, IP4 | None ... | 212 | 242 | 5 kg | 25 kg | A | 56, 58, 106 |
| | Barium chlorate | 5.1 | UN1445 | II | 5.1, 6.1 | A9, IB6, IP2, N34, T4, TP1 | None ... | 212 | 242 | 5 kg | 25 kg | A | 56, 58, 106 |
| | Barium compounds, n.o.s. | 6.1 | UN1564 | II | 6.1 | IB8, IP2, IP4 | None ... | 212 | 242 | 25 kg | 100 kg | A | ..... |
|  | ..... | ..... | ..... | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | ..... |
| | Barium cyanide | 6.1 | UN1565 | I | 6.1 | IB7, IP1, N74, N75 | None ... | 211 | 242 | 5 kg | 50 kg | A | 26, 40 |
| | Barium hypochlorite with more than 22 percent available chlo- rine. | 5.1 | UN2741 | II | 5.1, 6.1 | A7, A9, IB8, IP2, IP4, N34 | 152 | 212 | None ... | 5 kg | 25 kg | B | 56, 58, 106 |
| | Barium nitrate | 5.1 | UN1446 | II | 5.1, 6.1 | IB8, IP2, IP4 | None ... | 212 | 242 | 5 kg | 25 kg | A | ..... |
| | Barium oxide | 6.1 | UN1884 | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | ..... |
| | Barium perchlorate | 5.1 | UN1447 | II | 5.1, 6.1 | IB6, IP2, T4, TP1 | None ... | 212 | 242 | 5 kg | 25 kg | A | 56, 58, 106 |
| | Barium permanganate | 5.1 | UN1448 | II | 5.1, 6.1 | IB6, IP2 | None ... | 212 | 242 | 5 kg | 25 kg | D | 56, 58, 69, 106, 107 |
| | Barium peroxide | 5.1 | UN1449 | II | 5.1, 6.1 | IB6, IP2 | None ... | 212 | 242 | 5 kg | 25 kg | A | 13, 75, 106 |
| | Barium selenate, see Selenates or Selenites. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Barium selenite, see Selenates or Selenites. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Batteries, containing sodium | 4.3 | UN3292 | II | 4.3 ..... | ..... | 189 | 189 | 189 | Forbidden | No limit | A | ..... |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|--|----------------------------------|----------------------------------|-----|----------------|---|-----------------------------|----------|------|-----------------------------|--------------------------|-----------------------------|--------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | Batteries, dry, containing potas- sium hydroxide solid, <i>electric, storage.</i> | 8 | UN3028 | III | 8 | | None | 213 | None | 25 kg gross | 230 kg gross | A | |
| | Batteries, wet, filled with acid, <i>electric storage.</i> | 8 | UN2794 | III | 8 | | 159 | 159 | 159 | 30 kg gross | No limit | A | |
| | Batteries, wet, non-spillable, <i>elec- tric storage.</i> | 8 | UN2800 | III | 8 | | 159 | 159 | 159 | No Limit | No Limit | A | |
| | Batteries, dry, <i>not subject to the requirements of this subchapter.</i> | | | | | 130 | | | | | | | |
| | Battery fluid, acid | 8 | UN2796 | II | 8 | A3, A7, B2, B15, IB2, N6, N34, T8, TP2, TP12 | 154 | 202 | 242 | 1 L | 30 L | B | |
| | Battery fluid, alkali | 8 | UN2797 | II | 8 | B2, IB2, N6, T7, TP2 | 154 | 202 | 242 | 1 L | 30 L | A | |
| | <i>Battery lithium type, see Lithium batteries etc.</i> | | | | | | | | | | | | |
| | Battery-powered vehicle or Bat- tery-powered equipment. | 9 | UN3171 | | 9 | 134 | 220 | 220 | None | No limit | No limit | | |
| | <i>Battery, wet, filled with acid or al- kali with vehicle or mechanical equipment containing an inter- nal combustion engine, see Ve- hicle, etc. or Engines, internal combustion, etc.</i> | | | | | | | | | | | | |
| + | Benzaldehyde | 9 | UN1990 | III | 9 | IB3, T2, TP1 | 155 | 203 | 241 | 100 L | 220 L | A | |
| | Benzene | 3 | UN1114 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | 40 |
| | <i>Benzene diazonium chloride (dry)</i> | Forbidden | | | | | | | | | | | |
| | <i>Benzene diazonium nitrate (dry)</i> | Forbidden | | | | | | | | | | | |
| | <i>Benzene phosphorus dichloride, see Phenyl phosphorus dichlo- ride.</i> | | | | | | | | | | | | |
| | <i>Benzene phosphorus thiodichloride, see Phenyl phosphorus thiodichloride.</i> | | | | | | | | | | | | |
| | Benzene sulfonyl chloride | 8 | UN2225 | III | 8 | IB3, T4, TP1 | 154 | 203 | 241 | 5 L | 60 L | A | 40 |
| | <i>Benzene triozonide</i> | Forbidden | | | | | | | | | | | |
| | <i>Benzenethiol, see Phenyl mercaptan.</i> | | | | | | | | | | | | |
| | Benzidine | 6.1 | UN1885 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | <i>Benzol, see Benzene</i> | | | | | | | | | | | | |
| | Benzonitrile | 6.1 | UN2224 | II | 6.1 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | A | 26, 40 |
| | Benzoquinone | 6.1 | UN2587 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | Benzotrichloride | 8 | UN2226 | II | 8 | B2, IB2, T7, TP2 | 154 | 202 | 242 | 1 L | 30 L | A | 40 |
| | Benzotrifluoride | 3 | UN2338 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | 40 |
| | <i>Benzoxiadiazoles (dry)</i> | Forbidden | | | | | | | | | | | |
| | <i>Benzoyl azide</i> | Forbidden | | | | | | | | | | | |
| | Benzoyl chloride | 8 | UN1736 | II | 8 | B2, IB2, T8, TP2, TP12, TP13 | 154 | 202 | 242 | 1 L | 30 L | C | 40 |
| | Benzyl bromide | 6.1 | UN1737 | II | 6.1, 8 | A3, A7, IB2, N33, N34, T8, TP2, TP12, TP13 | None | 202 | 243 | 1 L | 30 L | D | 13, 40 |
| | Benzyl chloride | 6.1 | UN1738 | II | 6.1, 8 | A3, A7, B70, IB2, N33, N42, T8, TP2, TP12, TP13 | None | 202 | 243 | 1 L | 30 L | D | 13, 40 |
| | Benzyl chloride <i>unstabilized</i> | 6.1 | UN1738 | II | 6.1, 8 | A3, A7, B8, B11, IB2, N33, N34, N43, T8, TP2, TP12, TP13 | None | 202 | 243 | 1 L | 30 L | D | 13, 40 |
| | Benzyl chloroformate | 8 | UN1739 | I | 8 | A3, A6, B4, N41, T10, TP2, TP12, TP13 | None | 201 | 243 | Forbidden | 2.5 L | D | 40 |
| | Benzyl iodide | 6.1 | UN2653 | II | 6.1 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | B | 12, 40 |
| | Benzyl dimethylamine | 8 | UN2619 | II | 8, 3 | B2, IB2, T7, TP2 | 154 | 202 | 243 | 1 L | 30 L | A | 40, 48 |
| | Benzylidene chloride | 6.1 | UN1886 | II | 6.1 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | D | 40 |
| | Beryllium compounds, n.o.s. | 6.1 | UN1566 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | | | | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | |
| | Beryllium nitrate | 5.1 | UN2464 | II | 5.1, 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 5 kg | 25 kg | A | |
| | Beryllium, powder | 6.1 | UN1567 | II | 6.1, 4.1 | IB8, IP2, IP4 | None | 212 | 242 | 15 kg | 50 kg | A | |
| | Bicyclo [2,2,1] hepta-2,5-diene, stabilized or 2,5- Norbomadiene, stabilized. | 3 | UN2251 | II | 3 | IB2, T7, TP2 | 150 | 202 | 242 | 5 L | 60 L | D | |
| | <i>Biphenyl triozonide</i> | Forbidden | | | | | | | | | | | |
| | Bipyridilium pesticides, liquid, flammable, toxic, <i>flash point less than 23 degrees C.</i> | 3 | UN2782 | I | 3, 6.1 | T14, TP2, TP13, TP27 | None | 201 | 243 | Forbidden | 30 L | E | |
| | | | | II | 3, 6.1 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 1 L | 60 L | B | 40 |
| | Bipyridilium pesticides, liquid, toxic. | 6.1 | UN3016 | I | 6.1 | T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 40 |
| | | | | II | 6.1 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
| | | | | III | 6.1 | IB3, T7, TP2, TP28 | 153 | 203 | 241 | 60 L | 220 L | A | 40 |
| | Bipyridilium pesticides, liquid, toxic, flammable, <i>flash point not less than 23 degrees C.</i> | 6.1 | UN3015 | I | 6.1, 3 | T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 21, 40 |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|---|----------------------------------|----------------------------------|-----|----------------|---|-----------------------------|----------|----------|-----------------------------|--------------------------|-----------------------------|------------------------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | | | | II | 6.1, 3 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 21, 40 |
| | | | | III | 6.1, 3 | B1, IB3, T7, TP2, TP28 | 153 | 203 | 242 | 60 L | 220 L | A | 21, 40 |
| | Bipyridilium pesticides, solid, toxic | 6.1 | UN2781 | I | 6.1 | IB7, IP1 | None | 211 | 242 | 5 kg | 50 kg | A | 40 |
| | | | | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | 40 |
| | | | | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | 40 |
| | <i>Bis (Aminopropyl) piperazine, see Corrosive liquid, n.o.s.</i> | | | | | | | | | | | | |
| | Bisulfate, aqueous solution | 8 | UN2837 | II | 8 | A7, B2, IB2, N34, T7, TP2 | 154 | 202 | 242 | 1 L | 30 L | A | |
| | | | | III | 8 | A7, IB3, N34, T4, TP1 | 154 | 203 | 241 | 5 L | 60 L | A | |
| | Bisulfites, aqueous solutions, n.o.s. | 8 | UN2693 | III | 8 | IB3, T7, TP1, TP28 | 154 | 203 | 241 | 5 L | 60 L | A | 26, 40 |
| | Black powder, compressed or Gunpowder, compressed or Black powder, in pellets or Gunpowder, in pellets. | 1.1D | UN0028 | II | 1.1D | | None | 62 | None | Forbidden | Forbidden | 10 | |
| | Black powder or Gunpowder, granular or as a meal. | 1.1D | UN0027 | II | 1.1D | | None | 62 | None | Forbidden | Forbidden | 10 | |
| D | Black powder for small arms | 4.1 | NA0027 | I | 4.1 | 70 | None | 170 | None | Forbidden | Forbidden | E | |
| | <i>Blasting agent, n.o.s., see Explosives, blasting etc.</i> | | | | | | | | | | | | |
| | <i>Blasting cap assemblies, see Detonator assemblies, non-electric, for blasting.</i> | | | | | | | | | | | | |
| | <i>Blasting caps, electric, see Detonators, electric for blasting.</i> | | | | | | | | | | | | |
| | <i>Blasting caps, non-electric, see Detonators, non-electric, for blasting.</i> | | | | | | | | | | | | |
| | <i>Bleaching powder, see Calcium hypochlorite mixtures, etc.</i> | | | | | | | | | | | | |
| I | Blue asbestos (<i>Crocidolite</i>) or Brown asbestos (<i>amosite, mysorite</i>). | 9 | UN2212 | II | 9 | IB8, IP2, IP4 | 155 | 216 | 240 | Forbidden | Forbidden | A | 34, 40 |
| | Bombs, photo-flash | 1.1F | UN0037 | II | 1.1F | | | 62 | None | Forbidden | Forbidden | 08 | |
| | Bombs, photo-flash | 1.1D | UN0038 | II | 1.1D | | | 62 | None | Forbidden | Forbidden | 03 | |
| | Bombs, photo-flash | 1.2G | UN0039 | II | 1.2G | | | 62 | None | Forbidden | Forbidden | 03 | |
| | Bombs, photo-flash | 1.3G | UN0299 | II | 1.3G | | | 62 | None | Forbidden | Forbidden | 03 | |
| | Bombs, smoke, non-explosive, with corrosive liquid, without initiating device. | 8 | UN2028 | II | 8 | | None | 160 | None | Forbidden | 50 kg | E | 40 |
| | Bombs, with bursting charge | 1.1F | UN0033 | II | 1.1F | | | 62 | None | Forbidden | Forbidden | 08 | |
| | Bombs, with bursting charge | 1.1D | UN0034 | II | 1.1D | | | 62 | None | Forbidden | Forbidden | 03 | |
| | Bombs, with bursting charge | 1.2D | UN0035 | II | 1.2D | | | 62 | None | Forbidden | Forbidden | 03 | |
| | Bombs, with bursting charge | 1.2F | UN0291 | II | 1.2F | | | 62 | None | Forbidden | Forbidden | 08 | |
| | Bombs with flammable liquid, with bursting charge. | 1.1J | UN0399 | II | 1.1J | | | 62 | None | Forbidden | Forbidden | 04 | 23E |
| | Bombs with flammable liquid, with bursting charge. | 1.2J | UN0400 | II | 1.2J | | | 62 | None | Forbidden | Forbidden | 04 | 23E |
| | Boosters with detonator | 1.1B | UN0225 | II | 1.1B | | None | 62 | None | Forbidden | Forbidden | 11 | |
| | Boosters with detonator | 1.2B | UN0268 | II | 1.2B | | None | 62 | None | Forbidden | Forbidden | 07 | |
| | Boosters, without detonator | 1.1D | UN0042 | II | 1.1D | | None | 62 | None | Forbidden | Forbidden | 07 | |
| | Boosters, without detonator | 1.2D | UN0283 | II | 1.2D | | None | 62 | None | Forbidden | Forbidden | 07 | |
| | <i>Borate and chlorate mixtures, see Chlorate and borate mixtures.</i> | | | | | | | | | | | | |
| + | Borneol | 4.1 | UN1312 | III | 4.1 | A1, IB8, IP3 | None | 213 | 240 | 25 kg | 100 kg | A | |
| | Boron tribromide | 8 | UN2692 | I | 8, 6.1 | 2, A3, A7, B9, B14, B32, B74, N34, T20, TP2, TP12, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | C | 12 |
| | Boron trichloride | 2.3 | UN1741 | | 2.3, 8 | 3, B9, B14 | None | 304 | 314 | Forbidden | Forbidden | D | 25, 40 |
| | Boron trifluoride, compressed | 2.3 | UN1008 | | 2.3 | 2, B9, B14 | None | 302 | 314, 315 | Forbidden | Forbidden | D | 40 |
| | Boron trifluoride acetic acid complex. | 8 | UN1742 | II | 8 | B2, B6, IB2, T8, TP2, TP12 | 154 | 202 | 242 | 1 L | 30 L | A | |
| | Boron trifluoride diethyl etherate | 8 | UN2604 | I | 8, 3 | A19, T10, TP2 | None | 201 | 243 | 0.5 L | 2.5 L | D | 40 |
| | Boron trifluoride dihydrate | 8 | UN2851 | II | 8 | IB8, IP2, IP4, T7, TP2 | 154 | 212 | 240 | 15 kg | 50 kg | B | 12, 40, |
| | Boron trifluoride dimethyl etherate | 4.3 | UN2965 | I | 4.3, 8, 3. | A19, T10, TP2, TP7 | None | 201 | 243 | Forbidden | 1 L | D | 21, 28, 40, 49, 100 |
| | Boron trifluoride propionic acid complex. | 8 | UN1743 | II | 8 | B2, IB2, T8, TP2, TP12 | 154 | 202 | 242 | 1 L | 30 L | A | |
| | <i>Box toe gum, see Nitrocellulose etc.</i> | | | | | | | | | | | | |
| | Bromates, inorganic, aqueous solution, n.o.s. | 5.1 | UN3213 | II | 5.1 | IB2, T4, TP1 | 152 | 202 | 242 | 1 L | 5 L | B | 56, 58, 106 |
| | Bromates, inorganic, n.o.s. | 5.1 | UN1450 | II | 5.1 | IB8, IP2, IP4 | 152 | 212 | 242 | 5 kg | 25 kg | A | 56, 58, 106 |
| | <i>Bromine azide</i> | Forbidden | | | | | | | | | | | |
| + | Bromine or Bromine solutions | 8 | UN1744 | I | 8, 6.1 | 1, A3, A6, B9, B64, B85, N34, N43, T22, TP2, TP10, TP12, TP13 | None | 226 | 249 | Forbidden | Forbidden | | 12, 40, 66, 74, 89, 90 |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|--|----------------------------------|----------------------------------|-------|--------------------|---|-----------------------------|----------|----------|-----------------------------|--------------------------|-----------------------------|--------------------------------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| | | | | | | | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | Bromine chloride | 2.3 | UN2901 | ..... | 2.3, 8, 5.1. | 2, B9, B14 | None | 304 | 314, 315 | Forbidden | Forbidden | D | 40, 89, 90 |
| + | Bromine pentafluoride | 5.1 | UN1745 | I | 5.1, 6.1, 8. | 1, B9, B14, B30, B72, T22, TP2, TP12, TP13, TP38, TP44 | None | 228 | 244 | Forbidden | Forbidden | D | 25, 40, 66, 90 |
| + | Bromine trifluoride | 5.1 | UN1746 | I | 5.1, 6.1, 8. | 2, B9, B14, B32, B74, T22, TP2, TP12, TP13, TP38, TP45 | None | 228 | 244 | Forbidden | Forbidden | D | 25, 40, 66, 90 |
| | 4-Bromo-1,2-dinitrobenzene | Forbidden | | | | | | | | | | | |
| | 4-Bromo-1,2-dinitrobenzene (un- stable at 59 degrees C.) | Forbidden | | | | | | | | | | | |
| | 1-Bromo-3-chloropropane | 6.1 | UN2688 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | |
| | 1-Bromo-3-methylbutane | 3 | UN2341 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | 1-Bromo-3-nitrobenzene (unstable at 56 degrees C.) | Forbidden | | | | | | | | | | | |
| | 2-Bromo-2-nitropropane-1,3-diol .. | 4.1 | UN3241 | III | 4.1 | 46, IB8, IP3 | 151 | 213 | None | 25 kg | 50 kg | C | 12, 25, 40 |
| | Bromoacetic acid, solid | 8 | UN1938 | II | 8 | A7, IB8, IP2, IP4, N34, T7 | 154 | 212 | 240 | 15 kg | 50 kg | A | |
| | Bromoacetic acid, solution | 8 | UN1938 | II | 8 | B2, IB2, T7, TP2 | 154 | 202 | 242 | 1 L | 30 L | A | 40 |
| + | Bromoacetone | 6.1 | UN1569 | II | 6.1, 3 | 2, T20, TP2, TP13 | None | 193 | 245 | Forbidden | Forbidden | D | 40 |
| | Bromoacetyl bromide | 8 | UN2513 | II | 8 | B2, IB2, T8, TP2, TP12 | 154 | 202 | 242 | 1 L | 30 L | C | 40 |
| | Bromobenzene | 3 | UN2514 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Bromobenzyl cyanides, liquid | 6.1 | UN1694 | I | 6.1 | T14, TP2, TP13 | None | 201 | 243 | Forbidden | 30 L | D | 12, 40 |
| | Bromobenzyl cyanides, solid | 6.1 | UN1694 | I | 6.1 | T14, TP2, TP13 | None | 211 | 242 | Forbidden | 50 kg | D | 12, 40 |
| | 1-Bromobutane | 3 | UN1126 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5L | 60 L | B | 40 |
| | 2-Bromobutane | 3 | UN2339 | II | 3 | B1, IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | 40 |
| | Bromochloromethane | 6.1 | UN1887 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | |
| | 2-Bromoethyl ethyl ether | 3 | UN2340 | III | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | 40 |
| | Bromoform | 6.1 | UN2515 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | 12, 40 |
| | Bromomethylpropanes | 3 | UN2342 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | 2-Bromopentane | 3 | UN2343 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | Bromopropanes | 3 | UN2344 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | 40 |
| | 3-Bromopropyne | 3 | UN2345 | III | 3 | IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Bromosilane | Forbidden | | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | D | 40 |
| | Bromotoluene-alpha, see Benzyl bromide. | | | | | | | | | | | | |
| | Bromotrifluoroethylene | 2.1 | UN2419 | ..... | 2.1 | | None | 304 | 314, 315 | Forbidden | 150 kg | B | 40 |
| | Bromotrifluoromethane or Refrig- erant gas, R 13B1.. | 2.2 | UN1009 | ..... | 2.2 | T50 | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | |
| | Brucine | 6.1 | UN1570 | I | 6.1 | IB7, IP1 | None | 211 | 242 | 5 kg | 50 kg | A | |
| | Burstlers, explosive | 1.1D | UN0043 | II | 1.1D | | None | 62 | None | Forbidden | Forbidden | 07 | |
| | Butadienes, stabilized | 2.1 | UN1010 | ..... | 2.1 | T50 | 306 | 304 | 314, 315 | Forbidden | 150 kg | B | 40 |
| | Butane see also Petroleum gases, liquefied. | 2.1 | UN1011 | ..... | 2.1 | 19, T50 | 306 | 304 | 314, 315 | Forbidden | 150 kg | E | 40 |
| | Butane, butane mixtures and mix- tures having similar properties in cartridges each not exceed- ing 500 grams, see Recep- tacles, etc. | | | | | | | | | | | | |
| | Butanedione | 3 | UN2346 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | 1,2,4-Butanetriol trinitrate | Forbidden | | | | | | | | | | | |
| | Butanols | 3 | UN1120 | II | 3 | IB2, T4, TP1, TP29 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | tert-Butoxycarbonyl azide | Forbidden | | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Butyl acetates | 3 | UN1123 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | Butyl acid phosphate | 8 | UN1718 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Butyl acrylates, stabilized | 3 | UN2348 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 5 L | 60 L | A | |
| | Butyl alcohols, see Butanols | | | | | | | | | | | | |
| | Butyl benzenes | 3 | UN2709 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | n-Butyl bromide, see 1- Bromobutane. | | | | | | | | | | | | |
| | n-Butyl chloride, see Chlorobutanes. | | | | | | | | | | | | |
| D | sec-Butyl chloroformate | 6.1 | NA2742 | I | 6.1, 3, 8. | 2, B9, B14, B32, B74, T20, TP4, TP12, TP13, TP38, TP45 | None | 227 | 244 | 1 L | 30 L | A | 12, 13, 22, 25, 40, 48, 100 |
| | n-Butyl chloroformate | 6.1 | UN2743 | I | 6.1, 8, 3. | 2, B9, B14, B32, B74, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | A | 12, 13, 21, 25, 40, 100 |
| | Butyl ethers, see Dibutyl ethers ... | | | | | | | | | | | | |
| | Butyl ethyl ether, see Ethyl butyl ether. | | | | | | | | | | | | |
| | n-Butyl formate | 3 | UN1128 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | tert-Butyl hydroperoxide, with more than 90 percent with water. | Forbidden | | | | | | | | | | | |
| | tert-Butyl hypochlorite | 4.2 | UN3255 | I | 4.2, 8 | | None | 211 | 243 | Forbidden | Forbidden | D | |
| | N-n-Butyl imidazole | 6.1 | UN2690 | II | 6.1 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | A | |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|---|----------------------------------|----------------------------------|-----|----------------|-------------------------------------|-----------------------------|----------|---------------|-----------------------------|--------------------------|-----------------------------|--------------------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| | | | | | | | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | Calcium hypochlorite, dry or Calcium hypochlorite mixtures dry with more than 39 percent available chlorine (8.8 percent available oxygen). | 5.1 | UN1748 | II | 5.1 | A7, A9, IB8, IP2, IP4, N34, W9 | 152 | 212 | None | 5 kg | 25 kg | D | 4, 5, 25, 48, 56, 58, 69 |
| | Calcium hypochlorite, hydrated or Calcium hypochlorite, hydrated mixtures, with not less than 5.5 percent but not more than 10 percent water. | 5.1 | UN2880 | II | 5.1 | IB8, IP2, IP4, W9 | 152 | 212 | 240 | 5 kg | 25 kg | D | 4, 5, 25, 48, 56, 58, 69 |
| | Calcium hypochlorite mixtures, dry, with more than 10 percent but not more than 39 percent available chlorine. | 5.1 | UN2208 | III | 5.1 | A1, A29, IB8, IP3, N34, W9 | 152 | 213 | 240 | 25 kg | 100 kg | D | 4, 5, 25, 48, 56, 58, 69 |
| | Calcium manganese silicon | 4.3 | UN2844 | III | 4.3 | A1, A19, IB8, IP2, IP4 | 151 | 213 | 241 | 25 kg | 100 kg | A | 85, 103 |
| A | Calcium nitrate | 5.1 | UN1454 | III | 5.1 | 34, IB8, IP3 | 152 | 213 | 240 | 25 kg | 100 kg | A | |
| | Calcium oxide | 8 | UN1910 | III | 8 | IB8, IP3 | 154 | 213 | 240 | 25 kg | 100 kg | A | |
| | Calcium perchlorate | 5.1 | UN1455 | II | 5.1 | IB6, IP2 | 152 | 212 | 242 | 5 kg | 25 kg | A | 56, 58, 106 |
| | Calcium permanganate | 5.1 | UN1456 | II | 5.1 | IB6, IP2 | 152 | 212 | 242 | 5 kg | 25 kg | D | 56, 58, 69, 106, 107 |
| | Calcium peroxide | 5.1 | UN1457 | II | 5.1 | IB6, IP2 | 152 | 212 | 242 | 5 kg | 25 kg | A | 13, 75, 106 |
| | Calcium phosphide | 4.3 | UN1360 | I | 4.3, 6.1 | A8, A19, N40 | None | 211 | 242 | Forbidden | 15 kg | E | 40, 85 |
| | Calcium, pyrophoric or Calcium alloys, pyrophoric. | 4.2 | UN1855 | I | 4.2 | | None | 187 | None | Forbidden | Forbidden | D | |
| | Calcium resinate | 4.1 | UN1313 | III | 4.1 | A1, A19, IB6 | None | 213 | 240 | 25 kg | 100 kg | A | |
| | Calcium resinate, fused | 4.1 | UN1314 | III | 4.1 | A1, A19, IB4 | None | 213 | 240 | 25 kg | 100 kg | A | |
| | Calcium selenate, see Selenates or Selenites. | | | | | | | | | | | | |
| | Calcium silicide | 4.3 | UN1405 | II | 4.3 | A19, IB7, IP2 | 151 | 212 | 241 | 15 kg | 50 kg | B | 85, 103 |
| | Camphor oil | 3 | UN1130 | III | 3 | A1, A19, IB8, IP4 | 151 | 213 | 241 | 25 kg | 100 kg | B | 85, 103 |
| | Camphor, synthetic | 4.1 | UN2717 | III | 4.1 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Cannon primers, see Primers, tubular. | | | | | A1, IB8, IP3 | None | 213 | 240 | 25 kg | 100 kg | A | |
| | Caproic acid | 8 | UN2829 | III | 8 | IB3, T4, TP1 | 154 | 203 | 241 | 5 L | 60 L | A | |
| | Caps, blasting, see Detonators, etc. | | | | | | | | | | | | |
| | Carbamate pesticides, liquid, flammable, toxic, flash point less than 23 degrees C. | 3 | UN2758 | I | 3, 6.1 | T14, TP2, TP13, TP27 | None | 201 | 243 | Forbidden | 30 L | B | 40 |
| | | | | II | 3, 6.1 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 1 L | 60 L | B | 40 |
| | Carbamate pesticides, liquid, toxic. | 6.1 | UN2992 | I | 6.1 | T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 40 |
| | | | | II | 6.1 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
| | | | | III | 6.1 | IB3, T7, TP2, TP28 | 153 | 203 | 241 | 60 L | 220 L | A | 40 |
| | Carbamate pesticides, liquid, toxic, flammable, flash point not less than 23 degrees C. | 6.1 | UN2991 | I | 6.1, 3 | T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 40 |
| | | | | II | 6.1, 3 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
| | | | | III | 6.1, 3 | B1, IB3, T7, TP2, TP28 | 153 | 203 | 242 | 60 L | 220 L | A | 40 |
| | Carbamate pesticides, solid, toxic | 6.1 | UN2757 | I | 6.1 | IB7, IP1 | None | 211 | 242 | 5 kg | 50 kg | A | 40 |
| | | | | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | 40 |
| | | | | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | 40 |
| | Carbolic acid, see Phenol, solid or Phenol, molten. | | | | | | | | | | | | |
| | Carbolic acid solutions, see Phenol solutions. | | | | | | | | | | | | |
| I | Carbon, activated | 4.2 | UN1362 | III | 4.2 | IB8, IP3 | None | 213 | 241 | 0.5 kg | 0.5 kg | A | 12 |
| I | Carbon, animal or vegetable origin. | 4.2 | UN1361 | II | 4.2 | IB6 | None | 212 | 242 | Forbidden | Forbidden | A | 12 |
| | Carbon bisulfide, see Carbon disulfide. | | | | | | | | | | | | |
| | Carbon dioxide | 2.2 | UN1013 | | 2.2 | | 306 | 302, 304 | 302, 314, 315 | 75 kg | 150 kg | A | |
| | Carbon dioxide and nitrous oxide mixtures. | 2.2 | UN1015 | | 2.2 | | 306 | None | 314, 315 | 75 kg | 150 kg | A | |
| | Carbon dioxide and oxygen mixtures, compressed. | 2.2 | UN1014 | | 2.2, 5.1 | 77 | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | |
| | Carbon dioxide, refrigerated liquid | 2.2 | UN2187 | | 2.2 | T75, TP5 | 306 | 304 | 314, 315 | 50 kg | 500 kg | B | |
| A W | Carbon dioxide, solid or Dry ice | 9 | UN1845 | III | None | | 217 | 217 | 240 | 200 kg | 200 kg | C | 40 |
| | Carbon disulfide | 3 | UN1131 | I | 3, 6.1 | B16, T14, TP2, TP7, TP13 | None | 201 | 243 | Forbidden | Forbidden | D | 18, 40, 115 |
| | Carbon monoxide, compressed | 2.3 | UN1016 | | 2.3, 2.1 | | 4 | None | 302 | 314, 315 | 25 kg | D | 40 |
| | Carbon monoxide and hydrogen mixture, compressed. | 2.3 | UN2600 | | 2.3, 2.1 | | 6 | None | 302 | 302 | Forbidden | D | 40 |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym-bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|----------|--|----------------------------|----------------------------|-----|-------------|---------------------------------|--------------------------|----------|----------|--------------------------|-----------------------|-----------------------|----------------------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | <i>Caustic soda, (etc.) see Sodium hydroxide etc.</i> | | | | | | | | | | | | |
| | Cells, containing sodium | 4.3 | UN3292 | II | 4.3 | | 189 | 189 | 189 | 25 kg gross | No limit | A | |
| | Celluloid, in block, rods, rolls, sheets, tubes, etc., except scrap. | 4.1 | UN2000 | III | 4.1 | | None | 213 | 240 | 25 kg | 100 kg | A | |
| | Celluloid, scrap | 4.2 | UN2002 | III | 4.2 | IB8, IP3 | None | 213 | 241 | Forbidden | Forbidden | D | |
| | Cement, see Adhesives containing flammable liquid. | | | | | | | | | | | | |
| | Cerium, slabs, ingots, or rods | 4.1 | UN1333 | II | 4.1 | IB8, IP2, IP4, N34 | None | 212 | 240 | 15 kg | 50 kg | A | 74, 91 |
| | Cerium, turnings or gritty powder | 4.3 | UN3078 | II | 4.3 | A1, IB7, IP2 | 151 | 212 | 242 | 15 kg | 50 kg | E | |
| | Cesium or Caesium | 4.3 | UN1407 | I | 4.3 | A19, IB1, IP1, N34, N40 | None | 211 | 242 | Forbidden | 15 kg | D | |
| D | Cesium nitrate or Caesium nitrate | 5.1 | UN1451 | III | 5.1 | A1, A29, IB8, IP3 | 152 | 213 | 240 | 25 kg | 100 kg | A | |
| | Charcoal briquettes, shell, screenings, wood, etc. | 4.2 | NA1361 | III | 4.2 | IB8 | 151 | 213 | 240 | 25 kg | 100 kg | A | 12 |
| | Charges, bursting, plastics bonded. | 1.1D | UN0457 | II | 1.1D | | None | 62 | None | Forbidden | Forbidden | 07 | |
| | Charges, bursting, plastics bonded. | 1.2D | UN0458 | II | 1.2D | | None | 62 | None | Forbidden | Forbidden | 07 | |
| | Charges, bursting, plastics bonded. | 1.4D | UN0459 | II | 1.4D | | None | 62 | None | Forbidden | 75 kg | 06 | |
| | Charges, bursting, plastics bonded. | 1.4S | UN0460 | II | 1.4S | | None | 62 | None | 25 kg | 100 kg | 05 | |
| | Charges, demolition | 1.1D | UN0048 | II | 1.1D | | None | 62 | None | Forbidden | Forbidden | 03 | |
| | Charges, depth | 1.1D | UN0056 | II | 1.1D | | None | 62 | None | Forbidden | Forbidden | 03 | |
| | Charges, expelling, explosive, for fire extinguishers, see Cartridges, power device. | | | | | | | | | | | | |
| | Charges, explosive, commercial without detonator. | 1.1D | UN0442 | II | 1.1D | | None | 62 | None | Forbidden | Forbidden | 07 | |
| | Charges, explosive, commercial without detonator. | 1.2D | UN0443 | II | 1.2D | | None | 62 | None | Forbidden | Forbidden | 07 | |
| | Charges, explosive, commercial without detonator. | 1.4D | UN0444 | II | 1.4D | | None | 62 | None | Forbidden | 75 kg | 06 | |
| | Charges, explosive, commercial without detonator. | 1.4S | UN0445 | II | 1.4S | | None | 62 | None | 25 kg | 100 kg | 05 | |
| | Charges, propelling | 1.1C | UN0271 | II | 1.1C | | None | 62 | None | Forbidden | Forbidden | 07 | |
| | Charges, propelling | 1.3C | UN0272 | II | 1.3C | | None | 62 | None | Forbidden | Forbidden | 07 | |
| | Charges, propelling | 1.2C | UN0415 | II | 1.2C | | None | 62 | None | Forbidden | Forbidden | 07 | |
| | Charges, propelling | 1.4C | UN0491 | II | 1.4C | | None | 62 | None | Forbidden | 75 kg | 06 | |
| | Charges, propelling, for cannon | 1.3C | UN0242 | II | 1.3C | | None | 62 | None | Forbidden | Forbidden | 10 | |
| | Charges, propelling, for cannon | 1.1C | UN0279 | II | 1.1C | | None | 62 | None | Forbidden | Forbidden | 10 | |
| | Charges, propelling, for cannon | 1.2C | UN0414 | II | 1.2C | | None | 62 | None | Forbidden | Forbidden | 10 | |
| | Charges, shaped, flexible, linear | 1.4D | UN0237 | II | 1.4D | | None | 62 | None | Forbidden | 75 kg | 06 | |
| | Charges, shaped, flexible, linear | 1.1D | UN0288 | II | 1.1D | 101 | None | 62 | None | Forbidden | Forbidden | 07 | |
| | Charges, shaped, without detonator. | 1.1D | UN0059 | II | 1.1D | | None | 62 | None | Forbidden | Forbidden | 07 | |
| | Charges, shaped, without detonator. | 1.2D | UN0439 | II | 1.2D | | None | 62 | None | Forbidden | Forbidden | 07 | |
| | Charges, shaped, without detonator. | 1.4D | UN0440 | II | 1.4D | | None | 62 | None | Forbidden | 75 kg | 06 | |
| | Charges, shaped, without detonator. | 1.4S | UN0441 | II | 1.4S | | None | 62 | None | 25 kg | 100 kg | 05 | |
| | Charges, supplementary explosive. | 1.1D | UN0060 | II | 1.1D | | None | 62 | None | Forbidden | Forbidden | 10 | |
| D | Chemical kit | 8 | NA1760 | II | 8 | | 154 | 161 | None | 1 L | 30 L | B | 40 |
| | Chemical kits | 9 | UN3316 | | 9 | | None | None | None | 10 kg | 10 kg | A | |
| | Chloral, anhydrous, stabilized | 6.1 | UN2075 | II | 6.1 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | D | 40 |
| | Chlorate and borate mixtures | 5.1 | UN1458 | II | 5.1 | A9, IB8, IP2, IP4, N34 | 152 | 212 | 240 | 5 kg | 25 kg | A | 56, 58, 106 |
| | | | | III | 5.1 | A9, IB8, IP3, N34 | 152 | 213 | 240 | 25 kg | 100 kg | A | 56, 58, 106 |
| | Chlorate and magnesium chloride mixtures. | 5.1 | UN1459 | II | 5.1 | A9, IB8, IP2, IP4, N34, T4, TP1 | 152 | 212 | 240 | 5 kg | 25 kg | A | 56, 58, 106 |
| | | | | III | 5.1 | A9, IB8, IP3, N34, T4, TP1 | 152 | 213 | 240 | 25 kg | 100 kg | A | 56, 58, 106 |
| | <i>Chlorate of potash, see Potassium chlorate.</i> | | | | | | | | | | | | |
| | <i>Chlorate of soda, see Sodium chlorate.</i> | | | | | | | | | | | | |
| | Chlorates, inorganic, aqueous solution, n.o.s.. | 5.1 | UN3210 | II | 5.1 | IB2, T4, TP1 | 152 | 202 | 242 | 1 L | 5 L | B | 56, 58, 106 |
| | Chlorates, inorganic, n.o.s. | 5.1 | UN1461 | II | 5.1 | A9, IB6, IP2, N34 | 152 | 212 | 242 | 5 kg | 25 kg | A | 56, 58, 106 |
| | Chloric acid aqueous solution, with not more than 10 percent chloric acid. | 5.1 | UN2626 | II | 5.1 | IB2 | None | 229 | None | Forbidden | Forbidden | D | 56, 58, 106 |
| | <i>Chloride of phosphorus, see Phosphorus trichloride.</i> | | | | | | | | | | | | |
| | <i>Chloride of sulfur, see Sulfur chloride.</i> | | | | | | | | | | | | |
| | <i>Chlorinated lime, see Calcium hypochlorite mixtures, etc.</i> | | | | | | | | | | | | |
| | Chlorine | 2.3 | UN1017 | | 2.3, 8 | 2, B9, B14, T50, TP19 | None | 304 | 314, 315 | Forbidden | Forbidden | D | 40, 51, 55, 62, 68, 89, 90 |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|--|----------------------------------|----------------------------------|--------|----------------|---|-----------------------------|----------|----------|-----------------------------|--------------------------|-----------------------------|-------------------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| D | Chlorine azide | Forbidden | 5.1 | NA9191 | II | 5.1, 6.1 | None | 229 | None | Forbidden | Forbidden | E | |
| | Chlorine dioxide, hydrate, frozen Chlorine dioxide (not hydrate) | Forbidden | 2.3 | UN2548 | | 2.3, 5.1, 8 | 1, B7, B9, B14 | None | 304 | 314 | Forbidden | Forbidden | D | 40, 89, 90 |
| | Chlorine trifluoride | 2.3 | UN1749 | | 2.3, 5.1, 8 | 2, B7, B9, B14 | None | 304 | 314 | Forbidden | Forbidden | D | 40, 89, 90 |
| | Chlorite solution | 8 | UN1908 | II | 8 | A3, A6, A7, B2, IB2, N34, T7, TP2, TP24 | 154 | 202 | 242 | 1 L | 30 L | B | 26 |
|  | ..... |  |  | III | 8 | A3, A6, A7, B2, IB3, N34, T4, TP2, TP24 | 154 | 203 | 241 | 5 L | 60 L | B | 26 |
| | Chlorites, inorganic, n.o.s. | 5.1 | UN1462 | II | 5.1 | A7, IB6, IP2, N34 | 152 | 212 | 242 | 5 kg | 25 kg | A | 56, 58, 106, 40 |
| | 1-Chloro-1,1-difluoroethane or Refrigerant gas R 142b. | 2.1 | UN2517 | | 2.1 | T50 | 306 | 304 | 314, 315 | Forbidden | 150 kg | B | 40 |
| | 3-Chloro-4-methylphenyl isocyanate. | 6.1 | UN2236 | II | 6.1 | IB2 | None | 202 | 243 | 5 L | 60 L | B | 40 |
| | 1-Chloro-1,2,2,2- tetrafluoroethane or Refrigerant gas R 124. | 2.2 | UN1021 | | 2.2 | T50 | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | |
| | 4-Chloro-o-toluidine hydrochloride | 6.1 | UN1579 | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | |
| | 1-Chloro-2,2,2-trifluoroethane or Refrigerant gas R 133a. | 2.2 | UN1983 | | 2.2 | T50 | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | |
| | Chloroacetic acid, molten | 6.1 | UN3250 | II | 6.1, 8 | IB1, T7, TP3 | None | 202 | 243 | Forbidden | Forbidden | C | 40 |
| | Chloroacetic acid, solid | 6.1 | UN1751 | II | 6.1, 8 | A3, A7, IB8, IP4, N34 | None | 212 | 242 | 15 kg | 50 kg | A | 40 |
| | Chloroacetic acid, solution | 6.1 | UN1750 | II | 6.1, 8 | A7, IB2, N34, T7, TP2 | None | 202 | 243 | 1 L | 30 L | C | 40 |
| | Chloroacetone, stabilized | 6.1 | UN1695 | I | 6.1, 3, 8 | 2, B9, B14, B32, B74, N12, N32, N34, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 21, 40, 100 |
| + | Chloroacetone (unstabilized) | Forbidden | | | | | | | | | | | |
| | Chloroacetonitrile | 6.1 | UN2668 | II | 6.1, 3 | 2, B9, B14, B32, B74, IB99, T20, TP2, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | A | 12, 26, 40 |
| | Chloroacetophenone (CN), liquid | 6.1 | UN1697 | II | 6.1 | A3, IB2, N12, N32, N33, T11, TP2, TP13, TP27 | None | 202 | 243 | Forbidden | 60 L | D | 12, 40 |
| | Chloroacetophenone (CN), solid .. | 6.1 | UN1697 | II | 6.1 | A3, IB8, IP2, IP4, N12, N32, N33, N34, T7, TP2, TP13 | None | 212 | None | Forbidden | 100 kg | D | 12, 40 |
| | Chloroacetyl chloride | 6.1 | UN1752 | I | 6.1, 8 | 2, A3, A6, A7, B3, B8, B9, B14, B32, B74, B77, N34, N43, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 40 |
| | Chloroanilines, liquid | 6.1 | UN2019 | II | 6.1 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | A | |
| | Chloroanilines, solid | 6.1 | UN2018 | II | 6.1 | IB8, IP2, IP4, T7, TP2 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | Chloroanisidines | 6.1 | UN2233 | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | |
| | Chlorobenzene | 3 | UN1134 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Chlorobenzol, see Chlorobenzene | | | | | | | | | | | | |
| | Chlorobenzotrifluorides | 3 | UN2234 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | 40 |
| | Chlorobenzyl chlorides | 6.1 | UN2235 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | |
| | Chlorobutanes | 3 | UN1127 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | Chlorocresols, liquid | 6.1 | UN2669 | II | 6.1 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | A | 12 |
| | Chlorocresols, solid | 6.1 | UN2669 | II | 6.1 | IB8, IP2, IP3, T7 | None | 212 | 242 | 25 kg | 100 kg | A | 12 |
| | Chlorodifluorobromomethane or Refrigerant gas R 12B1. | 2.2 | UN1974 | | 2.2 | T50 | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | |
| | Chlorodifluoromethane and chloropentafluoroethane mix- ture or Refrigerant gas R 502 with fixed boiling point, with ap- proximately 49 percent chlorodifluoromethane. | 2.2 | UN1973 | | 2.2 | T50 | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | |
| | Chlorodifluoromethane or Refrig- erant gas R 22. | 2.2 | UN1018 | | 2.2 | T50 | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | |
| + | Chlorodinitrobenzenes | 6.1 | UN1577 | II | 6.1 | IB8, IP2, IP4, T7, TP2 | None | 212 | 242 | 25 kg | 100 kg | A | 91 |
| | 2-Chloroethanal | 6.1 | UN2232 | I | 6.1 | 2, B9, B14, B32, B74, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 40 |
| | Chloroform | 6.1 | UN1888 | III | 6.1 | IB3, N36, T7, TP2 | 153 | 203 | 241 | 60 L | 220 L | A | 40 |
| G | Chloroformates, toxic, corrosive, flammable, n.o.s.. | 6.1 | UN2742 | II | 6.1, 8, 3 | 5, IB1, T7, TP2 | None | 202 | 243 | 1 L | 30 L | A | 12, 13, 21, 25, 40, 100 |
| G | Chloroformates, toxic, corrosive, n.o.s.. | 6.1 | UN3277 | II | 6.1, 8 | IB2, T8, TP2, TP13, TP28 | None | 202 | 243 | 1 L | 30 L | A | 12, 13, 25, 40 |
| | Chloromethyl chloroformate | 6.1 | UN2745 | II | 6.1, 8 | IB2, T7, TP2, TP13 | None | 202 | 243 | 1 L | 30 L | A | 12, 13, 21, 25, 40, 100 |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|---|----------------------------------|----------------------------------|-------|----------------|--|-----------------------------|-----------|-----------|-----------------------------|--------------------------|-----------------------------|---------------------------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | Chloromethyl ethyl ether | 3 | UN2354 | II | 3, 6.1 | IB2, T7, TP1, TP13 | None ... | 202 | 243 | 1 L | 60 L | E | 40 |
| | Chloronitroanilines | 6.1 | UN2237 | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | ..... |
| + | Chloronitrobenzene, <i>ortho</i> , liquid | 6.1 | UN1578 | II | 6.1 | IB2, T11, TP2, TP13, TP27 | None ... | 202 | 243 | 5 L | 60 L | A | ..... |
| + | Chloronitrobenzenes <i>meta</i> or <i>para</i> , solid. | 6.1 | UN1578 | II | 6.1 | IB8, IP2, IP4, T7, TP2 | None ... | 212 | 242 | 25 kg | 100 kg | A | ..... |
| | Chloronitrotoluenes, liquid | 6.1 | UN2433 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | ..... |
| | Chloronitrotoluenes, solid | 6.1 | UN2433 | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | ..... |
| | Chloropentafluoroethane or Refrig- erant gas R 115. | 2.2 | UN1020 | ..... | 2.2 | T50 | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | ..... |
| | Chlorophenolates, liquid or Phenolates, liquid. | 8 | UN2904 | III | 8 | IB3 | 154 | 203 | 241 | 5 L | 60 L | A | ..... |
| | Chlorophenolates, solid or Phenolates, solid. | 8 | UN2905 | III | 8 | IB8, IP3 | 154 | 213 | 240 | 25 kg | 100 kg | A | ..... |
| | Chlorophenols, liquid | 6.1 | UN2021 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | ..... |
| | Chlorophenols, solid | 6.1 | UN2020 | III | 6.1 | IB8, IP3, T4, TP1 | 153 | 213 | 240 | 100 kg | 200 kg | A | ..... |
| | Chlorophenyltrichlorosilane | 8 | UN1753 | II | 8 | A7, B2, B6, IB2, N34, T7, TP2 | None ... | 202 | 242 | Forbidden | 30 L | C | 40 |
| + | Chloropicrin | 6.1 | UN1580 | I | 6.1 | 2, B7, B9, B14, B32, B46, B74, T20, TP2, TP13, TP38, TP45 | None ... | 227 | 244 | Forbidden | Forbidden | D | 40 |
| | Chloropicrin and methyl bromide mixtures. | 2.3 | UN1581 | ..... | 2.3 | 2, B9, B14, T50 | None ... | 193 | 314, 315 | Forbidden | Forbidden | D | 25, 40 |
| | Chloropicrin and methyl chloride mixtures. | 2.3 | UN1582 | ..... | 2.3 | 2, T50 | None ... | 193 | 245 | Forbidden | Forbidden | D | 25, 40 |
| | <i>Chloropicrin mixture, flammable (pressure not exceeding 14.7 psia at 115 degrees F flash point below 100 degrees F) see Toxic liquids, flammable, etc.</i> | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Chloropicrin mixtures, n.o.s. | 6.1 | UN1583 | I | 6.1 | 5 | None ... | 201 | 243 | Forbidden | Forbidden | C | 40 |
|  | ..... | ..... | ..... | II | 6.1 | IB2 | None ... | 202 | 243 | Forbidden | Forbidden | C | 40 |
|  | ..... | ..... | ..... | III | 6.1 | IB3 | 153 | 203 | 241 | Forbidden | Forbidden | C | 40 |
| D | Chloropivaloyl chloride | 6.1 | NA9263 | I | 6.1, 8 | 2, B9, B14, B32, B74, T20, TP4, TP12, TP13, TP38, TP45 | None ... | 227 | 244 | Forbidden | Forbidden | B | 40 |
| | Chloroplatinic acid, solid | 8 | UN2507 | III | 8 | IB8, IP3 | 154 | 213 | 240 | 25 kg | 100 kg | A | ..... |
| | Chloroprene, stabilized | 3 | UN1991 | I | 3, 6.1 | B57, T14, TP2, TP13 | None ... | 201 | 243 | Forbidden | 30 L | D | 40 |
| | <i>Chloroprene, uninhibited</i> | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | 2-Chloropropane | 3 | UN2356 | I | 3 | N36, T11, TP2, TP13 | 150 | 201 | 243 | 1 L | 30 L | E | ..... |
| | 3-Chloropropanol-1 | 6.1 | UN2849 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | ..... |
| | 2-Chloropropene | 3 | UN2456 | I | 3 | A3, N36, T11, TP2 | 150 | 201 | 243 | 1 L | 30 L | E | ..... |
| | 2-Chloropropionic acid | 8 | UN2511 | III | 8 | IB3, T4, TP2 | 154 | 203 | 241 | 5 L | 60 L | A | 8 |
| | 2-Chloropyridine | 6.1 | UN2822 | II | 6.1 | IB2, T7, TP2 | None ... | 202 | 243 | 5 L | 60 L | A | 40 |
| | Chlorosilanes, corrosive, flam- mable, n.o.s. | 8 | UN2986 | II | 8, 3 ... | IB2, T11, TP2, TP27 | None ... | 202 | 243 | 1 L | 30 L | C | 40 |
| | Chlorosilanes, corrosive, n.o.s. | 8 | UN2987 | II | 8 | B2, IB2, T14, TP2, TP27 | 154 | 202 | 242 | 1 L | 30 L | C | 40 |
| | Chlorosilanes, flammable, corro- sive, n.o.s. | 3 | UN2985 | II | 3, 8 ... | IB1, T11, TP2, TP13, TP27 | None ... | 201 | 243 | 1 L | 5 L | B | 40 |
| | Chlorosilanes, water-reactive, flammable, corrosive, n.o.s. | 4.3 | UN2988 | I | 4.3, 3, 8. | A2, T10, TP2, TP7, TP13 | None ... | 201 | 244 | Forbidden | 1 L | D | 21, 28, 40, 49, 100 40 |
| + | Chlorosulfonic acid (<i>with or with- out sulfur trioxide</i>). | 8 | UN1754 | I | 8, 6.1 | 2, A3, A6, A10, B9, B10, B14, B32, B74, T20, TP2, TP12, TP38, TP45 | None ... | 227 | 244 | Forbidden | Forbidden | C | 40 |
| | Chlorotoluenes | 3 | UN2238 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Chlorotoluidines liquid | 6.1 | UN2239 | III | 6.1 | IB3, T7, TP1, TP28 | 153 | 203 | 241 | 60 L | 220 L | A | ..... |
| | Chlorotoluidines solid | 6.1 | UN2239 | III | 6.1 | IB8, IP3, T4, TP1 | 153 | 213 | 240 | 100 kg | 200 kg | A | ..... |
| | Chlorotrifluoromethane and trifluoromethane azeotropic mixture or Refrigerant gas R 503 with approximately 60 per- cent chlorotrifluoromethane. | 2.2 | UN2599 | ..... | 2.2 ..... | ..... | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | ..... |
| | Chlorotrifluoromethane or Refrig- erant gas R 13. | 2.2 | UN1022 | ..... | 2.2 ..... | ..... | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | ..... |
| | Chromic acid solution | 8 | UN1755 | II | 8 | B2, IB2, T8, TP2, TP12 | 154 | 202 | 242 | 1 L | 30 L | C | 40 |
|  | ..... | ..... | ..... | III | 8 | IB3, T4, TP1, TP12 | 154 | 203 | 241 | 5 L | 60 L | C | 40 |
| | <i>Chromic anhydride, see Chro- mium trioxide, anhydrous.</i> | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Chromic fluoride, solid | 8 | UN1756 | II | 8 | IB8, IP2, IP4 | 154 | 212 | 240 | 15 kg | 50 kg | A | 26 |
| | Chromic fluoride, solution | 8 | UN1757 | II | 8 | B2, IB2, T7, TP2 | 154 | 202 | 242 | 1 L | 30 L | A | ..... |
|  | ..... | ..... | ..... | III | 8 | IB3, T4, TP1 | 154 | 203 | 241 | 5 L | 60 L | A | ..... |
| | Chromium nitrate | 5.1 | UN2720 | III | 5.1 | A1, A29, IB8, IP3 | 152 | 213 | 240 | 25 kg | 100 kg | A | ..... |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|---|----------------------------------|----------------------------------|-----|----------------|---|-----------------------------|----------|----------|-----------------------------|--------------------------|-----------------------------|--------------------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | Chromium oxychloride | 8 | UN1758 | I | 8 | A3, A6, A7, B10, N34, T10, TP2, TP12 | None | 201 | 243 | 0.5 L | 2.5 L | C | 40, 66, 74, 89, 90 |
| | Chromium trioxide, anhydrous | 5.1 | UN1463 | II | 5.1, 8 | IB8, IP4 | None | 212 | 242 | 5 kg | 25 kg | A | |
| | Chromosulfuric acid | 8 | UN2240 | I | 8 | A3, A6, A7, B4, B6, N34, T10, TP2, TP12, TP13 | None | 201 | 243 | 0.5 L | 2.5 L | B | 40, 66, 74, 89, 90 |
| | <i>Chromyl chloride, see Chromium oxychloride.</i> | | | | | | | | | | | | |
| | <i>Cigar and cigarette lighters, charged with fuel, see Lighters for cigars, cigarettes, etc.</i> | | | | | | | | | | | | |
| | <i>Coal briquettes, hot</i> | Forbidden | | | | | | | | | | | |
| | Coal gas, compressed | 2.3 | UN1023 | II | 2.3, 2.1 | 3 | None | 302 | 314, 315 | Forbidden | 25 kg | D | 40 |
| | Coal tar distillates, flammable | 3 | UN1136 | III | 3 | IB2, T4, TP1, B1, IB3, T4, TP1, TP29 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | <i>Coal tar dye, corrosive, liquid, n.o.s., see Dyes, liquid or solid, n.o.s. or Dye intermediates, liq- uid or solid, corrosive, n.o.s..</i> | | | | | | | | | | | | |
| | Coating solution (<i>includes surface treatments or coatings used for industrial or other purposes such as vehicle undercoating, drum or barrel lining</i>) | 3 | UN1139 | I | 3 | T11, TP1, TP8, TP27 | 150 | 201 | 243 | 1 L | 30 L | E | |
| | | | | II | 3 | IB2, T4, TP1, TP8 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | | | | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Cobalt naphthenates, powder | 4.1 | UN2001 | III | 4.1 | A19, IB8, IP3 | 151 | 213 | 240 | 25 kg | 100 kg | A | |
| | Cobalt resinate, precipitated | 4.1 | UN1318 | III | 4.1 | A1, A19, IB6 | 151 | 213 | 240 | 25 kg | 100 kg | A | |
| | <i>Coke, hot</i> | Forbidden | | | | | | | | | | | |
| | <i>Collodion, see Nitrocellulose etc ..</i> | | | | | | | | | | | | |
| D G | Combustible liquid, n.o.s. | Combustible | NA1993 | III | None | IB3,T1, T4, TP1 | 150 | 203 | 241 | 60 L | 220 L | A | |
| G | Components, explosive train, n.o.s. | 1.2B | UN0382 | II | 1.2B | 101 | None | 62 | None | Forbidden | Forbidden | 11 | |
| G | Components, explosive train, n.o.s. | 1.4B | UN0383 | II | 1.4B | 101 | None | 62 | None | Forbidden | 75 kg | 06 | |
| G | Components, explosive train, n.o.s. | 1.4S | UN0384 | II | 1.4S | 101 | None | 62 | None | 25 kg | 100 kg | 05 | |
| G | Components, explosive train, n.o.s. | 1.1B | UN0461 | II | 1.1B | 101 | None | 62 | None | Forbidden | Forbidden | 11 | |
| | <i>Composition B, see Hexolite, etc</i> | | | | | | | | | | | | |
| D G | Compounds, cleaning liquid | 8 | NA1760 | I | 8 | A7, B10, T14, TP2, TP9, TP27 | None | 201 | 243 | 0.5 L | 2.5 L | B | 40 |
| | | | | II | 8 | B2, IB2, N37, T11, TP2, TP27 | 154 | 202 | 242 | 1 L | 30 L | B | 40 |
| | | | | III | 8 | IB3, N37, T7, TP1, TP28 | 154 | 203 | 241 | 5 L | 60 L | A | 40 |
| D G | Compounds, cleaning liquid | 3 | NA1993 | I | 3 | T11, TP1, TP9 | 150 | 201 | 243 | 1 L | 30 L | E | |
| | | | | II | 3 | IB2, T7, TP1, TP8, TP28 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | | | | III | 3 | B1, B52, IB3, T4, TP1, TP29 | 150 | 203 | 242 | 60 L | 220 L | A | |
| D G | Compounds, tree killing, liquid or Compounds, weed killing, liquid. | 8 | NA1760 | I | 8 | A7, B10, T14, TP2, TP9, TP27 | None | 201 | 243 | 0.5 L | 2.5 L | B | 40 |
| | | | | II | 8 | B2, IB2, N37, T11, TP2, TP27 | 154 | 202 | 242 | 1 L | 30 L | B | 40 |
| | | | | III | 8 | IB3, N37, T7, TP1, TP28 | 154 | 203 | 241 | 5 L | 60 L | A | 40 |
| D G | Compounds, tree killing, liquid or Compounds, weed killing, liquid. | 3 | NA1993 | I | 3 | T11, TP1, TP9 | 150 | 201 | 243 | 1 L | 30 L | E | |
| | | | | II | 3 | IB2, T7, TP1, TP8, TP28 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | | | | III | 3 | B1, B52, IB3, T4, TP1, TP29 | 150 | 203 | 242 | 60 L | 220 L | A | |
| D G | Compounds, tree killing, liquid or Compounds, weed killing, liquid. | 6.1 | NA2810 | I | 6.1 | T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 40 |
| | | | | II | 6.1 | IB2, T11, TP2, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
| | | | | III | 6.1 | IB3, T7, TP1, TP28 | 153 | 203 | 241 | 60 L | 220 L | A | 40 |
| G | Compressed gas, flammable, n.o.s. | 2.1 | UN1954 | | 2.1 | | 306 | 302, 305 | 314, 315 | Forbidden | 150 kg | D | 40 |
| G | Compressed gas, n.o.s. | 2.2 | UN1956 | | 2.2 | | 306, 307 | 302, 305 | 314, 315 | 75 kg | 150 kg | A | |
| G | Compressed gas, oxidizing, n.o.s. | 2.2 | UN3156 | | 2.2, 5.1 | | 306 | 302 | 314, 315 | 75 kg | 150 kg | D | |
| G I | Compressed gas, toxic, corrosive, n.o.s. <i>Inhalation Hazard Zone A.</i> | 2.3 | UN3304 | | 2.3, 8 | | 1 | 192 | 245 | Forbidden | Forbidden | D | 40 |
| G I | Compressed gas, toxic, corrosive, n.o.s. <i>Inhalation Hazard Zone B.</i> | 2.3 | UN3304 | | 2.3, 8 | | 2 | 302, 305 | 314, 315 | Forbidden | Forbidden | D | 40 |
| G I | Compressed gas, toxic, corrosive, n.o.s. <i>Inhalation Hazard Zone C.</i> | 2.3 | UN3304 | | 2.3, 8 | | 3 | 302, 305 | 314, 315 | Forbidden | Forbidden | D | 40 |
| G I | Compressed gas, toxic, corrosive, n.o.s. <i>Inhalation Hazard Zone D.</i> | 2.3 | UN3304 | | 2.3, 8 | | 4 | 302, 305 | 314, 315 | Forbidden | Forbidden | D | 40 |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|---|----------------------------------|----------------------------------|-------|--------------------|-------------------------------------|-----------------------------|-----------|-----------|-----------------------------|--------------------------|-----------------------------|----------------------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| G I | Compressed gas, toxic, flam- mable, corrosive, n.o.s. <i>Inhala- tion Hazard Zone A.</i> | 2.3 | UN3305 | ..... | 2.3, 2.1, 8. | 1 | None | 192 | 245 | Forbidden | Forbidden | D | 17, 40 |
| G I | Compressed gas, toxic, flam- mable, corrosive, n.o.s. <i>Inhala- tion Hazard Zone B.</i> | 2.3 | UN3305 | ..... | 2.3, 2.1, 8. | 2 | None | 302, 305 | 314, 315 | Forbidden | Forbidden | D | 17, 40 |
| G I | Compressed gas, toxic, flam- mable, corrosive, n.o.s. <i>Inhala- tion Hazard Zone C.</i> | 2.3 | UN3305 | ..... | 2.3, 2.1, 8. | 3 | None | 302, 305 | 314, 315 | Forbidden | Forbidden | D | 17, 40 |
| G I | Compressed gas, toxic, flam- mable, corrosive, n.o.s. <i>Inhala- tion Hazard Zone D.</i> | 2.3 | UN3305 | ..... | 2.3, 2.1, 8. | 4 | None | 302, 305 | 314, 315 | Forbidden | Forbidden | D | 17, 40 |
| G | Compressed gas, toxic, flam- mable, n.o.s. <i>Inhalation hazard Zone A.</i> | 2.3 | UN1953 | ..... | 2.3, 2.1 | 1 | None | 192 | 245 | Forbidden | Forbidden | D | 40 |
| G | Compressed gas, toxic, flam- mable, n.o.s. <i>Inhalation hazard Zone B.</i> | 2.3 | UN1953 | ..... | 2.3, 2.1 | 2, B9, B14 | None | 302, 305 | 314, 315 | Forbidden | Forbidden | D | 40 |
| G | Compressed gas, toxic, flam- mable, n.o.s. <i>Inhalation Hazard Zone C.</i> | 2.3 | UN1953 | ..... | 2.3, 2.1 | 3, B14 | None | 302, 305 | 314, 315 | Forbidden | Forbidden | D | 40 |
| G | Compressed gas, toxic, flam- mable, n.o.s. <i>Inhalation Hazard Zone D.</i> | 2.3 | UN1953 | ..... | 2.3, 2.1 | 4 | None | 302, 305 | 314, 315 | Forbidden | Forbidden | D | 40 |
| G | Compressed gas, toxic, n.o.s. <i>In- halation Hazard Zone A.</i> | 2.3 | UN1955 | ..... | 2.3 | 1 | None | 192 | 245 | Forbidden | Forbidden | D | 40 |
| G | Compressed gas, toxic, n.o.s. <i>In- halation Hazard Zone B.</i> | 2.3 | UN1955 | ..... | 2.3 | 2, B9, B14 | None | 302, 305 | 314, 315 | Forbidden | Forbidden | D | 40 |
| G | Compressed gas, toxic, n.o.s. <i>In- halation Hazard Zone C.</i> | 2.3 | UN1955 | ..... | 2.3 | 3, B14 | None | 302, 305 | 314, 315 | Forbidden | Forbidden | D | 40 |
| G | Compressed gas, toxic, n.o.s. <i>In- halation Hazard Zone D.</i> | 2.3 | UN1955 | ..... | 2.3 | 4 | None | 302, 305 | 314, 315 | Forbidden | Forbidden | D | 40 |
| G I | Compressed gas, toxic, oxidizing, corrosive, n.o.s. <i>Inhalation Haz- ard Zone A.</i> | 2.3 | UN3306 | ..... | 2.3, 5.1, 8. | 1 | None | 192 | 244 | Forbidden | Forbidden | D | 40, 89, 90 |
| G I | Compressed gas, toxic, oxidizing, corrosive, n.o.s. <i>Inhalation Haz- ard Zone B.</i> | 2.3 | UN3306 | ..... | 2.3, 5.1, 8. | 2 | None | 302, 305 | 314, 315 | Forbidden | Forbidden | D | 40, 89, 90 |
| G I | Compressed gas, toxic, oxidizing, corrosive, n.o.s. <i>Inhalation Haz- ard Zone C.</i> | 2.3 | UN3306 | ..... | 2.3, 5.1, 8. | 3 | None | 302, 305 | 314, 315 | Forbidden | Forbidden | D | 40, 89, 90 |
| G I | Compressed gas, toxic, oxidizing, corrosive, n.o.s. <i>Inhalation Haz- ard Zone D.</i> | 2.3 | UN3306 | ..... | 2.3, 5.1, 8. | 4 | None | 302, 305 | 314, 315 | Forbidden | Forbidden | D | 40, 89, 90 |
| G | Compressed gas, toxic, oxidizing, n.o.s. <i>Inhalation Hazard Zone A.</i> | 2.3 | UN3303 | ..... | 2.3, 5.1 | 1 | None | 192 | 245 | Forbidden | Forbidden | D | 40 |
| G | Compressed gas, toxic, oxidizing, n.o.s. <i>Inhalation Hazard Zone B.</i> | 2.3 | UN3303 | ..... | 2.3, 5.1 | 2 | None | 302, 305 | 314, 315 | Forbidden | Forbidden | D | 40 |
| G | Compressed gas, toxic, oxidizing, n.o.s. <i>Inhalation Hazard Zone C.</i> | 2.3 | UN3303 | ..... | 2.3, 5.1 | 3 | None | 302, 305 | 314, 315 | Forbidden | Forbidden | D | 40 |
| G | Compressed gas, toxic, oxidizing, n.o.s. <i>Inhalation Hazard Zone D.</i> | 2.3 | UN3303 | ..... | 2.3, 5.1 | 4 | None | 302, 305 | 314, 315 | Forbidden | Forbidden | D | 40 |
| D | Consumer commodity | ORM-D | ..... | ..... | None .. | ..... | 156, 306 | 156, 306 | None | 30 kg gross | 30 kg gross | A | ..... |
| | Contrivances, water-activated, with burster, expelling charge or propelling charge. | 1.2L | UN0248 | II | 1.2L ... | 101 | None | 62 | None | Forbidden | Forbidden | 08 | 8E, 14E, 15E, 17E |
| | Contrivances, water-activated, with burster, expelling charge or propelling charge. | 1.3L | UN0249 | II | 1.3L ... | 101 | None | 62 | None | Forbidden | Forbidden | 08 | 8E, 14E, 15E, 17E |
| | Copper acetoarsenite | Forbidden | UN1585 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | ..... |
| | Copper acetylde | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Copper amine azide | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Copper arsenite | 6.1 | UN1586 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | ..... |
| | Copper based pesticides, liquid, flammable, toxic, flash point less than 23 degrees C. | 3 | UN2776 | I | 3, 6.1 | T14, TP2, TP13, TP27 | None | 201 | 243 | Forbidden | 30 L | B | 40 |
|  | ..... | ..... | ..... | II | 3, 6.1 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 1 L | 60 L | B | 40 |
| | Copper based pesticides, liquid, toxic. | 6.1 | UN3010 | I | 6.1 | T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 40 |
|  | ..... | ..... | ..... | II | 6.1 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
|  | ..... | ..... | ..... | III | 6.1 | IB3, T7, TP2, TP28 | 153 | 203 | 241 | 60 L | 220 L | A | 40 |
| | Copper based pesticides, liquid, toxic, flammable flash point not less than 23 degrees C. | 6.1 | UN3009 | I | 6.1, 3 | T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 40 |
|  | ..... | ..... | ..... | II | 6.1, 3 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
|  | ..... | ..... | ..... | III | 6.1, 3 | B1, IB3, T7, TP2, TP28 | 153 | 203 | 242 | 60 L | 220 L | A | 40 |
| | Copper based pesticides, solid, toxic. | 6.1 | UN2775 | I | 6.1 | IB7, IP1 | None | 211 | 242 | 5 kg | 50 kg | A | 40 |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|--|----------------------------------|----------------------------------|-----|----------------|-------------------------------------|-----------------------------|----------|------|-----------------------------|--------------------------|-----------------------------|--------------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| A W | Copper chlorate | 5.1 | UN2721 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | 40 |
| | | | | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | 40 |
| | Copper chloride | 8 | UN2802 | III | 8 | IB8, IP3 | 154 | 213 | 240 | 25 kg | 100 kg | A | ..... |
| | Copper cyanide | 6.1 | UN1587 | II | 6.1 | IB8, IP2, IP4 | None | 204 | 242 | 25 kg | 100 kg | A | 26 |
| | Copper selenate, see Selenates or Selenites. | | | | | | | | | | | | |
| | Copper selenite, see Selenates or Selenites. | | | | | | | | | | | | |
| | Copper tetramine nitrate | Forbidden | | | | | | | | | | | |
| | Copra | 4.2 | UN1363 | III | 4.2 | IB8, IP3, IP6 | None | 213 | 241 | Forbidden | Forbidden | A | 13, 19, 48, 119 |
| | Cord, detonating, flexible | 1.1D | UN0065 | II | 1.1D | 102 | 63(a) | 62 | None | Forbidden | Forbidden | 07 | ..... |
| | Cord, detonating, flexible | 1.4D | UN0289 | II | 1.4D | | None | 62 | None | Forbidden | 75 kg | 06 | ..... |
| | Cord detonating or Fuse deto- nating metal clad. | 1.2D | UN0102 | II | 1.2D | | None | 62 | None | Forbidden | Forbidden | 07 | ..... |
| | Cord, detonating or Fuse, deto- nating metal clad. | 1.1D | UN0290 | II | 1.1D | | None | 62 | None | Forbidden | Forbidden | 07 | ..... |
| | Cord, detonating, mild effect or Fuse, detonating, mild effect metal clad. | 1.4D | UN0104 | II | 1.4D | | None | 62 | None | Forbidden | 75 kg | 06 | ..... |
| | Cord, igniter | 1.4G | UN0066 | II | 1.4G | | None | 62 | None | Forbidden | 75 kg | 06 | ..... |
| | Cordeau detonant fuse, see Cord, detonating, etc.; Cord, deto- nating, flexible. | | | | | | | | | | | | |
| | Cordite, see Powder, smokeless | | | | | | | | | | | | |
| G | Corrosive liquid, acidic, inorganic, n.o.s.. | 8 | UN3264 | I | 8 | B10, T14, TP2, TP27 | None | 201 | 243 | 0.5 L | 2.5 L | B | 40 |
| | | | | II | 8 | B2, IB2, T11, TP2, TP27 | 154 | 202 | 242 | 1 L | 30 L | B | 40 |
| | | | | III | 8 | IB3, T7, TP1, TP28 | 154 | 203 | 241 | 5 L | 60 L | A | 40 |
| G | Corrosive liquid, acidic, organic, n.o.s.. | 8 | UN3265 | I | 8 | B10, T14, TP2, TP27 | None | 201 | 243 | 0.5 L | 2.5 L | B | 40 |
| | | | | II | 8 | B2, IB2, T11, TP2, TP27 | 154 | 202 | 242 | 1 L | 30 L | B | 40 |
| | | | | III | 8 | IB3, T7, TP1, TP28 | 154 | 203 | 241 | 5 L | 60 L | A | 40 |
| G | Corrosive liquid, basic, inorganic, n.o.s.. | 8 | UN3266 | I | 8 | B10, T14, TP2, TP27 | None | 201 | 243 | 0.5 L | 2.5 L | B | 40 |
| | | | | II | 8 | B2, IB2, T11, TP2, TP27 | 154 | 202 | 242 | 1 L | 30 L | B | 40 |
| | | | | III | 8 | IB3, T7, TP1, TP28 | 154 | 203 | 241 | 5 L | 60 L | A | 40 |
| G | Corrosive liquid, basic, organic, n.o.s.. | 8 | UN3267 | I | 8 | B10, T14, TP2, TP27 | None | 201 | 243 | 0.5 L | 2.5 L | B | 40 |
| | | | | II | 8 | B2, IB2, T11, TP2, TP27 | 154 | 202 | 242 | 1 L | 30 L | B | 40 |
| | | | | III | 8 | IB3, T7, TP1, TP28 | 154 | 203 | 241 | 5 L | 60 L | A | 40 |
| G | Corrosive liquid, self-heating, n.o.s.. | 8 | UN3301 | I | 8, 4.2 | B10 | None | 201 | 243 | 0.5 L | 2.5 L | D | ..... |
| | | | | II | 8, 4.2 | B2, IB1 | 154 | 202 | 242 | 1 L | 30 L | D | ..... |
| G | Corrosive liquids, flammable, n.o.s.. | 8 | UN2920 | I | 8, 3 | B10, T14, TP2, TP27 | None | 201 | 243 | 0.5 L | 2.5 L | C | 25, 40 |
| | | | | II | 8, 3 | B2, IB2, T11, TP2, TP27 | None | 202 | 243 | 1 L | 30 L | C | 25, 40 |
| G | Corrosive liquids, n.o.s. | 8 | UN1760 | I | 8 | A7, B10, T14, TP2, TP27 | None | 201 | 243 | 0.5 L | 2.5 L | B | 40 |
| | | | | II | 8 | B2, IB2, T11, TP2, TP27 | 154 | 202 | 242 | 1 L | 30 L | B | 40 |
| | | | | III | 8 | IB3, T7, TP1, TP28 | 154 | 203 | 241 | 5 L | 60 L | A | 40 |
| G | Corrosive liquids, oxidizing, n.o.s. | 8 | UN3093 | I | 8, 5.1 | IB2 | None | 201 | 243 | Forbidden | 2.5 L | C | 89 |
| | | | | II | 8, 5.1 | IB2 | None | 202 | 243 | 1 L | 30 L | C | 89 |
| G | Corrosive liquids, toxic, n.o.s. | 8 | UN2922 | I | 8, 6.1 | A7, B10, T14, TP2, TP13, TP27 | None | 201 | 243 | 0.5 L | 2.5 L | B | 40 |
| | | | | II | 8, 6.1 | B3, IB2, T7, TP2 | None | 202 | 243 | 1 L | 30 L | B | 40 |
| | | | | III | 8, 6.1 | IB3, T7, TP1, TP28 | 154 | 203 | 241 | 5 L | 60 L | B | 40 |
| G | Corrosive liquids, water-reactive, n.o.s.. | 8 | UN3094 | I | 8, 4.3 | | None | 201 | 243 | Forbidden | 1 L | E | ..... |
| | | | | II | 8, 4.3 | | None | 202 | 243 | 1 L | 5 L | E | ..... |
| G | Corrosive solid, acidic, inorganic, n.o.s.. | 8 | UN3260 | I | 8 | IB7, IP1 | None | 211 | 242 | 1 kg | 25 kg | B | ..... |
| | | | | II | 8 | IB8, IP2, IP4 | 154 | 212 | 240 | 15 kg | 50 kg | B | ..... |
| | | | | III | 8 | IB8, IP3 | 154 | 213 | 240 | 25 kg | 100 kg | A | ..... |
| G | Corrosive solid, acidic, organic, n.o.s.. | 8 | UN3261 | I | 8 | IB7, IP1 | None | 211 | 242 | 1 kg | 25 kg | B | ..... |
| | | | | II | 8 | IB8, IP2, IP4 | 154 | 212 | 240 | 15 kg | 50 kg | B | ..... |
| | | | | III | 8 | IB8, IP3 | 154 | 213 | 240 | 25 kg | 100 kg | A | ..... |
| G | Corrosive solid, basic, inorganic, n.o.s.. | 8 | UN3262 | I | 8 | IB7, IP1 | None | 211 | 242 | 1 kg | 25 kg | B | ..... |
| | | | | II | 8 | IB8, IP2, IP4 | 154 | 212 | 240 | 15 kg | 50 kg | B | ..... |
| | | | | III | 8 | IB8, IP3 | 154 | 213 | 240 | 25 kg | 100 kg | A | ..... |
| G | Corrosive solid, basic, organic, n.o.s.. | 8 | UN3263 | I | 8 | IB7, IP1 | None | 211 | 242 | 1 kg | 25 kg | B | ..... |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym-bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|----------|--|----------------------------|----------------------------|-----|-------------|---|--------------------------|-------------------|-------------------|--------------------------|--------------------------|-----------------------|-------------------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| G | Corrosive solids, flammable, n.o.s. | 8 | UN2921 | II | 8, 4.1 | IB8, IP2, IP4 IB8, IP3 IB6 | 154 154 None | 212 213 211 | 240 240 242 | 15 kg 25 kg 1 kg | 50 kg 100 kg 25 kg | B A B | 12, 25 |
| G | Corrosive solids, n.o.s. | 8 | UN1759 | II | 8, 4.1 | IB8, IP2, IP4 IB7, IP1 | None None | 212 211 | 242 242 | 15 kg 1 kg | 50 kg 25 kg | B B | 12, 25 |
| G | Corrosive solids, oxidizing, n.o.s. | 8 | UN3084 | III | 8 | 128, IB8, IP2, IP4 128, IB8, IP3 | 154 154 | 213 213 | 240 240 | 25 kg 100 kg | 100 kg 25 kg | A A | |
| G | Corrosive solids, self-heating, n.o.s. | 8 | UN3095 | I | 8, 5.1 | IB6, IP2 | None | 211 | 242 | 1 kg | 25 kg | C | |
| G | Corrosive solids, toxic, n.o.s. | 8 | UN2923 | II | 8, 4.2 | IB6, IP2 | None | 212 | 242 | 1 kg | 50 kg | C | |
| G | Corrosive solids, water-reactive, n.o.s. | 8 | UN3096 | I | 8, 4.3 | IB8, IP2 IB4, IP1 | None None | 212 211 | 242 243 | 15 kg 1 kg | 50 kg 25 kg | B D | 40 95 |
| D W | Cotton | 9 | NA1365 | II | 8, 4.3 | IB6, IP2 | None | 212 | 242 | 15 kg | 50 kg | D | |
| A W | Cotton waste, oily | 4.2 | UN1364 | III | 4.2 | IB8, IP6 | None | 213 | None | Forbidden | Forbidden | A | 54 |
| A I | Cotton, wet | 4.2 | UN1365 | III | 4.2 | IB8, IP6 | None | 204 | 241 | Forbidden | Forbidden | A | |
| W | Coumarin derivative pesticides, liquid, flammable, toxic, flash point less than 23 degrees C. | 3 | UN3024 | I | 3, 6.1 | T14, TP2, TP13, TP27 | None | 201 | 243 | Forbidden | 30 L | B | 40 |
| | Coumarin derivative pesticides, liquid, toxic. | 6.1 | UN3026 | II | 3, 6.1 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 1 L | 60 L | B | 40 |
| | Coumarin derivative pesticides, liquid, toxic. | 6.1 | UN3026 | I | 6.1 | T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 40 |
| | Coumarin derivative pesticides, liquid, toxic. | 6.1 | UN3026 | II | 6.1 | IB2, T11, TP2, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
| | Coumarin derivative pesticides, liquid, toxic, flammable flash point not less than 23 degrees C. | 6.1 | UN3025 | III | 6.1 | IB3, T7, TP1, TP28 | 153 | 203 | 241 | 60 L | 220 L | A | 40 |
| | Coumarin derivative pesticides, liquid, toxic, flammable flash point not less than 23 degrees C. | 6.1 | UN3025 | I | 6.1, 3 | T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 40 |
| | Coumarin derivative pesticides, solid, toxic. | 6.1 | UN3027 | II | 6.1, 3 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
| | Coumarin derivative pesticides, solid, toxic. | 6.1 | UN3027 | III | 6.1, 3 | B1, IB3, T7, TP1, TP28 | 153 | 203 | 242 | 60 L | 220 L | A | 40 |
| | Coumarin derivative pesticides, solid, toxic. | 6.1 | UN3027 | I | 6.1 | IB7, IP1, T14, TP2, TP27 | None | 211 | 242 | 5 kg | 50 kg | A | 40 |
| | Coumarin derivative pesticides, solid, toxic. | 6.1 | UN3027 | II | 6.1 | IB8, IP2, IP4, T11, TP2, TP27 | None | 212 | 242 | 25 kg | 100 kg | A | 40 |
| | Coumarin derivative pesticides, solid, toxic. | 6.1 | UN3027 | III | 6.1 | IB8, IP3, T7, TP1, TP28 | 153 | 213 | 240 | 100 kg | 200 kg | A | 40 |
| | Cresols | 6.1 | UN2076 | II | 6.1, 8 | IB8, IP2, IP4, T7, TP2 | None | 202 | 243 | 1 L | 30 L | B | |
| | Cresylic acid | 6.1 | UN2022 | II | 6.1, 8 | IB2, T7, TP2, TP13 | None | 202 | 243 | 1 L | 30 L | B | |
| | Crotonaldehyde, stabilized | 6.1 | UN1143 | I | 6.1, 3 | 2, B9, B14, B32, B74, B77, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | B | 40 |
| | Crotonic acid liquid | 8 | UN2823 | III | 8 | IB3, T4, TP1 | 154 | 203 | 241 | 5 L | 60 L | A | 12 |
| | Crotonic acid, solid | 8 | UN2823 | III | 8 | IB8, IP3 | 154 | 213 | 240 | 25 kg | 100 kg | A | 12 |
| | Crotonylene | 3 | UN1144 | I | 3 | T11, TP2 | 150 | 201 | 243 | 1 L | 30 L | E | |
| | Cupriethylenediamine solution | 8 | UN1761 | II | 8, 6.1 | IB2, T7, TP2 | None | 202 | 243 | 1 L | 30 L | A | |
| | Cupriethylenediamine solution | 8 | UN1761 | III | 8, 6.1 | IB3, T7, TP1, TP28 | 154 | 203 | 242 | 5 L | 60 L | A | 95 |
| | Cutters, cable, explosive | 1.4S | UN0070 | II | 1.4S | | None | 62 | None | 25 kg | 100 kg | 05 | |
| | Cyanide or cyanide mixtures, dry, see Cyanides, inorganic, solid, n.o.s. | | | | | | | | | | | | |
| | 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 |
| | Cyanide solutions, n.o.s. | 6.1 | UN1935 | II | 6.1 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | A | 40, 52 |
| | Cyanide solutions, n.o.s. | 6.1 | UN1935 | III | 6.1 | IB3, T7, TP2, TP13, TP28 | 153 | 203 | 241 | 60 L | 220 L | A | 40, 52 |
| | Cyanides, inorganic, solid, n.o.s. | 6.1 | UN1588 | I | 6.1 | IB7, IP1, N74, N75 | None | 211 | 242 | 5 kg | 50 kg | A | 52 |
| | Cyanides, inorganic, solid, n.o.s. | 6.1 | UN1588 | II | 6.1 | IB8, IP2, IP4, N74, N75 | None | 212 | 242 | 25 kg | 100 kg | A | 52 |
| | Cyanides, inorganic, solid, n.o.s. | 6.1 | UN1588 | III | 6.1 | IB8, IP3, N74, N75 | 153 | 213 | 240 | 100 kg | 200 kg | A | 52 |
| | Cyanogen | 2.3 | UN1026 | | 2.3, 2.1 | 2 | None | 192 | 245 | Forbidden | Forbidden | D | 40 |
| | Cyanogen bromide | 6.1 | UN1889 | I | 6.1, 8 | A6, A8 | None | 211 | 242 | 1 kg | 15 kg | D | 40 |
| | Cyanogen chloride, stabilized | 2.3 | UN1589 | | 2.3, 8 | 1 | None | 192 | 245 | Forbidden | Forbidden | D | 40 |
| | Cyanuric chloride | 8 | UN2670 | II | 8 | IB8, IP2, IP4 | None | 212 | 240 | 15 kg | 50 kg | A | 12, 40 |
| | Cyanuric triazide | Forbidden | | | | | | | | | | | |
| | Cyclobutane | 2.1 | UN2601 | | 2.1 | | 306 | 304 | 314, 315 | Forbidden | 150 kg | B | 40 |
| | Cyclobutyl chloroformate | 6.1 | UN2744 | II | 6.1, 8, 3 | IB1, T7, TP2, TP13 | None | 202 | 243 | 1 L | 30 L | A | 12, 13, 21, 25, 40, 100 |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|--|----------------------------------|----------------------------------|-------|----------------|--|-----------------------------|----------|----------|-----------------------------|--------------------------|-----------------------------|--------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| | | | | | | | | | | | | | |
| | 1,5,9-Cyclododecatriene | 6.1 | UN2518 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | 40 |
| | Cycloheptane | 3 | UN2241 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | 40 |
| | Cycloheptatriene | 3 | UN2603 | II | 3, 6.1 | IB2, T7, TP1, TP13 | None | 202 | 243 | 1 L | 60 L | E | 40 |
| | Cycloheptene | 3 | UN2242 | II | 3 | B1, IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
| | Cyclohexane | 3 | UN1145 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | E | ..... |
| | Cyclohexanone | 3 | UN1915 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Cyclohexene | 3 | UN2256 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | E | ..... |
| | Cyclohexenylnitrilchlorosilane | 8 | UN1762 | II | 8 | A7, B2, IB2, N34, T7, TP2, TP13 | None | 202 | 242 | Forbidden | 30 L | C | 40 |
| | Cyclohexyl acetate | 3 | UN2243 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Cyclohexyl isocyanate | 6.1 | UN2488 | I | 6.1, 3 | 2, B9, B14, B32, B74, B77, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 40 |
| | Cyclohexyl mercaptan | 3 | UN3054 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | 40, 95 |
| | Cyclohexylamine | 8 | UN2357 | II | 8, 3 | IB2, T7, TP1 | None | 202 | 243 | 1 L | 30 L | A | 40 |
| | Cyclohexyltrichlorosilane | 8 | UN1763 | II | 8 | A7, B2, IB2, N34, T7, TP2, TP13 | None | 202 | 242 | Forbidden | 30 L | C | 40 |
| | Cyclonite and cyclotetramethylenetetranitramine mixtures, wetted or desensitized see RDX and HMX mixtures, wetted or desensitized etc. | | | | | | | | | | | | |
| | Cyclonite and HMX mixtures, wetted or desensitized see RDX and HMX mixtures, wetted or desensitized etc. | | | | | | | | | | | | |
| | Cyclonite and octogen mixtures, wetted or desensitized see RDX and HMX mixtures, wetted or desensitized etc. | | | | | | | | | | | | |
| | Cyclonite, see Cyclotrimethylenetrinitramine, etc. | | | | | | | | | | | | |
| | Cyclooctadiene phosphines, see 9-Phosphabicyclononanes. | | | | | | | | | | | | |
| | Cyclooctadienes | 3 | UN2520 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Cyclooctatetraene | 3 | UN2358 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
| | Cyclopentane | 3 | UN1146 | II | 3 | IB2, T7, TP1 | 150 | 202 | 242 | 5 L | 60 L | E | ..... |
| | Cyclopentane, methyl, see Methylcyclopentane. | | | | | | | | | | | | |
| | Cyclopentanol | 3 | UN2244 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Cyclopentanone | 3 | UN2245 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Cyclopentene | 3 | UN2246 | II | 3 | IB2, IP8, T7, TP2 | 150 | 202 | 242 | 5 L | 60 L | E | ..... |
| | Cyclopropane | 2.1 | UN1027 | ..... | 2.1 | T50 | 306 | 304 | 314, 315 | Forbidden | 150 kg | E | 40 |
| | Cyclotetramethylene tetranitramine (dry or unphlegmatized) (HMX). | Forbidden | | | | | | | | | | | |
| | Cyclotetramethylenetetranitramine, desensitized or Octogen, desensitized or HMX, desensitized. | 1.1D | UN0484 | II | 1.1D | | None | 62 | None | Forbidden | Forbidden | 10 | ..... |
| | Cyclotetramethylenetetranitramine, wetted or HMX, wetted or Octogen, wetted with not less than 15 percent water, by mass. | 1.1D | UN0226 | II | 1.1D | | None | 62 | None | Forbidden | Forbidden | 10 | ..... |
| | Cyclotrimethylenetrinitramine and cyclotetramethylenetetranitramine mixtures, wetted or desensitized see RDX and HMX mixtures, wetted or desensitized etc. | | | | | | | | | | | | |
| | Cyclotrimethylenetrinitramine and octogen, mixtures, wetted or desensitized see RDX and HMX mixtures, wetted or desensitized etc. | | | | | | | | | | | | |
| | Cyclotrimethylenetrinitramine and HMX mixtures, wetted or desensitized see RDX and HMX mixtures, wetted or desensitized etc. | | | | | | | | | | | | |
| | Cyclotrimethylenetrinitramine, desensitized or Cyclonite, desensitized or Hexogen, desensitized or RDX, desensitized. | 1.1D | UN0483 | II | 1.1D | | None | 62 | None | Forbidden | Forbidden | 10 | ..... |
| | Cyclotrimethylenetrinitramine, wetted or Cyclonite, wetted or Hexogen, wetted or RDX, wetted with not less than 15 percent water by mass. | 1.1D | UN0072 | II | 1.1D | | None | 62 | None | Forbidden | Forbidden | 10 | ..... |
| | Cymenes | 3 | UN2046 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Dangerous Goods in Machinery or Dangerous Goods in Apparatus. | 9 | UN3363 | ..... |  | 136 | None | 222 | None | No limit | No limit | A | ..... |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|--|----------------------------------|----------------------------------|-----|----------------|--|-----------------------------|----------|----------|-----------------------------|--------------------------|-----------------------------|--------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | <i>Dicycloheptadiene, see</i> Bicyclo [2,2,1] hepta-2,5-diene, stabilized. | | | | | | | | | | | | |
| | Dicyclohexylamine | 8 | UN2565 | III | 8 | IB3, T4, TP1 | 154 | 203 | 241 | 5 L | 60 L | A | |
| | Dicyclohexylammonium nitrite | 4.1 | UN2687 | III | 4.1 | IB8, IP3 | 151 | 213 | 240 | 25 kg | 100 kg | A | 48 |
| | Dicyclopentadiene | 3 | UN2048 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Didymium nitrate | 5.1 | UN1465 | III | 5.1 | A1, IB8, IP3 | 152 | 213 | 240 | 25 kg | 100 kg | A | |
| D | Diesel fuel | 3 | NA1993 | III | None | B1, IB3, T4, TP1, TP29 | 150 | 203 | 242 | 60 L | 220 L | A | |
| I | Diesel fuel | 3 | UN1202 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | <i>Diethanol nitrosamine dinitrate (dry).</i> | Forbidden | | | | | | | | | | | |
| | Diethoxymethane | 3 | UN2373 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | E | |
| | 3,3-Diethoxypropene | 3 | UN2374 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | Diethyl carbonate | 3 | UN2366 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | <i>Diethyl cellosolve, see</i> Ethylene glycol diethyl ether. | | | | | | | | | | | | |
| | Diethyl ether or Ethyl ether | 3 | UN1155 | I | 3 | T11, TP2 | 150 | 201 | 243 | 1 L | 30 L | E | 40 |
| | Diethyl ketone | 3 | UN1156 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | <i>Diethyl peroxydicarbonate, with more than 27 percent in solution.</i> | Forbidden | | | | | | | | | | | |
| | Diethyl sulfate | 6.1 | UN1594 | II | 6.1 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | C | |
| | Diethyl sulfide | 3 | UN2375 | II | 3 | IB2, T7, TP1, TP13 | None | 202 | 243 | 5 L | 60 L | E | |
| | Diethylamine | 3 | UN1154 | II | 3, 8 | IB2, N34, T7, TP1 | None | 202 | 243 | 1 L | 5 L | E | 40 |
| | 2-Diethylaminoethanol | 8 | UN2686 | II | 8, 3 | B2, IB2, T7, TP2 | None | 202 | 243 | 1 L | 30 L | A | |
| | Diethylaminopropylamine | 3 | UN2684 | III | 3, 8 | B1, IB3, T4, TP1 | 150 | 203 | 242 | 5 L | 60 L | A | |
| + | N, N-Diethylaniline | 6.1 | UN2432 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | |
| | Diethylbenzene | 3 | UN2049 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Diethyldichlorosilane | 8 | UN1767 | II | 8, 3 | A7, B6, IB2, N34, T7, TP2, TP13 | None | 202 | 243 | Forbidden | 30 L | C | 40 |
| | <i>Diethylene glycol dinitrate</i> | Forbidden | | | | | | | | | | | |
| | Diethyleneglycol dinitrate, desensitized with not less than 25 percent non-volatile water-insoluble phlegmatizer, by mass. | 1.1D | UN0075 | II | 1.1D | | None | 62 | None | Forbidden | Forbidden | 13 | 21E |
| | Diethylenetriamine | 8 | UN2079 | II | 8 | B2, IB2, T7, TP2 | 154 | 202 | 242 | 1 L | 30 L | A | 40 |
| | N,N-Diethylethylenediamine | 8 | UN2685 | II | 8, 3 | IB2, T7, TP2 | None | 202 | 243 | 1 L | 30 L | A | |
| | <i>Diethylgold bromide</i> | Forbidden | | | | | | | | | | | |
| | Diethylthiophosphoryl chloride | 8 | UN2751 | II | 8 | B2, IB2, T7, TP2 | 154 | 202 | 242 | 1 L | 39 L | A | 40 |
| | Diethylzinc | 4.2 | UN1366 | I | 4.2, 4.3 | B11, T21, TP2, TP7 | None | 181 | 244 | Forbidden | Forbidden | D | 18 |
| | <i>Difluorochloroethanes, see</i> 1-Chloro-1,1-difluoroethanes. | | | | | | | | | | | | |
| | 1,1-Difluoroethane or Refrigerant gas R 152a. | 2.1 | UN1030 | | 2.1 | T50 | 306 | 304 | 314, 315 | Forbidden | 150 kg | B | 40 |
| | 1,1-Difluoroethylene or Refrigerant gas R 1132a. | 2.1 | UN1959 | | 2.1 | | 306 | 304 | None | Forbidden | 150 kg | E | 40 |
| | Difluoromethane or Refrigerant gas R 32. | 2.1 | UN3252 | | 2.1 | T50 | 306 | 302 | 314, 315 | Forbidden | 150 kg | D | 40 |
| | Difluorophosphoric acid, anhydrous. | 8 | UN1768 | II | 8 | A6, A7, B2, IB2, N5, N34, T8, TP2, TP12 | None | 202 | 242 | 1 L | 30 L | A | 40 |
| | 2,3-Dihydropyran | 3 | UN2376 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | <i>1,8-Dihydroxy-2,4,5,7-tetranitroanthraquinone (chrysamminic acid).</i> | Forbidden | | | | | | | | | | | |
| | <i>Diiodoacetylene</i> | Forbidden | | | | | | | | | | | |
| | Diisobutyl ketone | 3 | UN1157 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Diisobutylamine | 3 | UN2361 | III | 3, 8 | B1, IB3, T4, TP1 | 150 | 203 | 242 | 5 L | 60 L | A | |
| | Diisobutylene, isomeric compounds. | 3 | UN2050 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | Diisooctyl acid phosphate | 8 | UN1902 | III | 8 | IB3, T4, TP1 | 154 | 203 | 241 | 5 L | 60 L | A | |
| | Diisopropyl ether | 3 | UN1159 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | E | 40 |
| | Diisopropylamine | 3 | UN1158 | II | 3, 8 | IB2, T7, TP1 | None | 202 | 243 | 1 L | 5 L | B | |
| | <i>Diisopropylbenzene hydroperoxide, with more than 72 percent in solution.</i> | Forbidden | | | | | | | | | | | |
| | Diketene, stabilized | 6.1 | UN2521 | I | 6.1, 3 | 2, B9, B14, B32, B74, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 40, 49 |
| | 1,2-Dimethoxyethane | 3 | UN2252 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | 1,1-Dimethoxyethane | 3 | UN2377 | II | 3 | IB2, T7, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | Dimethyl carbonate | 3 | UN1161 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | <i>Dimethyl chlorothiophosphate, see</i> Dimethyl thiophosphoryl chloride. | | | | | | | | | | | | |
| | <i>2,5-Dimethyl-2,5-dihydroperoxy hexane, with more than 82 percent with water.</i> | Forbidden | | | | | | | | | | | |
| | Dimethyl disulfide | 3 | UN2381 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | 40 |
| | Dimethyl ether | 2.1 | UN1033 | | 2.1 | T50 | 306 | 304 | 314, 315 | Forbidden | 150 kg | B | 40 |
| | Dimethyl-N-propylamine | 3 | UN2266 | II | 3, 8 | IB2, T7, TP2, TP13 | None | 202 | 243 | 1 L | 5 L | B | 40 |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | | |
|--------------|---|----------------------------------|----------------------------------|--------|-------------------|--|---------------------------|----------|----------|----------------------------|--------------------------|--------------------------|--------------------|----|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) | |
| | Dimethyl sulfate | 6.1 | UN1595 | I | 6.1, 8 | 2, B9, B14, B32, B74, B77, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 40 | |
| | Dimethyl sulfide | 3 | UN1164 | II | 3 | IB1, IP8, T7, TP2 | None | 202 | 242 | 5 L | 60 L | E | 40 | |
| | Dimethyl thiophosphoryl chloride | 6.1 | UN2267 | II | 6.1, 8 | IB2, T7, TP2 | None | 202 | 243 | 1 L | 30 L | B | 25 | |
| | Dimethylamine, anhydrous | 2.1 | UN1032 | ..... | 2.1 | T50 | None | 304 | 314, 315 | Forbidden | 150 kg | D | 40 | |
| | Dimethylamine solution | 3 | UN1160 | II | 3, 8 | IB2, T7, TP1 | None | 202 | 243 | 1 L | 5 L | B | ..... |  |
| | 2-Dimethylaminoacetonitrile | 3 | UN2378 | II | 3, 6.1 | IB2, T7, TP1 | None | 202 | 243 | 1 L | 60 L | A | 26, 40 | |
| | 2-Dimethylaminoethanol | 8 | UN2051 | II | 8, 3 | B2, IB2, T7, TP2 | 154 | 202 | 243 | 1 L | 30 L | A | ..... |  |
| | 2-Dimethylaminoethyl acrylate | 6.1 | UN3302 | II | 6.1 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | D | 25 | |
| | 2-Dimethylaminoethyl methacry- late | 6.1 | UN2522 | II | 6.1 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | B | 40 | |
| | N,N-Dimethylaniline | 6.1 | UN2253 | II | 6.1 | IB1, T7, TP2 | None | 202 | 243 | 5 L | 60 L | A | ..... |  |
| | 2,3-Dimethylbutane | 3 | UN2457 | II | 3 | IB2, T7, TP1 | 150 | 202 | 242 | 5 L | 60 L | E | ..... |  |
| | 1,3-Dimethylbutylamine | 3 | UN2379 | II | 3, 8 | IB2, T7, TP1 | None | 202 | 243 | 1 L | 5 L | B | ..... |  |
| | Dimethylcarbamoyl chloride | 8 | UN2262 | II | 8 | B2, IB2, T7, TP2 | 154 | 202 | 242 | 1 L | 30 L | A | 40 | |
| | Dimethylcyclohexanes | 3 | UN2263 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |  |
| | Dimethylcyclohexylamine | 8 | UN2264 | II | 8, 3 | B2, IB2, T7, TP2 | 154 | 202 | 243 | 1 L | 30 L | A | 40 | |
| | Dimethyldichlorosilane | 3 | UN1162 | II | 3, 8 | B77, IB2, T7, TP2, TP13 | None | 202 | 243 | Forbidden | Forbidden | B | 40 | |
| | Dimethyldiethoxysilane | 3 | UN2380 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |  |
| | Dimethyldioxanes | 3 | UN2707 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |  |
|  | ..... | ..... | ..... | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |  |
| | N,N-Dimethylformamide | 3 | UN2265 | III | 3 | B1, IB3, T2, TP2 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |  |
| | Dimethylhexane dihydroperoxide (dry) | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |  |
| | Dimethylhydrazine, symmetrical .. | 6.1 | UN2382 | I | 6.1, 3 | 2, A7, B9, B14, B32, B74, B77, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 40 | |
| | Dimethylhydrazine, unsymmetrical | 6.1 | UN1163 | I | 6.1, 3, 8 | 2, B7, B9, B14, B32, B74, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 21, 38, 40, 100 | |
| | 2,2-Dimethylpropane | 2.1 | UN2044 | ..... | 2.1 | ..... | 306 | 304 | 314, 315 | Forbidden | 150 kg | E | 40 | |
| | Dimethylzinc | 4.2 | UN1370 | I | 4.2, 4.3 | B11, B16, T21, TP2, TP7 | None | 181 | 244 | Forbidden | Forbidden | D | 18 | |
| | Dinitro-o-cresol, solid | 6.1 | UN1598 | II | 6.1 | IB8, IP2, IP4, T7, TP2 | None | 212 | 242 | 25 kg | 100 kg | A | ..... |  |
| | Dinitro-o-cresol, solution | 6.1 | UN1598 | II | 6.1 | IB2, IP2, IP4, T7, TP2 | None | 202 | 243 | 5 L | 60 L | A | ..... |  |
| | 1,3-Dinitro-5,5-dimethyl hydantoin Dinitro-7,8-dimethylglycoluril (dry) 1,3-Dinitro-4,5-dinitrosobenzene .. 1,4-Dinitro-1,1,4,4- tetramethylolbutanetetranitrate (dry) | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |  |
| | 2,4-Dinitro-1,3,5-trimethylbenzene Dinitroanilines | Forbidden | 6.1 | UN1596 | II | 6.1 | IB8, IP2, IP4, T7, TP2 | None | 212 | 242 | 25 kg | 100 kg | A | 91 |
| | Dinitrobenzenes, liquid | 6.1 | UN1597 | II | 6.1 | 11, IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | A | 91 | |
| | Dinitrobenzenes, solid | 6.1 | UN1597 | II | 6.1 | 11, IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | 91 | |
| | Dinitrochlorobenzene, see Chlorodinitrobenzene. 1,2-Dinitroethane | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |  |
| | 1,1-Dinitroethane (dry) | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |  |
| | Dinitrogen tetroxide | 2.3 | UN1067 | ..... | 2.3, 5.1, 8 | 1, B7, B14, B45, B46, B61, B66, B67, B77, T50, TP21 | None | 336 | 314 | Forbidden | Forbidden | D | 40, 89, 90 | |
| | Dinitroglycoluril or Dingu | 1.1D | UN0489 | II | 1.1D | ..... | None | 62 | None | Forbidden | Forbidden | 10 | ..... |  |
| | Dinitromethane | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |  |
| | Dinitrophenol, dry or wetted with less than 15 percent water, by mass | 1.1D | UN0076 | II | 1.1D, 6.1 | ..... | None | 62 | None | Forbidden | Forbidden | 10 | 5E | |
| | Dinitrophenol solutions | 6.1 | UN1599 | II | 6.1 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | A | 36 | |
|  | ..... | ..... | ..... | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | 36 | |
| | Dinitrophenol, wetted with not less than 15 percent water, by mass | 4.1 | UN1320 | I | 4.1, 6.1 | 23, A8, A19, A20, N41 | None | 211 | None | 1 kg | 15 kg | E | 28, 36 | |
| | Dinitrophenolates alkali metals, dry or wetted with less than 15 percent water, by mass | 1.3C | UN0077 | II | 1.3C, 6.1 | ..... | None | 62 | None | Forbidden | Forbidden | 10 | 5E | |
| | Dinitrophenolates, wetted with not less than 15 percent water, by mass | 4.1 | UN1321 | I | 4.1, 6.1 | 23, A8, A19, A20, N41 | None | 211 | None | 1 kg | 15 kg | E | 28, 36 | |
| | Dinitropropylene glycol | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |  |
| | Dinitroresorcinol, dry or wetted with less than 15 percent water, by mass | 1.1D | UN0078 | II | 1.1D | ..... | None | 62 | None | Forbidden | Forbidden | 10 | 5E | |
| | 2,4-Dinitroresorcinol (heavy metal salts of) (dry) | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |  |
| | 4,6-Dinitroresorcinol (heavy metal salts of) (dry) | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |  |
| | Dinitroresorcinol, wetted with not less than 15 percent water, by mass | 4.1 | UN1322 | I | 4.1 | 23, A8, A19, A20, N41 | None | 211 | None | 1 kg | 15 kg | E | 28, 36 | |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|---|----------------------------------|----------------------------------|-----|----------------|--|-----------------------------|----------|------|-----------------------------|--------------------------|-----------------------------|-------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | 3,5-Dinitrosalicylic acid (lead salt) (dry). | Forbidden | | | | | | | | | | | |
| | Dinitrosobenzene | 1.3C | UN0406 | | II 1.3C | | None | 62 | None | Forbidden | Forbidden | 10 | |
| | Dinitrosobenzylamide and salts of (dry). | Forbidden | | | | | | | | | | | |
| | 2,2-Dinitrostilbene | Forbidden | | | | | | | | | | | |
| | Dinitrotoluenes, liquid | 6.1 | UN2038 | | II 6.1 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | A | |
| | Dinitrotoluenes, molten | 6.1 | UN1600 | | II 6.1 | T7, TP3 | None | 202 | 243 | Forbidden | Forbidden | C | |
| | Dinitrotoluenes, solid | 6.1 | UN2038 | | II 6.1 | IB8, IP2, IP4, T7, TP2 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | 1,9-Dinitroxy pentamethylene-2,4,6,8-tetramine (dry). | Forbidden | | | | | | | | | | | |
| | Dioxane | 3 | UN1165 | | II 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | Dioxolane | 3 | UN1166 | | II 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | 40 |
| | Dipentene | 3 | UN2052 | | III 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Diphenylamine chloroarsine | 6.1 | UN1698 | | I 6.1 | | None | 201 | None | Forbidden | Forbidden | D | 40 |
| | Diphenylchloroarsine, liquid | 6.1 | UN1699 | | I 6.1 | A8, B14, B32, N33, N34, T14, TP2, TP13, TP27 | None | 201 | 243 | Forbidden | Forbidden | D | 40 |
| | Diphenylchloroarsine, solid | 6.1 | UN1699 | | I 6.1 | A8, B14, B32, IB7, IP1, N33, N34 | None | 211 | 242 | Forbidden | 15 kg | D | 40 |
| | Diphenyldichlorosilane | 8 | UN1769 | | II 8 | A7, B2, IB2, N34, T7, TP2, TP13 | None | 202 | 242 | Forbidden | 30 L | C | 40 |
| | Diphenylmethyl bromide | 8 | UN1770 | | II 8 | IB8, IP2, IP4 | 154 | 212 | 240 | 15 kg | 50 kg | D | 40 |
| | Dipicryl sulfide, dry or wetted with less than 10 percent water, by mass. | 1.1D | UN0401 | | II 1.1D | | None | 62 | None | Forbidden | Forbidden | 10 | |
| | Dipicryl sulfide, wetted with not less than 10 percent water, by mass. | 4.1 | UN2852 | | I 4.1 | A2, N41 | None | 211 | None | Forbidden | 0.5 kg | D | 28 |
| | Dipicrylamine, see Hexanitrodiphenylamine. | | | | | | | | | | | | |
| | Dipropionyl peroxide, with more than 28 percent in solution. | Forbidden | | | | | | | | | | | |
| | Di-n-propyl ether | 3 | UN2384 | | II 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | Dipropyl ketone | 3 | UN2710 | | III 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Dipropylamine | 3 | UN2383 | | II 3, 8 | IB2, T7, TP1 | None | 202 | 243 | 1 L | 5 L | B | |
| G | Disinfectant, liquid, corrosive, n.o.s.. | 8 | UN1903 | | I 8 | A7, B10, T14, TP2, TP27 | None | 201 | 243 | 0.5 L | 2.5 L | B | |
| G | Disinfectants, liquid, corrosive n.o.s.. | 8 | UN1903 | | II 8 | B2, IB2, T7, TP2 | 154 | 202 | 242 | 1 L | 30 L | B | |
| G | Disinfectants, liquid, toxic, n.o.s. .. | 6.1 | UN3142 | | III 8 | IB3, T4, TP1 | 154 | 203 | 241 | 5 L | 60 L | A | |
| | | | | | I 6.1 | A4, T14, TP2, TP27 | None | 201 | 243 | 1 L | 30 L | A | 40 |
| | | | | | II 6.1 | IB2, T11, TP2, TP27 | None | 202 | 243 | 5 L | 60 L | A | 40 |
| | | | | | III 6.1 | IB3, T7, TP1, TP28 | 153 | 203 | 241 | 60 L | 220 L | A | 40 |
| G | Disinfectants, solid, toxic, n.o.s. ... | 6.1 | UN1601 | | II 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | 40 |
| | | | | | III 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | 40 |
| G | Dispersant gases, n.o.s. see Refrigerant gases, n.o.s.. | 8 | UN3253 | | III 8 | IB8, IP3 | 154 | 213 | 240 | 25 kg | 100 kg | A | |
| | Divinyl ether, stabilized | 3 | UN1167 | | I 3 | T11, TP2 | None | 201 | 243 | 1 L | 30 L | E | 40 |
| | Dodecyltrichlorosilane | 8 | UN1771 | | II 8 | A7, B2, B6, IB2, N34, T7, TP1, TP13 | None | 202 | 242 | Forbidden | 30 L | C | 40 |
| G | Dry ice, see Carbon dioxide, solid | | | | | | | | | | | | |
| | Dyes, liquid, corrosive, n.o.s. or Dye intermediates, liquid, corrosive, n.o.s.. | 8 | UN2801 | | I 8 | 11, B10, T14, TP2, TP27 | None | 201 | 243 | 0.5 L | 2.5 L | A | |
| | | | | | II 8 | 11, B2, IB2, T11, TP2, TP27 | 154 | 202 | 242 | 1 L | 30 L | A | |
| | | | | | III 8 | 11, IB3, T7, TP1, TP28 | 154 | 203 | 241 | 5 L | 60 L | A | |
| G | Dyes, liquid, toxic, n.o.s. or Dye intermediates, liquid, toxic, n.o.s.. | 6.1 | UN1602 | | II 6.1 | IB2 | None | 202 | 243 | 5 L | 60 L | A | |
| G | Dyes, solid, corrosive, n.o.s. or Dye intermediates, solid, corrosive, n.o.s.. | 8 | UN3147 | | III 6.1 | IB3 | 153 | 203 | 241 | 60 L | 220 L | A | |
| | | | | | I 8 | IB7, IP1 | None | 211 | 242 | 1 kg | 25 kg | A | |
| | | | | | II 8 | IB8, IP2, IP4 | 154 | 212 | 240 | 15 kg | 50 kg | A | |
| | | | | | III 8 | IB8, IP3 | 154 | 213 | 240 | 25 kg | 100 kg | A | |
| G | Dyes, solid, toxic, n.o.s. or Dye intermediates, solid, toxic, n.o.s.. | 6.1 | UN3143 | | I 6.1 | A5, IB7, IP1, T14, TP2, TP27 | None | 211 | 242 | 5 kg | 50 kg | A | |
| | | | | | II 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | | | | | III 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | |
| | Dynamite, see Explosive, blasting, type A. | | | | | | | | | | | | |
| | Electrolyte (acid or alkali) for batteries, see Battery fluid, acid or Battery fluid, alkali. | | | | | | | | | | | | |
| | Elevated temperature liquid, flammable, n.o.s., with 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 | |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | | |
|--------------|--|----------------------------------|----------------------------------|-----|----------------|--|-----------------------------|----------|----------|-----------------------------|--------------------------|-----------------------------|-------------------------|----|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) | |
| D | Ethyl phosphonothioic dichloride, anhydrous. | 6.1 | NA2927 | I | 6.1, 8 | 2, B9, B14, B32, B74, T20, TP4, TP12, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 40 | |
| D | Ethyl phosphonous dichloride, anhydrous <i>pyrophoric liquid</i> . | 6.1 | NA2845 | I | 6.1, 4.2 | 2, B9, B14, B32, B74, T20, TP4, TP12, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 18 | |
| D | Ethyl phosphorodichloridate | 6.1 | NA2927 | I | 6.1, 8 | 2, B9, B14, B32, B74, T20, TP4, TP12, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 40 | |
| | Ethyl propionate | 3 | UN1195 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | | |
| | Ethyl propyl ether | 3 | UN2615 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | E | | |
| | <i>Ethyl silicate, see Tetraethyl silicate.</i> | | | | | | | | | | | | | |
| | Ethylacetylene, stabilized | 2.1 | UN2452 | | 2.1 | | None | 304 | 314, 315 | Forbidden | 150 kg | B | 40 | |
| | Ethylamine | 2.1 | UN1036 | | 2.1 | B77, T50 | None | 321 | 314, 315 | Forbidden | 150 kg | D | 40 | |
| | Ethylamine, aqueous solution with not less than 50 percent but not more than 70 percent ethylamine. | 3 | UN2270 | II | 3, 8 | IB2, T7, TP1 | None | 202 | 243 | 1 L | 5 L | B | 40 | |
| | N-Ethylaniline | 6.1 | UN2272 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | | |
| | 2-Ethylaniline | 6.1 | UN2273 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | | |
| | Ethylbenzene | 3 | UN1175 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | | |
| | N-Ethylbenzyltoluidines liquid | 6.1 | UN2753 | III | 6.1 | IB3, T7, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | | |
| | N-Ethylbenzyltoluidines solid | 6.1 | UN2753 | III | 6.1 | IB8, IP3, T7, TP1 | 153 | 213 | 240 | 100 kg | 200 kg | A | | |
| | 2-Ethylbutanol | 3 | UN2275 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | | |
| | Ethylbutyl acetate | 3 | UN1177 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | | |
| | 2-Ethylbutyraldehyde | 3 | UN1178 | II | 3 | B1, IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | | |
| | Ethylidichloroarsine | 6.1 | UN1892 | I | 6.1 | 2, B9, B14, B32, B74, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 40 | |
| | Ethylidichlorosilane | 4.3 | UN1183 | I | 4.3, 8, 3 | A2, A3, A7, N34, T10, TP2, TP7, TP13 | None | 201 | 244 | Forbidden | 1 L | D | 21, 28, 40, 49, 100, 40 | |
| | Ethylene, acetylene and propylene in mixture, refrigerated liquid with at least 71.5 percent ethylene with not more than 22.5 percent acetylene and not more than 6 percent propylene. | 2.1 | UN3138 | | 2.1 | T75, TP5 | None | 304 | 314, 315 | Forbidden | Forbidden | D | | |
| | Ethylene chlorohydrin | 6.1 | UN1135 | I | 6.1, 3 | 2, B9, B14, B32, B74, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 40 | |
| | Ethylene, compressed | 2.1 | UN1962 | | 2.1 | | 306 | 304 | 302 | Forbidden | 150 kg | E | 40 | |
| | <i>Ethylene diamine diperchlorate</i> | Forbidden | | | | | | | | | | | | |
| | Ethylene dibromide | 6.1 | UN1605 | I | 6.1 | 2, B9, B14, B32, B74, B77, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 40 | |
| | <i>Ethylene dibromide and methyl bromide liquid mixtures, see Methyl bromide and ethylene dibromide, liquid mixtures.</i> | | | | | | | | | | | | | |
| | Ethylene dichloride | 3 | UN1184 | II | 3, 6.1 | IB2, T7, TP1 | None | 202 | 243 | 1 L | 60 L | B | 40 | |
| | Ethylene glycol diethyl ether | 3 | UN1153 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | | |
| | <i>Ethylene glycol dinitrate</i> | Forbidden | | | | | | | | | | | | |
| | Ethylene glycol monoethyl ether | 3 | UN1171 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | | |
| | Ethylene glycol monoethyl ether acetate. | 3 | UN1172 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | | |
| | Ethylene glycol monomethyl ether | 3 | UN1188 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | | |
| | Ethylene glycol monomethyl ether acetate. | 3 | UN1189 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | | |
| | Ethylene oxide and carbon dioxide mixture with more than 87 percent ethylene oxide. | 2.3 | UN3300 | | 2.3, 2.1 | | 4 | None | 304 | 314, 315 | Forbidden | Forbidden | D | 40 |
| | Ethylene oxide and carbon dioxide mixtures with more than 9 percent but not more than 87 percent ethylene oxide. | 2.1 | UN1041 | | 2.1 | | T50 | 306 | 304 | 314, 315 | Forbidden | 25 kg | B | 40 |
| | Ethylene oxide and carbon dioxide mixtures with not more than 9 percent ethylene oxide. | 2.2 | UN1952 | | 2.2 | | | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | |
| | Ethylene oxide and chlorotetrafluoroethane mixture with not more than 8.8 percent ethylene oxide. | 2.2 | UN3297 | | 2.2 | | T50 | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | |
| | Ethylene oxide and dichlorodifluoromethane mixture, with not more than 12.5 percent ethylene oxide. | 2.2 | UN3070 | | 2.2 | | T50 | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | |
| | Ethylene oxide and pentafluoroethane mixture with not more than 7.9 percent ethylene oxide. | 2.2 | UN3298 | | 2.2 | | T50 | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|---|----------------------------------|----------------------------------|-------|----------------|---|-----------------------------|----------|----------|-----------------------------|--------------------------|-----------------------------|-------------------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | Ethylene oxide and propylene oxide mixtures, with not more than 30 percent ethylene oxide. | 3 | UN2983 | I | 3, 6.1 | 5, A11, N4, N34, T14, TP2, TP7, TP13 | None | 201 | 243 | Forbidden | 30 L | E | 40 |
| | Ethylene oxide and tetrafluoroethane mixture with not more than 5.6 percent ethylene oxide. | 2.2 | UN3299 | ..... | 2.2 | T50 | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | ..... |
| | Ethylene oxide or Ethylene oxide with nitrogen up to a total pressure of 1MPa (10 bar) at 50 degrees C. | 2.3 | UN1040 | ..... | 2.3, 2.1 | 4, T50, TP20 | None | 323 | 323 | Forbidden | 25 kg | D | 40 |
| | Ethylene, refrigerated liquid (cryogenic liquid). | 2.1 | UN1038 | ..... | 2.1 | T75, TP5 | None | 316 | 318, 319 | Forbidden | Forbidden | D | 40 |
| | Ethylenediamine | 8 | UN1604 | II | 8, 3 | IB2, T7, TP2 | 154 | 202 | 243 | 1 L | 30 L | A | 40 |
| | Ethyleneimine, stabilized | 6.1 | UN1185 | I | 6.1, 3 | 1, B9, B14, B30, B72, B77, N25, N32, T22, TP2, TP13, TP38, TP44 | None | 226 | 244 | Forbidden | Forbidden | D | 40 |
| | <i>Ethylhexaldehyde, see Octyl aldehydes etc.</i> | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | 2-Ethylhexyl chloroformate | 6.1 | UN2748 | II | 6.1, 8 | IB2, T7, TP2, TP13 | None | 202 | 243 | 1 L | 30 L | A | 12, 13, 21, 25, 40, 100 |
| | 2-Ethylhexylamine | 3 | UN2276 | III | 3, 8 | B1, IB3, T4, TP1 | 150 | 203 | 242 | 5 L | 60 L | A | 40 |
| | Ethylphenyldichlorosilane | 8 | UN2435 | II | 8 | A7, B2, IB2, N34, T7, TP2, TP13 | None | 202 | 242 | Forbidden | 30 L | C | ..... |
| | 1-Ethylpiperidine | 3 | UN2386 | II | 3, 8 | IB2, T7, TP1 | None | 202 | 243 | 1 L | 5 L | B | ..... |
| | N-Ethyltoluidines | 6.1 | UN2754 | II | 6.1 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | A | ..... |
| | Ethyltrichlorosilane | 3 | UN1196 | II | 3, 8 | A7, IB1, N34, T7, TP2, TP13 | None | 202 | 243 | 1 L | 5 L | B | 40 |
| | <i>Etiologic agent, see Infectious substances, etc.</i> | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | <i>Explosive articles, see Articles, explosive, n.o.s. etc.</i> | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Explosive, blasting, type A | 1.1D | UN0081 | II | 1.1D | ..... | None | 62 | None | Forbidden | Forbidden | 10 | 21E |
| | Explosive, blasting, type B | 1.1D | UN0082 | II | 1.1D | ..... | None | 62 | None | Forbidden | Forbidden | 10 | ..... |
| | Explosive, blasting, type B or Agent blasting, Type B. | 1.5D | UN0331 | II | 1.5D | 105, 106 | None | 62 | None | Forbidden | Forbidden | 10 | ..... |
| | Explosive, blasting, type C | 1.1D | UN0083 | II | 1.1D | 123 | None | 62 | None | Forbidden | Forbidden | 10 | 22E |
| | Explosive, blasting, type D | 1.1D | UN0084 | II | 1.1D | ..... | None | 62 | None | Forbidden | Forbidden | 10 | ..... |
| | Explosive, blasting, type E | 1.1D | UN0241 | II | 1.1D | ..... | None | 62 | None | Forbidden | Forbidden | 10 | 19E |
| | Explosive, blasting, type E or Agent blasting, Type E. | 1.5D | UN0332 | II | 1.5D | 105, 106 | None | 62 | None | Forbidden | Forbidden | 10 | ..... |
| | <i>Explosive, forbidden. See § 173.54.</i> | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | <i>Explosive substances, see Substances, explosive, n.o.s. etc.</i> | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | <i>Explosives, slurry, see Explosive, blasting, type E.</i> | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | <i>Explosives, water gels, see Explosive, blasting, type E.</i> | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Extracts, aromatic, liquid | 3 | UN1169 | II | 3 | IB2, T4, TP1, TP8 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
|  | ..... | ..... | ..... | ..... | ..... | ..... | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Extracts, flavoring, liquid | 3 | UN1197 | II | 3 | IB2, T4, TP1, TP8 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
|  | ..... | ..... | ..... | ..... | ..... | ..... | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | <i>Fabric with animal or vegetable oil, see Fibers or fabrics, etc.</i> | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Ferric arsenate | 6.1 | UN1606 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | ..... |
| | Ferric arsenite | 6.1 | UN1607 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | ..... |
| | Ferric chloride, anhydrous | 8 | UN1773 | III | 8 | IB8, IP3 | 154 | 213 | 240 | 25 kg | 100 kg | A | ..... |
| | Ferric chloride, solution | 8 | UN2582 | III | 8 | B15, IB3, T4, TP1 | 154 | 203 | 241 | 5 L | 60 L | A | ..... |
| | Ferric nitrate | 5.1 | UN1466 | III | 5.1 | A1, A29, IB8, IP3 | 152 | 213 | 240 | 25 kg | 100 kg | A | ..... |
| | Ferrocenium | 4.1 | UN1323 | II | 4.1 | 59, A19, IB8, IP2, IP4 | 151 | 212 | 240 | 15 kg | 50 kg | A | ..... |
| | Ferrosilicon, with 30 percent or more but less than 90 percent silicon. | 4.3 | UN1408 | III | 4.3, 6.1 | A1, A19, IB8, IP4 | 151 | 213 | 240 | 25 kg | 100 kg | A | 13, 40, 85, 103 |
| | Ferrous arsenate | 6.1 | UN1608 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | ..... |
| D | Ferrous chloride, solid | 8 | NA1759 | II | 8 | IB8, IP2, IP4 | 154 | 212 | 240 | 15 kg | 50 kg | A | ..... |
| D | Ferrous chloride, solution | 8 | NA1760 | II | 8 | B3, IB2, T11, TP2, TP27 | 154 | 202 | 242 | 1 L | 30 L | B | 40 |
| | Ferrous metal borings or Ferrous metal shavings or Ferrous metal turnings or Ferrous metal cuttings in a form liable to self-heating. | 4.2 | UN2793 | III | 4.2 | A1, A19, IB8, IP3, IP6 | None | 213 | 241 | 25 kg | 100 kg | A | ..... |
| | Fertilizer ammoniating solution with free ammonia. | 2.2 | UN1043 | ..... | 2.2 | ..... | 306 | 304 | 314, 315 | Forbidden | 150 kg | E | 40 |
| A W | Fibers or Fabrics, animal or vegetable or Synthetic, n.o.s. with animal or vegetable oil. | 4.2 | UN1373 | III | 4.2 | 137, IB8, IP3 | None | 213 | 241 | Forbidden | Forbidden | A | ..... |
| | Fibers or Fabrics impregnated with weakly nitrated nitrocellulose, n.o.s.. | 4.1 | UN1353 | III | 4.1 | A1, IB8, IP3 | None | 213 | 240 | 25 kg | 100 kg | D | ..... |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|--|----------------------------------|----------------------------------|-----|----------------|-------------------------------------|-----------------------------|----------|------|-----------------------------|--------------------------|-----------------------------|-------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | <i>Films, nitrocellulose base, from which gelatine has been removed; film scrap, see Celluloid scrap.</i> | | | | | | | | | | | | |
| | Films, nitrocellulose base, gelatine coated (except scrap). | 4.1 | UN1324 | | III 4.1 | | None | 183 | None | 25 kg | 100 kg | D | 91 |
| | Fire extinguisher charges, corrosive liquid. | 8 | UN1774 | | II 8 | N41 | 154 | 202 | None | 1 L | 30 L | A | |
| | <i>Fire extinguisher charges, expelling, explosive, see Cartridges, power device.</i> | | | | | | | | | | | | |
| | Fire extinguishers containing compressed or liquefied gas. | 2.2 | UN1044 | | 2.2 | 18, 110 | 309 | 309 | None | 75 kg | 150 kg | A | |
| | Firelighters, solid with flammable liquid. | 4.1 | UN2623 | | III 4.1 | A1, A19 | None | 213 | None | 25 kg | 100 kg | A | |
| | Fireworks | 1.1G | UN0333 | | II 1.1G | 108 | None | 62 | None | Forbidden | Forbidden | 07 | |
| | Fireworks | 1.2G | UN0334 | | II 1.2G | 108 | None | 62 | None | Forbidden | Forbidden | 07 | |
| | Fireworks | 1.3G | UN0335 | | II 1.3G | 108 | None | 62 | None | Forbidden | Forbidden | 07 | |
| | Fireworks | 1.4G | UN0336 | | II 1.4G | 108 | None | 62 | None | Forbidden | 75 kg | 06 | |
| | Fireworks | 1.4S | UN0337 | | II 1.4S | 108 | None | 62 | None | 25 kg | 100 kg | 05 | |
| | First aid kits | 9 | UN3316 | | 9 | 15 | None | None | None | 10 kg | 10 kg | A | |
| W | Fish meal, stabilized or Fish scrap, stabilized. | 9 | UN2216 | | III None | IB8 | 155 | 218 | None | No limit | No limit | A | 88 |
| | Fish meal, unstabilized or Fish scrap, unstabilized. | 4.2 | UN1374 | | II 4.2 | A1, A19, IB8, IP2 | None | 212 | 241 | 15 kg | 50 kg | A | 119, 120 |
| | <i>Fissile radioactive materials, see Radioactive material, fissile, n.o.s..</i> | | | | | | | | | | | | |
| | <i>Flammable compressed gas, see Compressed or Liquefied gas, flammable, etc.</i> | | | | | | | | | | | | |
| | <i>Flammable compressed gas (small receptacles not fitted with a dispersion device, not refillable), see Receptacles, etc.</i> | | | | | | | | | | | | |
| | <i>Flammable gas in lighters, see Lighters or lighter refills, cigaretttes, containing flammable gas.</i> | | | | | | | | | | | | |
| G | Flammable liquid, toxic, corrosive, n.o.s.. | 3 | UN3286 | | I 3, 6.1, 8. | T14, TP2, TP13, TP27 | None | 201 | 243 | Forbidden | 2.5 L | E | 21, 40, 100 |
| | | | | | II 3, 6.1, 8. | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 1 L | 5 L | B | 21, 40, 100 |
| G | Flammable liquids, corrosive, n.o.s.. | 3 | UN2924 | | I 3, 8 | T14, TP2 | None | 201 | 243 | 0.5 L | 2.5 L | E | 40 |
| | | | | | II 3, 8 | IB2, T11, TP2, TP27 | None | 202 | 243 | 1 L | 5 L | B | 40 |
| | | | | | III 3, 8 | B1, IB3, T7, TP1, TP28 | 150 | 203 | 242 | 5 L | 60 L | A | 40 |
| G | Flammable liquids, n.o.s. | 3 | UN1993 | | I 3 | T11, TP1 | 150 | 201 | 243 | 1 L | 30 L | E | |
| | | | | | II 3 | IB2, T7, TP1, TP8, TP28 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | | | | | III 3 | B1, B52, IB3, T4, TP1, TP29 | 150 | 203 | 242 | 60 L | 220 L | A | |
| G | Flammable liquids, toxic, n.o.s. | 3 | UN1992 | | I 3, 6.1 | T14, TP2, TP13, TP27 | None | 201 | 243 | Forbidden | 30 L | E | 40 |
| | | | | | II 3, 6.1 | IB2, T7, TP2, TP13 | None | 202 | 243 | 1 L | 60 L | B | 40 |
| | | | | | III 3, 6.1 | B1, IB3, T7, TP1, TP28 | 150 | 203 | 242 | 60 L | 220 L | A | |
| G | Flammable solid, corrosive, inorganic, n.o.s.. | 4.1 | UN3180 | | II 4.1, 8 | A1, IB6, IP2 | 151 | 212 | 242 | 15 kg | 50 kg | D | 40 |
| | | | | | III 4.1, 8 | A1, IB6 | 151 | 213 | 242 | 25 kg | 100 kg | D | 40 |
| G | Flammable solid, inorganic, n.o.s. | 4.1 | UN3178 | | II 4.1 | A1, IB8, IP2, IP4 | 151 | 212 | 240 | 15 kg | 50 kg | B | |
| | | | | | III 4.1 | A1, IB8, IP3 | 151 | 213 | 240 | 25 kg | 100 kg | B | |
| G | Flammable solid, organic, molten, n.o.s.. | 4.1 | UN3176 | | II 4.1 | IB1, T3, TP3, TP26 | 151 | 212 | 240 | Forbidden | Forbidden | C | |
| | | | | | III 4.1 | IB1, T1, TP3, TP26 | 151 | 213 | 240 | Forbidden | Forbidden | C | |
| G | Flammable solid, oxidizing, n.o.s. | 4.1 | UN3097 | | II 4.1, 5.1 | 131 | None | 214 | 214 | Forbidden | Forbidden | E | 40 |
| | | | | | III 4.1, 5.1 | 131 | None | 214 | 214 | Forbidden | Forbidden | D | 40 |
| G | Flammable solid, toxic, inorganic, n.o.s.. | 4.1 | UN3179 | | II 4.1, 6.1 | A1, IB6, IP2 | 151 | 212 | 242 | 15 kg | 50 kg | B | 40 |
| | | | | | III 4.1, 6.1 | A1, IB6 | 151 | 213 | 242 | 25 kg | 100 kg | B | 40 |
| G | Flammable solids, corrosive, organic, n.o.s.. | 4.1 | UN2925 | | II 4.1, 8 | A1, IB6, IP2 | None | 212 | 242 | 15 kg | 50 kg | D | 40 |
| | | | | | III 4.1, 8 | A1, IB6 | 151 | 213 | 242 | 25 kg | 100 kg | D | 40 |
| G | Flammable solids, organic, n.o.s. | 4.1 | UN1325 | | II 4.1 | A1, IB8, IP2, IP4, T3, TP1 | 151 | 212 | 240 | 15 kg | 50 kg | B | |
| | | | | | III 4.1 | A1, IB8, IP3, T1, TP1 | 151 | 213 | 240 | 25 kg | 100 kg | B | |
| G | Flammable solids, toxic, organic, n.o.s.. | 4.1 | UN2926 | | II 4.1, 6.1 | A1, IB6, IP2 | None | 212 | 242 | 15 kg | 50 kg | B | 40 |
| | | | | | III 4.1, 6.1 | A1, IB6 | 151 | 213 | 242 | 25 kg | 100 kg | B | 40 |
| | Flares, aerial | 1.3G | UN0093 | | II 1.3G | | None | 62 | None | Forbidden | 75 kg | 07 | |
| | Flares, aerial | 1.4G | UN0403 | | II 1.4G | | None | 62 | None | Forbidden | 75 kg | 06 | |
| | Flares, aerial | 1.4S | UN0404 | | II 1.4S | | None | 62 | None | 25 kg | 100 kg | 05 | |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|---|----------------------------------|----------------------------------|-----|--------------------|--|-----------------------------|-----------|-----------|-----------------------------|--------------------------|-----------------------------|---------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | Flares, aerial | 1.1G | UN0420 | II | 1.1G ... | | None ... | 62 | None ... | Forbidden | Forbidden | 07 | ..... |
| | Flares, aerial | 1.2G | UN0421 | II | 1.2G ... | | None ... | 62 | None ... | Forbidden | Forbidden | 07 | ..... |
| | Flares, airplane, see Flares, aerial. | | | | | | | | | | | | |
| | Flares, signal, see Cartridges, signal. | | | | | | | | | | | | |
| | Flares, surface | 1.3G | UN0092 | II | 1.3G ... | | None ... | 62 | None ... | Forbidden | 75 kg | 07 | ..... |
| | Flares, surface | 1.1G | UN0418 | II | 1.1G ... | | None ... | 62 | None ... | Forbidden | Forbidden | 07 | ..... |
| | Flares, surface | 1.2G | UN0419 | II | 1.2G ... | | None ... | 62 | None ... | Forbidden | Forbidden | 07 | ..... |
| | Flares, water-activated, see Con- trivances, water-activated, etc. | | | | | | | | | | | | |
| | Flash powder | 1.1G | UN0094 | II | 1.1G ... | | None ... | 62 | None ... | Forbidden | Forbidden | 15 | ..... |
| | Flash powder | 1.3G | UN0305 | II | 1.3G ... | | None ... | 62 | None ... | Forbidden | Forbidden | 15 | ..... |
| | Flue dusts, poisonous, see Ar- senical dust. | | | | | | | | | | | | |
| | Fluoric acid, see Hydrofluoric acid, etc. | | | | | | | | | | | | |
| | Fluorine, compressed | 2.3 | UN1045 | | 2.3, 5.1, 8. | 1 | None ... | 302 | None ... | Forbidden | Forbidden | D | 40, 89, 90 |
| | Fluoroacetic acid | 6.1 | UN2642 | I | 6.1 | IB7, IP1 | None ... | 211 | 242 | 1 kg | 15 kg | E | ..... |
| | Fluoroanilines | 6.1 | UN2941 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | ..... |
| | Fluorobenzene | 3 | UN2387 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
| | Fluoroboric acid | 8 | UN1775 | II | 8 | A6, A7, B2, B15, IB2, N3, N34, T7, TP2 | 154 | 202 | 242 | 1 L | 30 L | A | ..... |
| | Fluorophosphoric acid anhydrous | 8 | UN1776 | II | 8 | A6, A7, B2, IB2, N3, N34, T8, TP2, TP12 | None ... | 202 | 242 | 1 L | 30 L | A | ..... |
| | Fluorosilicates, n.o.s. | 6.1 | UN2856 | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | 26 |
| | Fluorosilicic acid | 8 | UN1778 | II | 8 | A6, A7, B2, B15, IB2, N3, N34, T8, TP2, TP12 | None ... | 202 | 242 | 1 L | 30 L | A | ..... |
| | Fluorosulfonic acid | 8 | UN1777 | I | 8 | A3, A6, A7, A10, B6, B10, N3, T10, TP2, TP12 | None ... | 201 | 243 | 0.5 L | 2.5 L | D | 40 |
| | Fluorotoluenes | 3 | UN2388 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | 40 |
| | Forbidden materials. See § 173.21. | Forbidden | | | | | | | | | | | |
| | Formaldehyde, solutions, flam- mable. | 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 formalde- hyde. | 8 | UN2209 | III | 8 | IB3, T4, TP1 | 154 | 203 | 241 | 5 L | 60 L | A | ..... |
| | Formalin, see Formaldehyde, so- lutions. | | | | | | | | | | | | |
| | Formic acid | 8 | UN1779 | II | 8 | B2, B28, IB2, T7, TP2 | 154 | 202 | 242 | 1 L | 30 L | A | 40 |
| | Fracturing devices, explosive, without detonators for oil wells. | 1.1D | UN0099 | II | 1.1D ... | | None ... | 62 | None ... | Forbidden | Forbidden | 07 | ..... |
| | Fuel, aviation, turbine engine | 3 | UN1863 | I | 3 | T11, TP1, TP8 | 150 | 201 | 243 | 1 L | 30 L | E | ..... |
| | | | | | | IB2, T4, TP1, TP8 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
| | | | | | | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | | | | | | B1, IB3, T4, TP1, TP29 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| D | Fuel oil (No. 1, 2, 4, 5, or 6) | 3 | NA1993 | III | 3 | | | | | | | | |
| | Fuel system components (includ- ing fuel control units (FCU), carburetors, fuel lines, fuel pumps) see Dangerous Goods in Apparatus or Dangerous Goods in Machinery. | | | | | | | | | | | | |
| | Fulminate of mercury (dry) | Forbidden | | | | | | | | | | | |
| | Fulminate of mercury, wet, see Mercury fulminate, etc. | | | | | | | | | | | | |
| | Fulminating gold | Forbidden | | | | | | | | | | | |
| | Fulminating mercury | Forbidden | | | | | | | | | | | |
| | Fulminating platinum | Forbidden | | | | | | | | | | | |
| | Fulminating silver | Forbidden | | | | | | | | | | | |
| | Fulminic acid | Forbidden | | | | | | | | | | | |
| | Fumaryl chloride | 8 | UN1780 | II | 8 | B2, IB2, T7, TP2 | 154 | 202 | 242 | 1 L | 30 L | C | 8, 40 |
| | Fumigated lading, see §§ 172.302(g), 173.9 and 176.76(h). | | | | | | | | | | | | |
| | Fumigated transport vehicle or freight container see 173.9. | | | | | | | | | | | | |
| | Furaldehydes | 6.1 | UN1199 | II | 6.1, 3 | IB2, T7, TP2 | None ... | 202 | 243 | 5 L | 60 L | A | ..... |
| | Furan | 3 | UN2389 | I | 3 | T12, TP2, TP13 | None ... | 201 | 243 | 1 L | 30 L | E | 40 |
| | Furfuryl alcohol | 6.1 | UN2874 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | 26, 74 |
| | Furfurylamine | 3 | UN2526 | III | 3, 8 ... | B1, IB3, T4, TP1 | 150 | 203 | 242 | 5 L | 60 L | A | 40 |
| | Fuse, detonating, metal clad, see Cord, detonating, metal clad. | | | | | | | | | | | | |
| | Fuse, detonating, mild effect, metal clad, see Cord, deto- nating, mild effect, metal clad. | | | | | | | | | | | | |
| | Fuse, igniter tubular metal clad ... | 1.4G | UN0103 | II | 1.4G ... | | None ... | 62 | None ... | Forbidden | 75 kg | 06 | ..... |
| | Fuse, non-detonating instanta- neous or quickmatch. | 1.3G | UN0101 | II | 1.3G ... | | None ... | 62 | None ... | Forbidden | Forbidden | 07 | ..... |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|--|----------------------------------|----------------------------------|-----------|----------------|--|-----------------------------|-----------|-----------|-----------------------------|--------------------------|-----------------------------|--------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | Guanyl nitrosaminoguanilydene hydrazine, wetted with not less than 30 percent water, by mass. | 1.1A | UN0113 | II | 1.1A ... | 111, 117 | None ... | 62 | None ... | Forbidden | Forbidden | 12 | ..... |
| | Guanyl nitrosaminoguanilytetrazene (dry). | Forbidden | | | | | | | | | | | |
| | Guanyl nitrosaminoguanilytetrazene, wetted or Tetrazene, wetted with not less than 30 percent water or mixture of alcohol and water, by mass. | 1.1A | UN0114 | II | 1.1A ... | 111, 117 | None ... | 62 | None ... | Forbidden | Forbidden | 12 | ..... |
| | Gunpowder, compressed or Gun- powder in pellets, see Black powder (UN 0028). | | | | | | | | | | | | |
| | Gunpowder, granular or as a meal, see Black powder (UN 0027). | | | | | | | | | | | | |
| | Hafnium powder, dry | 4.2 | UN2545 | I II | 4.2 | A19, A20, IB6, IP2, N34 | None ... None ... | 211 | 242 | Forbidden 15 kg | Forbidden 50 kg | D D | ..... |
| | Hafnium powder, wetted with not less than 25 percent water (a visible excess of water must be present) (a) mechanically pro- duced, particle size less than 53 microns; (b) chemically pro- duced, particle size less than 840 microns. | 4.1 | UN1326 | III II | 4.2 | IB8, IP3 A6, A19, A20, IB6, IP2, N34 | None ... None ... | 213 | 241 | 25 kg 15 kg | 100 kg 50 kg | D E | ..... |
| | Hand signal device, see Signal devices, hand. | | | | | | | | | | | | |
| | Hazardous substances, liquid or solid, n.o.s., see Environ- mentally hazardous sub- stances, etc. | | | | | | | | | | | | |
| D G | Hazardous waste, liquid, n.o.s. | 9 | NA3082 | III | 9 | IB3, T2, TP1 | 155 | 203 | 241 | No limit | No limit | A | ..... |
| D G | Hazardous waste, solid, n.o.s. | 9 | NA3077 | III | 9 | B54, IB8, IP2 | 155 | 213 | 240 | No limit | No limit | A | ..... |
| | Heating oil, light | 3 | UN1202 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Helium, compressed | 2.2 | UN1046 | | 2.2 | | 306 | 302 | 302, 314 | 75 kg | 150 kg | A | 85 |
| | Helium-oxygen mixture, see Rare gases and oxygen mixtures. | | | | | | | | | | | | |
| | Helium, refrigerated liquid (cryo- genic liquid). | 2.2 | UN1963 | | 2.2 | T75, TP5 | 320 | 316 | 318 | 50 kg | 500 kg | B | ..... |
| | Heptafluoropropane or Refrig- erant gas R 227. | 2.2 | UN3296 | | 2.2 | T50 | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | ..... |
| | n-Heptaldehyde | 3 | UN3056 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Heptanes | 3 | UN1206 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
| | n-Heptene | 3 | UN2278 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
| | Hexachloroacetone | 6.1 | UN2661 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | B | 12, 40 |
| | Hexachlorobenzene | 6.1 | UN2729 | III | 6.1 | IB3 | 153 | 203 | 241 | 60 L | 220 L | A | ..... |
| | Hexachlorobutadiene | 6.1 | UN2279 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | ..... |
| | Hexachlorocyclopentadiene | 6.1 | UN2646 | I | 6.1 | 2, B9, B14, B32, B74, B77, T20, TP2, TP13, TP38, TP45 | None ... | 227 | 244 | Forbidden | Forbidden | D | 40 |
| | Hexachlorophene | 6.1 | UN2875 | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | ..... |
| | Hexadecyltrichlorosilane | 8 | UN1781 | II | 8 | A7, B2, B6, IB2, N34, T7, TP2 | None ... | 202 | 242 | Forbidden | 30 L | C | 40 |
| | Hexadienes | 3 | UN2458 | II | 3 | IB2, T4, TP1 | None ... | 202 | 242 | 5 L | 60 L | B | ..... |
| | Hexaethyl tetraphosphate and compressed gas mixtures. | 2.3 | UN1612 | | 2.3 | | None ... | 334 | None ... | Forbidden | Forbidden | D | 40 |
| | Hexaethyl tetraphosphate, liquid .. | 6.1 | UN1611 | II | 6.1 | IB2, IP2, IP4, N76 | None ... | 202 | 243 | 5 L | 60 L | E | 40 |
| | Hexaethyl tetraphosphate, solid ... | 6.1 | UN1611 | II | 6.1 | IB8, IP2, IP4, N76 | None ... | 212 | 242 | 25 kg | 100 kg | E | 40 |
| | Hexafluoroacetone | 2.3 | UN2420 | | 2.3, 8 | 2, B9, B14 | None ... | 304 | 314, 315 | Forbidden | Forbidden | D | 40 |
| | Hexafluoroacetone hydrate | 6.1 | UN2552 | II | 6.1 | IB2, T7, TP2 | None ... | 202 | 243 | 5 L | 60 L | B | 40 |
| | Hexafluoroethane, compressed or Refrigerant gas R 116. | 2.2 | UN2193 | | 2.2 | | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | ..... |
| | Hexafluorophosphoric acid | 8 | UN1782 | II | 8 | A6, A7, B2, IB2, N3, N34, T8, TP2, TP12 | None ... | 202 | 242 | 1 L | 30 L | A | ..... |
| | Hexafluoropropylene compressed or Refrigerant gas R 1216. | 2.2 | UN1858 | | 2.2 | T50 | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | ..... |
| | Hexaldehyde | 3 | UN1207 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Hexamethylene diisocyanate | 6.1 | UN2281 | II | 6.1 | IB2, T7, TP2, TP13 | None ... | 202 | 243 | 5 L | 60 L | C | 13, 40 |
| | Hexamethylene triperoxide diamine (dry). | Forbidden | | | | | | | | | | | |
| | Hexamethylenediamine, solid | 8 | UN2280 | III | 8 | IB8, IP3, T4, TP1 | 154 | 213 | 240 | 25 kg | 100 kg | A | 12 |
| | Hexamethylenediamine solution .. | 8 | UN1783 | II | 8 | IB2, T7, TP2 | None ... | 202 | 242 | 1 L | 30 L | A | ..... |
| | Hexamethylenimine | 3 | UN2493 | III | 8 | IB3, T4, TP1 | 154 | 203 | 241 | 5 L | 60 L | A | ..... |
| | Hexamethylenetetramine | 4.1 | UN1328 | III | 3, 8 ... | IB2, T7, TP1 | None ... | 202 | 243 | 1 L | 5 L | B | 40 |
| | Hexamethylol benzene hexanitrate. | Forbidden | | | | A1, IB8, IP3 | 151 | 213 | 240 | 25 kg | 100 kg | A | ..... |
| | Hexanes | 3 | UN1208 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | E | ..... |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|---|----------------------------------|----------------------------------|-------|----------------|---|-----------------------------|-----------|-----------|-----------------------------|--------------------------|-----------------------------|--------------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | 2,2',4,4',6,6'- Hexanitro-3,3'- dihydroxyazobenzene (dry). | Forbidden |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | Hexanitroazoxy benzene | Forbidden |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | N,N'-(hexanitrodiphenyl) ethylene dinitramine (dry). | Forbidden |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | Hexanitrodiphenyl urea | Forbidden |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | 2,2',3',4,4',6- Hexanitrodiphenylamine. | Forbidden |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | Hexanitrodiphenylamine or Dipicrylamine or Hexyl. | 1.1D | UN0079 | II | 1.1D ... | | None ... | 62 | None ... | Forbidden | Forbidden | 10 | ..... |
| | 2,3',4,4',6,6'- Hexanitrodiphenylether. | Forbidden |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | Hexanitroethane | Forbidden |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | Hexanitrooxanilide | Forbidden |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | Hexanitrostilbene | 1.1D | UN0392 | II | 1.1D ... | | None ... | 62 | None ... | Forbidden | Forbidden | 10 | ..... |
| | Hexanoic acid, see Corrosive liq- uids, n.o.s.. |  |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | Hexanols | 3 | UN2282 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | 1-Hexene | 3 | UN2370 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | E | ..... |
| | Hexogen and cyclotetramethylenetetranitramine mixtures, wetted or desensitized see RDX and HMX mix- tures, wetted or desensitized etc. |  |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | Hexogen and HMX mixtures, wetted or desensitized see RDX and HMX mixtures, wetted or desensitized etc. |  |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | Hexogen and octogen mixtures, wetted or desensitized see RDX and HMX mixtures, wetted or desensitized etc. |  |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | Hexogen, see Cyclotrimethylenetrinitramine, etc. |  |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | Hexolite, or Hexotol dry or wetted with less than 15 percent water, by mass. | 1.1D | UN0118 | II | 1.1D ... | | None ... | 62 | None ... | Forbidden | Forbidden | 10 | ..... |
| | Hexotonal | 1.1D | UN0393 | II | 1.1D ... | | None ... | 62 | None ... | Forbidden | Forbidden | 10 | ..... |
| | Hexyl, see Hexanitrodiphenylamine. |  |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | Hexyltrichlorosilane | 8 | UN1784 | II | 8 | A7, B2, B6, IB2, N34, T7, TP2, TP13 | None ... | 202 | 242 | Forbidden | 30 L | C | 40 |
| | High explosives, see individual explosives' entries. |  |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | HMX, see Cyclotetramethylenete- tranitramine, etc. |  |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | Hydrazine, anhydrous or Hydra- zine aqueous solutions with more than 64 percent hydra- zine, by mass. | 8 | UN2029 | I | 8, 3, 6.1. | A3, A6, A7, A10, B7, B16, B53 | None ... | 201 | 243 | Forbidden | 2.5 L | D | 21, 40, 42, 100 |
| | Hydrazine, aqueous solution with not more than 37 percent hydra- zine, by mass. | 6.1 | UN3293 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | ..... |
| | Hydrazine azide | Forbidden |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | Hydrazine chlorate | Forbidden |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | Hydrazine dicarbonic acid diazide | Forbidden |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | Hydrazine hydrate or Hydrazine aqueous solutions, with not less than 37 percent but not more than 64 percent hydra- zine, by mass. | 8 | UN2030 | II | 8, 6.1 | B16, B53, IB2, T7, TP2, TP13 | None ... | 202 | 243 | Forbidden | 30 L | D | 40, 42, 82 |
| | Hydrazine perchlorate | Forbidden |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | Hydrazine selenate | Forbidden |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | Hydriodic acid, anhydrous, see Hydrogen iodide, anhydrous. |  |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | Hydriodic acid | 8 | UN1787 | II | 8 | A3, A6, B2, IB2, N41, T7, TP2 | 154 | 202 | 242 | 1 L | 30 L | C | ..... |
| | | | | | | | | | | | | | |
| | Hydrobromic acid, anhydrous, see Hydrogen bromide, anhy- drous. |  |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | Hydrobromic acid, with more than 49 percent hydrobromic acid. | 8 | UN1788 | II | 8 | B2, B15, IB2, N41, T7, TP2 | 154 | 202 | 242 | Forbidden | Forbidden | C | ..... |
| | | | | | | | | | | | | | |
| | Hydrobromic acid, with not more than 49 percent hydrobromic acid. | 8 | UN1788 | III | 8 | IB3, T4, TP1 | 154 | 203 | 241 | Forbidden | Forbidden | C | 8 |
| | | | | | | | | | | | | | |
| | Hydrocarbon gas mixture, lique- fied, n.o.s.. | 2.1 | UN1965 | II | 8 | A3, A6, B2, B15, IB2, N41, T7, TP2 | 154 | 202 | 242 | 1 L | 30 L | C | ..... |
| | | | | | | | | | | | | | |
| | Hydrocarbon gas mixture, com- pressed, n.o.s.. | 2.1 | UN1964 | III | 8 | IB3, T4, TP1 | 154 | 203 | 241 | 5 L | 30 L | C | 8 |
| | | | | | | | | | | | | | |
| | Hydrocarbon gas mixture, lique- fied, n.o.s.. | 2.1 | UN1965 | ..... | 2.1 | T50 | 306 | 304 | 314, 315 | Forbidden | 150 kg | E | 40 |
| | | | | | | | | | | | | | |
| | Hydrocarbons, liquid, n.o.s. | 3 | UN3295 | I | 3 | T11, TP1, TP8 | 150 | 201 | 243 | 1 L | 30 L | E | ..... |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|--|----------------------------------|----------------------------------|-----|----------------|---|-----------------------------|----------|----------------------|-----------------------------|--------------------------|-----------------------------|--------------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | | | | II | 3 | IB2, T7, TP1, TP8, TP28 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | | | | III | 3 | B1, IB3, T4, TP1, TP29 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | <i>Hydrochloric acid, anhydrous, see</i> Hydrogen chloride, anhydrous. | | | | | | | | | | | | |
| | Hydrochloric acid | 8 | UN1789 | II | 8 | A3, A6, B3, B15, IB2, N41, T8, TP2, TP12 | 154 | 202 | 242 | 1 L | 30 L | C | |
| | | | | III | 8 | IB3, T4, TP1, TP12 | 154 | 203 | 241 | 5 L | 60 L | C | 8 |
| | <i>Hydrocyanic acid, anhydrous, see</i> Hydrogen cyanide etc. | | | | | | | | | | | | |
| | Hydrocyanic acid, aqueous solu- tions or Hydrogen cyanide, aqueous solutions with not more than 20 percent hydrogen cyanide. | 6.1 | UN1613 | I | 6.1 | 2, B61, B65, B77, B82, T20, TP2, TP13 | None | 195 | 244 | Forbidden | Forbidden | D | 40 |
| D | Hydrocyanic acid, aqueous solu- tions with less than 5 percent hydrogen cyanide. | 6.1 | NA1613 | II | 6.1 | IB1, T14, TP2, TP13, TP27 | None | 195 | 243 | Forbidden | 5 L | D | 40 |
| | <i>Hydrocyanic acid, liquefied, see</i> Hydrogen cyanide, etc. | | | | | | | | | | | | |
| | <i>Hydrocyanic acid (prussic), unstabilized.</i> | Forbidden | | | | | | | | | | | |
| | Hydrofluoric acid and Sulfuric acid mixtures. | 8 | UN1786 | I | 8, 6.1 | A6, A7, B15, B23, N5, N34, T10, TP2, TP12, TP13 | None | 201 | 243 | Forbidden | 2.5 L | D | 40 |
| | <i>Hydrofluoric acid, anhydrous, see</i> Hydrogen fluoride, anhydrous. | | | | | | | | | | | | |
| | Hydrofluoric acid, with more than 60 percent strength. | 8 | UN1790 | I | 8, 6.1 | A6, A7, B4, B15, B23, N5, N34, T10, TP2, TP12, TP13 | None | 201 | 243 | 0.5 L | 2.5 L | D | 12, 40 |
| | Hydrofluoric acid, with not more than 60 percent strength. | 8 | UN1790 | II | 8, 6.1 | A6, A7, B15, IB2, N5, N34, T8, TP2, TP12 | None | 202 | 243 | 1 L | 30 L | D | 12, 40 |
| | <i>Hydrofluoroboric acid, see</i> Fluoroboric acid. | | | | | | | | | | | | |
| | <i>Hydrofluorosilicic acid, see</i> Fluorosilicic acid. | | | | | | | | | | | | |
| | Hydrogen and Methane mixtures, compressed. | 2.1 | UN2034 | | 2.1 | | 306 | 302 | 302, 314, 315. | Forbidden | 150 kg | E | 40 |
| | Hydrogen bromide, anhydrous | 2.3 | UN1048 | | 2.3, 8 | 3, B14 | None | 304 | 314, 315 | Forbidden | 25 kg | D | 40 |
| | Hydrogen chloride, anhydrous | 2.3 | UN1050 | | 2.3, 8 | 3 | None | 304 | None | Forbidden | Forbidden | D | 40 |
| | Hydrogen chloride, refrigerated liquid. | 2.3 | UN2186 | | 2.3, 8 | 3, B6 | None | None | 314, 315 | Forbidden | Forbidden | B | 40 |
| | Hydrogen, compressed | 2.1 | UN1049 | | 2.1 | | 306 | 302 | 302, 314 | Forbidden | 150 kg | E | 40, 57 |
| | Hydrogen cyanide, solution in al- cohol with not more than 45 percent hydrogen cyanide. | 6.1 | UN3294 | I | 6.1, 3 | 2, 25, B9, B14, B32, B74, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 40 |
| | Hydrogen cyanide, stabilized with less than 3 percent water. | 6.1 | UN1051 | I | 6.1, 3 | 1, B35, B61, B65, B77, B82 | None | 195 | 244 | Forbidden | Forbidden | D | 40 |
| | Hydrogen cyanide, stabilized, with less than 3 percent water and absorbed in a porous inert ma- terial. | 6.1 | UN1614 | I | 6.1 | 5 | None | 195 | None | Forbidden | Forbidden | D | 25, 40 |
| | Hydrogen fluoride, anhydrous | 8 | UN1052 | I | 8, 6.1 | 3, B7, B46, B71, B77, T10, TP2 | None | 163 | 243 | Forbidden | Forbidden | D | 40 |
| | Hydrogen iodide, anhydrous | 2.3 | UN2197 | | 2.3 | 3, B14 | None | 304 | 314, 315 | Forbidden | Forbidden | D | 40 |
| | <i>Hydrogen iodide solution, see</i> Hy- driodic acid, solution. | | | | | | | | | | | | |
| | Hydrogen peroxide and peroxy- acetic acid mixtures, stabilized with acids, water and not more than 5 percent peroxyacetic acid. | 5.1 | UN3149 | II | 5.1, 8 | A2, A3, A6, B53, IB2, IP5, T7, TP2, TP6, TP24 | None | 202 | 243 | 1 L | 5 L | D | 25, 66, 75, 106 |
| | Hydrogen peroxide, aqueous solu- tions with more than 40 per- cent but not more than 60 per- cent hydrogen peroxide (sta- bilized as necessary). | 5.1 | UN2014 | II | 5.1, 8 | 12, A3, A6, B53, B80, B81, B85, IB2, IP5, T7, TP2, TP6, TP24 | None | 202 | 243 | Forbidden | Forbidden | D | 25, 66, 75, 106 |
| | Hydrogen peroxide, aqueous solu- tions with not less than 20 percent but not more than 40 percent hydrogen peroxide (stabilized as necessary). | 5.1 | UN2014 | II | 5.1, 8 | A2, A3, A6, B53, IB2, IP5, T7, TP2, TP6, TP24 | None | 202 | 243 | 1 L | 5 L | D | 25, 66, 75, 106 |
| | Hydrogen peroxide, aqueous solu- tions with not less than 8 per- cent but less than 20 percent hydrogen peroxide (stabilized as necessary). | 5.1 | UN2984 | III | 5.1 | A1, IB2, IP5, T4, TP1, TP6, TP24 | 152 | 203 | 241 | 2.5 L | 30 L | B | 25, 75, 106 |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | | |
|--------------|---|----------------------------------|----------------------------------|-------|----------------|---|-----------------------------|----------|----------|-----------------------------|--------------------------|-----------------------------|-------------------------------|----|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) | |
| | Hydrogen peroxide, stabilized or Hydrogen peroxide aqueous solutions, stabilized with more than 60 percent hydrogen peroxide. | 5.1 | UN2015 | I | 5.1, 8 | 12, A3, A6, B53, B80, B81, B85, T10, TP2, TP6, TP24 | None | 201 | 243 | Forbidden | Forbidden | D | 25, 66, 75, 106 | |
| | Hydrogen, refrigerated liquid (cryogenic liquid). | 2.1 | UN1966 | ..... | 2.1 | T75, TP5 | None | 316 | 318, 319 | Forbidden | Forbidden | D | 40 | |
| | Hydrogen selenide, anhydrous Hydrogen sulfate, see Sulfuric acid. | 2.3 | UN2202 | ..... | 2.3, 2.1 | 1 | None | 192 | 245 | Forbidden | Forbidden | D | 40 | |
| | Hydrogen sulfide | 2.3 | UN1053 | ..... | 2.3, 2.1 | 2, B9, B14 | None | 304 | 314, 315 | Forbidden | Forbidden | D | 40 | |
| | Hydrogendifluorides, n.o.s. solid .. | 8 | UN1740 | II | 8 | IB5, IP2, IP4, N3, N34 | None | 212 | 240 | 15 kg | 50 kg | A | 25, 26, 40 | |
| | | | | | | | | | | | | | | |
| | Hydrogendifluorides, n.o.s. solu- tions. | 8 | UN1740 | II | 8 | IB2, N3, N34 | None | 202 | 242 | 1 L | 30 L | A | 25, 26, 40 | |
| | | | | | | | | | | | | | | |
| | Hydroquinone | 6.1 | UN2662 | III | 6.1 | IB8, IP3, T4, TP1 | 153 | 213 | 240 | 100 kg | 200 kg | A | ..... |  |
| | Hydrosilicofluoric acid, see Fluorosilicic acid. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |  |
| | Hydroxyl amine iodide | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |  |
| | Hydroxylamine sulfate | 8 | UN2865 | III | 8 | IB8, IP3 | 154 | 213 | 240 | 25 kg | 100 kg | A | ..... |  |
| | Hypochlorite solutions | 8 | UN1791 | II | 8 | A7, B2, B15, IB2, IP5, N34, T7, TP2, TP24 | 154 | 202 | 242 | 1 L | 30 L | B | 26 | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | Hypochlorites, inorganic, n.o.s. | 5.1 | UN3212 | II | 5.1 | IB8, IP2, IP4 | 152 | 212 | 240 | 5 kg | 25 kg | D | 48, 56, 58, 69, 106, 116, 118 | |
| | | | | | | | | | | | | | | |
| | Hyponitrous acid | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |  |
| | Igniter fuse, metal clad, see Fuse, igniter, tubular, metal clad. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |  |
| | Igniters | 1.1G | UN0121 | II | 1.1G | ..... | None | 62 | None | Forbidden | Forbidden | 07 | ..... |  |
|  | ..... | 1.2G | UN0314 | II | 1.2G | ..... | None | 62 | None | Forbidden | Forbidden | 07 | ..... |  |
|  | ..... | 1.3G | UN0315 | II | 1.3G | ..... | None | 62 | None | Forbidden | Forbidden | 07 | ..... |  |
|  | ..... | 1.4G | UN0325 | II | 1.4G | ..... | None | 62 | None | Forbidden | 75 kg | 06 | ..... |  |
|  | ..... | 1.4S | UN0454 | II | 1.4S | ..... | None | 62 | None | 25 kg | 100 kg | 05 | ..... |  |
| | 3,3'-Iminodipropylamine | 8 | UN2269 | III | 8 | IB3, T4, TP2 | 154 | 203 | 241 | 5 L | 60 L | A | ..... |  |
| G | Infectious substances, affecting animals only. | 6.2 | UN2900 | ..... | 6.2 | ..... | 134 | 196 | None | 50 mL or 50 g | 4 L or 4 kg | B | ..... |  |
| G | Infectious substances, affecting humans. | 6.2 | UN2814 | ..... | 6.2 | ..... | 134 | 196 | None | 50 mL or 50 g | 4 L or 4 kg | B | ..... |  |
| | Inflammable, see Flammable ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |  |
| | Initiating explosives (dry) | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |  |
| | Inositol hexanitrate (dry) | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |  |
| G | Insecticide gases, n.o.s. | 2.2 | UN1968 | ..... | 2.2 | ..... | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | ..... |  |
| G | Insecticide gases, flammable, n.o.s. | 2.1 | UN3354 | ..... | 2.1 | T50 | 306 | 304 | 314, 315 | Forbidden | 150 kg | D | 40 | |
| G | Insecticide gases, toxic, flammable, n.o.s. Inhalation hazard Zone A. | 2.3 | UN3355 | ..... | 2.3, 2.1 | 1 | None | 192 | 245 | Forbidden | Forbidden | D | 40 | |
| G | Insecticide gases, toxic, flammable, n.o.s. Inhalation hazard Zone B. | 2.3 | UN3355 | ..... | 2.3, 2.1 | 2, B9, B14 | None | 302, 305 | 314, 315 | Forbidden | Forbidden | D | 40 | |
| G | Insecticide gases, toxic, flammable, n.o.s. Inhalation hazard Zone C. | 2.3 | UN3355 | ..... | 2.3, 2.1 | 3, B14 | None | 302, 305 | 314, 315 | Forbidden | Forbidden | D | ..... |  |
| G | Insecticide gases, toxic, flammable, n.o.s. Inhalation hazard Zone D. | 2.3 | UN3355 | ..... | 2.3, 2.1 | 4 | None | 302, 305 | 314, 315 | Forbidden | Forbidden | D | ..... |  |
| G | Insecticide gases, toxic, n.o.s. | 2.3 | UN1967 | | 2.3 | | 3 | None | 193, 334 | 245 | Forbidden | Forbidden | D | 40 |
| | Inulin trinitrate (dry) | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |  |
| | Iodine azide (dry) | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |  |
| | Iodine monochloride | 8 | UN1792 | II | 8 | B6, IB8, IP2, IP4, N41, T7, TP2 | None | 212 | 240 | Forbidden | 50 kg | D | 40, 66, 74, 89, 90 | |
| | Iodine pentafluoride | 5.1 | UN2495 | I | 5.1, 6.1, 8. | ..... | None | 205 | 243 | Forbidden | 2.5 L | D | 25, 40, 66, 90 | |
| | 2-Iodobutane | 3 | UN2390 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |  |
| | Iodomethylpropanes | 3 | UN2391 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |  |
| | Iodopropanes | 3 | UN2392 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |  |
| | Iodoxy compounds (dry) | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |  |
| | Iridium nitratopentamine iridium nitrate. | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |  |
| | Iron chloride, see Ferric chloride | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |  |
| | Iron oxide, spent, or Iron sponge, spent obtained from coal gas purification. | 4.2 | UN1376 | III | 4.2 | B18, IB8, IP3 | None | 213 | 240 | Forbidden | Forbidden | E | ..... |  |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|--|----------------------------------|----------------------------------|-------|----------------|-------------------------------------|-----------------------------|-----------|-----------|-----------------------------|--------------------------|-----------------------------|------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | Life-saving appliances, not self inflating containing dangerous goods as equipment. | 9 | UN3072 | ..... | None .. | 143 | None | 219 | None | No limit | No limit | A | ..... |
| | Life-saving appliances, self inflating. | 9 | UN2990 | ..... | None .. | | None | 219 | None | No limit | No limit | A | ..... |
| | Lighter replacement cartridges containing liquefied petroleum gases (and similar devices, each not exceeding 65 grams), see Lighters or lighter refills etc. containing flammable gas. |  |  | ..... | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | Lighters, fuse | 1.4S | UN0131 | II | 1.4S ... | | None | 62 | None | 25 kg | 100 kg | 05 | ..... |
| | Lighters or Lighter refills cigarettes, containing flammable gas. | 2.1 | UN1057 | ..... | 2.1 | N10 | None | 21, 308 | None | 1 kg | 15 kg | B | 40 |
| | Lime, unslaked, see Calcium oxide. | | | | | | | | | | | | |
| G | Liquefied gas, flammable, n.o.s. ... | 2.1 | UN3161 | ..... | 2.1 | T50 | 306 | 304 | 314, 315 | Forbidden | 150 kg | D | 40 |
| G | Liquefied gas, n.o.s. | 2.2 | UN3163 | ..... | 2.2 | T50 | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | ..... |
| G | Liquefied gas, oxidizing, n.o.s. | 2.2 | UN3157 | ..... | 2.2, 5.1 | | 306 | 304 | 314, 315 | 75 kg | 150 kg | D | ..... |
| G I | Liquefied gas, toxic, corrosive, n.o.s. Inhalation Hazard Zone A. | 2.3 | UN3308 | ..... | 2.3, 8 | 1 | None | 192 | 245 | Forbidden | Forbidden | D | 40 |
| G I | Liquefied gas, toxic, corrosive, n.o.s. Inhalation Hazard Zone B. | 2.3 | UN3308 | ..... | 2.3, 8 | 2 | None | 304 | 314, 315 | Forbidden | Forbidden | D | 40 |
| G I | Liquefied gas, toxic, corrosive, n.o.s. Inhalation Hazard Zone C. | 2.3 | UN3308 | ..... | 2.3, 8 | 3 | None | 304 | 314, 315 | Forbidden | Forbidden | D | 40 |
| G I | Liquefied gas, toxic, corrosive, n.o.s. Inhalation Hazard Zone D. | 2.3 | UN3308 | ..... | 2.3, 8 | 4 | None | 304 | 314, 315 | Forbidden | Forbidden | D | 40 |
| G I | Liquefied gas, toxic, flammable, corrosive, n.o.s. Inhalation Hazard Zone A. | 2.3 | UN3309 | ..... | 2.3, 2.1, 8. | 1 | None | 192 | 245 | Forbidden | Forbidden | D | 17, 40 |
| G I | Liquefied gas toxic, flammable, corrosive, n.o.s. Inhalation Hazard Zone B. | 2.3 | UN3309 | ..... | 2.3, 2.1, 8. | 2 | None | 304 | 314, 315 | Forbidden | Forbidden | D | 17, 40 |
| G I | Liquefied gas, toxic, flammable, corrosive, n.o.s. Inhalation Hazard Zone C. | 2.3 | UN3309 | ..... | 2.3, 2.1, 8. | 3 | None | 304 | 314, 315 | Forbidden | Forbidden | D | 17, 40 |
| G I | Liquefied gas, toxic, flammable, corrosive, n.o.s. Inhalation Hazard Zone D. | 2.3 | UN3309 | ..... | 2.3, 2.1, 8. | 4 | None | 304 | 314, 315 | Forbidden | Forbidden | D | 17, 40 |
| G | Liquefied gas, toxic, flammable, n.o.s. Inhalation Hazard Zone A. | 2.3 | UN3160 | ..... | 2.3, 2.1 | 1 | None | 192 | 245 | Forbidden | Forbidden | D | 40 |
| G | Liquefied gas, toxic, flammable, n.o.s. Inhalation Hazard Zone B. | 2.3 | UN3160 | ..... | 2.3, 2.1 | 2, B9, B14 | None | 304 | 314, 315 | Forbidden | Forbidden | D | 40 |
| G | Liquefied gas, toxic, flammable, n.o.s. Inhalation Hazard Zone C. | 2.3 | UN3160 | ..... | 2.3, 2.1 | 3, B14 | None | 304 | 314, 315 | Forbidden | Forbidden | D | 40 |
| G | Liquefied gas, toxic, flammable, n.o.s. Inhalation Hazard Zone D. | 2.3 | UN3160 | ..... | 2.3, 2.1 | 4 | None | 304 | 314, 315 | Forbidden | Forbidden | D | 40 |
| G | Liquefied gas, toxic, n.o.s. Inhalation Hazard Zone A. | 2.3 | UN3162 | ..... | 2.3 | 1 | None | 192 | 245 | Forbidden | Forbidden | D | 40 |
| G | Liquefied gas, toxic, n.o.s. Inhalation Hazard Zone B. | 2.3 | UN3162 | ..... | 2.3 | 2, B9, B14 | None | 304 | 314, 315 | Forbidden | Forbidden | D | 40 |
| G | Liquefied gas, toxic, n.o.s. Inhalation Hazard Zone C. | 2.3 | UN3162 | ..... | 2.3 | 3, B14 | None | 304 | 314, 315 | Forbidden | Forbidden | D | 40 |
| G | Liquefied gas, toxic, n.o.s. Inhalation Hazard Zone D. | 2.3 | UN3162 | ..... | 2.3 | 4 | None | 304 | 314, 315 | Forbidden | Forbidden | D | 40 |
| G I | Liquefied gas, toxic, oxidizing, corrosive, n.o.s. Inhalation Hazard Zone A. | 2.3 | UN3310 | ..... | 2.3, 5.1, 8. | 1 | None | 192 | 245 | Forbidden | Forbidden | D | 40, 89, 90 |
| G I | Liquefied gas, toxic, oxidizing, corrosive, n.o.s. Inhalation Hazard Zone B. | 2.3 | UN3310 | ..... | 2.3, 2.1, 8. | 2 | None | 304 | 314, 315 | Forbidden | Forbidden | D | 40, 89, 90 |
| G I | Liquefied gas, toxic, oxidizing, corrosive, n.o.s. Inhalation Hazard Zone C. | 2.3 | UN3310 | ..... | 2.3, 2.1, 8. | 3 | None | 304 | 314, 315 | Forbidden | Forbidden | D | 40, 89, 90 |
| G I | Liquefied gas, toxic, oxidizing, corrosive, n.o.s. Inhalation Hazard Zone D. | 2.3 | UN3310 | ..... | 2.3, 2.1, 8. | 4 | None | 304 | 314, 315 | Forbidden | Forbidden | D | 40, 89, 90 |
| G | Liquefied gas, toxic, oxidizing, n.o.s. Inhalation Hazard Zone A. | 2.3 | UN3307 | ..... | 2.3, 5.1 | 1 | None | 192 | 245 | Forbidden | Forbidden | D | 40 |
| G | Liquefied gas, toxic, oxidizing, n.o.s. Inhalation Hazard Zone B. | 2.3 | UN3307 | ..... | 2.3, 5.1 | 2 | None | 304 | 314, 315 | Forbidden | Forbidden | D | 40 |
| G | Liquefied gas, toxic, oxidizing, n.o.s. Inhalation Hazard Zone C. | 2.3 | UN3307 | ..... | 2.3, 5.1 | 3 | None | 304 | 314, 315 | Forbidden | Forbidden | D | 40 |
| G | Liquefied gas, toxic, oxidizing, n.o.s. Inhalation Hazard Zone D. | 2.3 | UN3307 | ..... | 2.3, 5.1 | 4 | None | 304 | 314, 315 | Forbidden | Forbidden | D | 40 |
| | Liquefied gases, non-flammable charged with nitrogen, carbon dioxide or air. | 2.2 | UN1058 | ..... | 2.2 | | 306 | 304 | None | 75 kg | 150 kg | A | ..... |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|--|----------------------------------|----------------------------------|-----|----------------|-------------------------------------|-----------------------------|----------|------|-----------------------------|--------------------------|-----------------------------|---------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| | | | | | | | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | Magnesium silicide | 4.3 | UN2624 | II | 4.3 | A19, A20, IB7, IP2 | 151 | 212 | 241 | 15 kg | 50 kg | B | 85, 103 |
| | <i>Magnetized material, see § 173.21.</i> | | | | | | | | | | | | |
| | Maleic anhydride | 8 | UN2215 | III | 8 | IB8, IP3, T4, TP1 | 154 | 213 | 240 | 25 kg | 100 kg | A | |
| | Malononitrile | 6.1 | UN2647 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | 12 |
| | <i>Mancozeb (manganese ethylenedisithiocarbamate complex with zinc) see Maneb.</i> | | | | | | | | | | | | |
| | <i>Maneb or Maneb preparations with not less than 60 percent maneb.</i> | 4.2 | UN2210 | III | 4.2, 4.3 | 57, A1, A19, IB6 | None | 213 | 242 | 25 kg | 100 kg | A | 34 |
| | <i>Maneb stabilized or Maneb preparations, stabilized against self-heating.</i> | 4.3 | UN2968 | III | 4.3 | 54, A1, A19, IB8, IP4 | 151 | 213 | 242 | 25 kg | 100 kg | B | 34 |
| | Manganese nitrate | 5.1 | UN2724 | III | 5.1 | A1, IB8, IP3 | 152 | 213 | 240 | 25 kg | 100 kg | A | |
| | Manganese resinate | 4.1 | UN1330 | III | 4.1 | A1, IB6 | 151 | 213 | 240 | 25 kg | 100 kg | A | |
| | <i>Mannitan tetranitrate</i> | Forbidden | | | | | | | | | | | |
| | <i>Mannitol hexanitrate (dry)</i> | Forbidden | | | | | | | | | | | |
| | <i>Mannitol hexanitrate, wetted or Nitromannite, wetted with not less than 40 percent water, or mixture of alcohol and water, by mass.</i> | 1.1D | UN0133 | II | 1.1D | 121 | None | 62 | None | Forbidden | Forbidden | 10 | |
| | <i>Marine pollutants, liquid or solid, n.o.s., see Environmentally hazardous substances, liquid or solid, n.o.s.</i> | | | | | | | | | | | | |
| | <i>Matches, block, see Matches, strike anywhere.</i> | | | | | | | | | | | | |
| | <i>Matches, fusee</i> | 4.1 | UN2254 | III | 4.1 | | 186 | 186 | None | Forbidden | Forbidden | A | |
| | <i>Matches, safety (book, card or strike on box).</i> | 4.1 | UN1944 | III | 4.1 | | 186 | 186 | None | 25 kg | 100 kg | A | |
| | <i>Matches, strike anywhere</i> | 4.1 | UN1331 | III | 4.1 | | 186 | 186 | None | Forbidden | Forbidden | B | |
| | <i>Matches, wax, Vesta</i> | 4.1 | UN1945 | III | 4.1 | | 186 | 186 | None | 25 kg | 100 kg | B | |
| | <i>Matting acid, see Sulfuric acid</i> | | | | | | | | | | | | |
| | <i>Medicine, liquid, flammable, toxic, n.o.s.</i> | 3 | UN3248 | II | 3, 6.1 | 36, IB2 | None | 202 | None | 1 L | 5 L | B | 40 |
| | | | | III | 3, 6.1 | 36, IB3 | 150 | 203 | None | 5 L | 5 L | A | |
| | <i>Medicine, liquid, toxic, n.o.s.</i> | 6.1 | UN1851 | II | 6.1 | | 153 | 202 | 243 | 5 L | 5 L | C | 40 |
| | | | | III | 6.1 | | 153 | 203 | 241 | 5 L | 5 L | C | 40 |
| | <i>Medicine, solid, toxic, n.o.s.</i> | 6.1 | UN3249 | II | 6.1 | 36 | 153 | 212 | None | 5 kg | 5 kg | C | 40 |
| | | | | III | 6.1 | 36 | 153 | 213 | None | 5 kg | 5 kg | C | 40 |
| | <i>Memetetrahydrophthalic anhydride, see Corrosive liquids, n.o.s.</i> | | | | | | | | | | | | |
| | <i>Mercaptans, liquid, flammable, n.o.s. or Mercaptan mixture, liquid, flammable, n.o.s.</i> | 3 | UN3336 | I | 3 | T11, TP2 | 150 | 201 | 243 | 1 L | 30 L | E | 95 |
| | | | | II | 3 | IB2, T7, TP1, TP8, TP28 | 150 | 202 | 242 | 5 L | 60 L | B | 95 |
| | | | | III | 3 | B1, B52, IB3, T4, TP1, TP29 | 150 | 203 | 241 | 60 L | 220 L | B | 95 |
| | <i>Mercaptans, liquid, flammable, toxic, n.o.s. or Mercaptan mixtures, liquid, flammable, toxic, n.o.s.</i> | 3 | UN1228 | II | 3, 6.1 | IB2, T11, TP2, TP27 | None | 202 | 243 | Forbidden | 60 L | B | 40, 95 |
| | | | | III | 3, 6.1 | B1, IB3, T7, TP1, TP28 | 150 | 203 | 242 | 5 L | 220 L | A | 40, 95 |
| | <i>Mercaptans, liquid, toxic, flammable, n.o.s. or Mercaptan mixtures, liquid, toxic, flammable, n.o.s., flash point not less than 23 degrees C.</i> | 6.1 | UN3071 | II | 6.1, 3 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | C | 40, 121 |
| | <i>5-Mercaptotetrazol-1-acetic acid</i> .. | 1.4C | UN0448 | II | 1.4C | | None | 62 | None | Forbidden | 75 kg | 09 | |
| | <i>Mercuric arsenate</i> | 6.1 | UN1623 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | <i>Mercuric chloride</i> | 6.1 | UN1624 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | <i>Mercuric compounds, see Mercury compounds, etc.</i> | | | | | | | | | | | | |
| | <i>Mercuric nitrate</i> | 6.1 | UN1625 | II | 6.1 | IB8, IP2, IP4, N73 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | <i>Mercuric potassium cyanide</i> | 6.1 | UN1626 | I | 6.1 | IB7, IP1, N74, N75 | None | 211 | 242 | 5 kg | 50 kg | A | 26 |
| | <i>Mercuric sulfocyanate, see Mercury thiocyanate.</i> | | | | | | | | | | | | |
| | <i>Mercuriol, see Mercury nucleate</i> .. | | | | | | | | | | | | |
| | <i>Mercurous azide</i> | Forbidden | | | | | | | | | | | |
| | <i>Mercurous compounds, see Mercury compounds, etc.</i> | | | | | | | | | | | | |
| | <i>Mercurous nitrate</i> | 6.1 | UN1627 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | <i>Mercury</i> | 8 | UN2809 | III | 8 | | 164 | 164 | 240 | 35 kg | 35 kg | B | 40, 97 |
| | <i>Mercury acetate</i> | 6.1 | UN1629 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | <i>Mercury acetylde</i> | Forbidden | | | | | | | | | | | |
| | <i>Mercury ammonium chloride</i> | 6.1 | UN1630 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | <i>Mercury based pesticides, liquid, flammable, toxic, flash point less than 23 degrees C.</i> | 3 | UN2778 | I | 3, 6.1 | T14, TP2, TP13, TP27 | None | 201 | 243 | Forbidden | 30 L | B | 40 |
| | | | | II | 3, 6.1 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 1 L | 60 L | B | 40 |
| | <i>Mercury based pesticides, liquid, toxic.</i> | 6.1 | UN3012 | I | 6.1 | T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 40 |

A W

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|---|----------------------------------|----------------------------------|-----|----------------|-------------------------------------|-----------------------------|----------|------|-----------------------------|--------------------------|-----------------------------|--------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | | | | II | 6.1 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
| | | | | III | 6.1 | IB3, T7, TP2, TP28 | 153 | 203 | 241 | 60 L | 220 L | A | 40 |
| | Mercury based pesticides, liquid, toxic, flammable, flash point not less than 23 degrees C. | 6.1 | UN3011 | I | 6.1, 3 | T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 40 |
| | | | | II | 6.1, 3 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
| | | | | III | 6.1, 3 | IB3, T7, TP2, TP28 | 153 | 203 | 242 | 60 L | 220 L | A | 40 |
| | Mercury based pesticides, solid, toxic. | 6.1 | UN2777 | I | 6.1 | IB7, IP1 | None | 211 | 242 | 5 kg | 50 kg | A | 40 |
| | | | | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | 40 |
| | | | | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | 40 |
| | Mercury benzoate | 6.1 | UN1631 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | Mercury bromides | 6.1 | UN1634 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | Mercury compounds, liquid, n.o.s. | 6.1 | UN2024 | I | 6.1 | | None | 201 | 243 | 1 L | 30 L | B | 40 |
| | | | | II | 6.1 | IB2 | None | 202 | 243 | 5 L | 60 L | B | 40 |
| | | | | III | 6.1 | IB3 | 153 | 203 | 241 | 60 L | 220 L | B | 40 |
| | Mercury compounds, solid, n.o.s. | 6.1 | UN2025 | I | 6.1 | IB7, IP1 | None | 211 | 242 | 5 kg | 50 kg | A | |
| | | | | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | | | | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | |
| A | Mercury contained in manufac- tured articles. | 8 | UN2809 | III | 8 | | None | 164 | None | No limit | No limit | B | 40, 97 |
| | Mercury cyanide | 6.1 | UN1636 | II | 6.1 | IB8, IP2, IP4, N74, N75 | None | 212 | 242 | 25 kg | 100 kg | A | 26 |
| | Mercury fulminate, wetted with not less than 20 percent water, or mixture of alcohol and water, by mass. | 1.1A | UN0135 | II | 1.1A | 111, 117 | None | 62 | None | Forbidden | Forbidden | 12 | |
| | Mercury gluconate | 6.1 | UN1637 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | Mercury iodide, solid | 6.1 | UN1638 | II | 6.1 | IB2, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | Mercury iodide aquabasic ammonobasic (iodide of Millon's base). | Forbidden | | | | | | | | | | | |
| | Mercury iodide, solution | 6.1 | UN1638 | II | 6.1 | IB8, IP2, IP4 | None | 202 | 243 | 5 L | 60 L | A | |
| | Mercury nitride | Forbidden | | | | | | | | | | | |
| | Mercury nucleate | 6.1 | UN1639 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | Mercury oleate | 6.1 | UN1640 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | Mercury oxide | 6.1 | UN1641 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | Mercury oxycyanide | Forbidden | | | | | | | | | | | |
| | Mercury oxycyanide, desensitized | 6.1 | UN1642 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | 26, 91 |
| | Mercury potassium iodide | 6.1 | UN1643 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | Mercury salicylate | 6.1 | UN1644 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| + | Mercury sulfates | 6.1 | UN1645 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | Mercury thiocyanate | 6.1 | UN1646 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | Mesityl oxide | 3 | UN1229 | III | 3 | B1, IB3, T2, TP1 | None | 203 | 242 | 60 L | 220 L | A | |
| | Metal alkyl halides, water-reactive n.o.s. or Metal aryl halides, water-reactive, n.o.s. | 4.2 | UN3049 | I | 4.2, 4.3 | B9, B11, T21, TP2, TP7 | None | 181 | 244 | Forbidden | Forbidden | D | |
| | Metal alkyl hydrides, water-reactive, n.o.s. or Metal aryl hy- drides, water-reactive, n.o.s. | 4.2 | UN3050 | I | 4.2, 4.3 | B9, B11, T21, TP2, TP7 | None | 181 | 244 | Forbidden | Forbidden | D | |
| | Metal alkyls, water-reactive, n.o.s. or Metal aryls, water-reactive n.o.s. | 4.2 | UN2003 | I | 4.2, 4.3 | B11, T21, TP2, TP7 | None | 181 | 244 | Forbidden | Forbidden | D | |
| | Metal carbonyls, n.o.s. | 6.1 | UN3281 | I | 6.1 | 5, T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 40 |
| | | | | II | 6.1 | IB2, T11, TP2, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
| | | | | III | 6.1 | IB3, T7, TP1, TP28 | 153 | 203 | 241 | 60 L | 220 L | A | 40 |
| | Metal catalyst, dry | 4.2 | UN2881 | I | 4.2 | N34 | None | 187 | None | 25 kg | 100 kg | C | |
| | | | | II | 4.2 | IB6, IP2, N34 | None | 187 | 242 | Forbidden | 50 kg | C | |
| | | | | III | 4.2 | IB8, IP3, N34 | None | 187 | 241 | 25 kg | 100 kg | C | |
| | Metal catalyst, wetted with a visi- ble excess of liquid. | 4.2 | UN1378 | II | 4.2 | A2, A8, IB1, N34 | None | 212 | None | Forbidden | 50 kg | C | |
| | Metal hydrides, flammable, n.o.s. | 4.1 | UN3182 | II | 4.1 | A1, IB4 | 151 | 212 | 240 | 15 kg | 50 kg | E | |
| | | | | III | 4.1 | A1, IB4 | 151 | 213 | 240 | 25 kg | 100 kg | E | |
| | Metal hydrides, water reactive, n.o.s. | 4.3 | UN1409 | I | 4.3 | A19, N34, N40 | None | 211 | 242 | Forbidden | 15 kg | D | |
| | | | | II | 4.3 | A19, IB4, N34, N40 | 151 | 212 | 242 | 15 kg | 50 kg | D | |
| | Metal powder, self-heating, n.o.s. | 4.2 | UN3189 | II | 4.2 | IB6, IP2 | None | 212 | 241 | 15 kg | 50 kg | C | |
| | | | | III | 4.2 | IB8, IP3 | None | 213 | 241 | 25 kg | 100 kg | C | |
| | Metal powders, flammable, n.o.s. | 4.1 | UN3089 | II | 4.1 | IB8, IP2, IP4 | 151 | 212 | 240 | 15 kg | 50 kg | B | |
| | | | | III | 4.1 | IB6 | 151 | 213 | 240 | 25 kg | 100 kg | B | |
| | Metal salts of methyl nitramine (dry). | Forbidden | | | | | | | | | | | |
| G | Metal salts of organic com- pounds, flammable, n.o.s. | 4.1 | UN3181 | II | 4.1 | A1, IB8, IP2, IP4 | 151 | 212 | 240 | 15 kg | 50 kg | B | 40 |
| | | | | III | 4.1 | A1, IB8, IP3 | 151 | 213 | 240 | 25 kg | 100 kg | B | 40 |
| | Metalddehyde | 4.1 | UN1332 | III | 4.1 | A1, IB8, IP3 | 151 | 213 | 240 | 25 kg | 100 kg | A | |
| G | Metallic substance, water-reactive, n.o.s. | 4.3 | UN3208 | I | 4.3 | IB4 | None | 211 | 242 | Forbidden | 15 kg | E | 40 |
| | | | | II | 4.3 | IB7, IP2 | 151 | 212 | 242 | 15 kg | 50 kg | E | 40 |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|---|----------------------------------|----------------------------------|-----------|--------------------|---|-----------------------------|------------|-----------|-----------------------------|--------------------------|-----------------------------|----------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| G | Metallic substance, water-reactive, self-heating, n.o.s.. | 4.3 | UN3209 | III I | 4.3 | IB8, IP4 | 151 | 213 | 241 | 25 kg Forbidden | 100 kg 15 kg | E E | 40 40 |
| | | | | | | | None | 211 | 242 | | | | |
| | Methacrylaldehyde, stabilized | 3 | UN2396 | III II | 4.3, 4.2 3, 6.1 | IB5, IP2 IB8, IP4 45, IB2, T7, TP1, TP13 | None | 212 | 242 | 15 kg 25 kg 1 L | 50 kg 100 kg 60 L | E E E | 40 40 40 |
| | | | | | | | None | 213 | 242 | | | | |
| | Methacrylic acid, stabilized | 8 | UN2531 | II | 8 | IB3, T4, TP1, TP18 | 154 | 202 | 242 | 1 L | 30 L | A | ..... |
| + | Methacrylonitrile, stabilized | 3 | UN3079 | I | 3, 6.1 | 2, B9, B14, B32, B74, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 12, 40, 48 |
| | Methallyl alcohol | 3 | UN2614 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Methane and hydrogen, mixtures, see Hydrogen and methane, mixtures, etc. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Methane, compressed or Natural gas, compressed (with high methane content). | 2.1 | UN1971 | ..... | 2.1 ..... | ..... | 306 | 302 | 302 | Forbidden | 150 kg | E | 40 |
| | Methane, refrigerated liquid (cryogenic liquid) or Natural gas, refrigerated liquid (cryogenic liquid), with high methane content). | 2.1 | UN1972 | ..... | 2.1 | T75, TP5 | None | None | 318 | Forbidden | Forbidden | D | 40 |
| | Methanesulfonyl chloride | 6.1 | UN3246 | I | 6.1, 8 | 2, 25, B9, B14, B32, B74, T20, TP2, TP12, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 40 |
| + I | Methanol | 3 | UN1230 | II | 3, 6.1 | IB2, T7, TP2 | 150 | 202 | 242 | 1 L | 60 L | B | 40 |
| D | Methanol | 3 | UN1230 | II | 3 | IB2, T7, TP2 | 150 | 202 | 242 | 1 L | 60 L | B | 40 |
| | Methazoic acid | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | 4-Methoxy-4-methylpentan-2-one | 3 | UN2293 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | 1-Methoxy-2-propanol | 3 | UN3092 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| + | Methoxymethyl isocyanate | 3 | UN2605 | I | 3, 6.1 | 1, B9, B14, B30, B72, T22, TP2, TP13, TP38, TP44 | None | 226 | 244 | Forbidden | Forbidden | D | 40 |
| | Methyl acetate | 3 | UN1231 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
| | Methyl acetylene and propadiene mixtures, stabilized. | 2.1 | UN1060 | ..... | 2.1 | T50 | 306 | 304 | 314, 315 | Forbidden | 150 kg | B | 40 |
| | Methyl acrylate, stabilized | 3 | UN1919 | II | 3 | IB2, T4, TP1, TP13 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
| | Methyl alcohol, see Methanol ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Methyl allyl chloride | 3 | UN2554 | II | 3 | IB2, T4, TP1, TP13 | 150 | 202 | 242 | 5 L | 60 L | E | ..... |
| | Methyl amyl ketone, see Amyl methyl ketone. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Methyl bromide | 2.3 | UN1062 | ..... | 2.3 | 3, B14, T50 | None | 193 | 314, 315 | Forbidden | 25 kg | D | 40 |
| | Methyl bromide and chloropicrin mixtures with more than 2 percent chloropicrin, see Chloropicrin and methyl bromide mixtures. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Methyl bromide and chloropicrin mixtures with not more than 2 percent chloropicrin, see Methyl bromide. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Methyl bromide and ethylene dibromide mixtures, liquid. | 6.1 | UN1647 | I | 6.1 | 2, B9, B14, B32, B74, N65, T20, TP2, TP13, TP38, TP44 | None | 227 | 244 | Forbidden | Forbidden | C | 40 |
| | Methyl bromoacetate | 6.1 | UN2643 | II | 6.1 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | D | 40 |
| | 2-Methyl-1-butene | 3 | UN2459 | I | 3 | T11, TP2 | None | 201 | 243 | 1 L | 30 L | E | ..... |
| | 2-Methyl-2-butene | 3 | UN2460 | II | 3 | IB2, IP8, T7, TP1 | None | 202 | 242 | 5 L | 60 L | E | ..... |
| | 3-Methyl-1-butene | 3 | UN2561 | I | 3 | T11, TP2 | None | 201 | 243 | 1 L | 30 L | E | ..... |
| | Methyl tert-butyl ether | 3 | UN2398 | II | 3 | IB2, T7, TP1 | 150 | 202 | 242 | 5 L | 60 L | E | ..... |
| | Methyl butyrate | 3 | UN1237 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
| | Methyl chloride, or Refrigerant gas R 40. | 2.1 | UN1063 | ..... | 2.1 | T50 | 306 | 304 | 314, 315 | 5 kg | 100 kg | D | 40 |
| | Methyl chloride and chloropicrin mixtures, see Chloropicrin and methyl chloride mixtures. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Methyl chloride and methylene chloride mixtures. | 2.1 | UN1912 | ..... | 2.1 | T50 | 306 | 304 | 314, 315 | Forbidden | 150 kg | D | 40 |
| | Methyl chloroacetate | 6.1 | UN2295 | I | 6.1, 3 | T14, TP2, TP13 | None | 201 | 243 | 1 L | 30 L | D | ..... |
| | Methyl chloroformate, see Methyl chloroformate. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Methyl chloroform, see 1,1,1-Trichloroethane. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Methyl chloroformate | 6.1 | UN1238 | I | 6.1, 3, 8. | 1, B9, B14, B30, B72, N34, T22, TP2, TP13, TP38, TP44 | None | 226 | 244 | Forbidden | Forbidden | D | 21, 40, 100 |
| | Methyl chloromethyl ether | 6.1 | UN1239 | I | 6.1, 3 | 1, B9, B14, B30, B72, T22, TP2, TP38, TP44 | None | 226 | 244 | Forbidden | Forbidden | D | 40 |
| | Methyl 2-chloropropionate | 3 | UN2933 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Methyl dichloroacetate | 6.1 | UN2299 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | ..... |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|---|----------------------------------|----------------------------------|-------|----------------|--|-----------------------------|----------|----------|-----------------------------|--------------------------|-----------------------------|---------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | <i>Methyl ethyl ether, see Ethyl methyl ether.</i> | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | <i>Methyl ethyl ketone, see Ethyl methyl ketone.</i> | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | <i>Methyl ethyl ketone peroxide, in solution with more than 9 percent by mass active oxygen.</i> | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | 2-Methyl-5-ethylpyridine | 6.1 | UN2300 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | ..... |
| | Methyl fluoride, or Refrigerant gas R 41. | 2.1 | UN2454 | ..... | 2.1 | ..... | 306 | 304 | 314, 315 | Forbidden | 150 kg | E | 40 |
| | Methyl formate | 3 | UN1243 | I | 3 | T11, TP2 | 150 | 201 | 243 | 1 L | 30 L | E | ..... |
| | 2-Methyl-2-heptanethiol | 6.1 | UN3023 | I | 6.1, 3 | 2, B9, B14, B32, B74, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 40, 102 |
| | Methyl iodide | 6.1 | UN2644 | I | 6.1 | 2, B9, B14, B32, B74, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | A | 12, 40 |
| | Methyl isobutyl carbinol | 3 | UN2053 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Methyl isobutyl ketone | 3 | UN1245 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
| | <i>Methyl isobutyl ketone peroxide, in solution with more than 9 percent by mass active oxygen.</i> | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Methyl isocyanate | 6.1 | UN2480 | I | 6.1, 3 | 1, B9, B14, B30, B72, T22, TP2, TP13, TP38, TP44 | None | 226 | 244 | Forbidden | Forbidden | D | 26, 40 |
| | Methyl isopropenyl ketone, stabilized. | 3 | UN1246 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
| | Methyl isothiocyanate | 6.1 | UN2477 | I | 6.1, 3 | 2, B9, B14, B32, B74, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | A | ..... |
| | Methyl isovalerate | 3 | UN2400 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
| | Methyl magnesium bromide, in ethyl ether. | 4.3 | UN1928 | I | 4.3, 3 | ..... | None | 201 | 243 | Forbidden | 1 L | D | ..... |
| | Methyl mercaptan | 2.3 | UN1064 | ..... | 2.3, 2.1 | 3, B7, B9, B14, T50 | None | 304 | 314, 315 | Forbidden | 25 kg | D | 40 |
| | <i>Methyl mercaptopropionaldehyde, see Thia-4-pentanal.</i> | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Methyl methacrylate monomer, stabilized. | 3 | UN1247 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | 40 |
| | <i>Methyl nitramine (dry)</i> | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | <i>Methyl nitrate</i> | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | <i>Methyl nitrite</i> | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | <i>Methyl norbornene dicarboxylic anhydride, see Corrosive liquids, n.o.s..</i> | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Methyl orthosilicate | 6.1 | UN2606 | I | 6.1, 3 | 2, B9, B14, B32, B74, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | E | 40 |
| D | Methyl phosphonic dichloride | 6.1 | NA9206 | I | 6.1, 8 | 2, A3, B9, B14, B32, B74, N34, N43, T20, TP4, TP12, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | C | ..... |
| | <i>Methyl phosphonothioic dichloride, anhydrous, see Corrosive liquid, n.o.s..</i> | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| D | Methyl phosphonous dichloride, pyrophoric liquid. | 6.1 | NA2845 | I | 6.1, 4.2 | 2, B9, B14, B16, B32, B74, T20, TP4, TP12, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 18 |
| | <i>Methyl picric acid (heavy metal salts of).</i> | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Methyl propionate | 3 | UN1248 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
| | Methyl propyl ether | 3 | UN2612 | II | 3 | IB2, IP8, T7, TP2 | 150 | 202 | 242 | 5 L | 60 L | E | 40 |
| | Methyl propyl ketone | 3 | UN1249 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
| | <i>Methyl sulfate, see Dimethyl sulfate.</i> | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | <i>Methyl sulfide, see Dimethyl sulfide.</i> | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Methyl trichloroacetate | 6.1 | UN2533 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | ..... |
| | <i>Methyl trimethylol methane trinitrate.</i> | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Methyl vinyl ketone, stabilized | 6.1 | UN1251 | I | 6.1, 3, 8. | 1, 25, B9, B14, B30, B72, T22, TP2, TP13, TP38, TP44 | None | 226 | 244 | Forbidden | Forbidden | B | 40 |
| | Methylal | 3 | UN1234 | II | 3 | IB2, IP8, T7, TP2 | None | 202 | 242 | 5 L | 60 L | E | ..... |
| | Methylamine, anhydrous | 2.1 | UN1061 | ..... | 2.1 | T50 | 306 | 304 | 314, 315 | Forbidden | 150 kg | B | 40 |
| | Methylamine, aqueous solution ... | 3 | UN1235 | II | 3, 8 | B1, IB2, T7, TP1 | 150 | 202 | 243 | 1 L | 5 L | E | 41 |
| | <i>Methylamine dinitramine and dry salts thereof.</i> | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | <i>Methylamine nitroform</i> | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | <i>Methylamine perchlorate (dry)</i> | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Methylamyl acetate | 3 | UN1233 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | N-Methylaniline | 6.1 | UN2294 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | ..... |
| | alpha-Methylbenzyl alcohol | 6.1 | UN2937 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | ..... |
| | 3-Methylbutan-2-one | 3 | UN2397 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym-bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|----------|---|----------------------------|----------------------------|-----|--------------|-------------------------------|--------------------------|-----------|-----------|--------------------------|-----------------------|-----------------------|------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | <i>N-Nitro-N-methylglycolamide ni- trate.</i> | Forbidden |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | <i>2-Nitro-2-methylpropanol nitrate .. Nitro urea</i> | Forbidden 1.1D | UN0147 | II | 1.1D .. | | None .. | 62 | None .. | Forbidden | Forbidden | 10 | ..... |
| | <i>N-Nitroaniline</i> | Forbidden |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| + | <i>Nitroanilines (o-; m-; p-)</i> | 6.1 | UN1661 | II | 6.1 | IB8, IP2, IP4, T7, TP2 | None .. | 212 | 242 | 25 kg | 100 kg | A | ..... |
| + | <i>Nitroanisole</i> | 6.1 | UN2730 | III | 6.1 | IB8, IP3, T4, TP1 | 153 | 213 | 240 | 100 kg | 200 kg | A | ..... |
| + | <i>Nitrobenzene</i> | 6.1 | UN1662 | II | 6.1 | IB2, T7, TP2 | None .. | 202 | 243 | 5 L | 60 L | A | 40 |
| | <i>m-Nitrobenzene diazonium per- chlorate.</i> | Forbidden |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | <i>Nitrobenzenesulfonic acid</i> | 8 | UN2305 | II | 8 | IB2 | 154 | 202 | 242 | 1 L | 30 L | A | ..... |
| | <i>Nitrobenzol, see Nitrobenzene .....</i> |  |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | <i>5-Nitrobenzotriazol</i> | 1.1D | UN0385 | II | 1.1D .. | | None .. | 62 | None .. | Forbidden | Forbidden | 10 | ..... |
| | <i>Nitrobenzotrifluorides</i> | 6.1 | UN2306 | II | 6.1 | IB2, T7, TP2 | None .. | 202 | 243 | 5 L | 60 L | A | 40 |
| | <i>Nitrobromobenzenes liquid</i> | 6.1 | UN2732 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | ..... |
| | <i>Nitrobromobenzenes solid</i> | 6.1 | UN2732 | III | 6.1 | IB8, IP3, T4, TP1 | 153 | 213 | 240 | 100 kg | 200 kg | A | ..... |
| | <i>Nitrocellulose, dry or wetted with less than 25 percent water (or alcohol), by mass.</i> | 1.1D | UN0340 | II | 1.1D .. | | None .. | 62 | None .. | Forbidden | Forbidden | 13 | 27E |
| | <i>Nitrocellulose membrane filters, with not more than 12.6% nitro- gen, by dry mass.</i> | 4.1 | UN3270 | II | 4.1 | 43, A1 | 151 | 212 | 240 | 1 kg | 15 kg | D | ..... |
| | <i>Nitrocellulose, plasticized with not less than 18 percent plasti- cizing substance, by mass.</i> | 1.3C | UN0343 | II | 1.3C .. | | None .. | 62 | None .. | Forbidden | Forbidden | 10 | ..... |
| | <i>Nitrocellulose, solution, flammable with not more than 12.6 per- cent nitrogen, by mass, and not more than 55 percent nitro- cellulose.</i> | 3 | UN2059 | II | 3 | IB2, T4, TP1, TP8 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
| | <i>Nitrocellulose, unmodified or plasti- cized with less than 18 per- cent plasticizing substance, by mass.</i> | 1.1D | UN0341 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | <i>Nitrocellulose, wetted with not less than 25 percent alcohol, by mass.</i> | 1.3C | UN0342 | II | 1.1D .. | | None .. | 62 | None .. | Forbidden | Forbidden | 13 | 27E |
| | <i>Nitrocellulose with alcohol with not less than 25 percent alco- hol by mass, and with not more than 12.6 percent nitrogen, by dry mass.</i> | 1.3C | UN0342 | II | 1.3C .. | | None .. | 62 | None .. | Forbidden | Forbidden | 10 | ..... |
| | <i>Nitrocellulose, with not more than 12.6 percent nitrogen, by dry mass, or Nitrocellulose mixture with pigment or Nitrocellulose mixture with plasticizer or Nitro- cellulose mixture with pigment and plasticizer.</i> | 4.1 | UN2556 | II | 4.1 | | 151 | 212 | None .. | 1 kg | 15 kg | D | 28 |
| | <i>Nitrocellulose, with not more than 12.6 percent nitrogen, by dry mass, or Nitrocellulose mixture with pigment or Nitrocellulose mixture with plasticizer or Nitro- cellulose mixture with pigment and plasticizer.</i> | 4.1 | UN2557 | II | 4.1 | 44 | 151 | 212 | None .. | 1 kg | 15 kg | D | 28 |
| | <i>Nitrocellulose with water with not less than 25 percent water, by mass.</i> | 4.1 | UN2555 | II | 4.1 | | 151 | 212 | None .. | 15 kg | 50 kg | E | 28 |
| | <i>Nitrochlorobenzene, see Chloronitrobenzenes etc.</i> |  |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | <i>Nitrocresols</i> | 6.1 | UN2446 | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | ..... |
| | <i>Nitroethane</i> | 3 | UN2842 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | <i>Nitroethyl nitrate</i> | Forbidden |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | <i>Nitroethylene polymer</i> | Forbidden |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | <i>Nitrogen, compressed</i> | 2.2 | UN1066 | | 2.2 | | 306 | 302 | 314, 315 | 75 kg | 150 kg | A | ..... |
| | <i>Nitrogen dioxide, see Dinitrogen tetroxide.</i> |  |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | <i>Nitrogen fertilizer solution, see Fertilizer ammoniating solution etc.</i> |  |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | <i>Nitrogen, mixtures with rare gases, see Rare gases and ni- trogen mixtures.</i> |  |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | <i>Nitrogen peroxide, see Dinitrogen tetroxide.</i> |  |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | <i>Nitrogen, refrigerated liquid cryo- genic liquid.</i> | 2.2 | UN1977 | | 2.2 | T75, TP5 | 320 | 316 | 318 | 50 kg | 500 kg | D | ..... |
| | <i>Nitrogen tetroxide and nitric oxide mixtures, see Nitric oxide and nitrogen tetroxide mixtures.</i> |  |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | <i>Nitrogen tetroxide, see Dinitrogen tetroxide.</i> |  |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | <i>Nitrogen trichloride</i> | Forbidden |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | <i>Nitrogen trifluoride, compressed .. Nitrogen triiodide</i> | 2.2 | UN2451 | | 2.2, 5.1 | | None .. | 302 | None .. | 75 kg | 150 kg | D | 40 |
| | <i>Nitrogen triiodide</i> | Forbidden |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | <i>Nitrogen triiodide monoamine</i> | Forbidden |  |  | ..... |  | ..... | ..... | ..... | ..... | ..... |  | ..... |
| | <i>Nitrogen trioxide</i> | 2.3 | UN2421 | | 2.3, 5.1, 8. | | 1 None .. | 336 | 245 | Forbidden | Forbidden | D | 40, 89, 90 |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym-bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|----------|--|----------------------------|----------------------------|-----|-------------|-------------------------------------|--------------------------|-----------|-----------|--------------------------|-----------------------|-----------------------|----------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | Nonyltrichlorosilane | 8 | UN1799 | II | 8 | A7, B2, B6, IB2, N34, T7, TP2, TP13 | None ... | 202 | 242 | Forbidden | 30 L | C | 40 |
| | <i>Nordhausen acid, see Sulfuric acid, fuming etc.</i> | | | | | | | | | | | | |
| | 2,5-Norbornadiene, stabilized, see Bicyclo 2,2,1 hepta-2,5-diene stabilized. | | | | | | | | | | | | |
| | Octadecyltrichlorosilane | 8 | UN1800 | II | 8 | A7, B2, B6, IB2, N34, T7, TP2, TP13 | None ... | 202 | 242 | Forbidden | 30 L | C | 40 |
| | Octadiene | 3 | UN2309 | II | 3 | B1, IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | 1,7-Octadine-3,5-diyne-1,8-dimethoxy-9-octadecyonic acid. | Forbidden | | | | | | | | | | | |
| | Octafluorobut-2-ene or Refrigerant gas R 1318. | 2.2 | UN2422 | | 2.2 | | None ... | 304 | 314, 315 | 75 kg | 150 kg | A | |
| | Octafluorocyclobutane, or Refrigerant gas RC 1318. | 2.2 | UN1976 | | 2.2 | T50 | None ... | 304 | 314, 315 | 75 kg | 150 kg | A | |
| | Octafluoropropane or Refrigerant gas R 218. | 2.2 | UN2424 | | 2.2 | T50 | None ... | 304 | 314, 315 | 75 kg | 150 kg | A | |
| | Octanes | 3 | UN1262 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | Octogen, etc. see Cyclotetramethylene tetranitramine, etc.. | | | | | | | | | | | | |
| | Octolite or Octol, dry or wetted with less than 15 percent water, by mass. | 1.1D | UN0266 | II | 1.1D ... | | None ... | 62 | None ... | Forbidden | Forbidden | 10 | |
| | Octonal | 1.1D | UN0496 | | 1.1D ... | | None ... | 62 | None ... | Forbidden | Forbidden | 10 | |
| | Octyl aldehydes | 3 | UN1191 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Octyltrichlorosilane | 8 | UN1801 | II | 8 | A7, B2, B6, IB2, N34, T7, TP2, TP13 | None ... | 202 | 242 | Forbidden | 30 L | C | 40 |
| | Oil gas, compressed | 2.3 | UN1071 | | 2.3, 2.1 | | None ... | 304 | 314, 315 | Forbidden | 25 kg | D | 40 |
| | <i>Oleum, see Sulfuric acid, fuming</i> | | | | | | | | | | | | |
| | <i>Organic peroxide type A, liquid or solid.</i> | Forbidden | | | | | | | | | | | |
| G | Organic peroxide type B, liquid | 5.2 | UN3101 | II | 5.2, 1 | | 53 | 152 | 225 | None ... | Forbidden | Forbidden | D 12, 40 |
| G | Organic peroxide type B, liquid, temperature controlled. | 5.2 | UN3111 | II | 5.2, 1 | | 53 | None ... | 225 | None ... | Forbidden | Forbidden | D 2, 40 |
| G | Organic peroxide type B, solid | 5.2 | UN3102 | II | 5.2, 1 | | 53 | 152 | 225 | None ... | Forbidden | Forbidden | D 12, 40 |
| G | Organic peroxide type B, solid, temperature controlled. | 5.2 | UN3112 | II | 5.2, 1 | | 53 | None ... | 225 | None ... | Forbidden | Forbidden | D 2, 40 |
| G | Organic peroxide type C, liquid ... | 5.2 | UN3103 | II | 5.2 | | | 152 | 225 | None ... | 5 L | 10 L | D 12, 40 |
| G | Organic peroxide type C, liquid, temperature controlled. | 5.2 | UN3113 | II | 5.2 | | | None ... | 225 | None ... | Forbidden | Forbidden | D 2, 40 |
| G | Organic peroxide type C, solid | 5.2 | UN3104 | II | 5.2 | | | 152 | 225 | None ... | 5 kg | 10 kg | D 12, 40 |
| G | Organic peroxide type C, solid, temperature controlled. | 5.2 | UN3114 | II | 5.2 | | | None ... | 225 | None ... | Forbidden | Forbidden | D 2, 40 |
| G | Organic peroxide type D, liquid ... | 5.2 | UN3105 | II | 5.2 | | | 152 | 225 | None ... | 5 L | 10 L | D 12, 40 |
| G | Organic peroxide type D, liquid, temperature controlled. | 5.2 | UN3115 | II | 5.2 | | | None ... | 225 | None ... | Forbidden | Forbidden | D 2, 40 |
| G | Organic peroxide type D, solid | 5.2 | UN3106 | II | 5.2 | | | 152 | 225 | None ... | 5 kg | 10 kg | D 12, 40 |
| G | Organic peroxide type D, solid, temperature controlled. | 5.2 | UN3116 | II | 5.2 | | | None ... | 225 | None ... | Forbidden | Forbidden | D 2, 40 |
| G | Organic peroxide type E, liquid | 5.2 | UN3107 | II | 5.2 | | | 152 | 225 | None ... | 10 L | 25 L | D 12, 40 |
| G | Organic peroxide type E, liquid, temperature controlled. | 5.2 | UN3117 | II | 5.2 | | | None ... | 225 | None ... | Forbidden | Forbidden | D 2, 40 |
| G | Organic peroxide type E, solid | 5.2 | UN3108 | II | 5.2 | | | 152 | 225 | None ... | 10 kg | 25 kg | D 12, 40 |
| G | Organic peroxide type E, solid, temperature controlled. | 5.2 | UN3118 | II | 5.2 | | | None ... | 225 | None ... | Forbidden | Forbidden | D 2, 40 |
| G | Organic peroxide type F, liquid | 5.2 | UN3109 | II | 5.2 | IB52, IP5, T23 | | 152 | 225 | 225 | 10 L | 25 L | D 12, 40 |
| G | Organic peroxide type F, liquid, temperature controlled. | 5.2 | UN3119 | II | 5.2 | IB52, IP5, T23 | | None ... | 225 | 225 | Forbidden | Forbidden | D 2, 40 |
| G | Organic peroxide type F, solid | 5.2 | UN3110 | II | 5.2 | IB52, T23 | | 152 | 225 | 225 | 10 kg | 25 kg | D 12, 40 |
| G | Organic peroxide type F, solid, temperature controlled. | 5.2 | UN3120 | II | 5.2 | T23 | | None ... | 225 | 225 | Forbidden | Forbidden | D 2, 40 |
| D | Organic phosphate, mixed with compressed gas or Organic phosphate compound, mixed with compressed gas or Organic phosphorus compound, mixed with compressed gas. | 2.3 | NA1955 | | 2.3 | | 3 | None ... | 334 | None ... | Forbidden | Forbidden | D 40 |
| | Organic pigments, self-heating | 4.2 | UN3313 | II | 4.2 | IB8, IP4 | | None ... | 212 | 241 | 15 kg | 50 kg | C |
| | | | | III | 4.2 | IB8, IP3 | | None ... | 213 | 241 | 25 kg | 100 kg | C |
| | Organoarsenic compound, n.o.s. | 6.1 | UN3280 | I | 6.1 | 5, IB7, IP1, T14, TP2, TP27 | | None ... | 211 | 242 | 5 kg | 50 kg | B |
| | | | | II | 6.1 | IB8, IP2, IP4, T11, TP2, TP27 | | None ... | 212 | 242 | 25 kg | 100 kg | B |
| | | | | III | 6.1 | IB8, IP3, T7, TP1, TP28 | | 153 | 213 | 240 | 100 kg | 200 kg | A |
| | Organochlorine pesticides liquid, flammable, toxic, flash point less than 23 degrees C. | 3 | UN2762 | I | 3, 6.1 | T14, TP2, TP13, TP27 | | None ... | 201 | 243 | Forbidden | 30 L | B 40 |
| | | | | II | 3, 6.1 | IB2, T11, TP2, TP13, TP27 | | None ... | 202 | 243 | 1 L | 60 L | B 40 |
| | Organochlorine pesticides, liquid, toxic. | 6.1 | UN2996 | I | 6.1 | T14, TP2, TP13, TP27 | | None ... | 201 | 243 | 1 L | 30 L | B 40 |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|--|----------------------------------|----------------------------------|-----|----------------|---|-----------------------------|----------|------|-----------------------------|--------------------------|-----------------------------|-------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | | | | II | 6.1 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
| | | | | III | 6.1 | IB3, T7, TP2, TP28 | 153 | 203 | 241 | 60 L | 220 L | A | 40 |
| | Organochlorine pesticides, liquid, toxic, flammable, flash point not less than 23 degrees C. | 6.1 | UN2995 | I | 6.1, 3 | T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 40 |
| | | | | II | 6.1, 3 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
| | | | | III | 6.1 | B1, IB3, T7, TP2, TP28 | 153 | 203 | 242 | 60 L | 220 L | A | 40 |
| | Organochlorine pesticides, solid toxic. | 6.1 | UN2761 | I | 6.1 | IB7, IP1 | None | 211 | 242 | 5 kg | 50 kg | A | 40 |
| | | | | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | 40 |
| | | | | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | 40 |
| G | Organometallic compound or Compound solution or Com- pound dispersion, water-reac- tive, flammable, n.o.s.. | 4.3 | UN3207 | I | 4.3, 3 | T13, TP2, TP7 | None | 201 | 244 | Forbidden | 1 L | E | 40 |
| | | | | II | 4.3, 3 | IB1, IP2, T7, TP2, TP7 | None | 202 | 243 | 1 L | 5 L | E | 40 |
| | | | | III | 4.3, 3 | IB2, IP4, T7, TP2, TP7 | None | 203 | 242 | 5 L | 60 L | E | 40 |
| G | Organometallic compound, toxic n.o.s.. | 6.1 | UN3282 | I | 6.1 | IB7, IP1, T14, TP2, TP27 | None | 211 | 242 | 5 kg | 50 kg | B | |
| | | | | II | 6.1 | IB8, IP2, IP4, T11, TP2, TP27 | None | 212 | 242 | 25 kg | 100 kg | B | |
| | | | | III | 6.1 | IB8, IP3, T7, TP1, TP28 | 153 | 213 | 240 | 100 kg | 200 kg | A | |
| | Organophosphorus compound, toxic, flammable, n.o.s.. | 6.1 | UN3279 | I | 6.1, 3 | 5, T14, TP2, TP13 | None | 201 | 243 | 1 L | 30 L | B | 40 |
| | | | | II | 6.1, 3 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
| | Organophosphorus compound, toxic n.o.s.. | 6.1 | UN3278 | I | 6.1 | 5, IB7, T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | |
| | | | | II | 6.1 | IB2, T11, TP2, TP27 | None | 202 | 243 | 5 L | 60 L | B | |
| | | | | III | 6.1 | IB3, T7, TP1, TP28 | 153 | 203 | 241 | 60 L | 220 L | A | |
| | Organophosphorus pesticides, liq- uid, flammable, toxic, flash point less than 23 degrees C. | 3 | UN2784 | I | 3, 6.1 | T14, TP2, TP13, TP27 | None | 201 | 243 | Forbidden | 30 L | B | 40 |
| | | | | II | 3, 6.1 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 1 L | 60 L | B | 40 |
| | Organophosphorus pesticides, liq- uid, toxic. | 6.1 | UN3018 | I | 6.1 | N76, T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 40 |
| | | | | II | 6.1 | IB2, N76, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
| | | | | III | 6.1 | IB3, N76, T7, TP2, TP28 | 153 | 203 | 241 | 60 L | 220 L | A | 40 |
| | Organophosphorus pesticides, liq- uid, toxic, flammable, flash point not less than 23 degrees C. | 6.1 | UN3017 | I | 6.1, 3 | N76, T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 40 |
| | | | | II | 6.1, 3 | IB2, N76, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
| | | | | III | 6.1, 3 | B1, IB3, N76, T7, TP2, TP28 | 153 | 203 | 242 | 60 L | 220 L | A | 40 |
| | Organophosphorus pesticides, solid, toxic. | 6.1 | UN2783 | I | 6.1 | IB7, IP1, N77 | None | 211 | 242 | 5 kg | 50 kg | A | 40 |
| | | | | II | 6.1 | IB8, IP2, IP4, N77 | None | 212 | 242 | 25 kg | 100 kg | A | 40 |
| | | | | III | 6.1 | IB8, IP3, N77 | 153 | 213 | 240 | 100 kg | 200 kg | A | 40 |
| | Organotin compounds, liquid, n.o.s.. | 6.1 | UN2788 | I | 6.1 | A3, N33, N34, T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 40 |
| | | | | II | 6.1 | A3, IB2, N33, N34, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | A | 40 |
| | | | | III | 6.1 | IB3, T7, TP2, TP28 | 153 | 203 | 241 | 60 L | 220 L | A | 40 |
| | Organotin compounds, solid, n.o.s.. | 6.1 | UN3146 | I | 6.1 | A5, IB7, IP1 | None | 211 | 242 | 5 kg | 50 kg | B | 40 |
| | | | | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | 40 |
| | | | | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | 40 |
| | Organotin pesticides, liquid, flam- mable, toxic, flash point less than 23 degrees C. | 3 | UN2787 | I | 3, 6.1 | T14, TP2, TP13, TP27 | None | 201 | 243 | Forbidden | 30 L | B | 40 |
| | | | | II | 3, 6.1 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 1 L | 60 L | B | 40 |
| | Organotin pesticides, liquid, toxic | 6.1 | UN3020 | I | 6.1 | T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 40 |
| | | | | II | 6.1 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
| | | | | III | 6.1 | IB3, T7, TP2, TP28 | 153 | 203 | 241 | 60 L | 220 L | A | 40 |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym-bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|----------|--|----------------------------|----------------------------|-----|--------------|-------------------------------|--------------------------|----------|----------|--------------------------|-----------------------|-----------------------|-------------------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| | | | | | | | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | Organotin pesticides, liquid, toxic, flammable, flash point not less than 23 degrees C. | 6.1 | UN3019 | I | 6.1, 3 | T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 40 |
| | | | | II | 6.1, 3 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
| | | | | III | 6.1, 3 | B1, IB3, T7, TP2, TP28 | 153 | 203 | 242 | 60 L | 220 L | A | 40 |
| | Organotin pesticides, solid, toxic | 6.1 | UN2786 | I | 6.1 | IB7, IP1 | None | 211 | 242 | 5 kg | 50 kg | A | 40 |
| | | | | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | 40 |
| | | | | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | 40 |
| | Orthonitroaniline, Nitroanilines etc. see | | | | | | | | | | | | |
| | Osmium tetroxide | 6.1 | UN2471 | I | 6.1 | A8, IB7, IP1, N33, N34 | None | 211 | 242 | 5 kg | 50 kg | B | 40 |
| D G | Other regulated substances, liquid, n.o.s.. | 9 | NA3082 | III | 9 | IB3, T2, TP1 | 155 | 203 | 241 | No limit | No limit | A | |
| D G | Other regulated substances, solid, n.o.s.. | 9 | NA3077 | III | 9 | B54, IB8, IP2 | 155 | 213 | 240 | No limit | No limit | A | |
| G | Oxidizing liquid, corrosive, n.o.s. | 5.1 | UN3098 | I | 5.1, 8 | | None | 201 | 244 | Forbidden | 2.5 L | D | 13, 56, 58, 69, 106 |
| | | | | II | 5.1, 8 | IB1 | None | 202 | 243 | 1 L | 5 L | B | 34, 56, 58, 69, 106 |
| | | | | III | 5.1, 8 | IB2 | 152 | 203 | 242 | 2.5 L | 30 L | B | 34, 56, 58, 69, 106 |
| G | Oxidizing liquid, n.o.s. | 5.1 | UN3139 | I | 5.1 | 127, A2 | None | 201 | 243 | Forbidden | 2.5 L | D | 56, 58, 69, 106 |
| | | | | II | 5.1 | 127, A2, IB2 | 152 | 202 | 242 | 1 L | 5 L | B | 56, 58, 69, 106 |
| | | | | III | 5.1 | 127, A2, IB2 | 152 | 203 | 241 | 2.5 L | 30 L | B | 56, 58, 69, 106 |
| G | Oxidizing liquid, toxic, n.o.s. | 5.1 | UN3099 | I | 5.1, 6.1 | | None | 201 | 244 | Forbidden | 2.5 L | D | 56, 58, 69, 106 |
| | | | | II | 5.1, 6.1 | IB1 | None | 202 | 243 | 1 L | 5 L | B | 56, 58, 95, 106 |
| | | | | III | 5.1, 6.1 | IB2 | 152 | 203 | 242 | 2.5 L | 30 L | B | 56, 58, 95, 106 |
| G | Oxidizing solid, corrosive, n.o.s. .. | 5.1 | UN3085 | I | 5.1, 8 | | None | 211 | 242 | 1 kg | 15 kg | D | 13, 56, 58, 69, 106 |
| | | | | II | 5.1, 8 | IB6, IP2 | None | 212 | 242 | 5 kg | 25 kg | B | 13, 34, 56, 58, 69, 106 |
| | | | | III | 5.1, 8 | IB8, IP3 | 152 | 213 | 240 | 25 kg | 100 kg | B | 13, 34, 56, 58, 69, 106 |
| G | Oxidizing solid, flammable, n.o.s. | 5.1 | UN3137 | I | 5.1, 4.1 | | None | 214 | 214 | Forbidden | Forbidden | D | 56, 58, 69, 106 |
| G | Oxidizing solid, n.o.s. | 5.1 | UN1479 | I | 5.1 | IB6, IP1 | None | 211 | 242 | 1 kg | 15 kg | D | 56, 58, 69, 106 |
| | | | | II | 5.1 | IB8, IP2, IP4 | 152 | 212 | 240 | 5 kg | 25 kg | B | 56, 58, 69, 106 |
| | | | | III | 5.1 | IB8, IP3 | 152 | 213 | 240 | 25 kg | 100 kg | B | 56, 58, 69, 106 |
| G | Oxidizing solid, self-heating, n.o.s.. | 5.1 | UN3100 | II | 5.1, 4.2 | | None | 214 | 214 | Forbidden | Forbidden | | |
| G | Oxidizing solid, toxic, n.o.s. | 5.1 | UN3087 | I | 5.1, 6.1 | | None | 211 | 242 | 1 kg | 15 kg | D | 56, 58, 69, 106 |
| | | | | II | 5.1, 6.1 | IB6, IP2 | None | 212 | 242 | 5 kg | 25 kg | B | 56, 58, 69, 95, 106 |
| | | | | III | 5.1, 6.1 | IB8, IP3 | 152 | 213 | 240 | 25 kg | 100 kg | B | 56, 58, 69, 95, 106 |
| G | Oxidizing solid, water-reactive, n.o.s.. | 5.1 | UN3121 | | 5.1, 4.3 | | None | 214 | 214 | Forbidden | Forbidden | | |
| | Oxygen and carbon dioxide mixtures, see Carbon dioxide and oxygen mixtures. | | | | | | | | | | | | |
| | Oxygen, compressed | 2.2 | UN1072 | | 2.2, 5.1 | A52 | 306 | 302 | 314, 315 | 75 kg | 150 kg | A | |
| | Oxygen difluoride, compressed | 2.3 | UN2190 | | 2.3, 5.1, 8. | 1 | None | 304 | None | Forbidden | Forbidden | D | 13, 40, 89, 90 |
| | Oxygen generator, chemical (including when contained in associated equipment, e.g., passenger service units (PSUs), portable breathing equipment (PBE), etc).. | 5.1 | UN3356 | II | 5.1 | 60, A51 | None | 212 | None | Forbidden | 25 kg gross | D | 56, 58, 69, 106 |
| + | Oxygen generator, chemical, spent. | 9 | NA3356 | III | 9 | 61 | None | 213 | None | Forbidden | Forbidden | A | |
| | Oxygen, mixtures with rare gases, see Rare gases and oxygen mixtures. | | | | | | | | | | | | |
| | Oxygen, refrigerated liquid (cryogenic liquid). | 2.2 | UN1073 | | 2.2, 5.1 | T75, TP5, TP22 | 320 | 316 | 318 | Forbidden | Forbidden | D | |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | | |
|--------------|--|----------------------------------|----------------------------------|-----|----------------|-------------------------------------|-----------------------------|----------|----------|-----------------------------|--------------------------|-----------------------------|-----------------|----|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) | |
| | Paint including paint, lacquer, enamel, stain, shellac solutions, varnish, polish, liquid filler, and liquid lacquer base. | 3 | UN1263 | I | 3 | T11, TP1, TP8 | 150 | 201 | 243 | 1 L | 30 L | E | | |
| | | | | II | 3 | B52, IB2, T4, TP1, TP8 | 150 | 173 | 242 | 5 L | 60 L | B | | |
| | | | | III | 3 | B1, B52, IB3, T2, TP1 | 150 | 173 | 242 | 60 L | 220 L | A | | |
| | Paint or Paint related material | 8 | UN3066 | II | 8 | B2, IB2, T7, TP2 | 154 | 173 | 242 | 1 L | 30 L | A | | |
| | | | | III | 8 | B52, IB3, T4, TP1 | 154 | 173 | 241 | 5 L | 60 L | A | | |
| | Paint related material including paint thinning, drying, removing, or reducing compound. | 3 | UN1263 | I | 3 | T11, TP1, TP8 | 150 | 201 | 243 | 1 L | 30 L | E | | |
| | | | | II | 3 | B52, IB2, T4, TP1, TP8 | 150 | 173 | 242 | 5 L | 60 L | B | | |
| | | | | III | 3 | B1, B52, IB3, T2, TP1 | 150 | 173 | 242 | 60 L | 220 L | A | | |
| | Paper, unsaturated oil treated incompletely dried (including carbon paper). | 4.2 | UN1379 | III | 4.2 | IB8, IP3 | None | 213 | 241 | Forbidden | Forbidden | A | | |
| | Paraformaldehyde | 4.1 | UN2213 | III | 4.1 | A1, IB8, IP3 | 151 | 213 | 240 | 25 kg | 100 kg | A | | |
| | Paraldehyde | 3 | UN1264 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | | |
| | Paranitroaniline, solid, see Nitroanilines etc. | | | | | | | | | | | | | |
| D | Parathion and compressed gas mixture. | 2.3 | NA1967 | | 2.3 | | 3 | None | 334 | 245 | Forbidden | Forbidden | E | 40 |
| | Paris green, solid, see Copper acetoarsenite. | | | | | | | | | | | | | |
| A W | PCB, see Polychlorinated biphenyls. | | | | | | | | | | | | | |
| + | Pentaborane | 4.2 | UN1380 | I | 4.2, 6.1 | 1 | None | 205 | 245 | Forbidden | Forbidden | D | | |
| | Pentachloroethane | 6.1 | UN1669 | II | 6.1 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | A | 40 | |
| | Pentachlorophenol | 6.1 | UN3155 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | | |
| | Pentaerythrite tetranitrate (dry) | Forbidden | | | | | | | | | | | | |
| | Pentaerythrite tetranitrate mixture, desensitized, solid, n.o.s. with more than 10 percent but not more than 20 percent PETN, by mass. | 4.1 | UN3344 | II | 4.1 | 118 | None | 214 | None | Forbidden | Forbidden | E | 40 | |
| | Pentaerythrite tetranitrate or Pentaerythritol tetranitrate or PETN, with not less than 7 percent wax by mass. | 1.1D | UN0411 | II | 1.1D | | None | 62 | None | Forbidden | Forbidden | 10 | | |
| | Pentaerythrite tetranitrate, wetted or Pentaerythritol tetranitrate, wetted, or PETN, wetted with not less than 25 percent water, by mass, or Pentaerythrite tetranitrate, or Pentaerythritol tetranitrate or PETN, desensitized with not less than 15 percent phlegmatizer by mass. | 1.1D | UN0150 | II | 1.1D | 121 | None | 62 | None | Forbidden | Forbidden | 10 | | |
| | Pentaerythritol tetranitrate, see Pentaerythrite tetranitrate, etc. | | | | | | | | | | | | | |
| | Pentafluoroethane or Refrigerant gas R 125. | 2.2 | UN3220 | | 2.2 | T50 | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | | |
| | Pentamethylheptane | 3 | UN2286 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | | |
| | Pentane-2,4-dione | 3 | UN2310 | III | 3, 6.1 | B1, IB3, T4, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | | |
| | Pentanes | 3 | UN1265 | I | 3 | T11, TP2 | 150 | 201 | 243 | 1 L | 30 L | E | | |
| | | | | II | 3 | IB2, IP8, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | E | | |
| | Pentanitroaniline (dry) | Forbidden | | | | | | | | | | | | |
| | Pentanol | 3 | UN1105 | II | 3 | IB2, T4, TP1, TP29 | 150 | 202 | 242 | 5 L | 60 L | B | | |
| | | | | III | 3 | B1, B3, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | | |
| | 1-Pentene (n-amylene) | 3 | UN1108 | I | 3 | T11, TP2 | 150 | 201 | 243 | 1 L | 30 L | E | | |
| | 1-Pentol | 8 | UN2705 | II | 8 | B2, IB2, T7, TP2 | 154 | 202 | 242 | 1 L | 30 L | B | 38 | |
| | Pentolite, dry or wetted with less than 15 percent water, by mass. | 1.1D | UN0151 | II | 1.1D | | None | 62 | None | Forbidden | Forbidden | 10 | | |
| | Pepper spray, see Aerosols, etc. or Self-defense spray, non-pressurized. | | | | | | | | | | | | | |
| | Perchlorates, inorganic, aqueous solution, n.o.s. | 5.1 | UN3211 | II | 5.1 | IB2, T4, TP1 | 152 | 202 | 242 | 1 L | 5 L | B | 46, 56, 58 | |
| | | | | III | 5.1 | IB2, T4, TP1 | 152 | 202 | 241 | 2.5 L | 30 L | B | 56, 58, 69, 106 | |
| | Pepper spray, see Aerosols, etc. or Self-defense spray, non-pressurized. | | | III | 5.1 | | 152 | 203 | 241 | 2.5 L | 30 L | B | 56, 58, 69, 106 | |
| | Perchlorates, inorganic, n.o.s. | 5.1 | UN1481 | II | 5.1 | IB6, IP2 | 152 | 212 | 242 | 5 kg | 25 kg | A | 46, 56 | |
| | | | | III | 5.1 | IB8, IP3 | 152 | 213 | 240 | 25 kg | 100 kg | A | 46, 56 | |
| | Perchloric acid, with more than 72 percent acid by mass. | Forbidden | | | | | | | | | | | | |
| | Perchloric acid with more than 50 percent but not more than 72 percent acid, by mass. | 5.1 | UN1873 | I | 5.1, 8 | A2, A3, N41, T10, TP1, TP12 | None | 201 | 243 | Forbidden | 2.5 L | D | 66 | |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|---|----------------------------------|----------------------------------|-------|----------------|--|-----------------------------|----------------------|-----------|-----------------------------|--------------------------|-----------------------------|-------------------------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | Perchloric acid <i>with not more than 50 percent acid by mass.</i> <i>Perchloroethylene, see</i> Tetrachloroethylene. Perchloromethyl mercaptan | 8 | UN1802 | II | 8, 5.1 | IB2, N41, T7, TP2 | None | 202 | 243 | Forbidden | 30 L | C | 66 |
|  | ..... | 6.1 | UN1670 | I | 6.1 | 2, A3, A7, B9, B14, B32, B74, N34, T20, TP2, TP13, TP38, TP45 2, B9, B14 | None | 227 | 244 | Forbidden | Forbidden | D | 40 |
| | Perchloryl fluoride | 2.3 | UN3083 | ..... | 2.3, 5.1 | ..... | None | 302 | 314, 315 | Forbidden | Forbidden | D | 40 |
| | <i>Percussion caps, see</i> Primers, cap type. <i>Perfluoro-2-butene, see</i> Octafluorobut-2-ene. Perfluoro(ethyl vinyl ether) | 2.1 | UN3154 | ..... | 2.1 ..... | ..... | 306 | 302, 304, 305. | 314, 315 | Forbidden | 150 kg | E | 40 |
| | Perfluoro(methyl vinyl ether) | 2.1 | UN3153 | ..... | 2.1 | T50 | 306 | 302, 304, 305. | 314, 315 | Forbidden | 150 kg | E | 40 |
| | Perfumery products <i>with flam- mable solvents.</i> | 3 | UN1266 | II | 3 | IB2, T4, TP1, TP8 | 150 | 202 | 242 | 15 L | 60 L | B | ..... |
|  | ..... | ..... | ..... | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Permanganates, inorganic, aque- ous solution, n.o.s.. | 5.1 | UN3214 | II | 5.1 | 26, IB2, T4, TP1 | 152 | 202 | 242 | 1 L | 5 L | D | 56, 58, 69, 106, 107 |
| | Permanganates, inorganic, n.o.s. | 5.1 | UN1482 | II | 5.1 | 26, A30, IB6, IP2 | 152 | 212 | 242 | 5 kg | 25 kg | D | 56, 58, 69, 106, 107 |
|  | ..... | ..... | ..... | III | 5.1 | 26, A30, IB8, IP3 | 152 | 213 | 240 | 25 kg | 100 kg | D | 56, 58, 69, 106, 107 |
| | Peroxides, inorganic, n.o.s. | 5.1 | UN1483 | II | 5.1 | A7, A20, IB6, IP2, N34 | None | 212 | 242 | 5 kg | 25 kg | A | 13, 75, 106 |
|  | ..... | ..... | ..... | III | 5.1 | A7, A20, IB8, IP3, N34 | 152 | 213 | 240 | 25 kg | 100 kg | A | 13, 75, 106 |
| | <i>Peroxyacetic acid, with more than 43 percent and with more than 6 percent hydrogen peroxide.</i> Persulfates, inorganic, aqueous solution, n.o.s.. | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Persulfates, inorganic, n.o.s. | 5.1 | UN3216 | III | 5.1 | IB2, T4, TP1, TP29 | 152 | 203 | 241 | 2.5 L | 30 L | A | ..... |
| | Persulfates, inorganic, n.o.s. | 5.1 | UN3215 | III | 5.1 | IB8, IP3 | 152 | 213 | 240 | 25 kg | 100 kg | A | ..... |
| G | Pesticides, liquid, flammable, toxic, flash point less than 23 degrees C. | 3 | UN3021 | I | 3, 6.1 | B5, T14, TP2, TP13, TP27 | None | 201 | 243 | Forbidden | 30 L | B | ..... |
|  | ..... | ..... | ..... | II | 3, 6.1 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 1 L | 60 L | B | ..... |
| G | Pesticides, liquid, toxic, flam- mable, n.o.s. flash point not less than 23 degrees C. | 6.1 | UN2903 | I | 6.1, 3 | T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 40 |
|  | ..... | ..... | ..... | II | 6.1, 3 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
|  | ..... | ..... | ..... | III | 6.1, 3 | B1, IB3, T7, TP2 | 153 | 203 | 242 | 60 L | 220 L | A | 40 |
| G | Pesticides, liquid, toxic, n.o.s. | 6.1 | UN2902 | I | 6.1 | T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 40 |
|  | ..... | ..... | ..... | II | 6.1 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
|  | ..... | ..... | ..... | III | 6.1 | IB3, T7, TP2, TP28 | 153 | 203 | 241 | 60 L | 220 L | A | 40 |
| G | Pesticides, solid, toxic, n.o.s. | 6.1 | UN2588 | I | 6.1 | IB7 | None | 211 | 242 | 5 kg | 50 kg | A | 40 |
|  | ..... | ..... | ..... | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | 40 |
|  | ..... | ..... | ..... | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | 40 |
| | PETN, <i>see</i> Pentaerythrite tetranitrate. PETN/TNT, <i>see</i> Pentolite, etc ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Petrol, <i>see</i> Gasoline ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Petroleum crude oil | 3 | UN1267 | I | 3 | T11, TP1, TP8 | None | 201 | 243 | 1 L | 30 L | E | ..... |
|  | ..... | ..... | ..... | II | 3 | IB2, T4, TP1, TP8 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
|  | ..... | ..... | ..... | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Petroleum distillates, n.o.s. or Pe- troleum products, n.o.s.. | 3 | UN1268 | I | 3 | T11, TP1, TP8 | 150 | 201 | 243 | 1 L | 30 L | E | ..... |
|  | ..... | ..... | ..... | II | 3 | IB2, T7, TP1, TP8, TP28 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
|  | ..... | ..... | ..... | III | 3 | B1, IB3, T4, TP1, TP29 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Petroleum gases, liquefied or Liq- uefied petroleum gas. | 2.1 | UN1075 | ..... | 2.1 | T50 | 306 | 304 | 314, 315 | Forbidden | 150 kg | E | 40 |
| D | Petroleum oil | 3 | NA1270 | I | 3 | T11, TP1, TP9 | None | 201 | 243 | 1 L | 30 L | E | ..... |
|  | ..... | ..... | ..... | II | 3 | IB2, T7, TP1, TP8, TP28 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
|  | ..... | ..... | ..... | III | 3 | B1, IB3, T4, TP1, TP29 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Phenacyl bromide | 6.1 | UN2645 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | B | 40 |
| + | Phenetidines | 6.1 | UN2311 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | ..... |
| | Phenol, molten | 6.1 | UN2312 | II | 6.1 | B14, T7, TP3 | None | 202 | 243 | Forbidden | Forbidden | B | 40 |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|---|----------------------------------|----------------------------------|-----|----------------|---|-----------------------------|----------|----------|-----------------------------|--------------------------|-----------------------------|--------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | Phosphorus heptasulfide, free from yellow or white phosphorus. | 4.1 | UN1339 | II | 4.1 | A20, IB4, N34 | None | 212 | 240 | 15 kg | 50 kg | B | 74 |
| | Phosphorus oxybromide | 8 | UN1939 | II | 8 | B8, IB8, IP2, IP4, N41, N43, T7, TP2 | None | 212 | 240 | Forbidden | 50 kg | C | 12, 40 |
| | Phosphorus oxybromide, molten | 8 | UN2576 | II | 8 | B2, B8, IB1, N41, N43, T7, TP3, TP13 | None | 202 | 242 | Forbidden | Forbidden | C | 40 |
| + | Phosphorus oxychloride | 8 | UN1810 | II | 8, 6.1 | 2, A7, B9, B14, B32, B74, B77, N34, T20, TP2, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | C | 40 |
| | Phosphorus pentabromide | 8 | UN2691 | II | 8 | A7, IB8, IP2, IP4, N34 | 154 | 212 | 240 | Forbidden | 50 kg | B | 12, 40 |
| | Phosphorus pentachloride | 8 | UN1806 | II | 8 | A7, IB8, IP2, IP4, N34 | None | 212 | 240 | Forbidden | 50 kg | C | 40 |
| | Phosphorus pentafluoride, compressed. | 2.3 | UN2198 | | 2.3, 8 | 2, B9, B14 | None | 302, 304 | 314, 315 | Forbidden | Forbidden | D | 40 |
| | Phosphorus pentasulfide, free from yellow or white phosphorus. | 4.3 | UN1340 | II | 4.3, 4.1 | A20, B59, IB4 | 151 | 212 | 242 | 15 kg | 50 kg | B | 74 |
| | Phosphorus pentoxide | 8 | UN1807 | II | 8 | A7, IB8, IP2, IP4, N34 | 154 | 212 | 240 | 15 kg | 50 kg | A | |
| | Phosphorus sesquisulfide, free from yellow or white phosphorus. | 4.1 | UN1341 | II | 4.1 | A20, IB4, N34 | None | 212 | 240 | 15 kg | 50 kg | B | 74 |
| | Phosphorus tribromide | 8 | UN1808 | II | 8 | A3, A6, A7, B2, B25, IB2, N34, N43, T7, TP2 | None | 202 | 242 | Forbidden | 30 L | C | 40 |
| | Phosphorus trichloride | 6.1 | UN1809 | I | 6.1, 8 | 2, B9, B14, B15, B32, B74, B77, N34, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | C | 40 |
| | Phosphorus trioxide | 8 | UN2578 | III | 8 | IB8, IP3 | 154 | 213 | 240 | 25 kg | 100 kg | A | 12 |
| | Phosphorus trisulfide, free from yellow or white phosphorus. | 4.1 | UN1343 | II | 4.1 | A20, IB4, N34 | None | 212 | 240 | 15 kg | 50 kg | B | 74 |
| | Phosphorus, white dry or Phosphorus, white, under water or Phosphorus white, in solution or Phosphorus, yellow dry or Phosphorus, yellow, under water or Phosphorus, yellow, in solution. | 4.2 | UN1381 | I | 4.2, 6.1 | B9, B26, N34, T9, TP3 | None | 188 | 243 | Forbidden | Forbidden | E | |
| | Phosphorus white, molten | 4.2 | UN2447 | I | 4.2, 6.1 | B9, B26, N34, T21, TP3, TP7, TP26 | None | 188 | 243 | Forbidden | Forbidden | D | |
| | Phosphorus (white or red) and a chlorate, mixtures of. | Forbidden | | | | | | | | | | | |
| | Phosphoryl chloride, see Phosphorus oxychloride. | | | | | | | | | | | | |
| | Phthalic anhydride with more than .05 percent maleic anhydride. | 8 | UN2214 | III | 8 | IB8, IP3, T4, TP3 | 154 | 213 | 240 | 25 kg | 100 kg | A | |
| | Picolines | 3 | UN2313 | III | 3 | B1, IB3, T4, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | 40 |
| | Picric acid, see Trinitrophenol, etc | | | | | | | | | | | | |
| | Picrite, see Nitroguanidine, etc | | | | | | | | | | | | |
| | Picryl chloride, see Trinitrochlorobenzene. | | | | | | | | | | | | |
| | Pine oil | 3 | UN1272 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | alpha-Pinene | 3 | UN2368 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Piperazine | 8 | UN2579 | III | 8 | IB8, IP3, T4, TP1 | 154 | 213 | 240 | 25 kg | 100 kg | A | 12 |
| | Piperidine | 8 | UN2401 | I | 8, 3 | T10, TP2 | None | 201 | 243 | 0.5 L | 2.5 L | B | |
| | Pivaloyl chloride, see Trimethylacetyl chloride. | | | | | | | | | | | | |
| | Plastic molding compound in dough, sheet or extruded rope form evolving flammable vapor. | 9 | UN3314 | III | 9 | 32, IB8, IP6 | 155 | 221 | 221 | 100 kg | 200 kg | A | 85, 87 |
| | Plastic solvent, n.o.s., see Flammable liquids, n.o.s.. | | | | | | | | | | | | |
| | Plastics, nitrocellulose-based, self-heating, n.o.s.. | 4.2 | UN2006 | III | 4.2 | | None | 213 | None | Forbidden | Forbidden | C | |
| | Poisonous gases, n.o.s., see Compressed or liquefied gases, flammable or toxic, n.o.s.. | | | | | | | | | | | | |
| | Polyalkylamines, n.o.s., see Amines, etc. | | | | | | | | | | | | |
| | Polychlorinated biphenyls, liquid | 9 | UN2315 | II | 9 | 9, 81, 140, IB3, T4, TP1 | 155 | 202 | 241 | 100 L | 220 L | A | 95 |
| | Polychlorinated biphenyls, solid | 9 | UN2315 | II | 9 | 9, 81, 140, IB7 | 155 | 212 | 240 | 100 kg | 200 kg | A | 95 |
| | Polyester resin kit | 3 | UN3269 | | 3 | 40 | 152 | 225 | None | 5 kg | 5 kg | B | |
| | Polyhalogenated biphenyls, liquid or Polyhalogenated terphenyls liquid. | 9 | UN3151 | II | 9 | IB3 | 155 | 204 | 241 | 100 L | 220 L | A | 95 |
| | Polyhalogenated biphenyls, solid or Polyhalogenated terphenyls, solid. | 9 | UN3152 | II | 9 | IB8, IP2, IP4 | 155 | 204 | 241 | 100 kg | 200 kg | A | 95 |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|--|----------------------------------|----------------------------------|-----|----------------|--|-----------------------------|----------|----------|-----------------------------|--------------------------|-----------------------------|----------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | Potassium sodium alloys | 4.3 | UN1422 | I | 4.3 | A19, B27, IB4, IP1, N34, N40, T9, TP3, TP7 | None | 211 | 244 | Forbidden | 15 kg | D | |
| | Potassium sulfide, anhydrous or Potassium sulfide with less than 30 percent water of crys- tallization. | 4.2 | UN1382 | II | 4.2 | A19, A20, B16, IB6, IP2, N34 | None | 212 | 241 | 15 kg | 50 kg | A | |
| | Potassium sulfide, hydrated with not less than 30 percent water of crystallization. | 8 | UN1847 | II | 8 | IB8, IP2, IP4 | 154 | 212 | 240 | 15 kg | 50 kg | A | 26 |
| | Potassium superoxide | 5.1 | UN2466 | I | 5.1 | A20, IB6, IP1 | None | 211 | None | Forbidden | 15 kg | B | 13, 75, 106 |
| | Powder cake, wetted or Powder paste, wetted with not less than 17 percent alcohol by mass. | 1.1C | UN0433 | II | 1.1C | | None | 62 | None | Forbidden | Forbidden | 10 | |
| | Powder cake, wetted or Powder paste, wetted with not less than 25 percent water, by mass. | 1.3C | UN0159 | II | 1.3C | | None | 62 | None | Forbidden | Forbidden | 10 | |
| | Powder paste, see Powder cake, etc. | | | | | | | | | | | | |
| | Powder, smokeless | 1.1C | UN0160 | II | 1.1C | | None | 62 | None | Forbidden | Forbidden | | 26E |
| | Powder, smokeless | 1.3C | UN0161 | II | 1.3C | | None | 62 | None | Forbidden | Forbidden | | 26E |
| | Power device, explosive, see Cartridges, power device. | | | | | | | | | | | | |
| | Primers, cap type | 1.4S | UN0044 | II | None | | None | 62 | None | 25 kg | 100 kg | 05 | |
| | Primers, cap type | 1.1B | UN0377 | II | 1.1B | | None | 62 | None | Forbidden | Forbidden | 11 | |
| | Primers, cap type | 1.4B | UN0378 | II | 1.4B | | None | 62 | None | Forbidden | 75 kg | 06 | |
| | Primers, small arms, see Primers, cap type. | | | | | | | | | | | | |
| | Primers, tubular | 1.3G | UN0319 | II | 1.3G | | None | 62 | None | Forbidden | Forbidden | 07 | |
| | Primers, tubular | 1.4G | UN0320 | II | 1.4G | | None | 62 | None | Forbidden | 75 kg | 06 | |
| | Primers, tubular | 1.4S | UN0376 | II | None | | None | 62 | None | 25 kg | 100 kg | 05 | |
| | Printing ink, flammable or Printing ink related material (including printing ink thinning or reducing compound), flammable. | 3 | UN1210 | I | 3 | T11, TP1, TP8 | 150 | 173 | 243 | 1 L | 30 L | E | |
| | | | | II | 3 | IB2, T4, TP1, TP8 | 150 | 173 | 242 | 5 L | 60 L | B | |
| | | | | III | 3 | B1, IB3, T2, TP1 | 150 | 173 | 242 | 60 L | 220 L | A | |
| | Projectiles, illuminating, see Am- munition, illuminating, etc. | | | | | | | | | | | | |
| | Projectiles, inert with tracer | 1.4S | UN0345 | II | 1.4S | | | 62 | None | 25 kg | 100 kg | 01 | |
| | Projectiles, inert, with tracer | 1.3G | UN0424 | II | 1.3G | | | 62 | None | Forbidden | Forbidden | 03 | |
| | Projectiles, inert, with tracer | 1.4G | UN0425 | II | 1.4G | | | 62 | None | Forbidden | 75 kg | 02 | |
| | Projectiles, with burster or expel- ling charge. | 1.2D | UN0346 | II | 1.2D | | | 62 | None | Forbidden | Forbidden | 03 | |
| | Projectiles, with burster or expel- ling charge. | 1.4D | UN0347 | II | 1.4D | | | 62 | None | Forbidden | 75 kg | 02 | |
| | Projectiles, with burster or expel- ling charge. | 1.2F | UN0426 | II | 1.2F | | | 62 | None | Forbidden | Forbidden | 08 | |
| | Projectiles, with burster or expel- ling charge. | 1.4F | UN0427 | II | 1.4F | | | 62 | None | Forbidden | Forbidden | 08 | |
| | Projectiles, with burster or expel- ling charge. | 1.2G | UN0434 | II | 1.2G | | | 62 | None | Forbidden | Forbidden | 03 | |
| | Projectiles, with burster or expel- ling charge. | 1.4G | UN0435 | II | 1.4G | | | 62 | None | Forbidden | 75 kg | 02 | |
| | Projectiles, with bursting charge .. | 1.1F | UN0167 | II | 1.1F | | | 62 | None | Forbidden | Forbidden | 08 | |
| | Projectiles, with bursting charge .. | 1.1D | UN0168 | II | 1.1D | | | 62 | None | Forbidden | Forbidden | 03 | |
| | Projectiles, with bursting charge .. | 1.2D | UN0169 | II | 1.2D | | | 62 | None | Forbidden | Forbidden | 03 | |
| | Projectiles, with bursting charge .. | 1.2F | UN0324 | II | 1.2F | | | 62 | None | Forbidden | Forbidden | 08 | |
| | Projectiles, with bursting charge .. | 1.4D | UN0344 | II | 1.4D | | | 62 | None | Forbidden | 75 kg | 02 | |
| | Propadiene, stabilized | 2.1 | UN2200 | | 2.1 | | None | 304 | 314, 315 | Forbidden | 150 kg | B | 40 |
| | Propadiene mixed with methyl acetylene, see Methyl acetylene and propadiene mix- tures, stabilized. | | | | | | | | | | | | |
| | Propane see also Petroleum gases, liquefied. | 2.1 | UN1978 | | 2.1 | 19, T50 | 306 | 304 | 314, 315 | Forbidden | 150 kg | E | 40 |
| | Propanethiols | 3 | UN2402 | II | 3 | IB2, T4, TP1, TP13 | 150 | 202 | 242 | 5 L | 60 L | E | 95, 102 |
| | n-Propanol or Propyl alcohol, nor- mal. | 3 | UN1274 | II | 3 | B1, IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | | | | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Propellant, liquid | 1.3C | UN0495 | II | 1.3C | 37 | None | 62 | None | Forbidden | Forbidden | 10 | |
| | Propellant, liquid | 1.1C | UN0497 | II | 1.1C | 37 | None | 62 | None | Forbidden | Forbidden | 10 | |
| | Propellant, solid | 1.1C | UN0498 | II | 1.1C | | None | 62 | None | Forbidden | Forbidden | | 26E |
| | Propellant, solid | 1.3C | UN0499 | II | 1.3C | | None | 62 | None | Forbidden | Forbidden | | 26E |
| | Propellant, solid | 1.4C | UN0501 | | 1.4C | | None | 62 | None | Forbidden | Forbidden | A | 24E |
| | Propionaldehyde | 3 | UN1275 | II | 3 | IB2, T7, TP1 | 150 | 202 | 242 | 5 L | 60 L | E | |
| | Propionic acid | 8 | UN1848 | III | 8 | IB3, T4, TP1 | 154 | 203 | 241 | 5 L | 60 L | A | |
| | Propionic anhydride | 8 | UN2496 | III | 8 | IB3, T4, TP1 | 154 | 203 | 241 | 5 L | 60 L | A | |
| | Propionitrile | 3 | UN2404 | II | 3, 6.1 | IB2, T7, TP1, TP13 | None | 202 | 243 | Forbidden | 60 L | E | 40 |
| | Propionyl chloride | 3 | UN1815 | II | 3, 8 | IB1, T7, TP1 | None | 202 | 243 | 1 L | 5 L | B | 40 |
| | n-Propyl acetate | 3 | UN1276 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | Propyl alcohol, see Propanol | | | | | | | | | | | | |
| | n-Propyl benzene | 3 | UN2364 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Propyl chloride | 3 | UN1278 | II | 3 | IB2, IP8, N34, T7, TP2 | None | 202 | 242 | Forbidden | 60 L | E | |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|---|----------------------------------|----------------------------------|-------|----------------|-------------------------------------|-----------------------------|-----------|-----------|-----------------------------|--------------------------|-----------------------------|--------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | <i>R 152a, see</i> Difluoroethane | | | | | | | | | | | | |
| | <i>R 500, see</i> Dichlorodifluoro- methane and difluoroethane, <i>etc.</i> | | | | | | | | | | | | |
| | <i>R 502, see</i> Chlorodifluoromethane and chloropentafluoroethane mix- ture, <i>etc.</i> | | | | | | | | | | | | |
| | <i>R 503, see</i> Chlorotrifluoromethane and trifluoromethane, <i>etc.</i> | | | | | | | | | | | | |
| D | Radioactive material, excepted package-articles manufactured from natural or depleted ura- nium or natural thorium. | 7 | UN2910 | ..... | None .. | | 422, 426 | 422, 426 | 422, 426 | ..... | ..... | A | ..... |
| I | Radioactive material, excepted package-articles manufactured from natural uranium or de- pleted uranium or natural tho- rium. | 7 | UN2909 | ..... | None .. | | 422, 426 | 422, 426 | 422, 426 | ..... | ..... | A | ..... |
| D | Radioactive material, excepted package-empty package or empty packaging. | 7 | UN2910 | ..... | Empty | | 428 | 428 | 428 ..... | ..... | ..... | A | ..... |
| I | Radioactive material, excepted package-empty packaging. | 7 | UN2908 | ..... | Empty | | 422, 428 | 422, 428 | 422, 428 | ..... | ..... | A | ..... |
| D | Radioactive material, excepted package-instruments or articles. | 7 | UN2910 | ..... | None .. | | 422, 424 | 422, 424 | 422, 424 | ..... | ..... | A | ..... |
| I | Radioactive material, excepted package-instruments or articles. | 7 | UN2911 | ..... | None .. | | 422, 424 | 422, 424 | 422, 424 | ..... | ..... | A | ..... |
| | Radioactive material, excepted package-limited quantity of ma- terial. | 7 | UN2910 | ..... | None .. | | 421, 422 | 421, 422 | 421, 422 | ..... | ..... | A | ..... |
| D | Radioactive material, fissile, n.o.s. | 7 | UN2918 | ..... | 7 | | 453 | 417 | 417 ..... | ..... | ..... | A | 40, 95 |
| I | Radioactive material, low specific activity (LSA-I) <i>non fissile</i> or <i>fissile-excepted</i> . | 7 | UN2912 | ..... | 7 | T5, TP4, W7 | 421, 422, 428. | 427 | 427 ..... | ..... | ..... | A | 95 |
| I | Radioactive material, low specific activity (LSA-II) <i>non fissile</i> or <i>fissile-excepted</i> . | 7 | UN3321 | ..... | 7 | T5, TP4, W7 | 421, 422, 428. | 427 | 427 ..... | ..... | ..... | A | 95 |
| I | Radioactive material, low specific activity (LSA-III) <i>non fissile</i> or <i>fissile excepted</i> . | 7 | UN3322 | ..... | 7 | T5, TP4, W7 | 421, 422, 428. | 427 | 427 ..... | ..... | ..... | A | 95 |
| D | Radioactive material, low specific activity, n.o.s. or Radioactive material, LSA, n.o.s.. | 7 | UN2912 | ..... | 7 | T5, TP4 | 421, 428 | 427 | 427 ..... | ..... | ..... | A | ..... |
| D | Radioactive material, n.o.s. | 7 | UN2982 | ..... | 7 | | 421, 428 | 415, 416 | 415, 416 | ..... | ..... | A | 40, 95 |
| D | Radioactive material, special form, n.o.s.. | 7 | UN2974 | ..... | 7 | | 421, 424 | 415, 416 | 415, 416 | ..... | ..... | A | ..... |
| D | Radioactive material, surface con- taminated object or Radioactive material, SCO. | 7 | UN2913 | ..... | 7 | | 421, 424, 426. | 427 | 427 ..... | ..... | ..... | A | ..... |
| I | Radioactive material, surface con- taminated objects (SCO-I or SCO-II) <i>non fissile</i> or <i>fissile-ex-</i> <i>cepted</i> . | 7 | UN2913 | ..... | 7 | | 421, 422, 428. | 427 | 427 ..... | ..... | ..... | A | 95 |
| I | Radioactive material, transported under special arrangement, <i>non</i> <i>fissile</i> or <i>fissile excepted</i> . | 7 | UN2919 | ..... | 7 | 139 | ..... | ..... | ..... | ..... | ..... |  | ..... |
| I | Radioactive material, transported under special arrangement, fissile. | 7 | UN3331 | ..... | 7 | 139 | ..... | ..... | ..... | ..... | ..... |  | ..... |
| I | Radioactive material, Type A package, fissile <i>non-special</i> <i>form</i> . | 7 | UN3327 | ..... | 7 | W7, W8 | 453 | 417 | 417 ..... | ..... | ..... | A | 95 |
| I | Radioactive material, Type A package <i>non-special form, non</i> <i>fissile</i> or <i>fissile-excepted</i> . | 7 | UN2915 | ..... | 7 | W7, W8 | ..... | 415 | 415 ..... | ..... | ..... | A | 95 |
| I | Radioactive material, Type A package, special form <i>non</i> <i>fissile</i> or <i>fissile-excepted</i> . | 7 | UN3332 | ..... | 7 | W7, W8 | ..... | 415, 476 | 415, 476 | ..... | ..... | A | 95 |
| I | Radioactive material, Type A package, special form, fissile. | 7 | UN3333 | ..... | 7 | W7, W8 | 453 | 417, 476 | 417, 476 | ..... | ..... | A | ..... |
| I | Radioactive material, Type B(M) package, fissile. | 7 | UN3329 | ..... | 7 | | 453 | 417 | 417 ..... | ..... | ..... | A | ..... |
| I | Radioactive material, Type B(M) package <i>non fissile</i> or <i>fissile-</i> <i>excepted</i> . | 7 | UN2917 | ..... | 7 ..... |  | ..... | 416 | 416 ..... | ..... | ..... | A | 95 |
| I | Radioactive material, Type B(U) package, fissile. | 7 | UN3328 | ..... | 7 | | 453 | 417 | 417 ..... | ..... | ..... | A | ..... |
| I | Radioactive material, Type B(U) package <i>non fissile</i> or <i>fissile-</i> <i>excepted</i> . | 7 | UN2916 | ..... | 7 ..... |  | ..... | 416 | 416 ..... | ..... | ..... | A | 95 |
| I | Radioactive material, uranium hexafluoride <i>non fissile</i> or <i>fissile-excepted</i> . | 7 | UN2978 | ..... | 7, 8 | | 423 | 420, 427 | 420, 427 | ..... | ..... | A | 95 |
| I | Radioactive material, uranium hexafluoride, fissile. | 7 | UN2977 | ..... | 7, 8 | | 453 | 417, 420 | 417, 420 | ..... | ..... | A | ..... |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|--|----------------------------------|----------------------------------|-----|----------------|-------------------------------------|-----------------------------|----------|----------|-----------------------------|--------------------------|-----------------------------|--------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | <i>Railway torpedo, see</i> Signals, railway track, explosive. | | | | | | | | | | | | |
| | Rare gases and nitrogen mixtures, compressed. | 2.2 | UN1981 | | 2.2 | | 306 | 302 | None | 75 kg | 150 kg | A | |
| | Rare gases and oxygen mixtures, compressed. | 2.2 | UN1980 | | 2.2 | 79 | 306 | 302 | None | 75 kg | 150 kg | A | |
| | Rare gases mixtures, compressed. | 2.2 | UN1979 | | 2.2 | | 306 | 302 | None | 75 kg | 150 kg | A | |
| | <i>RC 318, see</i> Octafluorocyclobutane. | | | | | | | | | | | | |
| | RDX and cyclotetramethylenetetranitramine, wetted or desensitized see RDX and HMX mixtures, wetted or desensitized. | | | | | | | | | | | | |
| | RDX and HMX mixtures, wetted with not less than 15 percent water by mass or RDX and HMX mixtures, desensitized with not less than 10 percent phlegmatizer by mass. | 1.1D | UN0391 | II | 1.1D | | None | 62 | None | Forbidden | Forbidden | 10 | |
| | RDX and Octogen mixtures, wetted or desensitized see RDX and HMX mixtures, wetted or desensitized etc. | | | | | | | | | | | | |
| | <i>RDX, see</i> Cyclotrimethylene trinitramine, etc. | | | | | | | | | | | | |
| | Receptacles, small, containing gas (gas cartridges) flammable, without release device, not refillable and not exceeding 1 L capacity. | 2.1 | UN2037 | | 2.1 | | 306 | 304 | None | 1 kg | 15 kg | B | 40 |
| | Receptacles, small, containing gas (gas cartridges) non-flammable, without release device, not refillable and not exceeding 1 L capacity. | 2.2 | UN2037 | | 2.2 | | 306 | 304 | None | 1 kg | 15 kg | B | 40 |
| | <i>Red phosphorus, see</i> Phosphorus, amorphous. | | | | | | | | | | | | |
| | Refrigerant gas R 404A | 2.2 | UN3337 | | 2.2 | T50 | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | |
| | Refrigerant gas R 407A | 2.2 | UN3338 | | 2.2 | T50 | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | |
| | Refrigerant gas R 407B | 2.2 | UN3339 | | 2.2 | T50 | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | |
| | Refrigerant gas R 407C | 2.2 | UN3340 | | 2.2 | T50 | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | |
| G | Refrigerant gases, n.o.s. | 2.2 | UN1078 | | 2.2 | T50 | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | |
| D | Refrigerant gases, n.o.s. or Dispersant gases, n.o.s. | 2.1 | NA1954 | | 2.1 | T50 | 306 | 304 | 314, 315 | Forbidden | 150 kg | D | 40 |
| | Refrigerating machines, containing flammable, non-toxic, liquefied gas. | 2.1 | UN3358 | | 2.1 | | 306 | 306 | 306 | Forbidden | Forbidden | C | 40 |
| | Refrigerating machines, containing non-flammable, non-toxic, liquefied gas or ammonia solution (UN2672). | 2.2 | UN2857 | | 2.2 | A53 | 306, 307 | 306 | 306, 307 | 450 kg | 450 kg | A | |
| | Regulated medical waste | 6.2 | UN3291 | II | 6.2 | A13, A14 | 134 | 197 | None | No limit | No limit | E | |
| | Release devices, explosive | 1.4S | UN0173 | II | 1.4S | | None | 62 | None | 25 kg | 100 kg | 05 | |
| | Resin solution, flammable | 3 | UN1866 | I | 3 | B52, T11, TP1, TP8 | 150 | 201 | 243 | 1 L | 30 L | E | |
| | | | | II | 3 | B52, IB2, T4, TP1, TP8 | 150 | 173 | 242 | 5 L | 60 L | B | |
| | | | | III | 3 | B1, B52, IB3, T2, TP1 | 150 | 173 | 242 | 60 L | 220 L | A | |
| | Resorcinol | 6.1 | UN2876 | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | |
| | <i>Rifle grenade, see</i> Grenades, hand or rifle, etc. | | | | | | | | | | | | |
| | <i>Rifle powder, see</i> Powder, smokeless (UN 0160). | | | | | | | | | | | | |
| | Rivets, explosive | 1.4S | UN0174 | II | 1.4S | | None | 62 | None | 25 kg | 100 kg | 05 | |
| | <i>Road asphalt or tar liquid, see</i> Tars, liquid, etc. | | | | | | | | | | | | |
| | Rocket motors | 1.3C | UN0186 | II | 1.3C | 109 | None | 62 | None | Forbidden | 220 kg | 03 | |
| | Rocket motors | 1.1C | UN0280 | II | 1.1C | 109 | None | 62 | None | Forbidden | Forbidden | 03 | |
| | Rocket motors | 1.2C | UN0281 | II | 1.2C | 109 | None | 62 | None | Forbidden | Forbidden | 03 | |
| | Rocket motors, liquid fueled | 1.2J | UN0395 | II | 1.2J | 109 | None | 62 | None | Forbidden | Forbidden | 04 | 23E |
| | Rocket motors, liquid fueled | 1.3J | UN0396 | II | 1.3J | 109 | None | 62 | None | Forbidden | Forbidden | 04 | 23E |
| | Rocket motors with hypergolic liquids with or without an expelling charge. | 1.3L | UN0250 | II | 1.3L | 109 | None | 62 | None | Forbidden | Forbidden | 08 | 8E, 14E, 15E |
| | Rocket motors with hypergolic liquids with or without an expelling charge. | 1.2L | UN0322 | II | 1.2L | 109 | None | 62 | None | Forbidden | Forbidden | 08 | 8E, 14E, 15E |
| | Rockets, line-throwing | 1.2G | UN0238 | II | 1.2G | | None | 62 | None | Forbidden | Forbidden | 07 | |
| | Rockets, line-throwing | 1.3G | UN0240 | II | 1.3G | | None | 62 | None | Forbidden | 75 kg | 07 | |
| | Rockets, line-throwing | 1.4G | UN0453 | II | 1.4G | | None | 62 | None | Forbidden | 75 kg | 06 | |
| | Rockets, liquid fueled with bursting charge. | 1.1J | UN0397 | II | 1.1J | | None | 62 | None | Forbidden | Forbidden | 04 | 23E |
| | Rockets, liquid fueled with bursting charge. | 1.2J | UN0398 | II | 1.2J | | None | 62 | None | Forbidden | Forbidden | 04 | 23E |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|--|----------------------------------|----------------------------------|-------|----------------|---|-----------------------------|-----------|-----------|-----------------------------|--------------------------|-----------------------------|--------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | Rockets, with bursting charge | 1.1F | UN0180 | II | 1.1F .. | | None ... | 62 | None ... | Forbidden | Forbidden | 08 | ..... |
| | Rockets, with bursting charge | 1.1E | UN0181 | II | 1.1E .. | | None ... | 62 | None ... | Forbidden | Forbidden | 03 | ..... |
| | Rockets, with bursting charge | 1.2E | UN0182 | II | 1.2E .. | | None ... | 62 | None ... | Forbidden | Forbidden | 03 | ..... |
| | Rockets, with bursting charge | 1.2F | UN0295 | II | 1.2F .. | | None ... | 62 | None ... | Forbidden | Forbidden | 08 | ..... |
| | Rockets, with expelling charge | 1.2C | UN0436 | II | 1.2C .. | | None ... | 62 | None ... | Forbidden | Forbidden | 03 | ..... |
| | Rockets, with expelling charge | 1.3C | UN0437 | II | 1.3C .. | | None ... | 62 | None ... | Forbidden | Forbidden | 03 | ..... |
| | Rockets, with expelling charge | 1.4C | UN0438 | II | 1.4C .. | | None ... | 62 | None ... | Forbidden | 75 kg | 02 | ..... |
| | Rockets, with inert head | 1.3C | UN0183 | II | 1.3C .. | | None ... | 62 | None ... | Forbidden | Forbidden | 03 | ..... |
| | Rockets, with inert head | 1.2C | UN0502 | ..... | 1.2 | | None ... | 62 | None ... | Forbidden | Forbidden | B | 1E, 5E |
| | Rosin oil | 3 | UN1286 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
|  | ..... | ..... | ..... | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Rubber solution | 3 | UN1287 | II | 3 | IB2, T4, TP1, TP8 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
|  | ..... | ..... | ..... | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Rubidium | 4.3 | UN1423 | I | 4.3 | 22, A7, A19, IB1, IP1, N34, N40, N45 | None ... | 211 | 242 | Forbidden | 15 kg | D | ..... |
| | Rubidium hydroxide | 8 | UN2678 | II | 8 | IB8, IP2, IP4, T7, TP2 | 154 | 212 | 240 | 15 kg | 50 kg | A | ..... |
| | Rubidium hydroxide solution | 8 | UN2677 | II | 8 | B2, IB2, T7, TP2 | 154 | 202 | 242 | 1 L | 30 L | A | ..... |
|  | ..... | ..... | ..... | III | 8 | IB3, T4, TP1 | 154 | 203 | 241 | 5 L | 60 L | A | ..... |
| | Safety fuse, see Fuse, safety ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Sand acid, see Fluorosilicic acid ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Seed cake, containing vegetable oil solvent extractions and expelled seeds, with not more than 10 percent of oil and when the amount of moisture is high- er than 11 percent, with not more than 20 percent of oil and moisture combined. | 4.2 | UN1386 | III | None .. | IB8, IP3, IP6, N7 | None ... | 213 | 241 | Forbidden | Forbidden | A | 13 |
| I | Seed cake with more than 1.5 percent oil and not more than 11 percent moisture. | 4.2 | UN1386 | III | None .. | IB8, IP3, IP6, N7 | None ... | 213 | 241 | Forbidden | Forbidden | E | 13 |
| I | Seed cake with not more than 1.5 percent oil and not more than 11 percent moisture. | 4.2 | UN2217 | III | None .. | IB8, IP3, IP6, N7 | None ... | 213 | 241 | Forbidden | Forbidden | A | 13 |
| | Selenates or Selenites | 6.1 | UN2630 | I | 6.1 | IB7, IP1 | None ... | 211 | 242 | 5 kg | 50 kg | E | ..... |
| | Selenic acid | 8 | UN1905 | I | 8 | IB7, IP1, N34 | None ... | 211 | 242 | Forbidden | 25 kg | A | ..... |
| | Selenium compound, n.o.s. | 6.1 | UN3283 | I | 6.1 | IB7, IP1, T14, TP2, TP27 | None ... | 211 | 242 | 5 kg | 50 kg | B | ..... |
|  | ..... | ..... | ..... | II | 6.1 | IB8, IP2, IP4, T11, TP2, TP27 | None ... | 212 | 242 | 25 kg | 100 kg | B | ..... |
|  | ..... | ..... | ..... | III | 6.1 | IB8, IP3, T7, TP1, TP28 | 153 | 213 | 240 | 100 kg | 200 kg | A | ..... |
| | Selenium disulfide | 6.1 | UN2657 | II | 6.1 | IB8, IP2, IP4 | None ... | 212 | 242 | 25 kg | 100 kg | A | ..... |
| | Selenium hexafluoride | 2.3 | UN2194 | ..... | 2.3, 8 | 1 | None ... | 302 | None ... | Forbidden | Forbidden | D | 40 |
| | Selenium nitride | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Selenium oxychloride | 8 | UN2879 | I | 8, 6.1 | A3, A6, A7, N34, T10, TP2, TP12, TP13 | None ... | 201 | 243 | 0.5 L | 2.5 L | E | 40 |
| | Self-defense spray, aerosol, see Aerosols, etc. | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| + A D | Self-defense spray, non-pressur- ized. | 9 | NA3334 | III | 9 | A37 | 155 | 203 | None ... | No limit | No limit | A | ..... |
| G | Self-heating liquid, corrosive, inor- ganic, n.o.s.. | 4.2 | UN3188 | II | 4.2, 8 | IB2 | None ... | 202 | 243 | 1 L | 5 L | C | ..... |
| G | Self-heating liquid, corrosive, or- ganic, n.o.s.. | 4.2 | UN3185 | II | 4.2, 8 | IB2 | None ... | 203 | 241 | 5 L | 60 L | C | ..... |
| G | Self-heating liquid, corrosive, or- ganic, n.o.s.. | 4.2 | UN3185 | II | 4.2, 8 | IB2 | None ... | 202 | 243 | 1 L | 5 L | C | ..... |
| G | Self-heating liquid, inorganic, n.o.s.. | 4.2 | UN3186 | III | 4.2, 8 | IB2 | None ... | 203 | 241 | 5 L | 60 L | C | ..... |
| G | Self-heating liquid, inorganic, n.o.s.. | 4.2 | UN3186 | II | 4.2 | IB2 | None ... | 202 | 242 | 1 L | 5 L | C | ..... |
| G | Self-heating liquid, organic, n.o.s. | 4.2 | UN3183 | III | 4.2 | IB2 | None ... | 203 | 241 | 5 L | 60 L | C | ..... |
| G | Self-heating liquid, organic, n.o.s. | 4.2 | UN3183 | II | 4.2 | IB2 | None ... | 202 | 242 | 1 L | 5 L | C | ..... |
| G | Self-heating liquid, toxic, inor- ganic, n.o.s.. | 4.2 | UN3187 | II | 4.2, 6.1 | IB2 | None ... | 203 | 241 | 5 L | 60 L | C | ..... |
| G | Self-heating liquid, toxic, organic, n.o.s.. | 4.2 | UN3184 | III | 4.2, 6.1 | IB2 | None ... | 203 | 241 | 5 L | 60 L | C | ..... |
| G | Self-heating liquid, toxic, organic, n.o.s.. | 4.2 | UN3184 | II | 4.2, 6.1 | IB2 | None ... | 202 | 243 | 1 L | 5 L | C | ..... |
| G | Self-heating solid, corrosive, inor- ganic, n.o.s.. | 4.2 | UN3192 | III | 4.2, 6.1 | IB2 | None ... | 203 | 241 | 5 L | 60 L | C | ..... |
| G | Self-heating solid, corrosive, inor- ganic, n.o.s.. | 4.2 | UN3192 | II | 4.2, 8 | IB5, IP2 | None ... | 212 | 242 | 15 kg | 50 kg | C | ..... |
| G | Self-heating solid, corrosive, or- ganic, n.o.s.. | 4.2 | UN3126 | III | 4.2, 8 | IB8, IP3 | None ... | 213 | 242 | 25 kg | 100 kg | C | ..... |
| G | Self-heating solid, corrosive, or- ganic, n.o.s.. | 4.2 | UN3126 | II | 4.2, 8 | IB5, IP2 | None ... | 212 | 242 | 15 kg | 50 kg | C | ..... |
| G | Self-heating solid, inorganic, n.o.s.. | 4.2 | UN3190 | III | 4.2, 8 | IB8, IP3 | None ... | 213 | 242 | 25 kg | 100 kg | C | ..... |
| G | Self-heating solid, inorganic, n.o.s.. | 4.2 | UN3190 | II | 4.2 | IB6, IP2 | None ... | 212 | 241 | 15 kg | 50 kg | C | ..... |
| G | Self-heating solid, organic, n.o.s. | 4.2 | UN3088 | III | 4.2 | IB8, IP3 | None ... | 213 | 241 | 25 kg | 100 kg | C | ..... |
| G | Self-heating solid, organic, n.o.s. | 4.2 | UN3088 | II | 4.2 | IB6, IP2 | None ... | 212 | 241 | 15 kg | 50 kg | C | ..... |
| G | Self-heating solid, organic, n.o.s. | 4.2 | UN3088 | III | 4.2 | IB8, IP3 | None ... | 213 | 241 | 25 kg | 100 kg | C | ..... |
| G | Self-heating solid, oxidizing, n.o.s.. | 4.2 | UN3127 | ..... | 4.2, 5.1 | ..... | None ... | 214 | 214 | Forbidden | Forbidden | ..... | ..... |
| G | Self-heating solid, toxic, inor- ganic, n.o.s.. | 4.2 | UN3191 | II | 4.2, 6.1 | IB5, IP2 | None ... | 212 | 242 | 15 kg | 50 kg | C | ..... |
| G | Self-heating solid, toxic, inor- ganic, n.o.s.. | 4.2 | UN3191 | III | 4.2, 6.1 | IB8, IP3 | None ... | 213 | 242 | 25 kg | 100 kg | C | ..... |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|--|----------------------------------|----------------------------------|-------|----------------|---|-----------------------------|----------|------|-----------------------------|--------------------------|-----------------------------|----------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| | | | | | | | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| G | Self-heating, solid, toxic, organic, n.o.s. | 4.2 | UN3128 | II | 4.2, 6.1 | IB5, IP2 | None | 212 | 242 | 15 kg | 50 kg | C | ..... |
| | <i>Self-propelled vehicle, see En- gines or Batteries etc.</i> | | | III | 4.2, 6.1 | IB8, IP3 | None | 213 | 242 | 25 kg | 100 kg | C | ..... |
| G | Self-reactive liquid type B | 4.1 | UN3221 | II | 4.1 | 53 | None | 224 | None | Forbidden | Forbidden | D | 61 |
| G | Self-reactive liquid type B, tem- perature controlled. | 4.1 | UN3231 | II | 4.1 | 53 | None | 224 | None | Forbidden | Forbidden | D | 2, 61 |
| G | Self-reactive liquid type C | 4.1 | UN3223 | II | 4.1 | | None | 224 | None | 5 L | 10 L | D | 61 |
| G | Self-reactive liquid type C, tem- perature controlled. | 4.1 | UN3233 | II | 4.1 | | None | 224 | None | Forbidden | Forbidden | D | 2, 61 |
| G | Self-reactive liquid type D | 4.1 | UN3225 | II | 4.1 | | None | 224 | None | 5 L | 10 L | D | 61 |
| G | Self-reactive liquid type D, tem- perature controlled. | 4.1 | UN3235 | II | 4.1 | | None | 224 | None | Forbidden | Forbidden | D | 2, 61 |
| G | Self-reactive liquid type E | 4.1 | UN3227 | II | 4.1 | | None | 224 | None | 10 L | 25 L | D | 61 |
| G | Self-reactive liquid type E, tem- perature controlled. | 4.1 | UN3237 | II | 4.1 | | None | 224 | None | Forbidden | Forbidden | D | 2, 61 |
| G | Self-reactive liquid type F | 4.1 | UN3229 | II | 4.1 | | None | 224 | None | 10 L | 25 L | D | 61 |
| G | Self-reactive liquid type F, tem- perature controlled. | 4.1 | UN3239 | II | 4.1 | | None | 224 | None | Forbidden | Forbidden | D | 2, 61 |
| G | Self-reactive solid type B | 4.1 | UN3222 | II | 4.1 | 53 | None | 224 | None | Forbidden | Forbidden | D | 61 |
| G | Self-reactive solid type B, tem- perature controlled. | 4.1 | UN3232 | II | 4.1 | 53 | None | 224 | None | Forbidden | Forbidden | D | 2, 61 |
| G | Self-reactive solid type C | 4.1 | UN3224 | II | 4.1 | | None | 224 | None | 5 kg | 10 kg | D | 61 |
| G | Self-reactive solid type C, tem- perature controlled. | 4.1 | UN3234 | II | 4.1 | | None | 224 | None | Forbidden | Forbidden | D | 2, 61 |
| G | Self-reactive solid type D | 4.1 | UN3226 | II | 4.1 | | None | 224 | None | 5 kg | 10 kg | D | 61 |
| G | Self-reactive solid type D, tem- perature controlled. | 4.1 | UN3236 | II | 4.1 | | None | 224 | None | Forbidden | Forbidden | D | 2, 61 |
| G | Self-reactive solid type E | 4.1 | UN3228 | II | 4.1 | | None | 224 | None | 10 kg | 25 kg | D | 61 |
| G | Self-reactive solid type E, tem- perature controlled. | 4.1 | UN3238 | II | 4.1 | | None | 224 | None | Forbidden | Forbidden | D | 2, 61 |
| G | Self-reactive solid type F | 4.1 | UN3230 | II | 4.1 | | None | 224 | None | 10 kg | 25 kg | D | 61 |
| G | Self-reactive solid type F, tem- perature controlled. | 4.1 | UN3240 | II | 4.1 | | None | 224 | None | Forbidden | Forbidden | D | 2, 61 |
| | Shale oil | 3 | UN1288 | I | 3 | T11, TP1, TP8, TP27 | None | 201 | 243 | 1 L | 30 L | B | ..... |
|  | ..... |  |  | II | 3 | IB2, T4, TP1, TP8 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
|  | ..... |  |  | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | <i>Shaped charges, see Charges, shaped, etc.</i> | | | | | | | | | | | | |
| | Signal devices, hand | 1.4G | UN0191 | II | 1.4G | | None | 62 | None | Forbidden | 75 kg | 06 | ..... |
| | Signal devices, hand | 1.4S | UN0373 | II | 1.4S | | None | 62 | None | 25 kg | 100 kg | 05 | ..... |
| | Signals, distress, <i>ship</i> | 1.1G | UN0194 | II | 1.1G | | None | 62 | None | Forbidden | Forbidden | 07 | ..... |
| | Signals, distress, <i>ship</i> | 1.3G | UN0195 | II | 1.3G | | None | 62 | None | Forbidden | 75 kg | 07 | ..... |
| | <i>Signals, highway, see Signal de- vices, hand.</i> | | | | | | | | | | | | |
| | Signals, railway track, explosive .. | 1.1G | UN0192 | II | 1.1G | | None | 62 | None | Forbidden | Forbidden | 07 | ..... |
| | Signals, railway track, explosive .. | 1.4S | UN0193 | II | 1.4S | | None | 62 | None | 25 kg | 100 kg | 05 | ..... |
| | Signals, railway track, explosive .. | 1.3G | UN0492 | ..... | 1.3G | | None | 62 | None | Forbidden | Forbidden | 07 | ..... |
| | Signals, railway track, explosive .. | 1.4G | UN0493 | ..... | 1.4G | | None | 62 | None | Forbidden | 75 kg | 06 | ..... |
| | <i>Signals, ship distress, water-acti- vated, see Contrivances, water- activated, etc.</i> | | | | | | | | | | | | |
| | Signals, smoke | 1.1G | UN0196 | II | 1.1G | | None | 62 | None | Forbidden | Forbidden | 07 | ..... |
| | Signals, smoke | 1.4G | UN0197 | II | 1.4G | | None | 62 | None | Forbidden | 75 kg | 06 | ..... |
| | Signals, smoke | 1.2G | UN0313 | II | 1.2G | | None | 62 | None | Forbidden | Forbidden | 07 | ..... |
| | Signals, smoke | 1.3G | UN0487 | II | 1.3G | | None | 62 | None | Forbidden | Forbidden | 07 | ..... |
| | Silane, compressed | 2.1 | UN2203 | ..... | 2.1 | | None | 302 | None | Forbidden | Forbidden | E | 40, 57, 104 |
| | <i>Silicofluoric acid, see Fluorosilicic acid.</i> | | | | | | | | | | | | |
| | <i>Silicon chloride, see Silicon tetra- chloride.</i> | | | | | | | | | | | | |
| | Silicon powder, amorphous | 4.1 | UN1346 | III | 4.1 | A1, IB8, IP3 | None | 213 | 240 | 25 kg | 100 kg | A | ..... |
| | Silicon tetrachloride | 8 | UN1818 | II | 8 | A3, A6, B2, B6, IB2, T7, TP2, TP7 | 154 | 202 | 242 | 1 L | 30 L | C | 40 |
| | Silicon tetrafluoride, compressed | 2.3 | UN1859 | ..... | 2.3, 8 | 2 | None | 302 | None | Forbidden | Forbidden | D | 40 |
| | <i>Silver acetylide (dry)</i> | Forbidden | | | | | | | | | | | |
| | Silver arsenite | 6.1 | UN1683 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | ..... |
| | <i>Silver azide (dry)</i> | Forbidden | | | | | | | | | | | |
| | <i>Silver chlorite (dry)</i> | Forbidden | | | | | | | | | | | |
| | Silver cyanide | 6.1 | UN1684 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | 26, 40 |
| | <i>Silver fulminate (dry)</i> | Forbidden | | | | | | | | | | | |
| | Silver nitrate | 5.1 | UN1493 | II | 5.1 | IB8, IP4 | 152 | 212 | 242 | 5 kg | 25 kg | A | ..... |
| | <i>Silver oxalate (dry)</i> | Forbidden | | | | | | | | | | | |
| | <i>Silver picrate (dry)</i> | Forbidden | | | | | | | | | | | |
| | Silver picrate, wetted with <i>not less than 30 percent water, by mass.</i> | 4.1 | UN1347 | I | 4.1 | | None | 211 | None | Forbidden | Forbidden | D | 28, 36 |
| | Sludge, acid | 8 | UN1906 | II | 8 | A3, A7, B2, IB2, N34, T8, TP2, TP12 | None | 202 | 242 | Forbidden | 30 L | C | 14 |
| D | Smokeless powder for small arms (100 pounds or less). | 4.1 | NA3178 | I | 4.1 | 16 | None | 171 | None | Forbidden | 7.3 kg | A | ..... |
| | Soda lime with more than 4 per- cent sodium hydroxide. | 8 | UN1907 | III | 8 | IB8, IP3 | 154 | 213 | 240 | 25 kg | 100 kg | A | ..... |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols (1) | Hazardous materials descriptions and proper shipping names (2) | Hazard class or Di- vision (3) | Identifica- tion Num- bers (4) | PG (5) | Label Codes (6) | Special provisions (§172.102) (7) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|-------------------------|--|---|---|---------------|---------------------------|--|-----------------------------|----------------------|------------------|--|--------------------------------------|-----------------------------|--------------------|
| | | | | | | | Excep- tions (8A) | Non-bulk (8B) | Bulk (8C) | Passenger aircraft/rail (9A) | Cargo air- craft only (9B) | Loca- tion (10A) | Other (10B) |
| | | | | | | | | | | | | | |
| | Sodium | 4.3 | UN1428 | I | 4.3 | A7, A8, A19, A20, B9, B48, B68, IB4, IP1, N34, T9, TP3, TP7, TP46 | None | 211 | 244 | Forbidden | 15 kg | D | |
| | Sodium aluminate, solid | 8 | UN2812 | III | 8 | IB8, IP3 | 154 | 213 | 240 | 25 kg | 100 kg | A | |
| | Sodium aluminate, solution | 8 | UN1819 | II | 8 | B2, IB2, T7, TP2 IB3, T4, TP1 | 154 | 202 | 242 | 1 L | 30 L | A | |
| | Sodium aluminum hydride | 4.3 | UN2835 | II | 4.3 | A8, A19, A20, IB1 | 151 | 212 | 242 | Forbidden | 50 kg | E | |
| | Sodium ammonium vanadate | 6.1 | UN2863 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | Sodium arsenilate | 6.1 | UN2473 | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | |
| | Sodium arsenate | 6.1 | UN1685 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | Sodium arsenite, aqueous solu- tions. | 6.1 | UN1686 | II | 6.1 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | A | |
| | Sodium arsenite, solid | 6.1 | UN2027 | III | 6.1 | IB3, T4, TP2 | 153 | 203 | 241 | 60 L | 220 L | A | |
| | Sodium azide | 6.1 | UN1687 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | <i>Sodium bifluoride, see</i> Sodium hydrogendifluoride. | | | | | | | | | | | | |
| | <i>Sodium bisulfite, solution, see</i> Bisulfites, aqueous solutions, n.o.s.. | | | | | | | | | | | | |
| | Sodium borohydride | 4.3 | UN1426 | I | 4.3 | N40 | None | 211 | 242 | Forbidden | 15 kg | E | |
| | Sodium borohydride and sodium hydroxide solution, with not more than 12 percent sodium borohydride and not more than 40 percent sodium hydroxide by mass. | 8 | UN3320 | II | 8 | B2, IB2, N34, T7, TP2 | 154 | 202 | 242 | 1 L | 30 L | A | 26 |
| | Sodium bromate | 5.1 | UN1494 | III | 8 | B2, IB3, N34, T4, TP2 | 154 | 203 | 241 | 5 L | 60 L | A | |
| | Sodium cacodylate | 6.1 | UN1688 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | 56, 58, 106 |
| | Sodium chlorate | 5.1 | UN1495 | II | 5.1 | A9, IB8, IP4, N34, T4, TP1 | 152 | 212 | 240 | 5 kg | 25 kg | A | 56, 58, 106 |
| | Sodium chlorate, aqueous solu- tion. | 5.1 | UN2428 | II | 5.1 | A2, IB2, T4, TP1 | 152 | 202 | 241 | 1 L | 5 L | B | 56, 58, 106 |
| | <i>Sodium chlorate mixed with dini- trotoluene, see</i> Explosive blast- ing, type C. | | | | | | | | | | | | |
| | Sodium chlorite | 5.1 | UN1496 | II | 5.1 | A9, IB8, IP2, IP4, N34, T4, TP1 | None | 212 | 242 | 5 kg | 25 kg | A | 56, 58, 106 |
| | Sodium chloroacetate | 6.1 | UN2659 | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | |
| | Sodium cuprocyanide, solid | 6.1 | UN2316 | I | 6.1 | IB7, IP1 | None | 211 | 242 | 5 kg | 50 kg | A | 26 |
| | Sodium cuprocyanide, solution | 6.1 | UN2317 | I | 6.1 | T14, TP2, TP13 | None | 201 | 243 | 1 L | 30 L | B | 26, 40 |
| | Sodium cyanide | 6.1 | UN1689 | I | 6.1 | B69, B77, IB7, IP1, N74, N75, T14, TP2, TP13 | None | 211 | 242 | 5 kg | 50 kg | B | 52 |
| | <i>Sodium dichloroisocyanurate or</i> <i>Sodium dichloro-</i> <i>triazinetriene, see</i> Dichloroisocyanuric acid etc. | | | | | | | | | | | | |
| | Sodium dinitro-o-cresolate, dry or wetted with less than 15 per- cent water, by mass. | 1.3C | UN0234 | II | 1.3C | | None | 62 | None | Forbidden | Forbidden | 10 | 5E |
| | Sodium dinitro-o-cresolate, wetted with not less than 15 percent water, by mass. | 4.1 | UN1348 | I | 4.1, 6.1 | 23, A8, A19, A20, N41 | None | 211 | None | 1 kg | 15 kg | E | 28, 36 |
| | Sodium dithionite or Sodium hy- drosulfitte. | 4.2 | UN1384 | II | 4.2 | A19, A20, IB6, IP2 | None | 212 | 241 | 15 kg | 50 kg | E | 13 |
| | Sodium fluoride | 6.1 | UN1690 | III | 6.1 | IB8, IP3, T4, TP1 | 153 | 213 | 240 | 100 kg | 200 kg | A | 26 |
| | Sodium fluoroacetate | 6.1 | UN2629 | I | 6.1 | IB7, IP1 | None | 211 | 242 | 5 kg | 50 kg | E | |
| | Sodium fluorosilicate | 6.1 | UN2674 | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | 26 |
| | <i>Sodium hydrate, see</i> Sodium hy- droxide, solid. | | | | | | | | | | | | |
| | Sodium hydride | 4.3 | UN1427 | I | 4.3 | A19, N40 | None | 211 | 242 | Forbidden | 15 kg | E | |
| | Sodium hydrogendifluoride, solid | 8 | UN2439 | II | 8 | IB8, IP2, IP4, N3, N34 | 154 | 212 | 240 | 15 kg | 50 kg | A | 12, 25, 26, 40 |
| | Sodium hydrogendifluoride solu- tion. | 8 | UN2439 | II | 8 | IB8, IP2, IP4, N3, N34 | 154 | 202 | 242 | 1 L | 30 L | A | 12, 25, 26, 40 |
| | Sodium hydrosulfide, with less than 25 percent water of crys- tallization. | 4.2 | UN2318 | II | 4.2 | A7, A19, A20, IB6, IP2 | None | 212 | 241 | 15 kg | 50 kg | A | |
| | Sodium hydrosulfide with not less than 25 percent water of crys- tallization. | 8 | UN2949 | II | 8 | A7, IB8, IP2, IP4, T7, TP2 | 154 | 212 | 240 | 15 kg | 50 kg | A | 26 |
| | <i>Sodium hydrosulfite, see</i> Sodium dithionite. | | | | | | | | | | | | |
| | Sodium hydroxide, solid | 8 | UN1823 | II | 8 | IB8, IP2, IP4 | 154 | 212 | 240 | 15 kg | 50 kg | A | |
| | Sodium hydroxide solution | 8 | UN1824 | II | 8 | B2, IB2, N34, T7, TP2 | 154 | 202 | 242 | 1 L | 30 L | A | |
| | <i>Sodium hypochlorite, solution,</i> <i>see</i> Hypochlorite solutions etc. | | | | | | | | | | | | |
| | | | | III | 8 | IB3, N34, T4, TP1 | 154 | 203 | 241 | 5 L | 60 L | A | |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | | |
|--------------|---|----------------------------------|----------------------------------|-----|----------------|-------------------------------------|-----------------------------|----------|------|-----------------------------|--------------------------|-----------------------------|----------------------|----|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) | |
| | <i>Sodium metal, liquid alloy, see Alkali metal alloys, liquid, n.o.s.</i> | | | | | | | | | | | | | |
| | Sodium methylate | 4.2 | UN1431 | II | 4.2, 8 | A19, IB5, IP2 | None | 212 | 242 | 15 kg | 50 kg | B | | |
| | Sodium methylate solutions in alcohol. | 3 | UN1289 | II | 3, 8 | IB2, T7, TP1, TP8 | None | 202 | 243 | 1 L | 5 L | B | | |
| | Sodium monoxide | 8 | UN1825 | III | 3, 8 | B1, IB3, T4, TP1 | 150 | 203 | 242 | 5 L | 60 L | A | | |
| | Sodium nitrate | 5.1 | UN1498 | II | 8 | IB8, IP2, IP4 | 154 | 212 | 240 | 15 kg | 50 kg | A | | |
| | Sodium nitrate and potassium nitrate mixtures. | 5.1 | UN1499 | III | 5.1 | A1, A29, IB8, IP3 | 152 | 213 | 240 | 25 kg | 100 kg | A | | |
| | Sodium nitrite | 5.1 | UN1500 | III | 5.1, 6.1 | A1, A29, IB8, IP3 | 152 | 213 | 240 | 25 kg | 100 kg | A | 56, 58 | |
| | Sodium pentachlorophenate | 6.1 | UN2567 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | | |
| | Sodium perchlorate | 5.1 | UN1502 | II | 5.1 | IB6, IP2 | 152 | 212 | 242 | 5 kg | 25 kg | A | 56, 58, 106 | |
| | Sodium permanganate | 5.1 | UN1503 | II | 5.1 | IB6, IP2 | 152 | 212 | 242 | 5 kg | 25 kg | D | 56, 58, 69, 106, 107 | |
| | Sodium peroxide | 5.1 | UN1504 | I | 5.1 | A20, IB6, IP1, N34 | None | 211 | None | Forbidden | 15 kg | B | 13, 75, 106 | |
| | Sodium peroxoborate, anhydrous | 5.1 | UN3247 | II | 5.1 | IB8, IP4 | 152 | 212 | 240 | 5 kg | 25 kg | A | 13, 25, 106 | |
| | Sodium persulfate | 5.1 | UN1505 | III | 5.1 | A1, IB8, IP3 | 152 | 213 | 240 | 25 kg | 100 kg | A | | |
| | Sodium phosphide | 4.3 | UN1432 | I | 4.3, 6.1 | A19, N40 | None | 211 | None | Forbidden | 15 kg | E | 40, 85 | |
| | Sodium picramate, dry or wetted with less than 20 percent water, by mass. | 1.3C | UN0235 | II | 1.3C | | None | 62 | None | Forbidden | Forbidden | 10 | 5E | |
| | Sodium picramate, wetted with not less than 20 percent water, by mass. | 4.1 | UN1349 | I | 4.1 | 23, A8, A19, N41 | None | 211 | None | Forbidden | 15 kg | E | 28, 36 | |
| | Sodium picryl peroxide | Forbidden | | | | | | | | | | | | |
| | Sodium potassium alloys, see Potassium sodium alloys. | | | | | | | | | | | | | |
| | Sodium selenate, see Selenates or Selenites. | | | | | | | | | | | | | |
| | Sodium sulfide, anhydrous or Sodium sulfide with less than 30 percent water of crystallization. | 4.2 | UN1385 | II | 4.2 | A19, A20, IB6, IP2, N34 | None | 212 | 241 | 15 kg | 50 kg | A | | |
| | Sodium sulfide, hydrated with not less than 30 percent water. | 8 | UN1849 | II | 8 | IB8, IP2, IP4, T7, TP2 | 154 | 212 | 240 | 15 kg | 50 kg | A | 26 | |
| | Sodium superoxide | 5.1 | UN2547 | I | 5.1 | A20, IB6, IP1, N34 | None | 211 | None | Forbidden | 15 kg | E | 13, 75, 106 | |
| | Sodium tetranitride | Forbidden | | | | | | | | | | | | |
| G | Solids containing corrosive liquid, n.o.s. | 8 | UN3244 | II | 8 | 49, IB5 | 154 | 212 | 240 | 15 kg | 50 kg | B | 40 | |
| G | Solids containing flammable liquid, n.o.s. | 4.1 | UN3175 | II | 4.1 | 47, IB6, IP2 | 151 | 212 | 240 | 15 kg | 50 kg | B | | |
| G | Solids containing toxic liquid, n.o.s. | 6.1 | UN3243 | II | 6.1 | 48, IB2 | None | 212 | 240 | 25 kg | 100 kg | B | 40 | |
| | Sounding devices, explosive | 1.2F | UN0204 | II | 1.2F | | None | 62 | None | Forbidden | Forbidden | 08 | | |
| | Sounding devices, explosive | 1.1F | UN0296 | II | 1.1F | | None | 62 | None | Forbidden | Forbidden | 08 | | |
| | Sounding devices, explosive | 1.1D | UN0374 | II | 1.1D | | None | 62 | None | Forbidden | Forbidden | 07 | | |
| | Sounding devices, explosive | 1.2D | UN0375 | II | 1.2D | | None | 62 | None | Forbidden | Forbidden | 07 | | |
| | Spirits of salt, see Hydrochloric acid. | | | | | | | | | | | | | |
| | Squibs, see Igniters etc | | | | | | | | | | | | | |
| | Stannic chloride, anhydrous | 8 | UN1827 | II | 8 | B2, IB2, T7, TP2 | 154 | 202 | 242 | 1 L | 30 L | C | | |
| | Stannic chloride, pentahydrate | 8 | UN2440 | III | 8 | IB8, IP3 | 154 | 213 | 240 | 25 kg | 100 kg | A | | |
| | Stannic phosphide | 4.3 | UN1433 | I | 4.3, 6.1 | A19, N40 | None | 211 | 242 | Forbidden | 15 kg | E | 40, 85 | |
| | Steel swarf, see Ferrous metal borings, etc. | | | | | | | | | | | | | |
| | Stibine | 2.3 | UN2676 | | 2.3, 2.1 | | 1 | None | 304 | None | Forbidden | Forbidden | D | 40 |
| | Storage batteries, wet, see Batteries, wet etc. | | | | | | | | | | | | | |
| | Strontium arsenite | 6.1 | UN1691 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | | |
| | Strontium chlorate | 5.1 | UN1506 | II | 5.1 | A1, A9, IB8, IP2, IP4, N34 | 152 | 212 | 242 | 5 kg | 25 kg | A | 56, 58, 106 | |
| | Strontium nitrate | 5.1 | UN1507 | III | 5.1 | A1, A29, IB8, IP3 | 152 | 213 | 240 | 25 kg | 100 kg | A | | |
| | Strontium perchlorate | 5.1 | UN1508 | II | 5.1 | IB6, IP2 | 152 | 212 | 242 | 5 kg | 25 kg | A | 56, 58, 106 | |
| | Strontium peroxide | 5.1 | UN1509 | II | 5.1 | IB6, IP2 | 152 | 212 | 242 | 5 kg | 25 kg | A | 13, 75, 106 | |
| | Strontium phosphide | 4.3 | UN2013 | I | 4.3, 6.1 | A19, N40 | None | 211 | None | Forbidden | 15 kg | E | 40, 85 | |
| | Strychnine or Strychnine salts | 6.1 | UN1692 | I | 6.1 | IB7, IP1 | None | 211 | 242 | 5 kg | 50 kg | A | 40 | |
| | Styphnic acid, see Trinitroresorcinol, etc. | | | | | | | | | | | | | |
| | Styrene monomer, stabilized | 3 | UN2055 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | | |
| G | Substances, explosive, n.o.s. | 1.1L | UN0357 | II | 1.1L | 101 | None | 62 | None | Forbidden | Forbidden | | 8E, 14E, 15E, 17E | |
| G | Substances, explosive, n.o.s. | 1.2L | UN0358 | II | 1.2L | 101 | None | 62 | None | Forbidden | Forbidden | | 8E, 14E, 15E, 17E | |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|---|----------------------------------|----------------------------------|-----|----------------|--|-----------------------------|-----------|-----------|-----------------------------|--------------------------|-----------------------------|----------------------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| G | Substances, explosive, n.o.s. | 1.3L | UN0359 | II | 1.3L ... | 101 | None ... | 62 | None ... | Forbidden | Forbidden | | 8E, 14E, 15E, 17E |
| G | Substances, explosive, n.o.s. | 1.1A | UN0473 | II | 1.1A ... | 101, 111 | None ... | 62 | None ... | Forbidden | Forbidden | 12 | |
| G | Substances, explosive, n.o.s. | 1.1C | UN0474 | II | 1.1C ... | 101 | None ... | 62 | None ... | Forbidden | Forbidden | 10 | |
| G | Substances, explosive, n.o.s. | 1.1D | UN0475 | II | 1.1D ... | 101 | None ... | 62 | None ... | Forbidden | Forbidden | 10 | |
| G | Substances, explosive, n.o.s. | 1.1G | UN0476 | II | 1.1G ... | 101 | None ... | 62 | None ... | Forbidden | Forbidden | 08 | |
| G | Substances, explosive, n.o.s. | 1.3C | UN0477 | II | 1.3C ... | 101 | None ... | 62 | None ... | Forbidden | Forbidden | 10 | |
| G | Substances, explosive, n.o.s. | 1.3G | UN0478 | II | 1.3G ... | 101 | None ... | 62 | None ... | Forbidden | Forbidden | 08 | |
| G | Substances, explosive, n.o.s. | 1.4C | UN0479 | II | 1.4C ... | 101 | None ... | 62 | None ... | Forbidden | 75 kg | 09 | |
| 6 | Substances, explosive, n.o.s. | 1.4D | UN0480 | II | 1.4D ... | 101 | None ... | 62 | None ... | Forbidden | 75 kg | 09 | |
| G | Substances, explosive, n.o.s. | 1.4S | UN0481 | II | 1.4S ... | 101 | None ... | 62 | None ... | 25 kg | 75 kg | 05 | |
| G | Substances, explosive, n.o.s. | 1.4G | UN0485 | II | 1.4G ... | 101 | None ... | 62 | None ... | Forbidden | 75 kg | 08 | |
| G | Substances, explosive, very in- sensitive, n.o.s., or Substances, EVI, n.o.s. | 1.5D | UN0482 | II | 1.5D ... | 101 | None ... | 62 | None ... | Forbidden | Forbidden | 10 | |
| | Substituted nitrophenol pes- ticides, liquid, flammable, toxic, flash point less than 23 de- grees C. | 3 | UN2780 | I | 3, 6.1 | T14, TP2, TP13, TP27 | None ... | 201 | 243 | Forbidden | 30 L | B | 40 |
|  | ..... |  |  | II | 3, 6.1 | IB2, T11, TP2, TP13, TP27 | None ... | 202 | 243 | 1 L | 60 L | B | 40 |
| | Substituted nitrophenol pes- ticides, liquid, toxic. | 6.1 | UN3014 | I | 6.1 | T14, TP2, TP13, TP27 | None ... | 201 | 243 | 1 L | 30 L | B | 40 |
|  | ..... |  |  | II | 6.1 | IB2, T11, TP2, TP13, TP27 | None ... | 202 | 243 | 5 L | 60 L | B | 40 |
|  | ..... |  |  | III | 6.1 | IB3, T7, TP2, TP28 | 153 | 203 | 241 | 60 L | 220 L | A | 40 |
| | Substituted nitrophenol pes- ticides, liquid, toxic, flammable flash point not less than 23 de- grees C. | 6.1 | UN3013 | I | 6.1, 3 | T14, TP2, TP13, TP27 | None ... | 201 | 243 | 1 L | 30 L | B | 40 |
|  | ..... |  |  | II | 6.1, 3 | IB2, T11, TP2, TP13, TP27 | None ... | 202 | 243 | 5 L | 60 L | B | 40 |
|  | ..... |  |  | III | 6.1, 3 | B1, IB3, T7, TP2, TP28 | 153 | 203 | 242 | 60 L | 220 L | A | 40 |
| | Substituted nitrophenol pes- ticides, solid, toxic. | 6.1 | UN2779 | I | 6.1 | IB7, IP1 | None ... | 211 | 242 | 5 kg | 50 kg | A | 40 |
|  | ..... |  |  | II | 6.1 | IB8, IP2, IP4 | None ... | 212 | 242 | 25 kg | 100 kg | A | 40 |
|  | ..... |  |  | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | 40 |
| | Sucrose octantrate (dry) | Forbidden | | | | | | | | | | | |
| | Sulfamic acid | 8 | UN2967 | III | 8 | IB8, IP3 | 154 | 213 | 240 | 25 kg | 100 kg | A | |
| D | Sulfur | 9 | NA1350 | III | 9 | 30, IB8, IP2 | None ... | None ... | 240 | No limit | No limit | A | 19, 74 |
| I | Sulfur | 4.1 | UN1350 | III | 4.1 | 30, IB8, IP3, T1, TP1 | None ... | None ... | 240 | No limit | No limit | A | 19, 74 |
| | Sulfur and chlorate, loose mix- tures of. | Forbidden | | | | | | | | | | | |
| | Sulfur chlorides | 8 | UN1828 | I | 8 | 5, A3, B10, B77, N34, T20, TP2, TP12 | None ... | 201 | 243 | Forbidden | 2.5 L | C | 40 |
| | Sulfur dichloride, see Sulfur chlorides. | | | | | | | | | | | | |
| | Sulfur dioxide | 2.3 | UN1079 | | 2.3, 8 | 3, B14, T50, TP19 | None ... | 304 | 314, 315 | Forbidden | 25 kg | D | 40 |
| | Sulfur dioxide solution, see Sulfu- rous acid. | | | | | | | | | | | | |
| | Sulfur hexafluoride | 2.2 | UN1080 | | 2.2 | | 306 | 304 | 314, 315 | 75 kg | 150 kg | A | |
| D | Sulfur, molten | 9 | NA2448 | III | 9 | IB3, T1, TP3 | None ... | 213 | 247 | Forbidden | Forbidden | C | 61 |
| I | Sulfur, molten | 4.1 | UN2448 | III | 4.1 | IB1, T1, TP3 | None ... | 213 | 247 | Forbidden | Forbidden | C | 61 |
| | Sulfur tetrafluoride | 2.3 | UN2418 | | 2.3, 8 | 1 | None ... | 302 | 245 | Forbidden | Forbidden | D | 40 |
| + | Sulfur trioxide, stabilized | 8 | UN1829 | I | 8, 6.1 | 2, A7, B9, B14, B32, B49, B74, B77, N34, T20, TP4, TP12, TP13, TP25, TP26, TP38, TP45 | None ... | 227 | 244 | Forbidden | Forbidden | A | 40 |
| | Sulfuretted hydrogen, see Hydro- gen sulfide. | | | | | | | | | | | | |
| | Sulfuric acid, fuming with less than 30 percent free sulfur tri- oxide. | 8 | UN1831 | I | 8 | A3, A7, B84, N34, T20, TP2, TP12, TP13 | None ... | 201 | 243 | Forbidden | 2.5 L | C | 14, 40 |
| + | Sulfuric acid, fuming with 30 per- cent or more free sulfur trioxide. | 8 | UN1831 | I | 8, 6.1 | 2, A3, A6, A7, B9, B14, B32, B74, B77, B84, N34, T20, TP2, TP12, TP13 | None ... | 227 | 244 | Forbidden | Forbidden | C | 14, 40 |
| | Sulfuric acid, spent | 8 | UN1832 | II | 8 | A3, A7, B2, B83, B84, IB2, N34, T8, TP2, TP12 | None ... | 202 | 242 | Forbidden | 30 L | C | 14 |
| | Sulfuric acid with more than 51 percent acid. | 8 | UN1830 | II | 8 | A3, A7, B3, B83, B84, IB2, N34, T8, TP2, TP12 | 154 | 202 | 242 | 1 L | 30 L | C | 14 |
| | Sulfuric acid with not more than 51% acid. | 8 | UN2796 | II | 8 | A3, A7, B2, B15, IB2, N6, N34, T8, TP2, TP12 | 154 | 202 | 242 | 1 L | 30 L | B | |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|--|----------------------------------|----------------------------------|-----|----------------|--|-----------------------------|----------|------|-----------------------------|--------------------------|-----------------------------|----------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| | | | | | | | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | <i>Tetrazine (dry)</i> | Forbidden | | | | | | | | | | | |
| | Tetrazol-1-acetic acid | 1.4C | UN0407 | II | 1.4C | | None | 62 | None | Forbidden | 75 kg | 09 | |
| | 1H-Tetrazole | 1.1D | UN0504 | | 1.1D | | None | 62 | None | Forbidden | Forbidden | B | 1E, 5E |
| | <i>Tetrazolyl azide (dry)</i> | Forbidden | | | | | | | | | | | |
| | Tetryl, <i>see</i> Trinitrophenylmethylnitramine. | | | | | | | | | | | | |
| | Thallium chlorate | 5.1 | UN2573 | II | 5.1, 6.1 | IB6, IP2 | None | 212 | 242 | 5 kg | 25 kg | A | 56, 58, 106 |
| | Thallium compounds, n.o.s. | 6.1 | UN1707 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | Thallium nitrate | 6.1 | UN2727 | II | 6.1, 5.1 | IB6, IP2 | None | 212 | 242 | 5 kg | 25 kg | A | |
| | 4-Thiapentanal | 6.1 | UN2785 | III | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | D | 25, 49 |
| | Thioacetic acid | 3 | UN2436 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | Thiocarbamate pesticide, liquid, flammable, toxic, flash point less than 23 degrees C. | 3 | UN2772 | I | 3, 6.1 | T14, TP2, TP13, TP27 | None | 201 | 243 | Forbidden | 30 L | B | 40 |
|  | ..... |  |  | II | 3, 6.1 | IB2, T11, TP13, TP27 | None | 202 | 243 | 1 L | 60 L | B | 40 |
| | Thiocarbamate pesticide, liquid, toxic, flammable, flash point not less than 23 degrees C. | 6.1 | UN3005 | I | 6.1, 3 | T14, TP2, TP13 | None | 201 | 243 | 1 L | 30 L | B | 40 |
|  | ..... |  |  | II | 6.1, 3 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
|  | ..... |  |  | III | 6.1, 3 | IB3, T7, TP2, TP28 | 153 | 203 | 242 | 60 L | 220 L | A | 40 |
| | Thiocarbamate pesticide, liquid, toxic. | 6.1 | UN3006 | I | 6.1 | T14, TP2, TP13 | None | 201 | 243 | 1 L | 30 L | B | 40 |
|  | ..... |  |  | II | 6.1 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
|  | ..... |  |  | III | 6.1 | IB3, T7, TP2, TP28 | 153 | 203 | 241 | 60 L | 220 L | A | 40 |
| | Thiocarbamate pesticides, solid, toxic. | 6.1 | UN2771 | I | 6.1 | IB7, IP1 | None | 211 | 242 | 5 kg | 50 kg | A | 40 |
|  | ..... |  |  | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | 40 |
|  | ..... |  |  | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | 40 |
| | <i>Thiocarbonylchloride,</i> <i>see</i> Thiophosgene. | | | | | | | | | | | | |
| | Thioglycol | 6.1 | UN2966 | II | 6.1 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | A | |
| | Thioglycolic acid | 8 | UN1940 | II | 8 | A7, B2, IB2, N34, T7, TP2 | 154 | 202 | 242 | 1 L | 30 L | A | |
| | Thiolactic acid | 6.1 | UN2936 | II | 6.1 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | A | |
| | Thionyl chloride | 8 | UN1836 | I | 8 | A7, B6, B10, N34, T10, TP2, TP12, TP13 | None | 201 | 243 | Forbidden | Forbidden | C | 40 |
| | Thiophene | 3 | UN2414 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | 40 |
| + | Thiophosgene | 6.1 | UN2474 | II | 6.1 | 2, A7, B9, B14, B32, B74, N33, N34, T20, TP2, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | B | 26, 40 |
| | Thiophosphoryl chloride | 8 | UN1837 | II | 8 | A3, A7, B2, B8, B25, IB2, N34, T7, TP2 | None | 202 | 242 | Forbidden | 30 L | C | 40 |
| | Thiourea dioxide | 4.2 | UN3341 | II | 4.2 | IB6, IP2 | None | 212 | 241 | 15 kg | 50 kg | D | |
|  | ..... |  |  | III | 4.2 | IB8, IP3 | None | 213 | 241 | 25 kg | 100 kg | D | |
| D | Thorium metal, pyrophoric | 7 | UN2975 | | 7, 4.2 | | None | 418 | None | Forbidden | Forbidden | D | |
| D | Thorium nitrate, solid | 7 | UN2976 | | 7, 5.1 | | None | 419 | None | Forbidden | 15 kg | A | |
| | <i>Tin chloride, fuming, see</i> Stannic chloride, anhydrous. | | | | | | | | | | | | |
| | <i>Tin perchloride or Tin tetra- chloride, see</i> Stannic chloride, anhydrous. | | | | | | | | | | | | |
| | Tinctures, medicinal | 3 | UN1293 | II | 3 | IB2, T4, TP1, TP8 | 150 | 202 | 242 | 5 L | 60 L | B | |
|  | ..... |  |  | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | <i>Tinning flux, see</i> Zinc chloride | | | | | | | | | | | | |
| | Titanium disulphide | 4.2 | UN3174 | III | 4.2 | IB8, IP3 | None | 213 | 241 | 25 kg | 100 kg | A | |
| | Titanium hydride | 4.1 | UN1871 | II | 4.1 | A19, A20, IB4, N34 | None | 212 | 241 | 15 kg | 50 kg | E | |
| | Titanium powder, dry | 4.2 | UN2546 | I | 4.2 | | None | 211 | 242 | Forbidden | Forbidden | D | |
|  | ..... |  |  | II | 4.2 | A19, A20, IB6, IP2, N5, N34 | None | 212 | 241 | 15 kg | 50 kg | D | |
|  | ..... |  |  | III | 4.2 | IB8, IP3 | None | 213 | 241 | 25 kg | 100 kg | D | |
| | Titanium powder, wetted with not less than 25 percent water (a visible excess of water must be present) (a) mechanically pro- duced, particle size less than 53 microns; (b) chemically pro- duced, particle size less than 840 microns. | 4.1 | UN1352 | II | 4.1 | A19, A20, IB6, IP2, N34 | None | 212 | 240 | 15 kg | 50 kg | E | |
| | Titanium sponge granules or Tita- nium sponge powders. | 4.1 | UN2878 | III | 4.1 | A1, IB8, IP3 | None | 213 | 240 | 25 kg | 100 kg | D | |
| + | Titanium tetrachloride | 8 | UN1838 | II | 8, 6.1 | 2, A3, A6, B7, B9, B14, B32, B74, B77, T20, TP2, TP13, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | C | 40 |
| | Titanium trichloride mixtures | 8 | UN2869 | II | 8 | A7, IB8, IP2, IP4, N34 | 154 | 212 | 240 | 15 kg | 50 kg | A | 40 |
|  | ..... |  |  | III | 8 | A7, IB8, IP3, N34 | 154 | 213 | 240 | 25 kg | 100 kg | A | 40 |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|---|----------------------------------|----------------------------------|----|----------------|---|-----------------------------|----------|------|-----------------------------|--------------------------|-----------------------------|--------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| | | | | | | | | | | | | | |
| | Titanium trichloride, pyrophoric or Titanium trichloride mixtures, pyrophoric. <i>TNT mixed with aluminum, see Tritonal.</i> TNT, <i>see</i> Trinitrotoluene, <i>etc.</i> | 4.2 | UN2441 | | I 4.2, 8 | A7, A8, A19, A20, N34 | None | 181 | 244 | Forbidden | Forbidden | D | 40 |
| + | Toluene | 3 | UN1294 | | II 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | Toluene diisocyanate | 6.1 | UN2078 | | II 6.1 | IB2, T7, TP2, TP13 | None | 202 | 243 | 5 L | 60 L | D | 25, 40 |
| | <i>Toluene sulfonic acid, see</i> Alkyl, <i>or</i> Aryl sulfonic acid <i>etc.</i> | | | | | | | | | | | | |
| + | Toluidines liquid | 6.1 | UN1708 | | II 6.1 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | A | |
| + | Toluidines solid | 6.1 | UN1708 | | II 6.1 | IB8, IP2, IP4, T7, TP2 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | 2,4-Toluylenediamine or 2,4- Toluenediamine. | 6.1 | UN1709 | | III 6.1 | IB8, IP3, T4, TP1 | 153 | 213 | 240 | 100 kg | 200 kg | A | |
| | Torpedoes, liquid fueled, with <i>inert head.</i> | 1.3J | UN0450 | | II 1.3J | | | 62 | None | Forbidden | Forbidden | 04 | 23E |
| | Torpedoes, liquid fueled, with or <i>without bursting charge.</i> | 1.1J | UN0449 | | II 1.1J | | | 62 | None | Forbidden | Forbidden | 04 | 23E |
| | Torpedoes with bursting charge .. | 1.1E | UN0329 | | II 1.1E | | | 62 | None | Forbidden | Forbidden | 03 | |
| | Torpedoes with bursting charge .. | 1.1F | UN0330 | | II 1.1F | | | 62 | None | Forbidden | Forbidden | 08 | |
| | Torpedoes with bursting charge .. | 1.1D | UN0451 | | II 1.1D | | | 62 | None | Forbidden | Forbidden | 03 | |
| G | Toxic liquid, corrosive, inorganic, n.o.s.. | 6.1 | UN3289 | | I 6.1, 8 | T14, TP2, TP13, TP27 | None | 201 | 243 | 0.5 L | 2.5 L | A | |
| | | | | | II 6.1, 8 | IB2, T11, TP2, TP27 | None | 202 | 243 | 1 L | 30 L | A | |
| G | Toxic liquid, corrosive, inorganic, n.o.s. <i>Inhalation Hazard, Pack- ing Group I, Zone A.</i> | 6.1 | UN3289 | | I 6.1, 8 | 1, B9, B14, B30, B72, T22, TP2, TP13, TP27, TP38, TP44 | None | 226 | 244 | Forbidden | Forbidden | B | 40 |
| G | Toxic liquid, corrosive, inorganic, n.o.s. <i>Inhalation Hazard, Pack- ing Group I, Zone B.</i> | 6.1 | UN3289 | | I 6.1, 8 | 2, B9, B14, B32, B74, T20, TP2, TP13, TP27, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | B | 40 |
| G | Toxic liquid, inorganic, n.o.s. | 6.1 | UN3287 | | I 6.1 | T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | A | |
| | | | | | II 6.1 | IB2, T11, TP2, TP27 | None | 202 | 243 | 5 L | 60 L | A | |
| | | | | | III 6.1 | IB3, T7, TP1, TP28 | 153 | 203 | 241 | 60 L | 220 L | A | |
| G | Toxic liquid, inorganic, n.o.s. <i>In- halation Hazard, Packing Group I, Zone A.</i> | 6.1 | UN3287 | | I 6.1 | 1, B9, B14, B30, B72, T22, TP2, TP13, TP27, TP38, TP44 | None | 226 | 244 | Forbidden | Forbidden | B | 40 |
| G | Toxic liquid, inorganic, n.o.s. <i>In- halation Hazard, Packing Group I, Zone B.</i> | 6.1 | UN3287 | | I 6.1 | 2, B9, B14, B32, B74, T20, TP2, TP13, TP27, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | B | 40 |
| G | Toxic liquids, corrosive, organic, n.o.s.. | 6.1 | UN2927 | | I 6.1, 8 | T14, TP2, TP13, TP27 | None | 201 | 243 | 0.5 L | 2.5 L | B | 40 |
| | | | | | II 6.1, 8 | IB2, T11, TP2, TP27 | None | 202 | 243 | 1 L | 30 L | B | 40 |
| G | Toxic liquids, corrosive, organic, n.o.s., <i>inhalation hazard, Pack- ing Group I, Zone A.</i> | 6.1 | UN2927 | | I 6.1, 8 | 1, B9, B14, B30, B72, T22, TP2, TP13, TP27, TP38, TP44 | None | 226 | 244 | Forbidden | Forbidden | D | 40 |
| G | Toxic liquids, corrosive, organic, n.o.s., <i>inhalation hazard, Pack- ing Group I, Zone B.</i> | 6.1 | UN2927 | | I 6.1, 8 | 2, B9, B14, B32, B74, T20, TP2, TP13, TP27, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 40 |
| G | Toxic liquids, flammable, organic, n.o.s.. | 6.1 | UN2929 | | I 6.1, 3 | T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 40 |
| | | | | | II 6.1, 3 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
| G | Toxic liquids, flammable, organic, n.o.s., <i>inhalation hazard, Pack- ing Group I, Zone A.</i> | 6.1 | UN2929 | | I 6.1, 3 | 1, B9, B14, B30, B72, T22, TP2, TP13, TP27, TP38, TP44 | None | 226 | 244 | Forbidden | Forbidden | D | 40 |
| G | Toxic liquids, flammable, organic, n.o.s., <i>inhalation hazard, Pack- ing Group I, Zone B.</i> | 6.1 | UN2929 | | I 6.1, 3 | 2, B9, B14, B32, B74, T20, TP2, TP13, TP27, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 40 |
| G | Toxic, liquids, organic, n.o.s. | 6.1 | UN2810 | | I 6.1 | T14, TP2, TP13, TP27 | None | 201 | 243 | 1 L | 30 L | B | 40 |
| | | | | | II 6.1 | IB2, T11, TP2, TP13, TP27 | None | 202 | 243 | 5 L | 60 L | B | 40 |
| | | | | | III 6.1 | IB3, T7, TP1, TP28 | 153 | 203 | 241 | 60 L | 220 L | A | 40 |
| G | Toxic, liquids, organic, n.o.s. <i>In- halation hazard, Packing Group I, Zone A.</i> | 6.1 | UN2810 | | I 6.1 | 1, B9, B14, B30, B72, T22, TP2, TP13, TP27, TP38, TP44 | None | 226 | 244 | Forbidden | Forbidden | D | 40 |
| G | Toxic, liquids, organic, n.o.s. <i>In- halation hazard, Packing Group I, Zone B.</i> | 6.1 | UN2810 | | I 6.1 | 2, B9, B14, B32, B74, T20, TP2, TP13, TP27, TP38, TP45 | None | 227 | 244 | Forbidden | Forbidden | D | 40 |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|--|----------------------------------|----------------------------------|-----|----------------|--|-----------------------------|-----------|-----------|-----------------------------|--------------------------|-----------------------------|--------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| G | Toxic liquids, oxidizing, n.o.s. | 6.1 | UN3122 | I | 6.1, 5.1 | A4 | None ... | 201 | 243 | Forbidden | 2.5 L | C | ..... |
| G | Toxic liquids, oxidizing, n.o.s. <i>Inhalation hazard, Packing Group I, Zone A.</i> | 6.1 | UN3122 | I | 6.1, 5.1 | IB2 | None ... | 202 | 243 | 1 L | 5 L | C | ..... |
| G | Toxic liquids, oxidizing, n.o.s. <i>Inhalation Hazard, Packing Group I, Zone B.</i> | 6.1 | UN3122 | I | 6.1, 5.1 | 1, B9, B14, B30, B72, T22, TP2, TP13, TP38, TP44 | None ... | 226 | 244 | Forbidden | Forbidden | C | ..... |
| G | Toxic liquids, water-reactive, n.o.s.. | 6.1 | UN3123 | I | 6.1, 4.3 | 2, B9, B14, B32, T20, TP2, TP13, TP38, TP44 | None ... | 227 | 244 | Forbidden | Forbidden | C | ..... |
| G | Toxic liquids, water-reactive, n.o.s. <i>Inhalation hazard, packing group I, Zone A.</i> | 6.1 | UN3123 | II | 6.1, 4.3 | A4 | None ... | 201 | 243 | Forbidden | 1 L | E | 40 |
| G | Toxic liquids, water-reactive, n.o.s. <i>Inhalation hazard, packing group I, Zone A.</i> | 6.1 | UN3123 | I | 6.1, 4.3 | IB2 | None ... | 202 | 243 | 1 L | 5 L | E | 40 |
| G | Toxic liquids, water-reactive, n.o.s. <i>Inhalation hazard, packing group I, Zone B.</i> | 6.1 | UN3123 | I | 6.1, 4.3 | 1, B9, B14, B30, B72, T22, TP2, TP13, TP38, TP44 | None ... | 226 | 244 | Forbidden | Forbidden | E | 40 |
| G | Toxic solid, corrosive, inorganic, n.o.s.. | 6.1 | UN3290 | I | 6.1, 8 | 2, B9, B14, B32, B74, T20, TP2, TP13, TP38, TP44 | None ... | 227 | 244 | Forbidden | Forbidden | E | 40 |
| G | Toxic solid, inorganic, n.o.s. | 6.1 | UN3288 | II | 6.1, 8 | IB7 | None ... | 211 | 242 | 1 kg | 25 kg | A | ..... |
| G | Toxic solids, corrosive, organic, n.o.s.. | 6.1 | UN2928 | I | 6.1, 8 | IB6, IP2 | None ... | 212 | 242 | 15 kg | 50 kg | A | ..... |
| G | Toxic solids, flammable, organic, n.o.s.. | 6.1 | UN2930 | II | 6.1, 8 | IB7 | None ... | 211 | 242 | 5 kg | 50 kg | A | ..... |
| G | Toxic solids, organic, n.o.s. | 6.1 | UN2811 | I | 6.1 | IB8, IP2, IP4 | None ... | 212 | 242 | 25 kg | 100 kg | A | ..... |
| G | Toxic solids, oxidizing, n.o.s. | 6.1 | UN3086 | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | ..... |
| G | Toxic solids, self-heating, n.o.s. ... | 6.1 | UN3124 | I | 6.1, 4.2 | IB7 | None ... | 211 | 242 | 1 kg | 15 kg | C | ..... |
| G | Toxic solids, water-reactive, n.o.s. | 6.1 | UN3125 | II | 6.1, 4.2 | IB6, IP2 | None ... | 212 | 242 | 15 kg | 50 kg | C | ..... |
| D | Toy Caps | 1.4S | NA0337 | I | 6.1, 4.3 | A5 | None ... | 211 | 242 | 5 kg | 15 kg | D | 40 |
| | Tracers for ammunition | 1.3G | UN0212 | II | 6.1, 4.3 | IB6, IP2 | None ... | 212 | 242 | 15 kg | 50 kg | D | 40 |
| | Tractors, see Vehicle, etc | 1.4G | UN0306 | II | 6.1, 4.3 | A5 | None ... | 211 | 242 | 5 kg | 15 kg | D | 40 |
| | <i>Tri-(b-nitroxyethyl) ammonium ni- trate.</i> | Forbidden | | II | 6.1, 4.3 | IB6, IP2 | None ... | 212 | 242 | 15 kg | 50 kg | D | 40 |
| | Triallyl borate | 6.1 | UN2609 | III | 6.1 | IB3 | None ... | 211 | 242 | 25 kg | 100 kg | 05 | ..... |
| | Triallylamine | 3 | UN2610 | III | 3, 8 | B1, IB3, T4, TP1 | None ... | 203 | 242 | Forbidden | Forbidden | 07 | ..... |
| | Triazine pesticides, liquid, flamm- able, toxic, flash point less than 23 degrees C. | 3 | UN2764 | I | 3, 6.1 | T14, TP2, TP13, TP27 | None ... | 201 | 243 | Forbidden | Forbidden | 06 | ..... |
| | Triazine pesticides, liquid, toxic ... | 6.1 | UN2998 | II | 3, 6.1 | IB2, T11, TP2, TP13, TP27 | None ... | 202 | 243 | 1 L | 60 L | B | 40 |
| | Triazine pesticides, liquid, toxic ... | 6.1 | UN2998 | I | 6.1 | T14, TP2, TP13, TP27 | None ... | 201 | 243 | 1 L | 30 L | B | 40 |
| | Triazine pesticides, liquid, toxic, flamm- able, flash point not less than 23 degrees C. | 6.1 | UN2997 | II | 6.1 | IB2, T11, TP2, TP13, TP27 | None ... | 202 | 243 | 5 L | 60 L | B | 40 |
| | Triazine pesticides, liquid, toxic, flamm- able, flash point not less than 23 degrees C. | 6.1 | UN2997 | III | 6.1 | IB3, T7, TP2, TP28 | 153 | 203 | 241 | 60 L | 220 L | A | 40 |
| | Triazine pesticides, solid, toxic ... | 6.1 | UN2763 | I | 6.1, 3 | T14, TP2, TP13, TP27 | None ... | 201 | 243 | 1 L | 30 L | B | 40 |
| | Tributylamine | 6.1 | UN2542 | II | 6.1, 3 | IB2, T11, TP2, TP13, TP27 | None ... | 202 | 243 | 5 L | 60 L | B | 40 |
| | Tributylphosphane | 4.2 | UN3254 | I | 4.2 | IB3, T7, TP2, TP28 | 153 | 203 | 242 | 60 L | 220 L | A | 40 |
| | <i>Trichloro-s-triazinetriene dry, with more than 39 percent available chlorine, see</i> <i>Trichloroisocyanuric acid, dry.</i> | 8 | UN1839 | II | 8 | IB7, IP1 | None ... | 211 | 242 | 5 kg | 50 kg | A | 40 |
| | Trichloroacetic acid | 8 | UN2564 | II | 8 | IB8, IP2, IP4 | None ... | 212 | 242 | 25 kg | 100 kg | A | 40 |
| | Trichloroacetic acid, solution | 8 | UN2564 | III | 8 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | 40 |
| + | Trichloroacetyl chloride | 8 | UN2442 | II | 8, 6.1 | IB2, T7, TP2 | None ... | 202 | 243 | 5 L | 60 L | A | ..... |
| | Trichlorobenzenes, liquid | 6.1 | UN2321 | III | 6.1 | 2, A3, A7, B9, B14, B32, B74, N34, T4, TP1 | None ... | 227 | 244 | Forbidden | Forbidden | D | 40 |
| | Trichlorobutene | 6.1 | UN2322 | II | 6.1 | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | ..... |
| | 1,1,1-Trichloroethane | 6.1 | UN2831 | III | 6.1 | IB2, T7, TP2 | None ... | 202 | 243 | 5 L | 60 L | A | 25, 40 |
| | Trichloroethylene | 6.1 | UN1710 | III | 6.1 | IB3, N36, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | 40 |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols (1) | Hazardous materials descriptions and proper shipping names (2) | Hazard class or Di- vision (3) | Identifica- tion Num- bers (4) | PG (5) | Label Codes (6) | Special provisions (§172.102) (7) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|-------------------------|---|---|---|---------------|---------------------------|--|-----------------------------|----------------------|----------------------|-----------------------------|--------------------------|-----------------------------|--------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| | | | | | | | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | Trinitronaphthalene | 1.1D | UN0217 | II | 1.1D ... | | None ... | 62 | None | Forbidden | Forbidden | 10 | ..... |
| | Trinitrophenetole | 1.1D | UN0218 | II | 1.1D ... | | None ... | 62 | None | Forbidden | Forbidden | 10 | ..... |
| | Trinitrophenol or Picric acid, dry or wetted with less than 30 per- cent water, by mass. | 1.1D | UN0154 | II | 1.1D ... | | None ... | 62 | None | Forbidden | Forbidden | 10 | 5E |
| | Trinitrophenol, wetted with not less than 30 percent water, by mass. | 4.1 | UN1344 | I | 4.1 | 23, A8, A19, N41 | None ... | 211 | None | 1 kg | 15 kg | E | 28, 36 |
| | 2,4,6-Trinitrophenyl guanidine (dry). | Forbidden | | | | | | | | | | | |
| | 2,4,6-Trinitrophenyl nitramine | Forbidden | | | | | | | | | | | |
| | 2,4,6-Trinitrophenyl trimethylol methyl nitramine trinitrate (dry). | Forbidden | | | | | | | | | | | |
| | Trinitrophenylmethyl nitramine or Tetryl. | 1.1D | UN0208 | II | 1.1D ... | | None ... | 62 | None | Forbidden | Forbidden | 10 | ..... |
| | Trinitroresorcinol or Styphnic acid, dry or wetted with less than 20 percent water, or mixture of al- cohol and water, by mass. | 1.1D | UN0219 | II | 1.1D ... | | None ... | 62 | None | Forbidden | Forbidden | 10 | 5E |
| | Trinitroresorcinol, wetted or Styphnic acid, wetted with not less than 20 percent water, or mixture of alcohol and water by mass. | 1.1D | UN0394 | II | 1.1D ... | | None ... | 62 | None | Forbidden | Forbidden | 10 | 5E |
| | 2,4,6-Trinitroso-3-methyl nitraminoanisole. | Forbidden | | | | | | | | | | | |
| | Trinitrotetramine cobalt nitrate | Forbidden | | | | | | | | | | | |
| | Trinitrotoluene and Trinitrobenzene mixtures or TNT and trinitrobenzene mix- tures or TNT and hexanitrostilbene mixtures or Trinitrotoluene and hexanitrostilbene mixtures. | 1.1D | UN0388 | II | 1.1D ... | | None ... | 62 | None | Forbidden | Forbidden | 10 | ..... |
| | Trinitrotoluene mixtures con- taining Trinitrobenzene and Hexanitrostilbene or TNT mix- tures containing trinitrobenzene and hexanitrostilbene. | 1.1D | UN0389 | II | 1.1D ... | | None ... | 62 | None | Forbidden | Forbidden | 10 | ..... |
| | Trinitrotoluene or TNT, dry or wetted with less than 30 per- cent water, by mass. | 1.1D | UN0209 | II | 1.1D ... | | None ... | 62 | None | Forbidden | Forbidden | 10 | ..... |
| | Trinitrotoluene, wetted with not less than 30 percent water, by mass. | 4.1 | UN1356 | I | 4.1 | 23, A2, A8, A19, N41 | None ... | 211 | None | 0.5 kg | 0.5 kg | E | 28 |
| | Tripropylamine | 3 | UN2260 | III | 3, 8 | B1, IB3, T4, TP1 | 150 | 203 | 242 | 5 L | 60 L | A | 40 |
| | Tripropylene | 3 | UN2057 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
| | Tris-(1-aziridinyl)phosphine oxide, solution. | 6.1 | UN2501 | II | 6.1 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Tris-(1-aziridinyl)phosphine oxide, solution. | 6.1 | UN2501 | II | 6.1 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | A | ..... |
| | Tris, bis-bifluoroamino diethoxy propane (TVOPA). | Forbidden | | | | IB3, T4, TP1 | 153 | 203 | 241 | 60 L | 220 L | A | ..... |
| | Tris(phenyl)phosphine oxide | 1.1D | UN0390 | II | 1.1D ... | | None ... | 62 | None | Forbidden | Forbidden | 10 | ..... |
| | Tungsten hexafluoride | 2.3 | UN2196 | ..... | 2.3, 8 | 2 | None | 338 | None | Forbidden | Forbidden | D | 40 |
| | Turpentine | 3 | UN1299 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Turpentine substitute | 3 | UN1300 | I | 3 | T11, TP1, TP8, TP27 | None | 201 | 243 | 1 L | 30 L | B | ..... |
|  | ..... |  |  | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
|  | ..... |  |  | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
|  | ..... |  |  | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| D | Uranium hexafluoride, fissile ex- cepted or non-fissile. | 7 | UN2978 | ..... | 7, 8 | B1, IB3, T2, TP1 | 423 | 420, 427 | 420, 427 | ..... | ..... | ..... | ..... |
| D | Uranium hexafluoride, fissile (with more than 1 percent U-235). | 7 | UN2977 | ..... | 7, 8 | | 453 | 417, 420 | 417, 420 | ..... | ..... | A | ..... |
| D | Uranium metal, pyrophoric | 7 | UN2979 | ..... | 7, 4.2 | | None | 418 | None | ..... | ..... | D | ..... |
| D | Uranyl nitrate hexahydrate solu- tion. | 7 | UN2980 | ..... | 7, 8 | | 421, 427 | 415, 416, 417. | 415, 416, 417. | ..... | ..... | D | ..... |
| D | Uranyl nitrate, solid | 7 | UN2981 | ..... | 7, 5.1 | | None | 419 | None | Forbidden | 15 kg | A | ..... |
| | Urea hydrogen peroxide | 5.1 | UN1511 | III | 5.1, 8 | A1, A7, A29, IB8, IP3 | 152 | 213 | 240 | 25 kg | 100 kg | A | 13 |
| | Urea nitrate, dry or wetted with less than 20 percent water, by mass. | 1.1D | UN0220 | II | 1.1D ... | 119 | None | 62 | None | Forbidden | Forbidden | 10 | ..... |
| | Urea nitrate, wetted with not less than 20 percent water, by mass. | 4.1 | UN1357 | I | 4.1 | 39, A8, A19, N41 | None | 211 | None | 1 kg | 15 kg | A | 28 |
| | Urea peroxide, see Urea hydro- gen peroxide. | | | | | | | | | | | | |
| | Valeraldehyde | 3 | UN2058 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
| | Valeric acid, see Corrosive liq- uids, n.o.s.. | | | | | | | | | | | | |
| | Valeryl chloride | 8 | UN2502 | II | 8, 3 | A3, A6, A7, B2, IB2, N34, T7, TP2 | 154 | 202 | 243 | 1 L | 30 L | C | 40 |
| | Vanadium compound, n.o.s. | 6.1 | UN3285 | I | 6.1 | IB7, IP1, T14, TP2, TP27 | None | 211 | 242 | 5 kg | 50 kg | B | ..... |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Symbols | Hazardous materials descriptions and proper shipping names | Hazard class or Division | Identification Numbers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stowage | |
|---------|---|--------------------------|------------------------|-----|-------------|--|--------------------------|----------|----------|--------------------------|---------------------|---------------------|--------|
| | | | | | | | Exceptions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo aircraft only | Location | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | | | | II | 6.1 | IB8, IP2, IP4, T11, TP2, TP27 | None | 212 | 242 | 25 kg | 100 kg | B | |
| | | | | III | 6.1 | IB8, IP3, T7, TP1, TP28 | 153 | 213 | 240 | 100 kg | 200 kg | A | |
| | Vanadium oxytrichloride | 8 | UN2443 | II | 8 | A3, A6, A7, B2, B16, IB2, N34, T7, TP2 | 154 | 202 | 242 | Forbidden | 30 L | C | 40 |
| | Vanadium pentoxide, <i>non-fused form</i> . | 6.1 | UN2862 | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | 40 |
| | Vanadium tetrachloride | 8 | UN2444 | I | 8 | A3, A6, A7, B4, N34, T10, TP2 | None | 201 | 243 | Forbidden | 2.5 L | C | 40 |
| | Vanadium trichloride | 8 | UN2475 | III | 8 | IB8, IP3 | 154 | 213 | 240 | 25 kg | 100 kg | A | 40 |
| | Vanadyl sulfate | 6.1 | UN2931 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | |
| | Vehicle, flammable gas powered | 9 | UN3166 | | 9 | 135 | 220 | 220 | 220 | Forbidden | No limit | A | |
| | Vehicle, flammable liquid powered. | 9 | UN3166 | | 9 | 135 | 220 | 220 | 220 | No limit | No limit | A | |
| | <i>Very signal cartridge, see Cartridges, signal.</i> | | | | | | | | | | | | |
| | Vinyl acetate, stabilized | 3 | UN1301 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | Vinyl bromide, stabilized | 2.1 | UN1085 | | 2.1 | T50 | 306 | 304 | 314, 315 | Forbidden | 150 kg | B | 40 |
| | Vinyl butyrate, stabilized | 3 | UN2838 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | Vinyl chloride, stabilized or Vinyl chloride, stabilized. | 2.1 | UN1086 | | 2.1 | 21, B44, T50 | 306 | 304 | 314, 315 | Forbidden | 150 kg | B | 40 |
| | Vinyl chloroacetate | 6.1 | UN2589 | II | 6.1, 3 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | A | |
| | Vinyl ethyl ether, stabilized | 3 | UN1302 | I | 3 | A3, T11, TP2 | None | 201 | 243 | 1 L | 30 L | D | |
| | Vinyl fluoride, stabilized | 2.1 | UN1860 | | 2.1 | | 306 | 304 | 314, 315 | Forbidden | 150 kg | E | 40 |
| | Vinyl isobutyl ether, stabilized | 3 | UN1304 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | |
| | Vinyl methyl ether, stabilized | 2.1 | UN1087 | | 2.1 | B44, T50 | 306 | 304 | 314, 315 | Forbidden | 150 kg | B | 40 |
| | <i>Vinyl nitrate polymer</i> | Forbidden | | | | | | | | | | | |
| | Vinylidene chloride, stabilized | 3 | UN1303 | I | 3 | T12, TP2, TP7 | 150 | 201 | 243 | 1 L | 30 L | E | 40 |
| | Vinylpyridines, stabilized | 6.1 | UN3073 | II | 6.1, 3, 8 | IB1, T7, TP2, TP13 | None | 202 | 243 | 1 L | 30 L | B | 40 |
| | Vinyltoluenes, stabilized | 3 | UN2618 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | |
| | Vinyltrichlorosilane, stabilized | 3 | UN1305 | I | 3, 8 | A3, A7, B6, N34, T11, TP2, TP13 | None | 201 | 243 | Forbidden | 2.5 L | B | 40 |
| | Warheads, rocket with burster or expelling charge. | 1.4D | UN0370 | II | 1.4D | | None | 62 | None | Forbidden | 75 kg | 02 | |
| | Warheads, rocket with burster or expelling charge. | 1.4F | UN0371 | II | 1.4F | | None | 62 | None | Forbidden | Forbidden | 08 | |
| | Warheads, rocket with bursting charge. | 1.1D | UN0286 | II | 1.1D | | None | 62 | None | Forbidden | Forbidden | 03 | |
| | Warheads, rocket with bursting charge. | 1.2D | UN0287 | II | 1.2D | | None | 62 | None | Forbidden | Forbidden | 03 | |
| | Warheads, rocket with bursting charge. | 1.1F | UN0369 | II | 1.1F | | None | 62 | None | Forbidden | Forbidden | 08 | |
| | Warheads, torpedo with bursting charge. | 1.1D | UN0221 | II | 1.1D | | None | 62 | None | Forbidden | Forbidden | 03 | |
| G | Water-reactive liquid, corrosive, n.o.s.. | 4.3 | UN3129 | I | 4.3, 8 | | None | 201 | 243 | Forbidden | 1 L | D | |
| | | | | II | 4.3, 8 | IB1 | None | 202 | 243 | 1 L | 5 L | E | 85 |
| | | | | III | 4.3, 8 | IB2 | None | 203 | 242 | 5 L | 60 L | E | |
| G | Water-reactive liquid, n.o.s. | 4.3 | UN3148 | I | 4.3 | | None | 201 | 244 | Forbidden | 1 L | E | 40 |
| | | | | II | 4.3 | IB1 | None | 202 | 243 | 1 L | 5 L | E | 40 |
| | | | | III | 4.3 | IB2 | None | 203 | 242 | 5 L | 60 L | E | 40 |
| G | Water-reactive liquid, toxic, n.o.s. | 4.3 | UN3130 | I | 4.3, 6.1 | A4 | None | 201 | 243 | Forbidden | 1 L | D | |
| | | | | II | 4.3, 6.1 | IB1 | None | 202 | 243 | 1 L | 5 L | E | 85 |
| | | | | III | 4.3, 6.1 | IB2 | None | 203 | 242 | 5 L | 60 L | E | 85 |
| G | Water-reactive solid, corrosive, n.o.s.. | 4.3 | UN3131 | I | 4.3, 8 | IB4, IP1, N40 | None | 211 | 242 | Forbidden | 15 kg | D | |
| | | | | II | 4.3, 8 | IB6, IP2 | 151 | 212 | 242 | 15 kg | 50 kg | E | 85 |
| | | | | III | 4.3, 8 | IB8, IP4 | 151 | 213 | 241 | 25 kg | 100 kg | E | 85 |
| G | Water-reactive solid, flammable, n.o.s.. | 4.3 | UN3132 | I | 4.3, 4.1 | IB4, N40 | None | 211 | 242 | Forbidden | 15 kg | D | |
| | | | | II | 4.3, 4.1 | IB4 | 151 | 212 | 242 | 15 kg | 50 kg | E | |
| | | | | III | 4.3, 4.1 | IB6 | 151 | 213 | 241 | 25 kg | 100 kg | E | |
| G | Water-reactive solid, n.o.s. | 4.3 | UN2813 | I | 4.3 | IB4, N40 | None | 211 | 242 | Forbidden | 15 kg | E | 40 |
| | | | | II | 4.3 | IB7, IP2 | 151 | 212 | 242 | 15 kg | 50 kg | E | 40 |
| | | | | III | 4.3 | IB8, IP4 | 151 | 213 | 241 | 25 kg | 100 kg | E | 40 |
| G | Water-reactive, solid, oxidizing, n.o.s.. | 4.3 | UN3133 | II | 4.3, 5.1 | | None | 214 | 214 | Forbidden | Forbidden | E | 40 |
| | | | | III | 4.3, 5.1 | | None | 214 | 214 | Forbidden | Forbidden | E | 40 |
| G | Water-reactive solid, self-heating, n.o.s.. | 4.3 | UN3135 | I | 4.3, 4.2 | N40 | None | 211 | 242 | Forbidden | 15 kg | E | |
| | | | | II | 4.3, 4.2 | IB5, IP2 | None | 212 | 242 | 15 kg | 50 kg | E | |
| | | | | III | 4.3, 4.2 | IB8, IP4 | None | 213 | 241 | 25 kg | 100 kg | E | |
| G | Water-reactive solid, toxic, n.o.s. | 4.3 | UN3134 | I | 4.3, 6.1 | A8, IB4, IP1, N40 | None | 211 | 242 | Forbidden | 15 kg | D | |
| | | | | II | 4.3, 6.1 | IB5, IP2 | 151 | 212 | 242 | 15 kg | 50 kg | E | 85 |
| | | | | III | 4.3, 6.1 | IB8, IP4 | 151 | 213 | 241 | 25 kg | 100 kg | E | 85 |
| | <i>Wheel chair, electric, see Battery powered vehicle or Battery powered equipment.</i> | | | | | | | | | | | | |
| | <i>White acid, see Hydrofluoric acid</i> | | | | | | | | | | | | |
| I | White asbestos (<i>chrysotile, actinolite, anthophyllite, tremolite</i>). | 9 | UN2590 | III | 9 | IB8, IP2, IP3 | 155 | 216 | 240 | 200 kg | 200 kg | A | 34, 40 |
| | Wood preservatives, liquid | 3 | UN1306 | II | 3 | IB2, T4, TP1, TP8 | 150 | 202 | 242 | 5 L | 60 L | B | 40 |
| | | | | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 20 L | 220 L | A | 40 |
| | Xanthates | 4.2 | UN3342 | II | 4.2 | IB6, IP2 | None | 212 | 241 | 15 kg | 50 kg | D | 40 |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym- bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|--------------|---|----------------------------------|----------------------------------|-------|----------------|---|-----------------------------|----------|-------|-----------------------------|--------------------------|-----------------------------|-------------------------------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | Xenon, compressed | 2.2 | UN2036 | III | 4.2 | IB8, IP3 | None | 213 | 241 | 25 kg | 100 kg | D | 40 |
| | Xenon, refrigerated liquid (<i>cry- ogenic liquids</i>) | 2.2 | UN2591 | ..... | 2.2 | T75, TP5 | 306 | 302 | None | 75 kg | 150 kg | A | ..... |
| | Xylenes | 3 | UN1307 | II | 3 | IB2, T4, TP1 | 150 | 202 | 242 | 5 L | 60 L | B | ..... |
| | Xylenols | 6.1 | UN2261 | III | 3 | B1, IB3, T2, TP1 | 150 | 203 | 242 | 60 L | 220 L | A | ..... |
| | Xylidines, solid | 6.1 | UN1711 | II | 6.1 | IB8, IP2, IP4, T7, TP2 | None | 212 | 242 | 25 kg | 100 kg | A | ..... |
| | Xylidines, solution | 6.1 | UN1711 | II | 6.1 | IB2, T7, TP2 | None | 202 | 243 | 5 L | 60 L | A | ..... |
| | Xylyl bromide | 6.1 | UN1701 | II | 6.1 | A3, A6, A7, IB2, N33, T7, TP2, TP13 | None | 340 | None | Forbidden | 60 L | D | 40 |
| | <i>p</i> -Xylyl diazide | Forbidden | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Zinc ammonium nitrite | 5.1 | UN1512 | II | 5.1 | IB8, IP4 | None | 212 | 242 | 5 kg | 25 kg | E | ..... |
| | Zinc arsenate or Zinc arsenite or Zinc arsenate and zinc arsenite mixtures | 6.1 | UN1712 | II | 6.1 | IB8, IP2, IP4 | None | 212 | 242 | 25 kg | 100 kg | A | ..... |
| | Zinc ashes | 4.3 | UN1435 | III | 4.3 | A1, A19, IB8, IP4 | 151 | 213 | 241 | 25 kg | 100 kg | A | ..... |
| | Zinc bisulfite solution, see Bisulfites, aqueous solutions, n.o.s. .... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Zinc bromate | 5.1 | UN2469 | III | 5.1 | A1, A29, IB8, IP3 | 152 | 213 | 240 | 25 kg | 100 kg | A | 56, 58, 106 |
| | Zinc chlorate | 5.1 | UN1513 | II | 5.1 | A9, IB8, IP2, IP4, N34 | 152 | 212 | 242 | 5 kg | 25 kg | A | 56, 58, 106 |
| | Zinc chloride, anhydrous | 8 | UN2331 | III | 8 | IB8, IP3 | None | 213 | 240 | 25 kg | 100 kg | A | ..... |
| | Zinc chloride, solution | 8 | UN1840 | III | 8 | IB3, T4, TP1 | 154 | 203 | 241 | 5 L | 60 L | A | ..... |
| | Zinc cyanide | 6.1 | UN1713 | I | 6.1 | IB7, IP1 | None | 211 | 242 | 5 kg | 50 kg | A | 26 |
| | Zinc dithionite or Zinc hydrosulfite Zinc ethyl, see Diethylzinc | 9 | UN1931 | III | None | IB8 | 155 | 204 | 240 | 100 kg | 200 kg | A | 49 |
| | Zinc fluorosilicate | 6.1 | UN2855 | III | 6.1 | IB8, IP3 | 153 | 213 | 240 | 100 kg | 200 kg | A | 26 |
| | Zinc hydrosulfite, see Zinc dithionite ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Zinc muriate solution, see Zinc chloride, solution ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Zinc nitrate | 5.1 | UN1514 | II | 5.1 | IB8, IP4 | 152 | 212 | 240 | 5 kg | 25 kg | A | ..... |
| | Zinc permanganate | 5.1 | UN1515 | II | 5.1 | IB6, IP2 | 152 | 212 | 242 | 5 kg | 25 kg | D | 56, 58, 69, 106, 107 |
| | Zinc peroxide | 5.1 | UN1516 | II | 5.1 | IB6, IP2 | 152 | 212 | 242 | 5 kg | 25 kg | A | 13, 75, 106 |
| | Zinc phosphide | 4.3 | UN1714 | I | 4.3, 6.1 | A19, N40 | None | 211 | None | Forbidden | 15 kg | E | 40, 85 |
| | Zinc powder or Zinc dust | 4.3 | UN1436 | I | 4.3, 4.2 | A19, IB4, IP1, N40 | None | 211 | 242 | Forbidden | 15 kg | A | ..... |
| | Zinc resinate | 4.1 | UN2714 | III | 4.3, 4.2 | A19, IB7, IP2 | None | 212 | 242 | 15 kg | 50 kg | A | ..... |
| | Zinc selenate, see Selenates or Selenites ..... | ..... | ..... | ..... | 4.3, 4.2 | IB8, IP4 | None | 213 | 242 | 25 kg | 100 kg | A | ..... |
| | Zinc selenite, see Selenates or Selenites ..... | ..... | ..... | ..... | 4.1 | A1, IB6 | 151 | 213 | 240 | 25 kg | 100 kg | A | ..... |
| | Zinc silicofluoride, see Zinc fluorosilicate ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| | Zirconium, dry, coiled wire, fin- ished metal sheets, strip (<i>thin- ner than 254 microns but not thinner than 18 microns</i>) | 4.1 | UN2858 | III | 4.1 | A1, IB8 | 151 | 213 | 240 | 25 kg | 100 kg | A | ..... |
| | Zirconium, dry, finished sheets, strip or coiled wire | 4.2 | UN2009 | III | 4.2 | A1, A19, IB8 | None | 213 | 240 | 25 kg | 100 kg | D | ..... |
| | Zirconium hydride | 4.1 | UN1437 | II | 4.1 | A19, A20, IB4, N34 | None | 212 | 240 | 15 kg | 50 kg | E | ..... |
| | Zirconium nitrate | 5.1 | UN2728 | III | 5.1 | A1, A29, IB8, IP3 | 152 | 213 | 240 | 25 kg | 100 kg | A | ..... |
| | Zirconium picramate, dry or wetted with less than 20 per- cent water, by mass | 1.3C | UN0236 | II | 1.3C | ..... | None | 62 | None | Forbidden | Forbidden | 10 | 5E |
| | Zirconium picramate, wetted with not less than 20 percent water, by mass | 4.1 | UN1517 | I | 4.1 | 23, N41 | None | 211 | None | 1 kg | 15 kg | D | 28, 36 |
| | Zirconium powder, dry | 4.2 | UN2008 | I | 4.2 | ..... | None | 211 | 242 | Forbidden | Forbidden | D | ..... |
| | Zirconium powder, wetted with not less than 25 percent water (a visible excess of water must be present) (a) mechanically produced, particle size less than 53 microns; (b) chemically produced, particle size less than 840 microns | 4.1 | UN1358 | III | 4.2 | A19, A20, IB6, IP2, N5, N34 | None | 212 | 241 | 15 kg | 50 kg | D | ..... |
| | Zirconium scrap | 4.2 | UN1932 | III | 4.2 | IB8, IP3 | None | 213 | 241 | 25 kg | 100 kg | D | ..... |
| | Zirconium suspended in a liquid .. | 3 | UN1308 | II | 4.1 | A19, A20, IB6, IP2, N34 | None | 212 | 241 | 15 kg | 50 kg | E | ..... |
| | Zirconium scrap | 4.2 | UN1932 | III | 4.2 | IB8, IP3, N34 | None | 213 | 240 | Forbidden | Forbidden | D | ..... |
| | Zirconium suspended in a liquid .. | 3 | UN1308 | I | 3 | ..... | None | 201 | 243 | Forbidden | Forbidden | B | ..... |
| | Zirconium suspended in a liquid .. | 3 | UN1308 | II | 3 | IB2 | None | 202 | 242 | 5 L | 60 L | B | ..... |
| | Zirconium suspended in a liquid .. | 3 | UN1308 | III | 3 | B1, IB2 | 150 | 203 | 242 | 60 L | 220 L | B | ..... |

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

| Sym-bols | Hazardous materials descriptions and proper shipping names | Hazard class or Di- vision | Identifica- tion Num- bers | PG | Label Codes | Special provisions (§172.102) | (8) Packaging (§173.***) | | | (9) Quantity limitations | | (10) Vessel stow- age | |
|----------|--|----------------------------|----------------------------|-----|-------------|-------------------------------|--------------------------|-----------|-----------|--------------------------|-----------------------|-----------------------|-------|
| | | | | | | | Excep- tions | Non-bulk | Bulk | Passenger aircraft/rail | Cargo air- craft only | Loca- tion | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | Zirconium tetrachloride | 8 | UN2503 | III | 8 | IB8, IP3 | 154 | 213 | 240 | 25 kg | 100 kg | A | ..... |

BILLING CODE 14910 60 S

12. In Appendix B to § 172.101, paragraphs 1. and 2. are revised and the List of Marine Pollutants is amended by removing 94 entries, adding 16 entries and revising 1 entry in appropriate alphabetical order to read as follows:

Appendix B to § 172.101—List of Marine Pollutants

1. See § 171.4 of this subchapter for applicability to marine pollutants. This appendix lists potential marine pollutants as defined in § 171.8 of this subchapter.

2. Marine pollutants listed in this appendix are not necessarily listed by name in the § 172.101 Table. If a marine pollutant not listed by name or by synonym in the § 172.101 Table meets the definition of any hazard Class 1 through 8, then you must determine the class and division of the material in accordance with § 173.2a of this subchapter. You must also select the most appropriate hazardous material description and proper shipping name. If a marine pollutant not listed by name or by synonym in the § 172.101 Table does not meet the definition of any Class 1 through 8, then you must offer it for transportation under the most appropriate of the following two Class 9 entries: “Environmentally hazardous substances, liquid, n.o.s.,” UN3082, or “Environmentally hazardous substances, solid, n.o.s.” UN3077.

* * * * *

LIST OF MARINE POLLUTANTS

| S.M.P. | Marine Pollutant |
|-----------|---------------------------------------|
| (1) | (2) |
| [Remove:] | AcetalAcetaldehyde |
| | Amyl mercaptans |
| | Anisole |
| | Benzaldehyde |
| | Butyl benzenes |
| | n-Butyl butyrate |
| | Butyl mercaptans |
| | Butylphenols, liquid |
| | Butylphenols, solid |
| | Butyraldehyde |
| | Calcium naphthenate |
| | Camphor oil |
| | Chlorotoluenes (ortho-, meta-, para-) |
| | Coal tar |
| | Coal tar naphtha |
| | Creosote (coal tar) |
| | Creosote (wood tar) |
| | Cresols (o-; m-; p-) |
| | Cresylic acid |
| | Cresylic acid sodium salt |

LIST OF MARINE POLLUTANTS

| S.M.P. | Marine Pollutant |
|--------|---|
| (1) | (2) |
| | <i>normal</i> -Decaldehyde |
| | <i>normal</i> -Decanol |
| | Decyl acrylate |
| | 1,2-Dichlorobenzene |
| | Dichlorobenzene (meta; ortho; para) |
| | Dichlorophenols, liquid |
| | Dichlorophenols, solid |
| | 2,4-Dichlorophenoxyacetic acid (see also 2,4D) |
| | 2,4 Dichlorophenoxyacetic acid diethanolamine salt |
| | 2,4 Dichlorophenoxyacetic acid dimethylamine salt |
| | 2,4-Dichlorophenoxyacetic acid triisopropylamine salt |
| | Diethybenzenes (mixed iso- mers) |
| | Diisopropyl-naphthalene |
| | Dimethyl disulphide |
| | Dimethyl glyoxal (butanedione) |
| | Dimethyl sulphide |
| | Diphenyl ether |
| | Diphenyl ether/biphenyl phenyl ether mixtures |
| | Diphenyl/diphenyl ether (mix- tures) |
| | EPTC (ISO) |
| | Ethyl acrylate, inhibited |
| | Ethyl chlorothioformate |
| | 1-Ethyl-2-methylbenzene |
| | 2-Ethylbutyraldehyde |
| | 2-Ethylhexenal |
| | 2,4-Hexadiene aldehyde |
| | <i>normal</i> -Hexaldehyde |
| | Iron oxide, spent |
| | Iron sponge, spent |
| | Isobutyl aldehyde |
| | Isobutyl isobutyrate |
| | Isobutyl propionate |
| | Isobutyraldehyde |
| | Isodecaldehyde |
| | Isodecanol |
| | Isononanol |
| | Isooctanol |
| | Isopropylbenzene |
| | Isovaleraldehyde |
| | 1-Methyl-4-ethylbenzene |
| | 2-Methyl-5-ethylpyridine |
| | Methyl salicylate |
| | 2-Methylbutyraldehyde |
| | Methylnaphthalenes, liquid |
| | Methylnaphthalenes, solid |
| | Methylstyrenes, inhibited |
| | Naphthalene, crude <i>or</i> refined |
| | Naphthalene, molten |
| | Naphthenic acids, liquid |
| | Naphthenic acids, solid |

LIST OF MARINE POLLUTANTS

| S.M.P. | Marine Pollutant |
|--------|---|
| (1) | (2) |
| | Nitrocresols |
| | Nitrotoluenes (ortho-;meta-;para-), liquid |
| | Nitrotoluenes (ortho-;meta-;para-), solid |
| | 1-Nonanal |
| | 1-Nonanol |
| | 1-Octanol |
| | Phenylethylene, inhibited |
| | alpha-Pinene |
| | Propanethiols |
| | Propionaldehyde |
| | n-Propylbenzene |
| | Styrene monomer, inhibited |
| | n-Tetramethylbenzenes |
| | 4-Thiapentanal |
| | 1,2,3-Trimethylbenzene |
| | 1,2,4-Trimethyl benzene |
| | 1,3,5-Trimethyl benzene |
| | Turpentine |
| | 1-Undecanol |
| | <i>normal</i> -Valeraldehyde |
| | Vinylbenzene, inhibited |
| | Vinyltoluenes, inhibited <i>mixed isomers</i> |
| | Xylenols |
| [Add:] | |
| * | * * * * * |
| | Acrolein, stabilized |
| * | * * * * * |
| | Chlorotoluenes (meta-;para-) |
| * | * * * * * |
| | Cyanogen chloride, stabilized |
| * | * * * * * |
| | Desmedipham |
| * | * * * * * |
| PP | Diclofop-methyl |
| * | * * * * * |
| | Dichlorobenzene (meta-; para-) |
| * | * * * * * |
| | Diisopropyl-naphthalenes, mixed isomers |
| * | * * * * * |
| | Ethyl acrylate, stabilized |
| * | * * * * * |
| PP | Fenchlorazole-ethyl |
| * | * * * * * |
| PP | Fenoxapro-ethyl |

LIST OF MARINE POLLUTANTS

| S.M.P. | Marine Pollutant |
|-----------|---------------------------------|
| (1) | (2) |
| PP | Fenoxaprop-P-ethyl |
| * | * * * |
| | Linuron |
| * | * * * |
| PP | Silafluofen |
| * | * * * |
| PP | 1,2,3—Trichlorobenzene |
| * | * * * |
| | Vinylidene chloride, stabilized |
| | Vinyltoluenes, stabilized |
| * | * * * |
| [Revise:] | |
| PP | Dodecyl hydroxypropyl sulfide |
| * | * * * |

13. In § 172.102:
- a. In paragraph (c)(1), Special Provisions 43, 110 and 136 are revised and Special Provisions 139, 142 and 143 are added;
 - b. In paragraph (c)(2), Special Provision A53 is added;
 - c. Paragraph (c)(3) introductory text and Special Provisions B53 and B69 are revised;
 - d. In paragraph (c)(3), Special Provisions B100, B101, B103, B104, B105, B106, B108, B109 and B110 are removed;
 - e. Paragraphs (c)(4) and (c)(7) are revised; and
 - f. Paragraph (c)(8), Special Provisions W7, W8 and W9 are added in numerical order.

The additions and revisions read as follows:

§ 172.102 Special provisions.

* * * * *

(c) * * *

(1) * * *

Code/Special Provisions

* * * * *

43 The membrane filters, including paper separators and coating or backing materials, that are present in transport, must not be able to propagate a detonation as tested by one of the tests described in the UN Manual of Tests and Criteria, Part I, Test series 1(a) (see § 171.7 of this subchapter). On the basis of the results of suitable burning rate tests, and taking into account the standard tests in the UN Manual of Tests and Criteria, Part III, subsection 33.2.1 (see § 171.7 of this subchapter), nitrocellulose membrane filters in the form in which they are to be

transported that do not meet the criteria for a Division 4.1 material are not subject to the requirements of this subchapter. Packagings must be so constructed that explosion is not possible by reason of increased internal pressure. Nitrocellulose membrane filters covered by this entry, each with a mass not exceeding 0.5 g, are not subject to the requirements of this subchapter when contained individually in an article or a sealed packet.

* * * * *

110 Fire extinguishers transported under UN1044 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 extinguishing unit.

* * * * *

136 This entry only applies to machinery and apparatus containing hazardous materials as in integral element of the machinery or apparatus. It may not be used to describe machinery or apparatus for which a proper shipping name exists in the § 172.101 Table. Except when approved by the Associate Administrator, machinery or apparatus may only contain hazardous materials for which exceptions are referenced in Column (8) of the § 172.101 Table and are provided in part 173, subpart D, of this subchapter. Hazardous materials shipped under this entry are excepted from the labeling requirements of this subchapter unless offered for transportation or transported by aircraft and are not subject to the placarding requirements of part 173, subpart F, of this subchapter. Orientation markings as described in § 172.312 (a)(2) are required when liquid hazardous materials may escape due to incorrect orientation. The machinery or apparatus, if unpackaged, or the packaging in which it is contained shall be marked "Dangerous goods in machinery" or "Dangerous goods in apparatus", as appropriate, with the identification number UN3363. For transportation by aircraft, machinery or apparatus may not contain any material forbidden for transportation by passenger or cargo aircraft. The Associate Administrator may except from the requirements of this subchapter, equipment, machinery and apparatus provided:

- a. It is shown that it does not pose a significant risk in transportation;
- b. The quantities of hazardous materials do not exceed those specified in § 173.4 of this subchapter; and
- c. The equipment, machinery or apparatus conforms with § 173.222 of this subchapter.

* * * * *

139 Use of the "special arrangement" proper shipping names for international shipments must be made under an IAEA Certificate of Competent Authority issued by the Associate Administrator in accordance with the requirements in § 173.471, § 173.472, or § 173.473 of this subchapter. Use of these proper shipping names for

domestic shipments may be made only under a DOT exemption, as defined in, and in accordance with the requirements of subpart B of part 107 of this subchapter.

* * * * *

142 These hazardous materials may not be classified and transported unless authorized by the Associate Administrator. The Associate Administrator will base the authorization on results from Series 2 tests and a Series 6(c) test from the UN Manual of Tests and Criteria (see § 171.7 of this subchapter) on packages as prepared for transport in accordance with the requirements of this subchapter.

143 These articles may contain:

- a. Division 2.2 compressed gases, including oxygen;
- b. Signal devices (Class 1) which may include smoke and illumination signal flares. Signal devices must be packed in plastic or fiberboard inner packagings;
- c. Electric storage batteries;
- d. First aid kits; or
- e. Strike anywhere matches.

(2) * * *

Code/Special Provisions

* * * * *

A53 Refrigerating machines and refrigerating machine components are not subject to the requirements of this subchapter when containing less than 12 kg (26.4 pounds) of a non-flammable gas or when containing 12 L (3 gallons) or less of ammonia solution (UN2672) (see § 173.307 of this subchapter).

(3) "B" codes. These provisions apply only to bulk packagings, other than IBCs:

Code/Special Provisions

* * * * *

B53 Packagings must be made of either aluminum or steel.

* * * * *

B69 Dry sodium cyanide or potassium cyanide may be shipped in sift-proof weather-resistant metal covered hopper cars, covered motor vehicles, portable tanks or non-specification bins. Siftproof, water-resistant, fiberboard IBCs are permitted when transported in closed freight containers or transport vehicles. Bins must be approved by the Associate Administrator.

* * * * *

(4) Table 1, Table 2, and Table 3—IB Codes, Organic Peroxide IBC Code, and IP Special IBC Packing Provisions.

These provisions apply only to transportation in IBCs. IBCs may be used for the transportation of hazardous materials when no IBC code is assigned in the § 172.101 Table for the specific material only when approved by the Associate Administrator. Tables 1, 2, and 3 follow:

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 130kPa 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. |
| IB4 | <i>Authorized IBCs:</i> Metal (11A, 11B, 11N, 21A, 21B, 21N, 31A, 31B and 31N). |
| IB5 | <i>Authorized IBCs:</i> Metal (11A, 11B, 11N, 21A, 21B, 21N, 31A, 31B and 31N); 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, 21N, 31A, 31B and 31N); 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, 21N, 31A, 31B and 31N); 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, 21N, 31A, 31B and 31N); 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). |
| IB99 | IBCs are only authorized if approved by the Associate Administrator. |

TABLE 2.—ORGANIC PEROXIDE IBC CODE (IB52)

[This IBC Code applies to organic peroxides of type F. For formulations not listed in this table, only IBCs that are approved by the Associate Administrator may be used.]

| UN No. | Organic peroxide | Type of IBC | Maximum quantity (liters) | Control temperature | Emergency temperature |
|------------|---|-------------|---------------------------|---------------------|-----------------------|
| 3109 | ORGANIC PEROXIDE, TYPE F, LIQUID tert-Butyl hydroperoxide, not more than 72% with water | 31A | 1250 | | |
| | tert-Butyl peroxyacetate, not more than 32% in diluent type A | 31A | 1250 | | |
| | | 31HA1 | 1000 | | |
| | tert-Butyl peroxy-3,5,5-trimethylhexanoate, not more than 32% in diluent type A. | 31A | 1250 | | |
| | | 31HA1 | 1000 | | |
| | Cumyl hydroperoxide, not more than 90% in diluent type A | 31HA1 | 1250 | | |
| | Dibenzoyl peroxide, not more than 42% as a stable dispersion | 31H1 | 1000 | | |
| | Di-tert-butyl peroxide, not more than 52% in diluent type A | 31A | 1250 | | |
| | | 31HA1 | 1000 | | |
| | 1,1-Di-(tert-butylperoxy) cyclohexane, not more than 42% in diluent type A | 31H1 | 1000 | | |
| | Dilauroyl peroxide, not more than 42%, stable dispersion, in water | 31HA1 | 1000 | | |
| | Isopropyl cumyl hydroperoxide, not more than 72% in diluent type A | 31HA1 | 1250 | | |
| | p-Menthyl hydroperoxide, not more than 72% in diluent type A | 31HA1 | 1250 | | |
| | Peroxyacetic acid, stabilized, not more than 17% | 31H1 | 1500 | | |
| | | 31HA1 | 1500 | | |
| | | 31A | 1500 | | |
| 3110 | Organic peroxide type F, solid | 31A | | | |
| | | 31H1 | | | |
| | | 31HA1 | | | |
| | Dicumyl peroxide | 31A | | | |
| | | 31H1 | | | |
| | | 31HA1 | | | |
| 3119 | ORGANIC PEROXIDE, TYPE F, LIQUID, TEMPERATURE CONTROLLED tert-Butyl peroxy-2-ethylhexanoate, not more than 32% in diluent type B | 31HA1 | 1000 | +30°C | +35°C |
| | | 31A | 1250 | +30°C | +35°C |
| | tert-Butyl peroxyneodecanoate, not more than 32% in diluent type A | 31A | 1250 | 0°C | +10°C |
| | tert-Butyl peroxyneodecanoate, not more than 42% stable dispersion, in water | 31A | 1250 | -5°C | +5°C |
| | tert-Butyl peroxy-pivalate, not more than 27% in diluent type B | 31HA1 | 1000 | +10°C | +15°C |
| | | 31A | 1250 | +10°C | +15°C |
| | Cumyl peroxyneodecanoate, not more than 52%, stable dispersion, in water .. | 31A | 1250 | -15°C | -5°C |
| | Di-(4-tert-butylcyclohexyl) peroxydicarbonate, not more than 42%, stable dispersion, in water. | 31HA1 | 1000 | +30°C | +35°C |
| | Dicetyl peroxydicarbonate, not more than 42%, stable dispersion, in water | 31HA1 | 1000 | +30°C | +35°C |
| | Di-(2-ethylhexyl) peroxydicarbonate, not more than 52%, stable dispersion, in water. | 31A | 1250 | -20°C | -10°C |
| | Dimyristyl peroxydicarbonate, not more than 42%, stable dispersion, in water | 31HA1 | 1000 | +15°C | +20°C |

TABLE 2.—ORGANIC PEROXIDE IBC CODE (IB52)—Continued

[This IBC Code applies to organic peroxides of type F. For formulations not listed in this table, only IBCs that are approved by the Associate Administrator may be used.]

| UN No. | Organic peroxide | Type of IBC | Maximum quantity (liters) | Control temperature | Emergency temperature |
|--------|--|-------------|---------------------------|---------------------|-----------------------|
| | Di-(3,5,5-trimethylhexanoyl) peroxide, not more than 38% in diluent type A | 31HA1 | 1000 | +10°C | +15°C |
| | | 31A | 1250 | +10°C | +15°C |
| | Di-(3,5,5-trimethylhexanoyl) peroxide, not more than 52%, stable dispersion, in water. | 31A | 1250 | +10°C | +15°C |
| | 1,1,3,3-Tetramethylbutyl peroxyneodecanoate, not more than 52%, stable dispersion, in water. | 31A | 1250 | -5°C | +5°C |

TABLE 3.—IP CODES

- IP1 IBCs must be packed in closed freight containers or a closed transport vehicle.
- IP2 When IBCs other than metal or rigid plastics IBCs are used, they must be offered for transportation in a closed freight container or a closed transport vehicle.
- IP3 Flexible IBCs must be sift-proof and water-resistant or must be fitted with a sift-proof and water-resistant liner.
- IP4 Flexible, fiberboard or wooden IBCs must be sift-proof and water-resistant or be fitted with a sift-proof and water-resistant liner.
- IP5 IBCs must have a device to allow venting. The inlet to the venting device must be located in the vapor space of the IBC under maximum filling conditions.
- IP6 Non-specification bulk bins are authorized.
- IP7 For UN identification numbers 1327, 1363, 1364, 1365, 1386, 1841, 2211, 2217, 2793 and 3314, IBCs are not required to meet the IBC performance tests specified in part 178, subpart N of this subchapter.

* * * * *

(7) “T” codes. (i) These provisions apply to the transportation of hazardous materials in UN portable tanks. Portable tank instructions specify the requirements applicable to a portable tank when used for the transportation of a specific hazardous material. These requirements must be met in addition to the design and construction specifications in part 178 of this subchapter. Portable tank instructions T1 through T22 specify the applicable minimum test pressure, the minimum shell thickness (in reference steel), bottom opening requirements and pressure relief requirements. In T23, the organic peroxides and self-reactive substances which are authorized to be

transported in portable tanks are listed along with the applicable control and emergency temperatures. Liquefied compressed gases are assigned to portable tank instruction T50. T50 provides the maximum allowable working pressures, bottom opening requirements, pressure relief requirements and degree of filling requirements for liquefied compressed gases permitted for transport in portable tanks. Refrigerated liquefied gases which are authorized to be transported in portable tanks are specified in tank instruction T75.

(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 the applicable requirements for bottom openings in part 178 of this subchapter or references “Prohibited” which means bottom openings are prohibited. The table follows:

TABLE OF PORTABLE TANK T CODER T1–T22

[Portable tank code 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) |
| T1 | 1.5 | § 178.274(d)(2) | Normal | § 178.275(d)(2). |
| T2 | 1.5 | § 178.274(d)(2) | Normal | § 178.275(d)(3). |
| T3 | 2.65 | § 178.274(d)(2) | Normal | § 178.275(d)(2). |
| T4 | 2.65 | § 178.274(d)(2) | Normal | § 178.275(d)(3). |
| T5 | 2.65 | § 178.274(d)(2) | § 178.275(g)(3) | Prohibited. |
| T6 | 4 | § 178.274(d)(2) | Normal | § 178.275(d)(2). |
| T7 | 4 | § 178.274(d)(2) | Normal | § 178.275(d)(3). |
| T8 | 4 | § 178.274(d)(2) | Normal | Prohibited. |
| T9 | 4 | 6 mm | Normal | Prohibited. |
| T10 | 4 | 6 mm | § 178.275(g)(3) | Prohibited. |
| T11 | 6 | § 178.274(d)(2) | Normal | § 178.275(d)(3). |
| T12 | 6 | § 178.274(d)(2) | § 178.275(g)(3) | § 178.275(d)(3). |

TABLE OF PORTABLE TANK T CODER T1-T22—Continued

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

| Portable tank instruction (1) | Minimum test pressure (bar) (2) | Minimum shell thickness (in mm-reference steel) (See § 178.274(d)) (3) | Pressure-relief requirements (See § 178.275(g)) (4) | Bottom opening requirements (See § 178.275(d)) (5) |
|----------------------------------|------------------------------------|--|---|--|
| T13 | 6 | 6 mm | Normal | Prohibited. |
| T14 | 6 | 6 mm | § 178.275(g)(3) | Prohibited. |
| T15 | 10 | § 178.274(d)(2) | Normal | § 178.275(d)(3). |
| T16 | 10 | § 178.274(d)(2) | § 178.275(g)(3) | § 178.275(d)(3). |
| T17 | 10 | 6 mm | Normal | § 178.275(d)(3). |
| T18 | 10 | 6 mm | § 178.275(g)(3) | § 178.275(d)(3). |
| T19 | 10 | 6 mm | § 178.275(g)(3) | Prohibited. |
| T20 | 10 | 8 mm | § 178.275(g)(3) | Prohibited. |
| T21 | 10 | 10 mm | Normal | Prohibited. |
| T22 | 10 | 10 mm | § 178.275(g)(3) | Prohibited. |

(iii) The following table specifies the portable tank requirements applicable to T23 for self-reactive substances of Division 4.1 and organic peroxides of Division 5.2 which are authorized to be transported in portable tanks:

PORTABLE TANK CODE T23

[Portable tank code T23 applies to self-reactive substances of Division 4.1 and organic peroxides of Division 5.2.]

| UN No. | Hazardous material | Minimum test pressure (bar) | Minimum shell thickness (mm-reference steel) See . . . | Bottom opening requirements See . . . | Pressure-relief requirements See . . . | Filling limits | Control temperature | Emergency temperature |
|--|--|-----------------------------|---|--|---|-----------------------------------|------------------------------|------------------------------|
| 3109 | Organic peroxide, Type F, liquid | 4 | § 178.274(d)(2) | § 178.275(d)(3) | § 178.275(g)(1) | Not more than 90% at 59° F (15°C) | | |
| | tert-Butyl hydroperoxide, not more than 72% with water. *Provided that steps have been taken to achieve the safety equivalence of 65% tert-Butyl hydroperoxide and 35% water | 4 | § 178.274(d)(2) | § 178.275(d)(3) | § 178.275(g)(1) | Not more than 90% at 59° F (15°C) | | |
| | Cumyl hydro-peroxide, not more than 90% in diluent type A | 4 | § 178.274(d)(2) | § 178.275(d)(3) | § 178.275(g)(1) | Not more than 90% at 59° F (15°C) | | |
| | Di-tert-butyl peroxide, not more than 32% in diluent type A | 4 | § 178.274(d)(2) | § 178.275(d)(3) | § 178.275(g)(1) | Not more than 90% at 59° F (15°C) | | |
| | Isopropyl cumyl hydro-peroxide, not more than 72% in diluent type A | 4 | § 178.274(d)(2) | § 178.275(d)(3) | § 178.275(g)(1) | Not more than 90% at 59° F (15°C) | | |
| | p-Menthyl hydro-peroxide, not more than 72% in diluent type A | 4 | § 178.274(d)(2) | § 178.275(d)(3) | § 178.275(g)(1) | Not more than 90% at 59° F (15°C) | | |
| 3110 | Pinanyl hydro-peroxide, not more than 50% in diluent type A | 4 | § 178.274(d)(2) | § 178.275(d)(3) | § 178.275(g)(1) | Not more than 90% at 59° F (15°C) | | |
| | Organic peroxide, Type F, solid | 4 | § 178.274(d)(2) | § 178.275(d)(3) | § 178.275(g)(1) | Not more than 90% at 59° F (15°C) | | |
| 3119 | Dicumyl peroxide. *Maximum quantity per portable tank 2,000 kg | | | | | | | |
| | Organic peroxide, Type F, liquid, temperature controlled | 4 | § 178.274(d)(2) | § 178.275(d)(3) | § 178.275(g)(1) | Not more than 90% at 59° F (15°C) | As approved by Assoc. Admin. | As approved by Assoc. Admin. |
| | tert-Butyl peroxyacetate, not more than 32% in diluent type B | 4 | § 178.274(d)(2) | § 178.275(d)(3) | § 178.275(g)(1) | Not more than 90% at 59° F (15°C) | +30°C | +35°C |
| | tert-Butyl peroxy-2-ethylhexanoate, not more than 32% in diluent type B | 4 | § 178.274(d)(2) | § 178.275(d)(3) | § 178.275(g)(1) | Not more than 90% at 59° F (15°C) | +15°C | +20°C |
| tert-Butyl peroxyvalate, not more than 27% in diluent type B | 4 | § 178.274(d)(2) | § 178.275(d)(3) | § 178.275(g)(1) | Not more than 90% at 59° F (15°C) | -5°C | +10°C | |

PORTABLE TANK CODE T23—Continued

[Portable tank code T23 applies to self-reactive substances of Division 4.1 and organic peroxides of Division 5.2.]

| UN No. | Hazardous material | Minimum test pressure (bar) | Minimum shell thickness (mm-reference steel) See . . . | Bottom opening requirements See . . . | Pressure-relief requirements See . . . | Filling limits | Control temperature | Emergency temperature |
|--------|--|-----------------------------|--|---------------------------------------|--|-----------------------------------|------------------------------|------------------------------|
| | tert-Butyl peroxy-3,5,5-trimethyl-hexanoate, not more than 32% in diluent type B | 4 | § 178.274(d)(2) | § 178.275(d)(3) | § 178.275(g)(1) | Not more than 90% at 59° F (15°C) | +35°C | +40°C |
| | Di-(3,5,5-trimethyl-hexanoyl) peroxide, not more than 38% in diluent type A | 4 | § 178.274(d)(2) | § 178.275(d)(3) | § 178.275(g)(1) | Not more than 90% at 59° F (15°C) | 0°C | +5°C |
| 3120 | Organic peroxide, Type F, solid, temperature controlled | 4 | § 178.274(d)(2) | § 178.275(d)(3) | § 178.275(g)(1) | Not more than 90% at 59° F (15°C) | As approved by Assoc. Admin. | As approved by Assoc. Admin. |
| 3229 | Self-reactive liquid Type F | 4 | § 178.274(d)(2) | § 178.275(d)(3) | § 178.275(g)(1) | Not more than 90% at 59° F (15°C) | | |
| 3230 | Self-reactive solid Type F | 4 | § 178.274(d)(2) | § 178.275(d)(3) | § 178.275(g)(1) | Not more than 90% at 59° F (15°C) | | |
| 3239 | Self-reactive liquid Type F, temperature controlled | 4 | § 178.274(d)(2) | § 178.275(d)(3) | § 178.275(g)(1) | Not more than 90% at 59° F (15°C) | As approved by Assoc. Admin. | As approved by Assoc. Admin. |
| 3240 | Self-reactive solid Type F, temperature controlled | 4 | § 178.274(d)(2) | § 178.275(d)(3) | § 178.275(g)(1) | Not more than 90% at 59° F (15°C) | As approved by Assoc. Admin. | As approved by Assoc. Admin. |

(iv) The following portable tank instruction applies to portable tanks used for the transportation of liquefied compressed gases. The T50 table provides the UN identification number and proper shipping name for each liquefied compressed gas authorized to be transported in a T50 portable tank. The table provides maximum allowable working pressures, bottom opening requirements, pressure relief device

requirements and degree of filling requirements for each liquefied compressed gases permitted for transportation in a T50 portable tank. In the minimum test pressure column, “small” means a portable tank with a diameter of 1.5 meters or less when measured at the widest part of the shell, “sunshield” means a portable tank with a shield covering at least the upper third of the shell, “bare” means no sunshield

or insulation is provided, and “insulated” means a complete cladding of sufficient thickness of insulating material necessary to provide a minimum conductance of not more than 0.67 w/m²/k. In the pressure relief requirements column, the word “Normal” denotes that a frangible disc as specified in § 178.276(e)(3) of this subchapter is not required. The T50 table follows:

PORTABLE TANK CODE T50

[Portable tank code T50 applies to liquefied compressed gases.]

| UN No. | Non-refrigerated liquefied compressed gases | Max. allowable working pressure (bar) small; bare; sunshield; insulated | Openings below liquid level | Pressure relief requirements (see § 178.27(e)) | Maximum filling density (kg/l) |
|--------|--|---|-----------------------------|--|--------------------------------|
| 1005 | Ammonia, anhydrous | 29.0 25.7 22.0 19.7 | Allowed | § 178.276(e)(3) | 0.53 |
| 1009 | Bromotrifluoromethane or Refrigerant gas R 13B1. | 38.0 34.0 30.0 27.5 | Allowed | Normal | 1.13 |
| 1010 | Butadienes, stabilized | 7.5 7.0 7.0 7.0 | Allowed | Normal | 0.55 |
| 1011 | Butane | 7.0 7.0 7.0 7.0 | Allowed | Normal | 0.51 |

PORTABLE TANK CODE T50—Continued
[Portable tank code T50 applies to liquefied compressed gases.]

| UN No. | Non-refrigerated liquefied compressed gases | Max. allowable working pressure (bar) small; bare; sunshield; insulated | Openings below liquid level | Pressure relief requirements (see § 178.27(e)) | Maximum filling density (kg/l) |
|--------|--|---|-----------------------------|--|--------------------------------|
| 1012 | Butylene | 8.0 7.0 7.0 7.0 | Allowed | Normal | 0.53 |
| 1017 | Chlorine | 19.0 17.0 15.0 13.5 | Not Allowed | § 178.276(e)(3) | 1.25 |
| 1018 | Chlorodifluoromethane or Refrigerant gas R 22. | 26.0 24.0 21.0 19.0 | Allowed | Normal | 1.03 |
| 1020 | Chloropentafluoroethane or Refrigerant gas R 115. | 23.0 20.0 18.0 16.0 | Allowed | Normal | 1.06 |
| 1021 | 1-Chloro-1,2,2,2-tetrafluoroethane or Refrigerant gas R 124. | 10.3 9.8 7.9 7.0 | Allowed | Normal | 1.2 |
| 1027 | Cyclopropane | 18.0 16.0 14.5 13.0 | Allowed | Normal | 0.53 |
| 1028 | Dichlorodifluoromethane or Refrigerant gas R 12. | 16.0 15.0 13.0 11.5 | Allowed | Normal | 1.15 |
| 1029 | Dichlorofluoromethane or Refrigerant gas R 21. | 7.0 7.0 7.0 7.0 | Allowed | Normal | 1.23 |
| 1030 | 1,1-Difluoroethane or Refrigerant gas R 152a. | 16.0 14.0 12.4 11.0 | Allowed | Normal | 0.79 |
| 1032 | Dimethylamine, anhydrous | 7.0 7.0 7.0 7.0 | Allowed | Normal | 0.59 |
| 1033 | Dimethyl ether | 15.5 13.8 12.0 10.6 | Allowed | Normal | 0.58 |
| 1036 | Ethylamine | 7.0 7.0 7.0 7.0 | Allowed | Normal | 0.61 |
| 1037 | Ethyl chloride | 7.0 7.0 7.0 7.0 | Allowed | Normal | 0.8 |

PORTABLE TANK CODE T50—Continued
[Portable tank code T50 applies to liquefied compressed gases.]

| UN No. | Non-refrigerated liquefied compressed gases | Max. allowable working pressure (bar) small; bare; sunshield; insulated | Openings below liquid level | Pressure relief requirements (see § 178.27(e)) | Maximum filling density (kg/l) |
|------------|---|---|-----------------------------|--|--------------------------------|
| 1040 | Ethylene oxide with <i>nitrogen up to a total pressure of 1MPa (10 bar) at 50 °C.</i> | Only authorized in 10 bar insulated portable tanks. | Not allowed | § 178.276(e)(3) | 0.78 |
| 1041 | Ethylene oxide and carbon dioxide mixture with more than 9% but not more than 87% ethylene oxide. | See MAWP definition in § 178.276(a). | Allowed | Normal | See § 173.32(f) |
| 1055 | Isobutylene | 8.1 | Allowed | Normal | 0.52 |
| | | 7.0 | | | |
| | | 7.0 | | | |
| | | 7.0 | | | |
| 1060 | Methyl acetylene and propadiene mixture, stabilized. | 28.0 | Allowed | Normal | 0.43 |
| | | 24.5 | | | |
| | | 22.0 | | | |
| | | 20.0 | | | |
| 1061 | Methylamine, anhydrous | 10.8 | Allowed | Normal | 0.58 |
| | | 9.6 | | | |
| | | 7.8 | | | |
| | | 7.0 | | | |
| 1062 | Methyl bromide | 7.0 | Not allowed | § 178.276(e)(3) | 1.51 |
| | | 7.0 | | | |
| | | 7.0 | | | |
| | | 7.0 | | | |
| 1063 | Methyl chloride or Refrigerant gas R 40. | 14.5 | Allowed | Normal | 0.81 |
| | | 12.7 | | | |
| | | 11.3 | | | |
| | | 10.0 | | | |
| 1064 | Methyl mercaptan | 7.0 | Not allowed | § 178.276(e)(3) | 0.78 |
| | | 7.0 | | | |
| | | 7.0 | | | |
| | | 7.0 | | | |
| 1067 | Dinitrogen tetroxide | 7.0 | Not allowed | § 178.276(e)(3) | 1.3 |
| | | 7.0 | | | |
| | | 7.0 | | | |
| | | 7.0 | | | |
| 1075 | Petroleum gas, liquefied | See MAWP definition in § 178.276(a). | Allowed | Normal | See § 173.32(f) |
| 1077 | Propylene | 28.0 | Allowed | Normal | 0.43 |
| | | 24.5 | | | |
| | | 22.0 | | | |
| | | 20.0 | | | |
| 1078 | Refrigerant gas, n.o.s. | See MAWP definition in § 178.276(a). | Allowed | Normal | See § 173.32(f) |
| 1079 | Sulphur dioxide | 11.6 | Not allowed | § 178.276(e)(3) | 1.23 |
| | | 10.3 | | | |
| | | 8.5 | | | |
| | | 7.6 | | | |
| 1082 | Trifluorochloroethylene, stabilized or Refrigerant gas R 1113. | 17.0 | Not allowed | § 178.276(e)(3) | 1.13 |
| | | 15.0 | | | |
| | | 13.1 | | | |
| | | 11.6 | | | |

PORTABLE TANK CODE T50—Continued
[Portable tank code T50 applies to liquefied compressed gases.]

| UN No. | Non-refrigerated liquefied compressed gases | Max. allowable working pressure (bar) small; bare; sunshield; insulated | Openings below liquid level | Pressure relief requirements (see § 178.27(e)) | Maximum filling density (kg/l) |
|---------------|---|---|-----------------------------|--|--------------------------------|
| 1083 | Trimethylamine, anhydrous | 7.0 7.0 7.0 7.0 | Allowed | Normal | 0.56 |
| 1085 | Vinyl bromide, stabilized | 7.0 7.0 7.0 7.0 | Allowed | Normal | 1.37 |
| 1086 | Vinyl chloride, stabilized | 10.6 9.3 8.0 7.0 | Allowed | Normal | 0.81 |
| 1087 | Vinyl methyl ether, stabilized | 7.0 7.0 7.0 7.0 | Allowed | Normal | 0.67 |
| 1581 | Chloropicrin and methyl bromide mixture. | 7.0 7.0 7.0 7.0 | Not Allowed | § 178.276(e)(3) | 1.51 |
| 1582 | Chloropicrin and methyl chloride mixture. | 19.2 16.9 15.1 13.1 | Not allowed | § 178.276(e)(3) | 0.81 |
| 1858 | Hexafluoropropylene compressed or Refrigerant gas R 1216. | 19.2 16.9 15.1 13.1 | Allowed | Normal | 1.11 |
| 1912 | Methyl chloride and methylene chloride mixture. | 15.2 13.0 11.6 10.1 | Allowed | Normal | 0.811954 |
| NA 1954 | Insecticide gases, <i>flammable</i> , n.o.s. | See MAWP definition in § 178.276(a). | Allowed | Normal | § 173.32(f) |
| 1958 | 1,2-Dichloro-1,1,2,2-tetrafluoroethane or Refrigerant gas R 114. | 7.0 7.0 7.0 7.0 | Allowed | Normal | 1.3 |
| 1965 | Hydrocarbon gas, mixture liquefied, n.o.s.. | See MAWP definition in 178.276(a). | Allowed | Normal | See § 173.32(f) |
| 1969 | Isobutane | 8.5 7.5 7.0 7.0 | Allowed | Normal | 0.49 |
| 1973 | Chlorodifluoromethane and chloropentafluoroethane mixture with fixed boiling point, with approximately 49% chlorodifluoromethane or Refrigerant gas R502. | 28.3 25.3 22.8 20.3 | Allowed | Normal | 1.05 |
| 1974 | Chlorodifluorobromomethane or Refrigerant gas R 12B1. | 7.4 7.0 7.0 7.0 | Allowed | Normal | 1.61 |

PORTABLE TANK CODE T50—Continued
[Portable tank code T50 applies to liquefied compressed gases.]

| UN No. | Non-refrigerated liquefied compressed gases | Max. allowable working pressure (bar) small; bare; sunshield; insulated | Openings below liquid level | Pressure relief requirements (see § 178.27(e)) | Maximum filling density (kg/l) |
|------------|--|---|-----------------------------|--|--------------------------------|
| 1976 | Octafluorocyclobutane or Refrigerant gas RC 318. | 8.8 7.8 7.0 7.0 | Allowed | Normal | 1.34 |
| 1978 | Propane | 22.5 20.4 18.0 16.5 | Allowed | Normal | 0.42 |
| 1983 | 1-Chloro-2,2,2-trifluoroethane or Refrigerant gas R 133a. | 7.0 7.0 7.0 7.0 | Allowed | Normal | 1.18 |
| 2035 | 1,1,1-Trifluoroethane compressed or Refrigerant gas R 143a. | 31.0 27.5 24.2 21.8 | Allowed | Normal | 0.76 |
| 2424 | Octafluoropropane or Refrigerant gas R 218. | 23.1 20.8 18.6 16.6 | Allowed | Normal | 1.07 |
| 2517 | 1-Chloro-1,1-difluoroethane or Refrigerant gas R 142b. | 8.9 7.8 7.0 7.0 | Allowed | Normal | 0.99 |
| 2602 | Dichlorodifluoromethane and difluoroethane azeotropic mixture with approximately 74% dichlorodifluoromethane or Refrigerant gas R 500. | 20.0 18.0 16.0 14.5 | Allowed | Normal | 1.01 |
| 3057 | Trifluoroacetyl chloride | 14.6 12.9 11.3 9.9 | Not allowed | § 178.276(e)(3) | 1.17 |
| 3070 | Ethylene oxide and dichlorodifluoromethane mixture with not more than 12.5% ethylene oxide. | 14.0 12.0 11.0 9.0 | Allowed | § 178.276(e)(3) | 1.09 |
| 3153 | Perfluoro (methyl vinyl ether) | 14.3 13.4 11.2 10.2 | Allowed | Normal | 1.14 |
| 3159 | 1,1,1,2-Tetrafluoroethane or Refrigerant gas R 134a. | 17.7 15.7 13.8 12.1 | Allowed | Normal | 1.04 |
| 3161 | Liquefied gas, flammable, n.o.s. | See MAWP definition in § 178.276(a). | Allowed | Normal | § 173.32(f) |
| 3163 | Liquefied gas, n.o.s. | See MAWP definition in § 178.276(a). | Allowed | Normal | § 173.32(f) |

PORTABLE TANK CODE T50—Continued
[Portable tank code T50 applies to liquefied compressed gases.]

| UN No. | Non-refrigerated liquefied compressed gases | Max. allowable working pressure (bar) small; bare; sunshield; insulated | Openings below liquid level | Pressure relief requirements (see § 178.27(e)) | Maximum filling density (kg/l) |
|--------|---|---|-----------------------------|--|--------------------------------|
| 3220 | Pentafluoroethane or Refrigerant gas R 125. | 34.4 30.8 27.5 24.5 | Allowed | Normal | 0.95 |
| 3252 | Difluoromethane or Refrigerant gas R 32. | 43.0 39.0 34.4 30.5 | Allowed | Normal | 0.78 |
| 3296 | Heptafluoropropane or Refrigerant gas R 227. | 16.0 14.0 12.5 11.0 | Allowed | Normal | 1.2 |
| 3297 | Ethylene oxide and chlorotetrafluoroethane mixture, with not more than 8.8% ethylene oxide. | 8.1 7.0 7.0 7.0 | Allowed | Normal | 1.16 |
| 3298 | Ethylene oxide and pentafluoroethane mixture, with not more than 7.9% ethylene oxide. | 25.9 23.4 20.9 18.6 | Allowed | Normal | 1.02 |
| 3299 | Ethylene oxide and tetrafluoroethane mixture, with not more than 5.6% ethylene oxide. | 16.7 14.7 12.9 11.2 | Allowed | Normal | 1.03 |
| 3318 | Ammonia solution, relative density less than 0.880 at 15 °C in water, with more than 50% ammonia. | See MAWP definition in 178.276(a). | Allowed | § 178.276(e)(3) | § 173.32(f) |
| 3337 | Refrigerant gas R 404A | 31.6 28.3 25.3 22.5 | Allowed | Normal | 0.84 |
| 3338 | Refrigerant gas R 407A | 31.3 28.1 25.1 22.4 | Allowed | Normal | 0.95 |
| 3339 | Refrigerant gas R 407B | 33.0 29.6 26.5 23.6 | Allowed | Normal | 0.95 |
| 3340 | Refrigerant gas R 407C | 29.9 26.8 23.9 21.3 | Allowed | Normal | 0.95 |

(v) When portable tank instruction T75 is referenced in Column (7) of the § 172.101 Table, the applicable refrigerated liquefied gases are authorized to be transported in portable tanks in accordance with the requirements of § 178.277 of this subchapter.

(vi) *UN and IM portable tank codes/special provisions.* When a specific portable tank instruction is specified by

a T Code in Column (7) of the § 172.101 Table for a specific hazardous material, a Specification portable tank conforming to an alternative tank instruction may be used if:

(A) the alternative portable tank has a higher or equivalent test pressure (for example, 4 bar when 2.65 bar is specified);

(B) the alternative portable tank has greater or equivalent wall thickness (for

example, 10 mm when 6 mm is specified);

(C) the alternative portable tank has a pressure relief device as specified in the T Code. If a frangible disc is required in series with the reclosing pressure relief device for the specified portable tank, the alternative portable tank must be fitted with a frangible disc in series with the reclosing pressure relief device; and

(D) With regard to bottom openings—

(1) When two effective means are specified, the alternative portable tank is fitted with bottom openings having two or three effective means of closure or no bottom openings; or

(2) When three effective means are specified, the portable tank has no bottom openings or three effective means of closure; or

(3) When no bottom openings are authorized, the alternative portable tank must not have bottom openings.

(vii) When a hazardous material is not assigned a portable tank T Code or TP 9 is referenced in Column (7) of the § 172.101 Table, the hazardous material may only be transported in a portable tank if approved by the Associate Administrator.

(viii) Portable tank special provisions are assigned to certain hazardous materials to specify requirements that are in addition to those provided by the portable tank instructions or the requirements in part 178 of this subchapter. Portable tank special provisions are designated with the abbreviation TP (tank provision) and are assigned to specific hazardous materials in Column (7) of the § 172.101 Table. The following is a list of the portable tank special provisions:

Code/Special Provisions

TP1 The maximum degree of filling must not exceed the degree of filling determined by the following:

$$\left(\text{Degree of filling} = \frac{97}{1 + \alpha(t_r - t_f)} \right).$$

Where:

t_r is the maximum mean bulk temperature during transport, and t_f is the temperature in degrees celsius of the liquid during filling.

TP2 a. The maximum degree of filling must not exceed the degree of filling determined by the following:

$$\left(\text{Degree of filling} = \frac{95}{1 + \alpha(t_r - t_f)} \right).$$

Where:

t_r is the maximum mean bulk temperature during transport,

t_f is the temperature in degrees celsius of the liquid during filling, and

α is the mean coefficient of cubical expansion of the liquid between the mean temperature of the liquid during filling (t_f) and the maximum mean bulk temperature during transportation (t_r) both in degrees celsius.

b. For liquids transported under ambient conditions α may be calculated using the formula:

$$\alpha = \frac{d_{15} - d_{50}}{35 d_{50}}$$

Where:

d_{15} and d_{50} are the densities (in units of mass per unit volume) of the liquid at 15°C (59°F) and 50°C (122°F), respectively.

TP3 For liquids transported under elevated temperature, the maximum degree of filling is determined by the following:

$$\left(\text{Degree of filling} = 95 \frac{d_t}{d_f} \right).$$

Where:

d_t is the density of the material at the maximum mean bulk temperature during transport; and

d_f is the density of the material at the temperature in degrees celsius of the liquid during filling; and

d_r is the density of the liquid at the mean temperature of the liquid during filling, and d_t is the maximum mean bulk temperature during transport.

TP4 The maximum degree of filling for portable tanks must not exceed 90%.

TP5 For a portable tank used for the transport of flammable refrigerated liquefied gases or refrigerated liquefied oxygen, the maximum rate at which the portable tank may be filled must not exceed the liquid flow capacity of the primary pressure relief system rated at a pressure not exceeding 120 percent of the portable tank's design pressure. For portable tanks used for the transport of refrigerated liquefied helium and refrigerated liquefied atmospheric gas (except oxygen), the maximum rate at which the tank is filled must not exceed the liquid flow capacity of the pressure relief device rated at 130 percent of the portable tank's design pressure. Except for a portable tank containing refrigerated liquefied helium, a portable tank shall have an outage of at least two percent below the inlet of the pressure relief device or pressure control valve, under conditions of incipient opening, with the portable tank in a level attitude. No outage is required for helium.

TP6 To prevent the tank from bursting in an event, including fire engulfment (the conditions prescribed in CGA pamphlet S-1.2 (see § 171.7 of this subchapter) may be used to consider the fire engulfment condition), it must be equipped with pressure relief devices that are adequate in relation to the capacity of the tank and the nature of the hazardous material transported.

TP7 The vapor space must be purged of air by nitrogen or other means.

TP8 A portable tank having a minimum test pressure of 1.5 bar (150 kPa) may be used when the flash point of the hazardous material transported is greater than 0°C (32°F).

TP9 A hazardous material assigned to special provision TP9 in Column (7) of the § 172.101 Table may only be transported in a portable tank if approved by the Associate Administrator.

TP10 The portable tank must be fitted with a lead lining at least 5 mm (0.2 inches) thick. The lead lining must be tested annually to ensure that it is intact and functional. Another suitable lining material

may be used if approved by the Associate Administrator.

TP12 This material is considered highly corrosive to steel.

TP13 Self-contained breathing apparatus must be provided when this hazardous material is transported by sea.

TP16 The portable tank must be protected against over and under pressurization which may be experienced during transportation. The means of protection must be approved by the approval agency designated to approve the portable tank in accordance with the procedures in part 107, subpart E, of this subchapter. The pressure relief device must be preceded by a frangible disk in accordance with the requirements in § 178.275(g)(3) of this subchapter to prevent crystallization of the product in the pressure relief device.

TP17 Only inorganic non-combustible materials may be used for thermal insulation of the tank.

TP18 The temperature of this material must be maintained between 18°C (64.4°F) and 40°C (104°F) while in transportation. Portable tanks containing solidified methacrylic acid must not be reheated during transportation.

TP19 The calculated wall thickness must be increased by 3 mm at the time of construction. Wall thickness must be verified ultrasonically at intervals midway between periodic hydraulic tests (every 2.5 years). The portable tank must not be used if the wall thickness is less than that prescribed by the applicable T code in Column (7) of the Table for this material.

TP20 This hazardous material must only be transported in insulated tanks under a nitrogen blanket.

TP21 The wall thickness must not be less than 8 mm. Portable tanks must be hydraulically tested and internally inspected at intervals not exceeding 2.5 years.

TP22 Lubricants for portable tank fittings (for example, gaskets, shut-off valves, flanges) must be oxygen compatible.

TP24 The portable tank may be fitted with a device to prevent the build up of excess pressure due to the slow decomposition of the hazardous material being transported. The device must be in the vapor space when the tank is filled under maximum filling conditions. This device must also prevent an unacceptable amount of leakage of liquid in the case of overturning.

TP25 Sulphur trioxide 99.95% pure and above may be transported in tanks without an inhibitor provided that it is maintained at a temperature equal to or above 32.5°C (90.5°F).

TP26 The heating device must be exterior to the shell. For UN 3176, this requirement only applies when the hazardous material reacts dangerously with water.

TP27 A portable tank having a minimum test pressure of 4 bar (400 kPa) may be used provided the calculated test pressure is 4 bar or less based on the MAWP of the hazardous material, as defined in § 178.275 of this subchapter, where the test pressure is 1.5 times the MAWP.

TP28 A portable tank having a minimum test pressure of 2.65 bar (265 kPa) may be used provided the calculated test pressure is 2.65 bar or less based on the MAWP of the

hazardous material, as defined in § 178.275 of this subchapter, where the test pressure is 1.5 times the MAWP.

TP29 A portable tank having a minimum test pressure of 1.5 bar (150.0 kPa) may be used provided the calculated test pressure is 1.5 bar or less based on the MAWP of the hazardous materials, as defined in § 178.275 of this subchapter, where the test pressure is 1.5 times the MAWP.

TP30 This hazardous material may only be transported in insulated tanks.

TP31 This hazardous material may only be transported in tanks in the solid state.

TP37 IM portable tanks are only authorized for the shipment of hydrogen peroxide solutions in water containing 72% or less hydrogen peroxide by weight. Pressure relief devices shall be designed to prevent the entry of foreign matter, the leakage of liquid and the development of any dangerous excess pressure. In addition, the portable tank must be designed so that internal surfaces may be effectively cleaned and passivated. Each tank must be equipped with pressure relief devices conforming to the following requirements:

| Concentration of hydrogen per peroxide solution | Total ¹ |
|---|--------------------|
| 52% or less | 11 |
| Over 52%, but not greater than 60% | 22 |
| Over 60%, but not greater than 72% | 32 |

¹Total venting capacity in standard cubic feet hour (S.C.F.H.) per pound of hydrogen peroxide solution.

TP38 Each portable tank must be insulated with an insulating material so that the overall thermal conductance at 15.5 °C (60 °F) is no more than 1.5333 kilojoules per hour per square meter per degree Celsius (0.075 Btu per hour per square foot per degree Fahrenheit) temperature differential. Insulating materials may not promote corrosion to steel when wet.

TP44 Each portable tank must be made of stainless steel, except that steel other than stainless steel may be used in accordance with the provisions of § 173.24b(b) of this subchapter. Thickness of stainless steel for tank shell and heads must be the greater of 7.62 mm (0.300 inch) or the thickness required for a portable tank with a design pressure at least equal to 1.5 times the vapor pressure of the hazardous material at 46 °C (115 °F).

TP45 Each portable tank must be made of stainless steel, except that steel other than stainless steel may be used in accordance with the provisions of 173.24b(b) of this subchapter. Thickness of stainless steel for portable tank shells and heads must be the greater of 6.35 mm (0.250 inch) or the thickness required for a portable tank with a design pressure at least equal to 1.3 times the vapor pressure of the hazardous material at 46 °C (115 °F).

TP46 Portable tanks in sodium metal service are not required to be hydrostatically retested.

(8) * * *

Code/Special Provisions

W7 Vessel stowage category for uranyl nitrate hexahydrate solution is "D" as defined in § 172.101(k)(4).

W8 Vessel stowage category for pyrophoric thorium metal or pyrophoric uranium metal is "D" as defined in § 172.101(k)(4).

W9 When offered for transportation by water, the following Specification packagings are not authorized unless approved by the Associate Administrator: woven plastic bags, plastic film bags, textile bags, paper bags, IBCs and bulk packagings.

* * * * *

14. In § 172.202, paragraphs (a)(4) and (e) are revised to read as follows:

§ 172.202 Description of hazardous material on shipping papers.

(a) * * *

(4) The packing group in Roman numerals, as designated for the hazardous material in Column 5 of the § 172.101 Table. Class 1 (explosives) materials, self-reactive substances, organic peroxides and entries that are not assigned a packing group are excepted from this requirement. The packing group may be preceded by the letters "PG" (for example, "PG II"); and

(e) Except for those materials in the UN Recommendations, the ICAO Technical Instructions, or the IMDG Code (see § 171.7 of this subchapter), a material that is not a hazardous material according to this subchapter may not be offered for transportation or transported when its description on a shipping paper includes a hazard class or an identification number specified in the § 172.101 Table.

15. In § 172.203, paragraph (d)(11) is revised, new paragraphs (i)(5) and (i)(6) are added, and paragraph (n) is revised to read as follows:

§ 172.203 Additional description requirements.

* * * * *

(d) * * *

(11) For a shipment of low specific activity material or surface contaminated objects, the appropriate group notation of LSA-I, LSA-II, LSA-III, SCO-I, or SCO-II, unless the group notation is contained in the proper shipping name as described in the § 172.101 Table.

* * * * *

(i) * * *

(5) Minimum flash point if 61°C or below (in °C closed cup (c.c.) in association with the basic description.

(6) Subsidiary hazards not communicated in the proper shipping name shown either following the hazard

class or division in parentheses, or in association with the basic description.

* * * * *

(n) *Elevated temperature materials.* If a liquid material in a package meets the definition of an elevated temperature material in § 171.8 of this subchapter, and the fact that it is an elevated temperature material is not disclosed in the proper shipping name (for example, when the words "Molten" or "Elevated temperature" are part of the proper shipping name), the word "HOT" must immediately precede the proper shipping name of the material on the shipping paper.

* * * * *

§ 172.330 [Amended]

16. In § 172.330, in paragraph (a)(1)(ii), the following changes are made:

a. The proper shipping name, "Acrolein, inhibited" is revised to read "Acrolein, stabilized".

b. The proper shipping name, "Chloroprene, inhibited" is revised to read "Chloroprene, stabilized".

c. The proper shipping name, "Sulfur trioxide, inhibited" is revised to read "Sulfur trioxide, stabilized".

17. In § 172.402, paragraph (b) is revised to read as follows:

§ 172.402 Additional labeling requirements.

* * * * *

(b) *Display of hazard class on labels.* The appropriate hazard class or division number must be displayed in the lower corner of a primary hazard label and a subsidiary hazard label. A subsidiary label meeting the specifications of this section which were in effect on September 30, 2001, such as, a label without the hazard class or division number displayed in the lower corner of the label) may continue to be used as a subsidiary label in domestic transportation by rail or highway until October 1, 2005, provided the color tolerances are maintained and are in accordance with the display requirements in this subchapter.

* * * * *

§ 172.405 [Amended]

18. In § 172.405, the following changes are made:

a. In paragraph (a) introductory text, the wording "subsidiary label when—" is removed and the wording "subsidiary label." is added in its place.

b. Paragraphs (a)(1) and (a)(2) are removed.

19–20. In § 172.411, the section heading, the text of paragraph (c) preceding the labels, and paragraph (d)

are revised and, in paragraph (c), the wording "EXPLOSIVE SUBSIDIARY LABEL:" and the explosive subsidiary label following it are removed, to read as follows:

§ 172.411 EXPLOSIVE 1.1, 1.2, 1.3, 1.4, 1.5 and 1.6 labels.

* * * * *

(c) Except for size and color, the EXPLOSIVE 1.4, EXPLOSIVE 1.5 and EXPLOSIVE 1.6 labels must be as follows:

* * * * *

(d) In addition to complying with § 172.407, the background color on the EXPLOSIVE 1.4, EXPLOSIVE 1.5, EXPLOSIVE 1.6 and EXPLOSIVE subsidiary label must be orange. The "*" shall be replaced with the appropriate compatibility group. The compatibility group letter must be shown as a capitalized Roman letter. Division numerals must measure at least 30 mm (1.2 inches) in height and at least 5 mm (0.2 inches) in width.

21. In § 172.502, paragraph (b)(1) is revised to read as follows:

§ 172.502 Prohibited and permissive placarding.

* * * * *

(b) * * * (1) The restrictions in paragraph (a) of this section do not apply to a bulk packaging, freight container, unit load device, transport vehicle or rail car which is placarded in conformance with TDG Regulations, the IMDG Code or the UN Recommendations (see § 171.7 of this subchapter).

* * * * *

22. In § 172.504, in paragraph (g), a sentence is added at the end of the existing text and paragraphs (g)(1) through (g)(4) are added to read as follows:

§ 172.504 General placarding requirements.

* * * * *

(g) * * * When more than one compatibility group placard is required for Class 1 materials, only one placard is required to be displayed as follows:

- (1) Explosive articles of compatibility groups C, D or E may be placarded displaying compatibility group E.
(2) Explosive articles of compatibility groups C, D, E or N may be placarded displaying compatibility group D.
(3) Explosive substances of compatibility groups C and D may be placarded displaying compatibility group D.
(4) Explosive articles of compatibility groups C, D, E or G, except for fireworks, may be placarded displaying compatibility group E.

§ 172.512 [Amended]

23. In § 172.512, in paragraph (a)(3), the wording "ICAO Technical Instructions" is removed and "ICAO Technical Instructions (see § 171.7 of this subchapter)" is added in its place.

24. In § 172.519, paragraph (b)(4) is revised to read as follows:

§ 172.519 General specifications for placards.

* * * * *

(b) * * *

(4) For a placard corresponding to the primary or subsidiary hazard class of a material, the hazard class or division number must be displayed in the lower corner of the placard. However, a permanently affixed subsidiary placard meeting the specifications of this section which were in effect on September 30, 2001, (such as, a placard without the hazard class or division number displayed in the lower corner of the placard) and which was installed prior to September 30, 2001, may continue to be used as a subsidiary placard in domestic transportation by rail or highway, provided the color tolerances are maintained and are in accordance with the display requirements in this subchapter. Stocks of non-permanently affixed subsidiary placards in compliance with the requirements in effect on September 30, 2001, may continue to be used in domestic transportation by rail or highway until October 1, 2005, or until current stocks are depleted, whichever occurs first.

* * * * *

PART 173—SHIPPERS—GENERAL REQUIREMENTS FOR SHIPMENTS AND PACKAGINGS

25. The authority citation for part 173 continues to read as follows:

Authority: 49 U.S.C. 5101-5127, 44701; 49 CFR 1.53.

26. In § 173.2a, in paragraph (b), in the Precedence of Hazard Table, in the first column, the first three entries are amended by adding a footnote reference "2" immediately following "I", "II", and "III", respectively, and footnote 2 at the end of the Precedence of Hazard Table is revised to read as follows:

§ 173.2a Classification of a material having more than one hazard.

* * * * *

(b) * * *

PRECEDENCE OF HAZARD TABLE

Table with 5 columns and 2 rows of asterisks representing hazard precedence.

2 Materials of Division 4.1 other than self-reactive substances and solid desensitized explosives, and materials of Class 3 other than liquid desensitized explosives.

* * * * *

27. In § 173.4, paragraph (a)(1) introductory text is revised to read as follows:

§ 173.4 Small quantity exceptions.

(a) * * *

(1) The maximum quantity of material per inner receptacle or article is limited to—

* * * * *

28. In § 173.24b, paragraph (e) is added to read as follows:

§ 173.24b Additional general requirements for bulk packagings.

* * * * *

(e) UN portable tanks. (1) A UN portable tank manufactured in the United States must conform in all details to the applicable requirements in parts 172, 173, 178 and 180 of this subchapter.

(2) UN portable tanks manufactured outside the United States. A UN portable tank manufactured outside the United States, in accordance with national or international regulations based on the UN Recommendations on the Transport of Dangerous Goods which is an authorized packaging under § 173.24 of this subchapter, may be filled, offered and transported in the United States, if the § 172.101 Table of this subchapter authorizes the hazardous material for transportation in the UN portable tank and it conforms to the applicable T codes, and tank provision codes, or other special provisions assigned to the hazardous material in Column (7) of the Table when manufactured in a country other than the United States. In addition, the portable tank must be—

- (i) Conform to applicable provisions in the UN Recommendations on the Transport of Dangerous Goods (see § 171.7 of this subchapter) and the requirements of this subpart;
(ii) Be capable of passing the prescribed tests and inspections in part 180 of this subchapter applicable to the UN portable tank specification;
(iii) Be designed and manufactured according to the ASME Code (see § 171.7 of this subchapter) or a pressure vessel design code approved by the Associate Administrator;
(iv) Be approved by the Associate Administrator when the portable tank is

designed and constructed under the provisions of an alternative arrangement (see § 178.274(a)(2) of this subchapter); and

(v) The competent authority of the country of manufacture must provide reciprocal treatment for UN portable tanks manufactured in the United States.

§ 173.31 [Amended]

29. In § 173.31, in paragraph (b)(2)(ii), in the first sentence, the wording “chloroprene, inhibited” is revised to read “chloroprene, stabilized”.

30. Section 173.32 is revised to read as follows:

§ 173.32 Requirements for the use of portable tanks.

(a) *General requirements.* No person may offer a hazardous material for transportation in a portable tank except as authorized by this subchapter.

(1) Except as otherwise provided in this subpart, no person may use a portable tank for the transportation of a hazardous material unless it meets the requirements of this subchapter.

(2) No person may fill and offer for transportation a portable tank when the prescribed periodic test or inspection under subpart G of part 180 of this subchapter has become due until the test or inspection has been successfully completed. This requirement does not apply to any portable tank filled prior to the test or inspection due date.

(3) When a portable tank is used as a cargo tank motor vehicle, it must conform to all the requirements prescribed for cargo tank motor vehicles. (See § 173.33.)

(b) *Substitute packagings.* A particular Specification portable tank may be substituted for another portable tank as follows:

(1) An IM or UN portable tank may be used whenever an IM or UN portable tank having less stringent requirements is authorized provided the portable tank meets or exceeds the requirements for pressure-relief devices, bottom outlets and any other special provisions specified in § 172.102(c)(7)(vi) of this subchapter.

(2) Where a Specification IM101 or IM102 portable tank is prescribed, a UN portable tank or Specification 51 portable tank otherwise conforming to the special commodity requirements of § 172.102(c)(7) of this subchapter for the material to be transported may be used.

(3) A DOT Specification 51 portable tank may be used whenever a DOT Specification 56, 57, or 60 portable tank is authorized. A DOT Specification 60 portable tank may be used whenever a DOT Specification 56 or 57 portable

tank is authorized. A higher integrity tank used instead of a specified portable tank must meet the same design profile; for example, a DOT Specification 51 portable tank must be lined if used instead of a lined DOT Specification 60 portable tank.

(c) *Grandfather provisions for portable tanks—(1) Continued use of Specification 56 and 57 portable tanks.* Continued use of an existing portable tank constructed to DOT Specification 56 or 57 is authorized only for a portable tank constructed before October 1, 1996. A stainless steel portable tank internally lined with polyethylene that was constructed on or before October 1, 1996, and that meets all requirements of DOT Specification 57 except for being equipped with a polypropylene discharge ball valve and polypropylene secondary discharge opening closure, may be marked as a Specification 57 portable tank and used in accordance with the provisions of this section.

(2) A DOT Specification 51, IM 101, or IM 102 portable tank may not be manufactured after January 1, 2003; however, such tanks may continue to be used for the transportation of a hazardous material provided they meet the requirements of this subchapter, including the specification requirements and the requirements of this subchapter for the transportation of the particular hazardous material (see § 171.14(d)(4) of this subchapter), and provided it conforms to the periodic inspection and tests specified for the particular portable tank in subpart G of part 180 of this subchapter. After January 1, 2003, all newly manufactured portable tanks must conform to the requirements for the design, construction and approval of UN portable tanks as specified in §§ 178.273, 178.274, 178.275, 178.276, 178.277 and part 180, subpart G, of this subchapter.

(3) A DOT Specification portable tank manufactured prior to January 1, 1992 that is equipped with a non-reclosing pressure relief device may continue in service for the hazardous materials for which it is authorized. Except for a DOT Specification 56 or 57 portable tank, a DOT Specification portable tank manufactured after January 1, 1992, used for materials meeting the definition for Division 6.1 liquids, Packing Group I or II, Class 2 gases, or Class 3 or 4 liquids, must be equipped with a reclosing pressure relief valve having adequately sized venting capacity unless otherwise specified in this subchapter (see §§ 178.275(f)(4) and 178.277 of this subchapter).

(4) Any portable tank container constructed prior to May 15, 1950,

complying with the requirements of either the ASME Code for Unfired Pressure Vessels, 1946 Edition, or the API ASME Code for Unfired Pressure Vessels, 1943 Edition (see § 171.7 of this subchapter), may be used for the transportation of liquefied compressed gas, provided it fulfills all the requirements of the part and specifications for the particular gas or gases to be transported. Such portable tanks must be marked “ICC Specification 51X” on the plate required by the specification, except as modified by any or all of the following:

(i) Portable tanks designed and constructed in accordance with Pars. U-68, U-69, or U-201 of the ASME Code (see § 171.7 of this subchapter) may be used. Portable tanks designed and constructed in accordance with Par. U-68 or Par. U-69 may be re-rated at a working pressure 25 percent in excess of the design pressure for which the portable tank was originally constructed. If the portable tank is re-rated, the re-rated pressure must be marked on the plate as follows: “Re-rated working pressure—psig”.

Note to Paragraph (c)(4)(i): For purposes of setting safety relief valves, pressure control valves, establishing retest pressure and maximum and minimum design pressures, the re-rated working pressure must be considered as the equivalent of the design pressure as defined in the specification.

(ii) Loading and unloading accessories, valves, piping, fittings, safety and gauging devices, do not have to comply with the requirements for the particular location on the portable tank.

(5) Any ICC Specification 50 portable tank fulfilling the requirements of that specification may be continued in service for transportation of a liquefied petroleum gas if it is retested every five years in accordance with the requirements in § 180.605 of this subchapter. Use of existing portable tanks is authorized. New construction is not authorized.

(d) *Determination of an authorized portable tank.* Prior to filling and offering a portable tank for transportation, the shipper must ensure that the portable tank conforms to the authorized specification and meets the applicable requirements in this subchapter for the hazardous material. The shipper must ensure that the MAWP, design pressure or test pressure of the portable tank, as applicable, is appropriate for the hazardous material being transported. Determination of the applicable pressure must take into account the maximum pressure used to load or unload the hazardous material, the vapor pressure, static head and surge pressures of the hazardous

material and the temperatures that the hazardous material will experience during transportation.

(e) *External inspection prior to filling.* Each portable tank must be given a complete external inspection prior to filling. Any unsafe condition must be corrected prior to its being filled and offered for transportation. The external inspection shall include a visual inspection of:

(1) The shell, piping, valves and other appurtenances for corroded areas, dents, defects in welds and other defects such as missing, damaged, or leaking gaskets;

(2) All flanged connections or blank flanges for missing or loose nuts and bolts;

(3) All emergency devices for corrosion, distortion, or any damage or defect that could prevent their normal operation;

(4) All required markings on the tank for legibility; and

(5) Any device for tightening manhole covers to ensure such devices are operative and adequate to prevent leakage at the manhole cover.

(f) *Loading requirements.* (1) A hazardous material may not be loaded into a portable tank if the hazardous material would:

(i) Damage the portable tank;

(ii) React with the portable tank; or

(iii) Otherwise compromise its

product retention capability.

(2) A hazardous material may not be loaded in a DOT Specification 51, DOT Specification 60, an IM or UN portable tank unless the portable tank has a pressure relief device that provides total relieving capacity meeting the requirements of this subchapter.

(3) Except during a pressure test, a portable tank may not be subjected to a pressure greater than its marked maximum allowable working pressure or, when appropriate, its marked design pressure.

(4) A portable tank may not be loaded to a gross mass greater than the maximum allowable gross mass specified on its identification plate.

(5) Except for a non-flowable solid or a liquid with a viscosity of 2,680 centistokes (millimeters squared per second) or greater at 20°C (68°F), an IM or UN portable tank, or compartment thereof, having a volume greater than 7,500 L (1,980 gallons) may not be loaded to a filling density of more than 20% and less than 80% by volume. This filling restriction does not apply if a portable tank is divided by partitions or surge plates into compartments of not more than 7,500 L (1,980 gallons) capacity; this portable tank must not be offered for transportation in an ullage condition liable to produce an

unacceptable hydraulic force due to surge.

(6) The outage for a portable tank may not be less than 2% at a temperature of 50 °C (122 °F) unless otherwise specified in this subchapter. For UN portable tanks, the applicable maximum filling limits apply as specified according to the assigned TP codes in Column (7) of the § 172.101 Table of this subchapter except when transported domestically.

(7) Each tell-tale indicator or pressure gauge located in the space between a frangible disc and a safety relief valve mounted in series must be checked after the tank is filled and prior to transportation to ensure that the frangible disc is leak free. Any leakage through the frangible disc must be corrected prior to offering the tank for transportation.

(8) During filling, the temperature of the hazardous materials shall not exceed the limits of the design temperature range of the portable tank.

(9) The maximum mass of liquefied compressed gas per liter (gallon) of shell capacity (kg/L or lbs./gal.) may not exceed the density of the liquefied compressed gas at 50 °C (122 °F). The portable tank must not be liquid full at 60 °C (140 °F).

(g) *Additional requirements for specific modal transport.* In addition to other applicable requirements, the following apply:

(1) A portable tank containing a hazardous material may not be loaded on to a highway or rail transport vehicle unless loaded entirely within the horizontal outline thereof, without overhang or projection of any part of the tank assembly. In addition, for unloading a portable tank, see § 177.834(i)(2) of this subchapter.

(2) An IM or UN portable tank used for the transportation of flammable liquids by rail may not be fitted with non-reclosing pressure relief devices except in series with reclosing pressure relief valves.

(3) A portable tank or Specification 106A or 110A multi-unit tank car containing a hazardous material may not be offered for transportation aboard a passenger vessel unless:

(i) The vessel is operating under a change to its character of vessel certification as defined in § 171.8 of this subchapter; and

(ii) The material is permitted to be transported aboard a passenger vessel in the § 172.101 Table of this subchapter.

(h) *Additional general commodity-specific requirements.* In addition to other applicable requirements, the following requirements apply:

(1) Each uninsulated portable tank used for the transportation of a liquefied compressed gas must have an exterior surface finish that is significantly reflective, such as a light-reflecting color if painted, or a bright reflective metal or other material if unpainted.

(2) If a hazardous material is being transported in a molten state, the portable tank must be thermally insulated with suitable insulation material of sufficient thickness that the overall thermal conductance is not more than 0.080 Btu per hour per square foot per degree Fahrenheit differential.

(i) *Additional requirements for portable tanks other than IM specification and UN portable tanks.* (1) The bursting strength of any piping and fittings must be at least four times the design pressure of the tank, and at least four times the pressure to which, in any instance, it may be subjected in service by the action of a pump or other device (not including safety relief valves) that may subject piping to pressures greater than the design pressure of the tank.

(2) Pipe joints must be threaded, welded or flanged. If threaded pipe is used, the pipe and pipe fittings must not be lighter than Schedule 80 weight. Where copper tubing is permitted, joints must be brazed or be of equally strong metal union type. The melting point of brazing material may not be lower than 1,000 °F (537.8 °C). The method of joining tubing must not decrease the strength of the tubing such as by the cutting of threads.

(3) Non-malleable metals may not be used in the construction of valves or fittings.

(4) Suitable provision must be made in every case to allow for expansion, contraction, jarring and vibration of all pipe. Slip joints may not be used for this purpose.

(5) Piping and fittings must be grouped in the smallest practicable space and must be protected from damage as required by the specification.

(6) All piping, valves and fittings on every portable tank must be leakage tested with gas or air after installation and proved tight at not less than the design pressure of the portable tank on which they are used. In the event of replacement, all such piping, valves, or fittings must be tested in accordance with the requirements of this section before the portable tank is returned to transportation service. The requirements of this section apply to all hoses used on portable tanks, except that hoses may be tested either before or after installation on the portable tank.

(7) All materials used in the construction of portable tanks and their appurtenances may not be subject to

destructive attack by the contents of the portable tank.

(8) No aluminum, copper, silver, zinc nor their alloys may be used. Brazed joints may not be used. All parts of a portable tank and its appurtenances used for anhydrous ammonia must be steel.

(9) Each outlet of a portable tank used for the transportation of non-refrigerated liquefied compressed gases, except carbon dioxide, must be provided with a suitable automatic excess-flow valve (see definition in § 178.337-1(g) of this subchapter). The valve must be located inside the portable tank or at a point outside the portable tank where the line enters or leaves the portable tank. The valve seat must be located inside the portable tank or may be located within a welded flange or its companion flange, or within a nozzle or within a coupling. The installation must be made in such a manner as to reasonably assure that any undue strain which causes failure requiring functioning of the valve shall cause failure in such a manner that it will not impair the operation of the valve.

(i) A safety device connection or liquid level gauging device that is constructed so that the outward flow of the tank contents will not exceed that passed by an opening of 0.1397 cm (0.0550 inches) is not required to be equipped with excess-flow valves.

(ii) An excess-flow valve must close automatically if the flow reaches the rated flow of gas or liquid specified by the original valve manufacturer when piping mounted directly on the valve is sheared off before the first valve, pump, or fitting downstream from the excess flow valve.

(iii) An excess-flow valve may be designed with a by-pass, not to exceed a 0.1016 cm (0.040 inches) diameter opening to allow equalization of pressure.

(iv) Filling and discharge lines must be provided with manually operated shut-off valves located as close to the tank as practical. Unless this valve is manually operable at the valve, the line

must also have a manual shut-off valve. The use of "Stop-Check" valves to satisfy with one valve the requirements of this section is forbidden. For portable tanks used for refrigerated liquefied gases, a "stop check" valve may be used on the vapor side of the pressure buildup circuit.

(10) Each portable tank used for carbon dioxide or nitrous oxide must be lagged with a suitable insulation material of such thickness that the overall thermal conductance is not more than 0.08 Btu per square foot per degree Fahrenheit differential in temperature per hour. The conductance must be determined at 60° Fahrenheit. Insulation material used on portable tanks for nitrous oxide must be noncombustible.

(11) Refrigerating or heating coils must be installed in portable tanks used for carbon dioxide and nitrous oxide. Such coils must be tested externally to at least the same pressure as the test pressure of the portable tank. The coils must also be tested internally to at least twice the working pressure of the heating or refrigerating system to be used, but in no case less than the test pressure of the portable tank. Such coils must be securely anchored. In the event of leakage, the refrigerant or heating medium to be circulated through the coil or coils must have no adverse chemical reaction with the portable tank or its contents.

(12) Excess flow valves are not required for portable tanks used for the transport of refrigerated liquefied gases.

§ 173.32a [Removed]

31. Section 173.32a is removed.

§ 173.32b [Removed]

32. Section 173.32b is removed.

§ 173.32c [Removed]

33. § 173.32c is removed.

§ 173.34 [Amended]

34. In § 173.34, in the paragraph (e)(13) table, in the second column, the following changes are made:

a. In the second entry, the wording "Butadiene, inhibited" is revised to read "Butadiene, stabilized".

b. In the ninth entry, the wording "Ethyleneimine, inhibited" is revised to read "Ethyleneimine, stabilized".

35. In § 173.61, paragraph (e)(3) is revised and a new paragraph (e)(8) is added to read as follows:

§ 173.61 Mixed packaging requirements.

* * * * *

(e) * * *

(3) Explosives of compatibility group S may be packaged together with explosives of any other compatibility group except A or L, and the combined package may be treated as belonging to any of the packaged compatibility groups except S.

* * * * *

(8) Explosive articles of compatibility group G, except for fireworks and articles requiring special packaging, may be packaged together with explosive articles of compatibility groups C, D or E and the combined package shall be treated as belonging to compatibility group E.

36. In § 173.62, in paragraph (b), in the Explosives Table, two entries are added in appropriate alphanumerical order and in paragraph (c), in the Explosives Packing Instructions Table, in the fourth column, for the packing instruction entry 144, under the Boxes entry "plastics, expanded (4H1)" add an entry for Drums to read as follows:

§ 173.62 Specific packaging requirements for explosives.

* * * * *

(b) * * *

EXPLOSIVES TABLE

| | ID# | PI |
|-----------|-------|--------|
| * * * * * | | |
| UN0502 | | 130 |
| UN0504 | | 112(c) |
| * * * * * | | |

(c) * * *

TABLE OF PACKING METHODS

| Packing instruction | Inner packagings | Intermediate packagings | Outer packagings |
|---------------------|------------------|-------------------------|---|
| 144 * * * | * * * | * * * | * * * |
| | | | Drums. Steel, removable head (1A2). Aluminum, removable head (1B2). Plastics, removable head (1H2). Plywood (1D). |
| * * * | * * * | * * * | * * * |

37. In addition, in § 173.62, in paragraph (c), in the Explosives Packing Instructions Table, in the fourth column, the following changes are made in appropriate packaging specification number order:

a. For packing instruction entries, 112(a), 112(b), 112(c), 113, 115, 116, 130, 131, 134, 135, 136, 138, 140, 141 and 142, under the word "Drums", the wording "plywood (1D)" is added in the alpha-numeric order of the parenthetical.

b. For the packing instruction entries, 112(c), 113, 115, 134, 138 and 140, under the word "Drums", the wording "plastics, removable head (1H2)" is added in the alpha-numeric order of the parenthetical.

c. For the packing instruction entries, 134 and 138, under the word "Drums", the wording "fiberboard (1G)" is added in the alpha-numeric order of the parenthetical.

d. For the packing instruction entries, 112(c) and 113, under the word "Boxes", the wording "aluminum (4B)" is added in the alpha-numeric order of the parenthetical.

e. For the packing instruction entry, 144, under the word "Boxes", the wording "plastics, solid (4H2)" is added in the alpha-numeric order of the parenthetical.

38. In § 173.150, paragraph (d)(2) is revised to read as follows:

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

* * * * *

(d) * * *

(2) Is in an inner packaging of five liters (1.3 gallons) or less for transportation on passenger-carrying aircraft and conforms to § 175.10(a)(17) of this subchapter as checked or carry-on baggage; or

* * * * *

39. In § 173.162, paragraphs (a) introductory text and (a)(1) are revised to read as follows:

§ 173.162 Gallium.

(a) Except when packaged in cylinders or steel flasks, gallium must be packaged in packagings which meet the requirements of part 178 of this subchapter at the Packing Group I performance level for transportation by aircraft, and at the Packing Group III performance level for transport by highway, rail or vessel, as follows:

(1) In combination packagings intended to contain liquids consisting of glass, earthenware or rigid plastic inner packagings with a maximum net mass of 15 kg (33 pounds) each. The inner packagings must be packed in wood boxes (4C1, 4C2, 4D, 4F), fiberboard

boxes (4G), plastic boxes (4H1, 4H2), fiber drums (1G) or removable head steel and plastic drums or jerricans (1A2, 1H2, 3A2 or 3H2) with sufficient cushioning materials to prevent breakage. Either the inner packagings or the outer packagings must have an inner liner that is leakproof or bags of strong leakproof and puncture-resistant material impervious to the contents and completely surrounding the contents to prevent it from escaping from the package, irrespective of its position.

* * * * *

40. Section 173.185 is revised to read as follows:

§ 173.185 Lithium batteries and cells.

(a) Except as otherwise provided in this subpart, a lithium cell or battery is authorized for transportation only if it conforms to the provisions of this section. For the purposes of this subchapter, "lithium content" means the mass of lithium in the anode of a lithium metal or lithium alloy cell, except in the case of a lithium ion cell or battery where the "equivalent lithium content" in grams is calculated to be 0.3 times the rated capacity in ampere-hours.

(b) *Exceptions.* Cells and batteries are not subject to the requirements of this subchapter if they meet the following requirements:

(1) Each cell with a liquid cathode may contain not more than 0.5 g of lithium content. Each cell with a solid cathode may contain not more than 1.0 g of lithium content. Each lithium ion cell may contain not more than 1.5 g of equivalent lithium content;

(2) Each battery with a liquid cathode may contain an aggregate quantity of not more than 1.0 g of lithium content. Each battery with a solid cathode may contain an aggregate quantity of not more than 2.0 g of lithium content. Each lithium-ion battery may contain an aggregate quantity of not more than 8.0 grams of equivalent lithium content;

(3) Each cell or battery containing a liquid cathode must be hermetically sealed;

(4) Cells and batteries must be packed in such a way so as to prevent short circuits and must be packed in strong packagings, except when installed in equipment; and

(5) If when fully charged, the aggregate lithium content of the anodes in a liquid cathode battery is more than 0.5 g, or the aggregate lithium content of the anodes in a solid cathode battery is more than 1.0 g, then the battery may not contain a liquid or gas that is a hazardous material according to this subchapter unless the liquid or gas, if

free, would be completely absorbed or neutralized by other materials in the battery.

(c) *Additional exceptions.* Cells and batteries also are not subject to this subchapter if they meet the following requirements:

(1) The lithium content of the anode of each cell, when fully charged, is not more than 5 g;

(2) The aggregate lithium content of the anodes of each battery, when fully charged, is not more than 25 g;

(3) Each cell or battery is of the type proven to be non-dangerous by testing in accordance with tests in the UN Manual of Tests and Criteria (see § 171.7 of this subchapter). Such testing must be carried out on each type of cell or battery prior to the initial transport of that type; and

(4) Cells and batteries are designed or packed in such a way as to prevent short circuits under conditions normally encountered in transportation.

(d) Cells and batteries and equipment containing cells and batteries which were first transported prior to January 1, 1995, and were assigned to Class 9 on the basis of the requirements of this subchapter in effect on October 1, 1993, may continue to be transported in accordance with the applicable requirements in effect on October 1, 1993.

(e) Cells and batteries may be transported as items of Class 9 if they meet the requirements in paragraphs (e)(1) through (e)(7) of this section:

(1) Each cell and battery must be equipped with an effective means of preventing external short circuits.

(2) Each cell and battery must incorporate a safety venting device or be designed in a manner that will preclude a violent rupture under conditions normally incidental to transportation.

(3) Batteries containing cells or series of cells connected in parallel must be equipped with diodes to prevent reverse current flow.

(4) Cells and batteries must be packed in inner packagings in such a manner as to effectively prevent short circuits and to prevent movement which could lead to short circuits.

(5) Cells and batteries must be packaged in packagings conforming to the requirements of part 178 of this subchapter at the Packing Group II performance level: Inner packagings must be packed within metal boxes (4A or 4B), wooden boxes (4C1, 4C2, 4D or 4F), fiberboard boxes (4G), solid plastic boxes (4H2), fiber drums (1G), metal drums (1A2 or 1B2), plywood drums (1D), plastic jerricans (3H2), or metal jerricans (3A2 or 3B2).

(6) Each cell or battery must be of the type proven to meet the lithium battery requirements in the UN Manual of Tests and Criteria (see § 171.7 of this subchapter).

(7) Except as provided in paragraph (h) of this section, cells or batteries may not be offered for transportation or transported if any cell has been discharged to the extent that the open circuit voltage is less than two volts or is less than 2/3 of the voltage of the fully charged cell, whichever is less.

(f) Equipment containing or packed with cells and batteries meeting the requirements of paragraph (b) or (c) of this section is excepted from all other requirements of this subchapter.

(g) Equipment containing or packed with cells and batteries may be transported as items of Class 9 if the batteries and cells meet all requirements of paragraph (e) of this section and are packaged as follows:

(1) Equipment containing cells and batteries must be packed in a strong outer packaging that is waterproof or has a waterproof liner, unless the equipment is made waterproof by nature of its construction. The equipment must be secured within the outer packaging and be packed as to effectively prevent movement, short circuits, and

accidental operation during transport; and

(2) Cells and batteries packed with equipment must be packed in inner packagings conforming to (e)(5) of this section in such a manner as to effectively prevent movement and short circuits.

(h) Cells and batteries, for disposal, may be offered for transportation or transported to a permitted storage facility and disposal site by motor vehicle when they meet the following requirements:

(1) Be equipped with an effective means of preventing external short circuits; and

(2) Be packed in a strong outer packaging conforming to the requirements of §§ 173.24 and 173.24a. The packaging need not conform to performance requirements of part 178 of this subchapter.

(i) Cells and batteries and equipment containing or packed with cells and batteries which do not comply with the provisions of this section may be transported only if they are approved by the Associate Administrator.

(j) For testing purposes, when not contained in equipment, cells and batteries may be offered for transportation or transported by

highway as items of Class 9. Packaging must conform with paragraph (e)(5) of this section.

41. In § 173.224, paragraph (b)(4) is revised; in the table following paragraph (b)(7), the following entry is added in appropriate alphabetical order; and paragraph (d) is removed to read as follows:

§ 173.224 Packaging and control and emergency temperatures for self-reactive materials.

* * * * *

(b) * * *

(4) *Packing method.* Column 4 specifies the highest packing method which is authorized for the self-reactive material. A packing method corresponding to a smaller package size may be used, but a packing method corresponding to a larger package size may not be used. The Table of Packing Methods in § 173.225(d) defines the packing methods. Bulk packagings are authorized as specified in § 173.225(d) for Type F self-reactive substances. Additional bulk packagings are authorized if approved by the Associate Administrator.

* * * * *

(7) * * *

SELF-REACTIVE MATERIALS TABLE

| Self-reactive substance (1) | Identification no. (2) | Concentration (%) (3) | Packing method (4) | Control temperature—(°C) (5) | (Emergency temperature (6) | Notes (7) |
|---|---------------------------|--------------------------|-----------------------|---------------------------------|-------------------------------|--------------|
| * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * |
| 2,2'-Azodi(isobutyronitrile) as a water based paste ... | | 3224 | ..... | ≤50% | OP6 | ..... |
| * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * |

42. In § 173.225, in paragraph (b), in the Organic Peroxide Table, the following entries are removed and added in the appropriate alphabetical order; in Column (8), Notes "7" and "10" are removed each place they

appear; and in the "NOTES" immediately following the Table, Notes "7" and "10" are removed and reserved and Note "26" is added in the appropriate numerical order; and

paragraphs (e) introductory text, (e)(3) and (e)(5) are revised to read as follows:

§ 173.225 Packaging requirements and other provisions for organic peroxides.

* * * * *

(b) * * *

ORGANIC PEROXIDE TABLE

| Technical name (1) | ID No. (2) | Concentration (mass %) (3) | Diluent (mass %) | | | Water (mass %) (5) | Packing method (6) | Temperature (°C) | | Notes (8) |
|--|---------------|-------------------------------|------------------|-----------|-----------|-----------------------|-----------------------|------------------|-------------------|--------------|
| | | | A (4a) | B (4b) | I (4c) | | | Control (7a) | Emergency (7b) | |
| [REMOVE:] | | | | | | | | | | |
| tert-Amyl peroxybenzoate | UN3105 | ≤96 | ≥4 | | | OP7 | | | | |
| * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * |
| tert-Butyl peroxy-2-ethylhexanoate | UN3119 | ≤32 | | ≥68 | | Bulk | +10 | +15 | 14 | |
| * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * |
| tert-Butyl peroxyneodecanoate [asa stable dispersion inwater]. | UN3117 | ≤42 | | | | OP8 | 0 | +10 | | |

ORGANIC PEROXIDE TABLE—Continued

| Technical name | ID No. | Concentration (mass %) | Diluent (mass %) | | | Water (mass %) | Packing method | Temperature (°C) | | Notes |
|---|-------------|---------------------------|------------------|----------|------|----------------|-----------------|------------------|-----------|-------|
| | | | A | B | I | | | Control | Emergency | |
| (1) | (2) | (3) | (4a) | (4b) | (4c) | (5) | (6) | (7a) | (7b) | (8) |
| * tert-Butyl peroxyneohexanoate | * UN3115 | * ≤77 | * ≥23 | | * | | * OP7 | * +10 | * +15 | |
| * tert-Butyl peroxyneopentanoate | * UN3119 | * ≤27 | | * ≥73 | * | | * Bulk | * −5 | * +5 | 14 |
| * Cumyl peroxyneohexanoate | * UN3115 | * ≤77 | * ≥23 | | * | | * OP7 | * 0 | * +10 | |
| * Cyclohexanoneperoxide(s) | * UN3105 | * ≤72 | | * ≥28 | * | | * OP7 | | * | 5 |
| * 1,1-Di-(tert-butylperoxy)-3,5,5-trimethylcyclohexane. | UN3101 | >90–100 | | | | | OP5 | | | |
| * 1,1-Di-(tert-butylperoxy)-3,5,5-trimethylcyclohexane. | UN3103 | >57–90 | ≥10 | | | | OP5 | | | |
| * 1,1-Di-(tert-butylperoxy)-3,5,5-trimethylcyclohexane. | UN3106 | ≤57 | | | ≥43 | | OP7 | | | |
| * 1,1-Di-(tert-butylperoxy)-3,5,5-trimethylcyclohexane. | UN3107 | ≤57 | ≥43 | | | | OP8 | | | |
| * 1,1-Di-(tert-butylperoxy)-3,5,5-trimethylcyclohexane. | UN3107 | ≤32 | ≥26 | ≥42 | | | OP8 | | | |
| * Di-(2-ethylhexyl)peroxydicarbonate | * UN3115 | * ≤77 | | | * | | * OP7 | * −15 | * −5 | |
| * Diisopropylperoxydicarbonate | * UN3115 | * ≤52 | | * ≥48 | * | | * OP7 | * −10 | * 0 | |
| * 2,5-Dimethyl-2,5-di-(2-ethylhexanoylperoxy)hexane. | UN3115 | ≤100 | | | | | OP7 | +20 | +25 | |
| * Dimyristylperoxydicarbonate [as a stable dispersion in water]. | UN3119 | ≤42 | | | * | | IBC | +15 | +25 | |
| * Di-n-propylperoxydicarbonate | UN3113 | ≤100 | | | * | | OP4 | −25 | −15 | |
| * Di-(3,5,5-trimethylhexanoyl)peroxide | UN3119 | ≤38 | ≥62 | | * | | Bulk | −10 | 0 | 14 |
| * Isopropyl sec-butylperoxydicarbonate [and]Di-sec-butylperoxydi-carbonate [and]Di-isopropylperoxydicarbonate. | UN3115 | ≤32 +≤15–18 +≤12–15 | ≥38 | | * | | OP7 | −20 | −10 | |
| * 2,4,4-Trimethylpentyl-2-peroxyneodecanoate | UN3115 | ≤72 | | ≥28 | | | OP7 | −5 | +5 | |
| * 2,4,4-Trimethylpentyl-2-phenoxynodecanoate [as a stable dispersion in water]. | UN3119 | ≤52 | | | | | OP8 | −5 | +5 | |
| * 2,4,4-Trimethylpentyl-2-peroxyphenoxyacetate. | UN3115 | ≤37 | | ≥63 | | | OP7 | −10 | 0 | |
| [ADD:] | | | | | | | | | | |
| * tert-Amyl peroxybenzoate | * UN3103 | * ≤100 | | | * | | * OP5 | | * | |
| * tert-Butyl peroxy-2-ethylhexanoate | * UN3119 | * ≤32 | | * ≥68 | * | | * Bulk | * +15 | * +20 | 14 |
| * tert-Butyl peroxyneodecanoate [as a stable dispersion in water]. | UN3117 | ≤52 | | | | | OP8 | 0 | +10 | |
| * tert-Butyl peroxyneodecanoate [as a stable dispersion in water]. | UN3119 | ≤42 | | | * | | IBC | −5 | +5 | |
| * tert-Butyl peroxyneodecanoate | UN3119 | ≤32 | ≥68 | | * | | IBC | 0 | +10 | |
| * tert-Butyl peroxyneohexanoate | UN3115 | ≤77 | ≥23 | | * | | OP7 | 0 | +10 | |
| * tert-Butyl peroxyneopentanoate | UN3119 | ≤27 | | ≥73 | * | | Bulk | +5 | +10 | 14 |
| * Cumyl peroxyneodecanoate [as a stable dispersion in water]. | UN3119 | ≤52 | | | * | | IBC | −15 | −5 | |
| * Cumyl peroxyneohexanoate | UN3115 | ≤77 | ≥23 | | * | | OP7 | −10 | 0 | |

ORGANIC PEROXIDE TABLE—Continued

| Technical name | ID No. | Concentration (mass %) | Diluent (mass %) | | | Water (mass %) | Packing method | Temperature (°C) | | Notes |
|---|--------|------------------------|------------------|------|------|----------------|----------------|------------------|-----------|-------|
| | | | A | B | I | | | Control | Emergency | |
| (1) | (2) | (3) | (4a) | (4b) | (4c) | (5) | (6) | (7a) | (7b) | (8) |
| Cyclohexanone peroxide(s) | UN3105 | ≤72 | ≥28 | | | | OP7 | | | 5 |
| 1,1-Di-(tert-butylperoxy)-3,3,5-trimethylcyclohexane. | UN3101 | >90–100 | | | | | OP5 | | | |
| 1,1-Di-(tert-butylperoxy)-3,3,5-trimethylcyclohexane. | UN3103 | >57–90 | ≥10 | | | | OP5 | | | |
| 1,1-Di-(tert-butylperoxy)-3,3,5-trimethylcyclohexane. | UN3105 | ≤77 | | ≥23 | | | OP7 | | | |
| 1,1-Di-(tert-butylperoxy)-3,3,5-trimethylcyclohexane. | UN3106 | ≤57 | | | ≥43 | | OP7 | | | |
| 1,1-Di-(tert-butylperoxy)-3,3,5-trimethylcyclohexane. | UN3107 | ≤57 | ≥43 | | | | OP8 | | | |
| 1,1-Di-(tert-butylperoxy)-3,3,5-trimethylcyclohexane. | UN3107 | ≤32 | ≥26 | ≥42 | | | OP8 | | | |
| 2,2-Di-(4,4-di-(tert-butylperoxy) cyclohexyl) propane. | UN3107 | ≤22 | | ≥78 | | | OP8 | | | |
| Di-(2-ethylhexyl) peroxydicarbonate [as a stable dispersion in water]. | UN3119 | ≤52 | | | | | IBC | –20 | –10 | |
| Di-(2-ethoxyethyl) peroxydicarbonate | UN3115 | ≤52 | | ≥48 | | | OP7 | –10 | 0 | |
| Di-(2-ethylhexyl) peroxydicarbonate | UN3115 | ≤77 | | ≥23 | | | OP7 | –15 | –5 | |
| Di-(2-ethylhexyl) peroxydicarbonate [as a stable dispersion in water]. | UN3117 | ≤62 | | | | | OP8 | –15 | –5 | |
| Diisopropyl peroxydicarbonate | UN3115 | ≤52 | | ≥48 | | | OP7 | –20 | –10 | |
| Di-(3-methoxybutyl) peroxydicarbonate | UN3115 | ≤52 | | ≥48 | | | OP7 | –5 | +5 | |
| Di-(3-methylbenzoyl) peroxide + Benzoyl (3-methylbenzoyl) peroxide +Dibenzoyl peroxide. | UN3115 | ≤20 +≤18 +≤4 | | ≥58 | | | OP7 | +35 | +40 | |
| 2,5 Dimethyl 2,5 di-2-ethylhexanoylperoxy hexane. | UN3113 | ≤100 | | | | | OP5 | +20 | +25 | |
| 2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexane | UN3108 | ≤77 | | | ≥23 | | OP8 | | | |
| 2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexyne-3. | UN3101 | >86–100 | | | | | OP5 | | | |
| Dimyristyl peroxydicarbonate [as a stable dispersion in water]. | UN3119 | ≤42 | | | | | IBC | +15 | +20 | |
| Di-n-propyl peroxydicarbonate | UN3113 | ≤100 | | | | | OP3 | –25 | –15 | |
| Di-n-propyl peroxydicarbonate | UN3113 | ≤77 | | ≥23 | | | OP5 | –20 | –10 | |
| tert-Hexyl peroxyneodecanoate | UN3115 | ≤71 | ≥29 | | | | OP7 | 0 | +10 | |
| tert-Hexyl peroxyvalate | UN3115 | ≤72 | | ≥28 | | | OP7 | +10 | +15 | |
| Methyl ethyl ketone peroxide(s) | UN3105 | ≤37 | ≥55 | | | ≥8 | OP7 | | | 5 |
| 1,1,3,3-Tetramethylbutyl peroxyneodecanoate. | UN3115 | ≤72 | | ≥28 | | | OP7 | –5 | +5 | |

ORGANIC PEROXIDE TABLE—Continued

| Technical name (1) | ID No. (2) | Concentration (mass %) (3) | Diluent (mass %) | | | Water (mass %) (5) | Packing method (6) | Temperature (°C) | | Notes (8) |
|--|---------------|-------------------------------|------------------|-----------|-----------|-----------------------|-----------------------|------------------|-------------------|--------------|
| | | | A (4a) | B (4b) | I (4c) | | | Control (7a) | Emergency (7b) | |
| 1,1,3,3-Tetramethylbutyl peroxyneodecanoate [as a stable dispersion in water]. | UN3119 | ≤52 | ..... | ..... | ..... | ..... | IBC | -5 | +5 | ..... |
| 1,1,3,3-Tetramethylbutyl peroxy phenoxyacetate. | UN3115 | ≤37 | ..... | ≥63 | ..... | ..... | OP7 | -10 | 0 | ..... |
| * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * |
| 3,6,9-Triethyl-3,6,9-trimethyl-1,4,7-triperoxonane. | UN3105 | ≤42 | ≥58 | ..... | ..... | ..... | OP7 ..... | ..... | ..... | 26 |
| * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * | * * * * * |

Notes:

* * * * *
 * 26. Available oxygen must be ≤ 7.6%.
 * * * * *

(e) *Bulk packagings for organic peroxides.* The following bulk packagings are authorized:

(3) *Portable tanks.* The following requirements apply to portable tanks intended for the transport of Type F organic peroxides or Type F self-reactive substances. DOT 51, 57, IM 101 portable tanks, and UN portable tanks that conform to the requirements of T23 (see § 172.102(c)(7) of this subchapter), when T23 is specified in Column (7) of the § 171.101 Table of this subchapter for the Type F organic peroxide or Type F self-reactive substance. Type F organic peroxide or self-reactive substance formulations other than those indicated in T23 may be transported in portable tanks if approved by the Associate Administrator. The following conditions also apply:

(i) The portable tank must be designed for a test pressure of at least 0.4 MPa (4 bar).

(ii) Portable tanks must be fitted with temperature-sensing devices.

(iii) Portable tanks must be fitted with pressure relief devices and emergency-relief devices. Vacuum-relief devices may also be used. Pressure relief devices must operate at pressures determined according to both the properties of the hazardous material and the construction characteristics of the portable tank. Fusible elements are not allowed in the shell.

(iv) The pressure relief devices must consist of reclosing devices fitted to prevent significant build-up within the portable tank of the decomposition products and vapors released at a temperature of 50 °C (122 °F). The capacity and start-to-discharge pressure of the relief devices must be in accordance with the applicable

requirements of this subchapter specified for the portable tank. The start-to-discharge pressure must in no case be such that liquid would escape from the pressure relief devices if the portable tank were overturned.

(v)(A) The emergency-relief devices may be of the reclosing or frangible types, or a combination of the two, designed to vent all the decomposition products and vapors evolved during a period of not less than one hour of complete fire engulfment as calculated by the following formula:

$$q = 70961 F A^{0.82}$$

Where:

q = heat absorption (W)

A = wetted area (m²)

F = insulation factor (-)

(B) Insulation factor (F) in the formula in paragraph (e)(3)(v)(A) of this section equals 1 for non-insulated vessels and for insulated vessels F is calculated using the following formula:

$$F = \frac{U(923 - T_{PO})}{47032}$$

Where:

U = K/L = heat transfer coefficient of the insulation (W·m⁻²·K⁻¹); where K = heat conductivity of insulation layer (W·m⁻¹·K⁻¹), and L = thickness of insulation layer (m).

T_{PO} = temperature of material at relieving conditions (K).

(vi) The start-to-discharge pressure of emergency-relief devices must be higher than that specified for the pressure relief devices in paragraph (e)(3)(iv) of this section. The emergency-relief devices must be sized and designed in such a way that the maximum pressure in the shell never exceeds the test pressure of the portable tank.

Note to Paragraph (e)(3)(vi): An example of a method to determine the size of emergency-relief devices is given in Appendix 5 of the UN Manual of Tests and Criteria (incorporated by reference, see § 171.7 of this subchapter).

(vii) For insulated portable tanks, the capacity and setting of emergency-relief devices must be determined assuming a loss of insulation from 1 percent of the surface area.

(viii) Vacuum-relief devices and reclosing devices on portable tanks used for flammable hazardous materials must be provided with flame arresters. Any reduction of the relief capacity caused by the flame arrester must be taken into account and the appropriate relief capacity must be provided.

(ix) Service equipment such as devices and external piping must be designed and constructed so that no hazardous material remains in them after filling the portable tank.

(x) Portable tanks may be either insulated or protected by a sun-shield. If the SADT of the hazardous material in the portable tank is 55 °C (131°F) or less, the portable tank must be completely insulated. The outer surface must be finished in white or bright metal.

(xi) The degree of filling must not exceed 90% at 15 °C (59 °F).

(xii) DOT 57 metal portable tanks are authorized only for tert-butyl cumyl peroxide, di-(2-tert-butylperoxyisopropyl)-benzene(s), dicumyl peroxide and mixtures of two or more of these peroxides. DOT 57 portable tanks must conform to the venting requirements of paragraph (e)(5) of this section. These portable tanks are not subject to the requirements of

paragraphs (e)(3)(ii) and (e)(3)(iv) of this section.

* * * * *

(5) *IBCs.* IBCs are authorized subject to the conditions and limitations of this section provided the IBC type is authorized according to IB52 (see § 172.102(c)(4) of this subchapter), as applicable, and the IBC conforms to the requirements in subpart O of part 178 of this subchapter at the Packing Group II performance level. The following additional requirements also apply:

(i) IBCs shall be provided with a device to allow venting during transportation. The inlet to the pressure relief device shall be sited in the vapor space of the IBC under maximum filling conditions during transportation.

(ii) To prevent explosive rupture of metal IBCs or composite IBCs with complete metal casing, the emergency-relief devices shall be designed to vent all the decomposition products and vapors evolved during self-accelerating decomposition or during a period of not less than one hour of complete fire-engulfment as calculated by the formula in paragraph (e)(3)(v) of this section. The control and emergency temperatures specified in IB52 are based on a non-insulated IBC.

43. In § 173.240, paragraphs (c) and (d) are revised to read as follows:

§ 173.240 Bulk packaging for certain low hazard solid materials.

* * * * *

(c) *Portable tanks and closed bulk bins.* DOT 51, 56, 57 and 60 portable tanks; IMO type 1, 2 and 5, and IM 101 and IM 102 portable tanks; UN portable tanks; marine portable tanks conforming to 46 CFR part 64; and sift-proof non-DOT Specification portable tanks and closed bulk bins are authorized.

(d) *IBCs.* IBCs are authorized subject to the conditions and limitations of this section provided the IBC type is authorized according to the IBC packaging code specified for the specific hazardous material in Column (7) of the § 172.101 Table of this subchapter and the IBC conforms to the requirements in subpart O of part 178 of this subchapter at the Packing Group performance level as specified in Column (5) of the § 172.101 Table of this subchapter for the material being transported.

(1) IBCs may not be used for the following hazardous materials:

(i) Packing Group I liquids; and
(ii) Packing Group I solids that may become liquid during transportation.

(2) The following IBCs may not be used for Packing Group II and III solids that may become liquid during transportation:

(i) Wooden: 11C, 11D and 11F;

(ii) Fiberboard: 11G;

(iii) Flexible: 13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 and 13M2; and

(iv) Composite: 11HZ2 and 21HZ2.

44. In § 173.241, paragraphs (c) and (d) are revised to read as follows:

§ 173.241 Bulk packagings for certain low hazard liquid and solid materials.

* * * * *

(c) *Portable tanks.* DOT Specification 51, 56, 57 and 60 portable tanks; IMO type 1, 2 and 5, and IM 101 and IM 102 portable tanks; UN portable tanks; marine portable tanks conforming to 46 CFR part 64; and non-DOT Specification portable tanks suitable for transport of liquids are authorized.

(d) *IBCs.* IBCs are authorized subject to the conditions and limitations of this section provided the IBC type is authorized according to the IBC packaging code specified for the specific hazardous material in Column (7) of the § 172.101 Table of this subchapter and the IBC conforms to the requirements in subpart O of part 178 of this subchapter at the Packing Group performance level as specified in Column (5) of the § 172.101 Table for the material being transported.

(1) IBCs may not be used for the following hazardous materials:

(i) Packing Group I liquids; and
(ii) Packing Group I solids that may become liquid during transportation.

(2) The following IBCs may not be used for Packing Group II and III solids that may become liquid during transportation:

(i) Wooden: 11C, 11D and 11F;
(ii) Fiberboard: 11G;
(iii) Flexible: 13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 and 13M2; and
(iv) Composite: 11HZ2 and 21HZ2.

45. In § 173.242, paragraphs (c) introductory text and (d) are revised to read as follows:

§ 173.242 Bulk packagings for certain medium hazard liquids and solids, including solids with dual hazards.

* * * * *

(c) *Portable tanks.* DOT Specification 51, 56, 57 and 60 portable tanks; Specification IM and UN portable tanks when a T Code is specified in Column (7) of the § 172.101 Hazardous Materials Table for a specific hazardous material; and marine portable tanks conforming to 46 CFR part 64 are authorized. DOT Specification 57 portable tanks used for the transport by vessel of Class 3, Packaging Group II materials must conform to the following:

* * * * *

(d) *IBCs.* IBCs are authorized subject to the conditions and limitations of this

section provided the IBC type is authorized according to the IBC packaging code specified for the specific hazardous material in Column (7) of the § 172.101 Table of this subchapter and the IBC conforms to the requirements in subpart O of part 178 of this subchapter at the Packing Group performance level as specified in Column (5) of the § 172.101 Table of this subchapter for the material being transported.

(1) IBCs may not be used for the following hazardous materials:

(i) Packing Group I liquids; and
(ii) Packing Group I solids that may become liquid during transportation.

(2) The following IBCs may not be used for Packing Group II and III solids that may become liquid during transportation:

(i) Wooden: 11C, 11D and 11F;
(ii) Fiberboard: 11G;
(iii) Flexible: 13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 and 13M2; and
(iv) Composite: 11HZ2 and 21HZ2.

46. In § 173.243, paragraphs (c) and (d) are revised to read as follows:

§ 173.243 Bulk packaging for certain high hazard liquids and dual hazard materials which pose a moderate hazard.

* * * * *

(c) *Portable tanks.* DOT Specification 51 and 60 portable tanks; UN portable tanks when a T code is specified in Column (7) of the § 172.101 Table of this subchapter for a specific hazardous material; and marine portable tanks conforming to 46 CFR part 64 with design pressure of at least 172.4 kPa (25 psig) are authorized.

(d) *IBCs.* IBCs are authorized subject to the conditions and limitations of this section provided the IBC type is authorized according to the IBC packaging code specified for the specific hazardous material in Column (7) of the § 172.101 Table of this subchapter and the IBC conforms to the requirements in subpart O of part 178 of this subchapter at the Packing Group performance level as specified in Column (5) of the § 172.101 Table of this subchapter for the material being transported.

(1) IBCs may not be used for the following hazardous materials:

(i) Packing Group I liquids; and
(ii) Packing Group I solids that may become liquid during transportation.

(2) The following IBCs may not be used for Packing Group II and III solids that may become liquid during transportation:

(i) Wooden: 11C, 11D and 11F;
(ii) Fiberboard: 11G;
(iii) Flexible: 13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 and 13M2; and

(iv) Composite: 11HZ2 and 21HZ2.

* * * * *

47. In § 173.247, paragraph (c) is revised to read as follows:

§ 173.247 Bulk packaging for certain elevated temperature materials (Class 9) and certain flammable elevated temperature materials (Class 3).

* * * * *

(c) *Portable tanks.* DOT Specification 51, 56, 57 and 60 portable tanks; IM 101 and IM 102 portable tanks; UN portable tanks; marine portable tanks conforming to 46 CFR part 64; metal IBCs and non-specification portable tanks equivalent in structural design and accident damage resistance to specification packagings are authorized.

* * * * *

§ 173.301 [Amended]

48. In § 173.301, in paragraph (d)(2), in the first sentence, the wording “tetrafluoroethylene, inhibited” is revised to read “tetrafluoroethylene, stabilized”.

§ 173.304 [Amended]

49. In § 173.304, the following changes are made:

a. In the paragraph (a)(2) table, in the first column, in the second to the last entry, the wording “Vinyl fluoride, inhibited” is revised to read “Vinyl fluoride, stabilized”.

b. In paragraph (b), in the first sentence, the wording “vinyl fluoride, inhibited” is revised to read “vinyl fluoride, stabilized”.

50. In § 173.306, paragraph (a)(4)(iii) is revised to read as follows:

§ 173.306 Limited quantities of compressed gases.

* * * * *

(4) * * *

(iii) Non-pressurized gases, flammable must be packed in hermetically-sealed glass or metal inner packagings of not more than 5 L (1.3 gallons) and overpacked in a strong outer packaging.

* * * * *

§ 173.314 [Amended]

51. In § 173.314, the following changes are made:

a. In the paragraph (c) table, in the first column, the last entry, “Vinyl fluoride, inhibited” is revised to read “Vinyl fluoride, stabilized”.

b. In paragraph (g) introductory text, the wording “vinyl fluoride, inhibited” is revised to read “vinyl fluoride, stabilized”.

52. In § 173.315:

a. The text of paragraph (a) preceding the table is revised;

b. In the paragraph (a) table, in the first column, the entry “Butadiene, inhibited” is revised to read “Butadiene, stabilized” and the second to the last entry “Vinyl fluoride, inhibited” is revised to read “Vinyl fluoride, stabilized”;

c. In paragraph (b) introductory text, the wording “butadiene, inhibited” is revised to read “butadiene, stabilized”;

d. In the paragraph (h) table, in the first column, the sixth entry, “Butadiene, inhibited” is revised to read “Butadiene, stabilized”;

e. Paragraphs (i)(1)(iii), (i)(3), (i)(4) and (i)(8) are revised; and

f. Paragraph (i)(7) is removed and reserved.

The revisions read as follows:

§ 173.315 Compressed gases in cargo tanks and portable tanks.

(a) Liquefied compressed gases that are transported in UN portable tanks must be loaded and offered for transportation in accordance with portable tank provision T50 in § 172.102 of this subchapter. A liquefied compressed gas offered for transportation in a cargo tank motor vehicle or a portable tank must be prepared in accordance with this section, § 173.32, § 173.33 and subpart E or subpart G of part 180 of this subchapter, as applicable. For cryogenic liquids, see § 173.318. For marking requirements, see §§ 172.326 and 172.328 of this subchapter. Except for UN portable tanks, a liquefied compressed gas must be loaded and offered for transportation in accordance with the following table:

* * * * *

(i) * * *

(1) * * *

(iii) For an insulated tank, the required relieving capacity of the relief devices must be the same as for an uninsulated tank, unless the insulation will remain in place and will be effective under fire conditions. In this case, except for UN portable tanks, each insulated tank must be covered by a sheet metal jacket of not less than 16 gauge thickness. For UN portable tanks where the relieving capacity of the valves has been reduced on the basis of the insulation system, the insulation system must remain effective at all temperatures less than 649°C (1200.2°F) and be jacketed with a material having a melting point of 700 °C (1292.0 °F) or greater.

* * * * *

(3) Each safety relief valve on a portable tank, other than a UN portable tank, must be set to start-to-discharge at pressure no higher than 110% of the tank design pressure and no lower than

the design pressure specified in paragraph (a) of this section for the gas transported. For UN portable tanks used for liquefied compressed gases and constructed in accordance with the requirements of § 178.276 of this subchapter, the pressure relief device(s) must conform to § 178.276(e) of this subchapter.

(4) Except for UN portable tanks, each safety relief valve must be plainly and permanently marked with the pressure in p.s.i.g. at which it is set to discharge, with the actual rate of discharge of the device in cubic feet per minute of the gas or of air at 60 °F (15.6 °C) and 14.7 p.s.i.a., and with the manufacturer’s name or trade name and catalog number. The start-to-discharge valve marking must be visible after the valve is installed. The rated discharge capacity of the device must be determined at a pressure of 120% of the design pressure of the tank. For UN portable tanks, each pressure relief device must be clearly and permanently marked as specified in § 178.274(f)(1) of this subchapter.

* * * * *

(8) Each safety relief valve outlet must be provided with a protective device to prevent the entrance and accumulation of dirt and water. This device must not impede flow through the valve. Pressure relief devices must be designed to prevent the entry of foreign matter, the leakage of liquid and the development of any dangerous excess pressure.

* * * * *

53. In § 173.320, paragraph (c) is revised to read as follows:

§ 173.320 Cryogenic liquids; exceptions.

* * * * *

(c) For transportation aboard aircraft, see the ICAO Technical Instructions, Packing Instruction P202 and the packaging specifications in part 6, Chapter 5. (See § 171.7 of this subchapter for ICAO Technical Instructions.)

PART 175—CARRIAGE BY AIRCRAFT

54. The authority citation for part 175 continues to read as follows:

Authority: 49 U.S.C. 5101–5127; 49 CFR 1.53.

55. In § 175.10, paragraphs (a)(10) and (a)(16) are revised, and paragraph (a)(17) is added to read as follows:

§ 175.10 Exceptions.

(a) * * *

(10) Safety matches or a lighter intended for use by an individual when carried on one’s person. However, lighters containing unabsorbed liquid

fuel (other than liquefied gas), lighter fuel, and lighter refills are not permitted on one's person or in checked or carry-on baggage.

* * * * *

(16) Perfumes and colognes, purchased through duty-free sales, carried by passengers or crew in carry-on baggage.

(17) Alcoholic beverages containing:

(i) Not more than 24% alcohol by volume; or

(ii) More than 24% and not more than 70% alcohol by volume when in retail packagings not exceeding 5 liters (1.3 gallons) carried by a crew member or passenger in checked or carry-on baggage, with a total net quantity per person of 5 liters (1.3 gallons) for such beverages.

* * * * *

56. In § 175.33, paragraph (a) introductory text is revised to read as follows:

§ 175.33 Notification of pilot-in-command.

(a) Except as provided in § 175.10, when a hazardous material subject to the provisions of this subchapter is carried in an aircraft, the operator of the aircraft must provide the pilot-in-command with accurate and legible written information as early as practicable before departure of the aircraft, which specifies at least the following:

* * * * *

57. § 175.78 is revised to read as follows:

§ 175.78 Stowage compatibility of cargo.

(a) For stowage on an aircraft, in a cargo facility, or in any other area at an airport designated for the stowage of hazardous materials, packages containing hazardous materials which might react dangerously with one another may not be placed next to each other or in a position that would allow a dangerous interaction in the event of leakage.

(b) As a minimum, the segregation instructions prescribed in the following Segregation Table must be followed to maintain acceptable segregation between packages containing hazardous materials with different hazards. The Segregation Table instructions apply whether or not the class or division is the primary or subsidiary risk. The Segregation Table follows:

SEGREGATION TABLE

| Hazard label | Class or division | | | | | | | |
|--------------|-------------------|--------|--------|--------|--------|--------|--------|--------|
| | 1 | 2 | 3 | 4.2 | 4.3 | 5.1 | 5.2 | 8 |
| 1 | Note 1 | Note 2 | Note 2 | Note 2 | Note 2 | Note 2 | Note 2 | Note 2 |
| 2 | Note 2 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 3 | Note 2 | ..... | ..... | ..... | ..... | X | ..... | ..... |
| 4.2 | Note 2 | ..... | ..... | ..... | ..... | X | ..... | ..... |
| 4.3 | Note 2 | ..... | ..... | ..... | ..... | ..... | ..... | X |
| 5.1 | Note 2 | ..... | X | X | ..... | ..... | ..... | ..... |
| 5.2 | Note 2 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 8 | Note 2 | ..... | ..... | ..... | X | ..... | ..... | ..... |

(c) Instructions for using the Segregation Table are as follows:(1) The dots at the intersection of a row and column indicate that no restrictions apply.

(2) The letter "X" at the intersection of a row and column indicates that packages containing these classes of hazardous materials may not be stowed next to or in contact with each other, or in a position which would allow interaction in the event of leakage of the contents.

(3) **Note 1.** "Note 1" at the intersection of a row and column means the following:

(i) For explosives in compatibility groups A through K and N —

(A) Packages bearing the same compatibility group letter and the same division number may be stowed together.

(B) Explosives of the same compatibility group, but different divisions may be stowed together

provided the whole shipment is treated as belonging to the division having the smaller number. However, when explosives of Division 1.5 Compatibility Group D are stowed together with explosives of Division 1.2 Compatibility Group D, the whole shipment must be treated as Division 1.1, Compatibility Group D.

(C) Packages bearing different compatibility group letters may not be stowed together whether or not they belong to the same division, except as provided in paragraphs (c)(3)(ii) and (iii) of this section.

(ii) Explosives in Compatibility Group L may not be stowed with explosives in other compatibility groups. They may only be stowed with the same type of explosives in Compatibility Group L.

(iii) Explosives of Division 1.4, Compatibility Group S, may be stowed with explosives of all compatibility groups except for Compatibility Groups A and L.

(iv) Other than explosives of Division 1.4, Compatibility Group S (see paragraph (c)(3)(iii) of this section), and Compatibility Groups C, D and E that may be stowed together, explosives that do not belong in the same compatibility group may not be stowed together.

(A) Any combination of substances in Compatibility Groups C and D must be assigned to the most appropriate compatibility group shown in the § 172.101 Table of this subchapter.

(B) Explosives in Compatibility Group N may be stowed together with explosives in Compatibility Groups C, D or E when the combination is assigned Compatibility Group D.

(4) **Note 2.** "Note 2" at the intersection of a row and column means that other than explosives of Division 1.4, Compatibility Group S, explosives may not be stowed together with that class.

(5) Packages containing hazardous materials with multiple hazards in the

class or divisions, which require segregation in accordance with the Segregation Table need not be segregated from other packages bearing the same UN number.

(6) A package labeled "BLASTING AGENT" may not be stowed next to or in a position that will allow contact with a package of special fireworks or railway torpedoes.

58. In § 175.85, paragraph (a) is revised to read as follows:

§ 175.85 Cargo location.

(a) Except as provided in § 175.10, no person may carry a hazardous material subject to the requirements of this subchapter in the cabin of a passenger-carrying aircraft or on the flight deck of any aircraft. 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).

* * * * *

PART 176—CARRIAGE BY VESSEL

59. The authority citation for part 176 continues to read as follows:

Authority: 49 U.S.C. 5101–5127; 49 CFR 1.53.

60. In § 176.2, the following definition is added in appropriate alphabetical order to read as follows:

§ 176.2 Definitions.

* * * * *

INF cargo means packaged irradiated nuclear fuel, plutonium or high-level radioactive wastes as those terms are defined in the "International Code for the Safe Carriage of Packaged Irradiated Nuclear Fuel, Plutonium and High-Level Radioactive Wastes on Board Ships" (INF Code) (contained in IMDG Code, 2000 edition, see § 171.7 of this subchapter).

* * * * *

61. In § 176.63, a new paragraph (e) is added to read as follows:

§ 176.63 Stowage locations.

* * * * *

(e) Closed cargo transport unit, for the purpose of stowage of Class 1 (explosive) materials on board a vessel, means a clean, substantial, weatherproof box structure which can be secured to the ship's structure and includes a closed freight container, a closed vehicle, a closed rail wagon or a portable magazine. When this stowage is specified, stowage in small compartments such as deckhouses and mast lockers or oversized weatherproof packages (overpacks) are acceptable alternatives. The floor of any closed cargo transport unit or compartment shall be constructed of wood, close boarded or arranged so that goods are stowed on sparred gratings, wooden pallets or dunnage. Provided that the necessary additional specifications are met, a closed cargo transport unit may be used for Class 1 (explosive) magazine stowage type "A," "B" or "C," but not as a portable magazine.

62. In § 176.84, in paragraph (b) Table of provisions, the entries "4" and "5" are revised; paragraph (c)(1) is revised; paragraph (c)(2), the List of Notes is revised; and paragraph (c)(3) is removed to read as follows:

§ 176.84 Other requirements for stowage and segregation for cargo vessels and passenger vessels.

* * * * *

(b) Table of provisions:

Table with 2 columns: Code, Provisions. Rows include 4 and 5 regarding stowage of liquid organic materials and powdered metals.

(c) * * * (1) Explosive substances and explosive articles must be stowed in accordance with Column (10A) and Column (10B) of the 172.101 Table of this subchapter.

(2) * * *

Table with 2 columns: Notes, Provisions. Rows include 5E and 7E regarding stowage of lead and other types.

Table with 2 columns: Notes, Provisions. Rows include 8E through 26E and 0127E regarding stowage and segregation requirements.

§ 176.128 [Amended]

63. In § 176.128, in paragraph (c), the word "UN 0600" is revised to read "UN 0060".

§ 176.136 [Amended]

64. In § 176.136, in paragraph (e), the word "portable" is removed.

65. In § 176.142, paragraph (a) is revised to read as follows:

§ 176.142 Hazardous materials of extreme flammability.

(a) Except as allowed by paragraph (b) of this section, certain hazardous materials of extreme flammability may not be transported in a vessel carrying Class 1 (explosive) materials. This prohibition applies to the following liquid hazardous materials:

Table listing hazardous materials (Carbon disulfide, Diethylzinc, etc.) and their corresponding UN numbers and divisions.

* * * * *

66. A new section § 176.720 is added to subpart M to read as follows:

§ 176.720 Requirements for carriage of INF cargo in international transportation.

A vessel carrying INF cargo (see § 176.2, under INF cargo definition) in international transportation must meet the requirements of the INF Code (contained in IMDG Code, 2000 edition, see § 171.7 of this subchapter) in addition to all other applicable requirements of this subchapter.

PART 177—CARRIAGE BY PUBLIC HIGHWAY

67. The authority citation for part 177 continues to read as follows:

Authority: 49 U.S.C. 5101–5127; 49 CFR 1.53.

68. In § 177.848, paragraph (g)(3)(vi) is revised to read as follows:

§ 177.848 Segregation of hazardous materials.

* * * * *

(g) * * *
(3) * * *

(vi) “6” means explosive articles in compatibility group G, other than fireworks and those requiring special handling, may be loaded, transported and stored with other explosive articles of compatibility groups C, D and E, provided that explosive substances (such as those not contained in articles) are not carried in the same vehicle.

* * * * *

PART 178—SPECIFICATIONS FOR PACKAGINGS

69. The authority citation for part 178 continues to read as follows:

Authority: 49 U.S.C. 5101–5127; 49 CFR 1.53.

70. A new section § 178.273 is added to subpart H to read as follows:

§ 178.273 Approval of Specification IM portable tanks and UN portable tanks.

(a) *Application for approval.* (1) An owner or manufacturer of a portable tank shall apply for approval to a designated approval agency authorized to approve the portable tank in accordance with the procedures in subpart E, part 107 of this subchapter.

(2) Each application for approval must contain the following information:

(i) Two complete copies of all engineering drawings, calculations, and test data necessary to ensure that the design meets the relevant specification.

(ii) The manufacturer’s serial number that will be assigned to each portable tank.

(iii) A statement as to whether the design type has been examined by any approval agency previously and judged unacceptable. Affirmative statements must be documented with the name of the approval agency, reason for nonacceptance, and the nature of modifications made to the design type.

(b) *Action by approval agency.* The approval agency must perform the following activities:

(1) Review the application for approval to determine whether it is complete and conforms with the requirements of paragraph (a) of this section. If an application is incomplete, it will be returned to the applicant with an explanation as to why the application is incomplete.

(2) Review all drawings and calculations to ensure that the design is in compliance with all requirements of the relevant specification. If the application is approved, one set of the approved drawings, calculations, and test data shall be returned to the applicant. The second (inspector’s copy) set of approved drawings, calculations, and test data shall be retained by the approval agency. Maintain drawings and approval records for as long as the portable tank remains in service. The drawings and records must be provided to the Department of Transportation (DOT) upon request.

(3) Witness all tests required for the approval of the portable tank specified in this section and part 180, subpart G of this subchapter.

(4) Ensure, through appropriate inspection that each portable tank is fabricated in all respects in conformance with the approved drawings, calculations, and test data.

(5) Determine and ensure that the portable tank is suitable for its intended use and that it conforms to the requirements of this subchapter.

(6) For UN portable tanks intended for non-refrigerated and refrigerated liquefied gases and Division 6.1 liquids which meet the inhalation toxicity criteria (Zone A or B) as defined in § 173.132 of this subchapter, or that are designated as toxic by inhalation materials in the § 172.101 Table of this subchapter, the approval agency must ensure that:

(i) The portable tank has been constructed in accordance with the ASME Code, Section VIII, Division 1 (see § 171.7 of this subchapter). ASME Code, Section VIII, Division 2 (see § 171.7 of this subchapter) or other design codes may be used if approved by the Associate Administrator (see § 178.274(b)(1));

(ii) All applicable provisions of the design and construction have been met

to the satisfaction of the designated approval agency in accordance with the rules established in the ASME Code and that the portable tank meets the requirements of the ASME Code and all the applicable requirements specified in this subchapter;

(iii) The inspector has carried out all the inspections specified by the rules established in the ASME Code; and

(iv) The portable tank is marked with a U stamp code symbol under the authority of the authorized independent inspector.

(7) Upon successful completion of all requirements of this subpart, the approval agency must:

(i) Apply its name, identifying mark or identifying number, and the date upon which the approval was issued, to the metal identification marking plate attached to the portable tank. Any approvals for UN portable tanks authorizing design or construction alternatives (Alternate Arrangements) approved by the Associate Administrator (see § 178.274(a)(2)) must be indicated on the plate as specified in § 178.274(i).

(ii) Issue an approval certificate for each portable tank or, in the case of a series of identical portable tanks manufactured to a single design type, for each series of portable tanks. The approval certificate must include all the information required to be displayed on the required metal identification plate required by § 178.270–14 of this subchapter for IM portable tanks, § 178.245–6 for Specification 51 steel portable tanks, or § 178.274(i) for UN portable tanks. The approval certificate must certify that the approval agency designated to approve the portable tank has approved the portable tank in accordance with the procedures in subpart E of part 107 of this subchapter and that the portable tank is suitable for its intended purpose and meets the requirements of this subchapter. When a series of portable tanks is manufactured without change in the design type, the certificate may be valid for the entire series of portable tanks representing a single design type. For UN portable tanks, the certificate must refer to the prototype test report, the hazardous material or group of hazardous materials allowed to be transported, the materials of construction of the shell and lining (when applicable) and an approval number. The approval number must consist of the distinguishing sign or mark of the country (“USA” for the United States of America) where the approval was granted and a registration number.

(iii) Retain a copy of each approval certificate.

(8) For UN portable tanks, the approval certificate must also include the following:

(i) The results of the applicable framework and rail impact test specified in part 180, subpart G, of this subchapter; and

(ii) The results of the initial inspection and test in § 180.605 of this subchapter.

(9) The approval agency shall be independent from the manufacturer. The approval agency and the authorized inspector may be the same entity.

(c) *Manufacturers' responsibilities.* The manufacturer is responsible for compliance with the applicable specifications for the design and construction of portable tanks. In addition to responsibility for compliance, manufacturers are responsible for ensuring that the contracted approval agency and authorized inspector, if applicable, are qualified, reputable and competent. The manufacturer of a portable tank shall—

(1) Comply with all the applicable requirements of the ASME Code (see § 171.7 of this subchapter) and of this subpart including, but not limited to, ensuring that the quality control, design calculations and required tests are performed and that all aspects of the portable tank meet the applicable requirements.

(2) Obtain and use a designated approval agency, if applicable, and obtain and use a DOT-designated approval agency to approve the design, construction and certification of the portable tank.

(3) Provide a statement in the manufacturers' data report certifying that each portable tank that is manufactured complies with the relevant specification and all the applicable requirements of this subchapter.

(4) Maintain records of the qualification of portable tanks for at least 5 years and provide copies to the approval agency, the owner or lessee of the tank. Upon request, provide these records to a representative of DOT.

(d) *Denial of application for approval.* If an approval agency finds that a portable tank cannot be approved for any reason, it shall notify the applicant in writing and shall provide the applicant with the reasons for which the approval is denied. A copy of the notification letter shall be provided to the Associate Administrator. An applicant aggrieved by a decision of an approval agency may appeal the decision in writing, within 90 days of receipt, to the Associate Administrator.

(e) *Modifications to approved portable tanks.* (1) Prior to modification of any approved portable tank which may affect conformance and the safe use of an IM or UN portable tank, which may involve a change to the design type or which may affect its ability to retain the hazardous material in transportation, the person desiring to make such modification shall inform the approval agency that issued the initial approval of the portable tank (or if unavailable another approval agency) of the nature of the modification and request approval of the modification. The person desiring to modify the tank must supply the approval agency with three sets of all revised drawings, calculations, and test data relative to the intended modification.

(2) A statement as to whether the intended modification has been examined and determined to be unacceptable by any approval agency. The written statement must include the name of the approving agency, the reason for nonacceptance, and the nature of changes made to the modification since its original rejection.

(3) The approval agency shall review the request for modification, and if it is determined that the proposed modification is in full compliance with the relevant DOT specification, including a UN portable tank, the request shall be approved and the approval agency shall perform the following activities:

(i) Return one set of the approved revised drawings, calculations, and test data to the applicant. The second and third sets of the approved revised drawings, calculations, and data shall be retained by the approval agency as required in § 107.404(a)(3) of this subchapter.

(ii) Ensure through appropriate inspection that all modifications conform to the revised drawings, calculations, and test data.

(iii) Determine the extent to which retesting of the modified tank is necessary based on the nature of the proposed modification, and ensure that all required retests are satisfactorily performed.

(iv) If modification to an approved tank alters any information on the approval certificate, issue a new approval certificate for the modified tank and ensure that any necessary changes are made to the metal identification plate. A copy of each newly issued approval certificate shall be retained by the approval agency and by the owner of each portable tank.

(4) If the approval agency determines that the proposed modification is not in compliance with the relevant DOT

specification, the approval agency shall deny the request in accordance with paragraph (d) of this section.

(f) *Termination of Approval Certificate.* (1) The Associate Administrator may terminate an approval issued under this section if he determines that—

(i) Information upon which the approval was based is fraudulent or substantially erroneous; or

(ii) Termination of the approval is necessary to adequately protect against risks to life and property; or

(iii) The approval was not issued by the approval agency in good faith; or

(iv) The portable tank does not meet the specification.

(2) Before an approval is terminated, the Associate Administrator gives the interested party(ies):

(i) Written notice of the facts or conduct believed to warrant the termination;

(ii) Opportunity to submit oral and written evidence; and

(iii) Opportunity to demonstrate or achieve compliance with the applicable requirements.

(3) If the Associate Administrator determines that a certificate of approval must be terminated to preclude a significant and imminent adverse effect on public safety, he may terminate the certificate immediately. In such circumstances, the opportunities of paragraphs (f)(2) (ii) and (iii) of this section need not be provided prior to termination of the approval, but shall be provided as soon as practicable thereafter.

71. Section 178.274 is added to subpart H to read as follows:

§ 178.274 Specifications for UN portable tanks.

(a) *General.* (1) Each UN portable tank must meet the requirements of this section. In addition to the requirements of this section, requirements specific to UN portable tanks used for liquid and solid hazardous materials, non-refrigerated liquefied gases and refrigerated liquefied gases are provided in §§ 178.275, 178.276 and 178.277, respectively. Requirements for approval, maintenance, inspection, testing and use are provided in § 178.273 and part 180, subpart G, of this subchapter. Any portable tank which meets the definition of a "container" within the terms of the International Convention for Safe Containers (CSC) must meet the requirements of the CSC as amended and 49 CFR parts 450 through 453 and must have a CSC safety approval plate.

(2) In recognition of scientific and technological advances, the technical requirements applicable to UN portable

tanks may be varied if approved by the Associate Administrator and the portable tank is shown to provide a level of safety equal to or exceeding the requirements of this subchapter.

Portable tanks approved to alternative technical requirements must be marked "Alternative Arrangement" as specified in paragraph (i) of this section.

(3) *Definitions.* The following definitions apply for the purposes of design and construction of UN portable tanks under this subpart:

Alternate Arrangement portable tank means a UN portable tank that has been approved to alternative technical requirements or testing methods other than those specified for UN portable tanks in part 178 or part 180 of this subchapter.

Approval agency means the designated approval agency authorized to approve the portable tank in accordance with the procedures in subpart E of part 107 of this subchapter.

Design pressure is defined according to the hazardous materials intended to be transported in the portable tank. See §§ 178.275, 178.276 and 178.277, as applicable.

Design type means a portable tank or series of portable tanks made of materials of the same material specifications and thicknesses, manufactured by a single manufacturer, using the same fabrication techniques (for example, welding procedures) and made with equivalent structural equipment, closures, and service equipment.

Fine grain steel means steel which has a ferritic grain size of 6 or finer when determined in accordance with ASTM E 112-96 (see § 171.7 of this subchapter).

Fusible element means a non-reclosing pressure relief device that is thermally activated and that provides protection against excessive pressure buildup in the portable tank developed by exposure to heat, such as from a fire (see § 178.275(g)).

Jacket means the outer insulation cover or cladding which may be part of the insulation system.

Leakage test means a test using gas to subject the shell and its service equipment to an internal pressure.

Maximum allowable working pressure (MAWP) is defined according to the hazardous materials intended to be transported in the portable tank. See §§ 178.275, 178.276 and 178.277, as applicable.

Maximum permissible gross mass (MPGM) means the sum of the tare mass of the portable tank and the heaviest hazardous material authorized for transportation.

Mild steel means a steel with a guaranteed minimum tensile strength of 360 N/mm² to 440 N/mm² and a guaranteed minimum elongation at fracture as specified in paragraph (c)(10) of this section.

Offshore portable tank means a portable tank specially designed for repeated use in the transportation of hazardous materials to, from and between offshore facilities. An offshore portable tank is designed and constructed in accordance with the Guidelines for the Approval of Containers Handled in Open Seas specified in the IMDG Code (see § 171.7 of this subchapter).

Reference steel means a steel with a tensile strength of 370 N/mm² and an elongation at fracture of 27%.

Service equipment means measuring instruments and filling, discharge, venting, safety, heating, cooling and insulating devices.

Shell means the part of the portable tank which retains the hazardous materials intended for transportation, including openings and closures, but does not include service equipment or external structural equipment.

Structural equipment means the reinforcing, fastening, protective and stabilizing members external to the shell.

Test pressure means the maximum gauge pressure at the top of the shell during the hydraulic pressure test equal to not less than 1.5 times the design pressure for liquids and 1.3 for liquefied compressed gases. In some instances a pneumatic test is authorized as an alternative to the hydraulic test. The minimum test pressures for portable tanks intended for specific liquid and solid hazardous materials are specified in the applicable portable tank T codes (such as T1-T23) assigned to these hazardous materials in the § 172.101 Table of this subchapter.

(b) *General design and construction requirements.* (1) The design temperature range for the shell must be -40 °C to 50 °C (-40 °F to 122 °F) for hazardous materials transported under normal conditions of transportation, except for portable tanks used for refrigerated liquefied gases where the minimum design temperature must not be higher than the lowest (coldest) temperature (for example, service temperature) of the contents during filling, discharge or transportation. For hazardous materials handled under elevated temperature conditions, the design temperature must not be less than the maximum temperature of the hazardous material during filling, discharge or transportation. More severe design temperatures must be considered

for portable tanks subjected to severe climatic conditions (for example, portable tanks transported in arctic regions). Shells must be designed and constructed in accordance with the requirements of the ASME Code, Section VIII, Division 1 (see § 171.7 of this subchapter), except as limited or modified in this subchapter. For portable tanks used for liquid or solid hazardous materials, a design code other than the ASME Code may be used if approved by the Associate Administrator. Portable tanks used for non-refrigerated and refrigerated liquefied compressed gases require an ASME certification and U stamp. Shells must be made of metallic materials suitable for forming. Non-metallic materials may be used for the attachments and supports between the shell and jacket, provided their material properties at the minimum and maximum design temperatures are proven to be sufficient. For welded shells, only a material whose weldability has been fully demonstrated may be used. Welds must be of high quality and conform to a level of integrity at least equivalent to the welding requirements specified in Section VIII of the ASME Code for the welding of pressure vessels. When the manufacturing process or the materials make it necessary, the shells must be suitably heat-treated to guarantee adequate toughness in the weld and in the heat-affected zones. In choosing the material, the design temperature range must be taken into account with respect to risk of brittle fracture, stress corrosion cracking, resistance to impact, and suitability for the hazardous materials intended for transportation in the portable tank. When fine grain steel is used, the guaranteed value of the yield strength must be not more than 460 N/mm² and the guaranteed value of the upper limit of the tensile strength must be not more than 725 N/mm² according to the material specification. Aluminum may not be used as a construction material for the shells of portable tanks intended for the transport of non-refrigerated liquefied gases. For portable tanks intended for the transport of liquid or solid hazardous materials, aluminum may only be used as a construction material for portable tank shells if approved by the Associate Administrator. Portable tank materials must be suitable for the external environment where they will be transported, taking into account the determined design temperature range. Portable tanks shall be designed to withstand, without loss of contents, at least the internal pressure due to the

contents and the static, dynamic and thermal loads during normal conditions of handling and transportation. The design must take into account the effects of fatigue, caused by repeated application of these loads through the expected life of the portable tank.

(2) Portable tank shells, fittings, and pipework shall be constructed from materials that are:

- (i) Compatible with the hazardous materials intended to be transported; or
- (ii) Properly passivated or neutralized by chemical reaction, if applicable; or
- (iii) For portable tanks used for liquid and solid materials, lined with corrosion-resistant material directly bonded to the shell or attached by equivalent means.

(3) Gaskets and seals shall be made of materials that are compatible with the hazardous materials intended to be transported.

(4) When shells are lined, the lining must be compatible with the hazardous materials intended to be transported, homogeneous, non-porous, free from perforations, sufficiently elastic and compatible with the thermal expansion characteristics of the shell. The lining of every shell, shell fittings and piping must be continuous and must extend around the face of any flange. Where external fittings are welded to the tank, the lining must be continuous through the fitting and around the face of external flanges. Joints and seams in the lining must be made by fusing the material together or by other equally effective means.

(5) Contact between dissimilar metals which could result in damage by galvanic action must be prevented by appropriate measures.

(6) The construction materials of the portable tank, including any devices, gaskets, linings and accessories, must not adversely affect or react with the hazardous materials intended to be transported in the portable tank.

(7) Portable tanks must be designed and constructed with supports that provide a secure base during transportation and with suitable lifting and tie-down attachments.

(c) *Design criteria.* (1) Portable tanks and their fastenings must, under the maximum permissible loads and maximum permissible working pressures, be capable of absorbing the following separately applied static forces (for calculation purposes, acceleration due to gravity (g) = 9.81m/s^2):

(i) In the direction of travel: $2g$ (twice the MPGM multiplied by the acceleration due to gravity);

(ii) Horizontally at right angles to the direction of travel: $1g$ (the MPGM

multiplied by the acceleration due to gravity);

(iii) Vertically upwards: $1g$ (the MPGM multiplied by the acceleration due to gravity); and

(iv) Vertically downwards: $2g$ (twice the MPGM multiplied by the acceleration due to gravity).

(2) Under each of the forces specified in paragraph (c)(1) of this section, the safety factor must be as follows:

(i) For metals having a clearly defined yield point, a design margin of 1.5 in relation to the guaranteed yield strength; or

(ii) For metals with no clearly defined yield point, a design margin of 1.5 in relation to the guaranteed 0.2% proof strength and, for austenitic steels, the 1% proof strength.

(3) The values of yield strength or proof strength must be the values according to recognized material standards. When austenitic steels are used, the specified minimum values of yield strength or proof strength according to the material standards may be increased by up to 15% for portable tanks used for liquid and solid hazardous materials, other than toxic by inhalation liquids meeting the criteria of Hazard Zone A or Hazard Zone B (see § 173.133 of this subchapter), when these greater values are attested in the material inspection certificate.

(4) Portable tanks must be capable of being electrically grounded to prevent dangerous electrostatic discharge when they are used for Class 2 flammable gases or Class 3 flammable liquids, including elevated temperature materials transported at or above their flash point.

(5) For shells of portable tanks used for liquefied compressed gases, the shell must consist of a circular cross section. Shells must be of a design capable of being stress-analysed mathematically or experimentally by resistance strain gauges as specified in UG-101, Section VIII of the ASME Code (see § 171.7 of this subchapter), or other methods approved by the Associate Administrator.

(6) Shells must be designed and constructed to withstand a hydraulic test pressure of not less than 1.5 times the design pressure for portable tanks used for liquids and 1.3 times the design pressure for portable tanks used for liquefied compressed gases. Specific requirements are provided for each hazardous material in the applicable T Code or portable tank special provision specified in the § 172.101 Table of this subchapter. The minimum shell thickness requirements must also be taken into account.

(7) For metals exhibiting a clearly defined yield point or characterized by a guaranteed proof strength (0.2% proof strength, generally, or 1% proof strength for austenitic steels), the primary membrane stress σ (sigma) in the shell must not exceed $0.75 Re$ or $0.50 Rm$, whichever is lower, at the test pressure, where:

Re = yield strength in N/mm^2 , or 0.2% proof strength or, for austenitic steels, 1% proof strength;
 Rm = minimum tensile strength in N/mm^2 .

(8) The values of Re and Rm to be used must be the specified minimum values according to recognized material standards. When austenitic steels are used, the specified minimum values for Re and Rm according to the material standards may be increased by up to 15% when greater values are attested in the material inspection certificate.

(9) Steels which have a Re/Rm ratio of more than 0.85 are not allowed for the construction of welded shells. The values of Re and Rm to be used in determining this ratio must be the values specified in the material inspection certificate.

(10) Steels used in the construction of shells must have an elongation at fracture, in percentage, of not less than $10,000/Rm$ with an absolute minimum of 16% for fine grain steels and 20% for other steels.

(11) For the purpose of determining actual values for materials for sheet metal, the axis of the tensile test specimen must be at right angles (transversely) to the direction of rolling. The permanent elongation at fracture must be measured on test specimens of rectangular cross sections in accordance with ISO 6892 (see § 171.7 of this subchapter), using a 50 mm gauge length.

(d) *Minimum shell thickness.* (1) The minimum shell thickness must be the greatest thickness of the following:

(i) the minimum thickness determined in accordance with the requirements of paragraphs (d)(2) through (d)(10) of this section;

(ii) the minimum thickness determined in accordance with Section VIII of the ASME Code (see § 171.7 of this subchapter) or other approved pressure vessel code; or

(iii) the minimum thickness specified in the applicable T code or portable tank special provision indicated for each hazardous material in the § 172.101 Table of this subchapter.

(2) Shells (cylindrical portions, heads and manhole covers) not more than 1.80 m in diameter may not be less than 5 mm thick in the reference steel or of

equivalent thickness in the metal to be used. Shells more than 1.80 m in diameter may not be less than 6 mm (0.2 inches) thick in the reference steel or of equivalent thickness in the metal to be used. For portable tanks used only for the transportation of powdered or granular solid hazardous materials of Packing Group II or III, the minimum thickness requirement may be reduced to 5 mm in the reference steel or of equivalent thickness in the metal to be used regardless of the shell diameter. For vacuum-insulated tanks, the aggregate thickness of the jacket and the shell must correspond to the minimum thickness prescribed in this paragraph, with the thickness of the shell itself not less than the minimum thickness prescribed in paragraph (d)(3) of this section.

(3) When additional protection against shell damage is provided in the case of portable tanks used for liquid and solid hazardous materials requiring test pressures less than 2.65 bar (265.0 kPa), subject to certain limitations specified in the UN Recommendations (see § 171.7 of this subchapter), the Associate Administrator may approve a reduced minimum shell thickness.

(4) The cylindrical portions, heads and manhole covers of all shells must not be less than 3 mm (0.1 inch) thick regardless of the material of construction, except for portable tanks used for liquefied compressed gases where the cylindrical portions, ends (heads) and manhole covers of all shells must not be less than 4 mm (0.2 inch) thick regardless of the material of construction.

(5) When steel is used, that has characteristics other than that of reference steel, the equivalent thickness of the shell and heads must be determined according to the following formula:

$$e_1 = \frac{21.4e_0d_1}{1.8m \sqrt[3]{Rm_1 \times A_1}}$$

Where:

e_1 = required equivalent thickness (in mm) of the metal to be used;

e_0 = minimum thickness (in mm) of the reference steel specified in the applicable T code or portable tank special provision indicated for each material in the § 172.101 Table of this subchapter;

d_1 = 1.8m, unless the formula is used to determine the equivalent minimum thickness for a portable tank shell that is required to have a minimum thickness of 8mm or 10mm according to the applicable T code indicated in the § 172.101 Table of this subchapter. When reference steel thicknesses of 8mm or 10mm are specified, d_1 is equal to the

actual diameter of the shell but not less than 1.8m;

Rm_1 = guaranteed minimum tensile strength (in N/mm²) of the metal to be used;

A_1 = guaranteed minimum elongation at fracture (in %) of the metal to be used according to recognized material standards.

(6) The wall and all parts of the shell may not have a thickness less than that prescribed in paragraphs (d)(2), (d)(3) and (d)(4) of this section. This thickness must be exclusive of any corrosion allowance.

(7) There must be no sudden change of plate thickness at the attachment of the heads to the cylindrical portion of the shell.

(e) *Service equipment.* (1) Service equipment must be arranged so that it is protected against the risk of mechanical damage by external forces during handling and transportation. When the connections between the frame and the shell allow relative movement between the sub-assemblies, the equipment must be fastened to allow such movement without risk of damage to any working part. The external discharge fittings (pipe sockets, shut-off devices) and the internal stop-valve and its seating must be protected against mechanical damage by external forces (for example, by using shear sections). Each internal self-closing stop-valve must be protected by a shear section or sacrificial device located outboard of the valve. The shear section or sacrificial device must break at no more than 70% of the load that would cause failure of the internal self-closing stop valve. The filling and discharge devices (including flanges or threaded plugs) and any protective caps must be capable of being secured against unintended opening.

(2) Each filling or discharge opening of a portable tank must be clearly marked to indicate its function.

(3) Each stop-valve or other means of closure must be designed and constructed to a rated pressure not less than the MAWP of the shell taking into account the temperatures expected during transport. All stop-valves with screwed spindles must close by a clockwise motion of the handwheel. For other stop-valves, the position (open and closed) and direction of closure must be clearly indicated. All stop-valves must be designed to prevent unintentional opening.

(4) Piping must be designed, constructed and installed to avoid the risk of damage due to thermal expansion and contraction, mechanical shock and vibration. All piping must be of a suitable metallic material. Welded pipe joints must be used wherever possible.

(5) Joints in copper tubing must be brazed or have an equally strong metal union. The melting point of brazing materials must be no lower than 525°C (977°F). The joints must not decrease the strength of the tubing, such as may happen when cutting threads. Brazed joints are not authorized for portable tanks intended for refrigerated liquefied gases.

(6) The burst pressure of all piping and pipe fittings must be greater than the highest of four times the MAWP of the shell or four times the pressure to which it may be subjected in service by the action of a pump or other device (except pressure relief devices).

(7) Ductile metals must be used in the construction of valves and accessories.

(f) *Pressure relief devices.*—(1) *Marking of pressure relief devices.* Every pressure relief device must be clearly and permanently marked with the following:

(i) the pressure (in bar or kPa) or temperature for fusible elements (in °C) at which it is set to discharge;

(ii) the allowable tolerance at the discharge pressure for reclosing devices;

(iii) the reference temperature corresponding to the rated pressure for frangible discs;

(iv) the allowable temperature tolerance for fusible elements;

(v) the rated flow capacity of the device in standard cubic meters of air per second (m³/s) determined according to ISO 4126-1 (see § 171.7 of this subchapter); and

(vi) when practicable, the device must show the manufacturer's name and product number.

(2) *Connections to pressure relief devices.* Connections to pressure relief devices must be of sufficient size to enable the required discharge to pass unrestricted to the safety device. No stop-valve may be installed between the shell and the pressure relief devices except where duplicate devices are provided for maintenance or other reasons and the stop-valves serving the devices actually in use are locked open or the stop-valves are interlocked so that at least one of the devices is always in use. There must be no obstruction in an opening leading to a vent or pressure relief device which might restrict or cut-off the flow from the shell to that device. Vents or pipes from the pressure relief device outlets, when used, must deliver the relieved vapor or liquid to the atmosphere in conditions of minimum back-pressure on the relieving devices.

(3) *Location of pressure relief devices.* (i) Each pressure relief device inlet must be situated on top of the shell in a position as near the longitudinal and

transverse center of the shell as reasonably practicable. All pressure relief device inlets must, under maximum filling conditions, be situated in the vapor space of the shell and the devices must be so arranged as to ensure that any escaping vapor is not restricted in any manner. For flammable hazardous materials, the escaping vapor must be directed away from the shell in such a manner that it cannot impinge upon the shell. For refrigerated liquefied gases, the escaping vapor must be directed away from the tank and in such a manner that it cannot impinge upon the tank. Protective devices which deflect the flow of vapor are permissible provided the required relief-device capacity is not reduced.

(ii) Provisions must be implemented to prevent unauthorized persons from access to the pressure relief devices and to protect the devices from damage caused by the portable tank overturning.

(g) *Gauging devices.* Unless a portable tank is intended to be filled by weight, it must be equipped with one or more gauging devices. Glass level-gauges and gauges made of other fragile material, which are in direct communication with the contents of the tank are prohibited. A connection for a vacuum gauge must be provided in the jacket of a vacuum-insulated portable tank.

(h) *Portable tank supports, frameworks, lifting and tie-down attachments.* (1) Portable tanks must be designed and constructed with a support structure to provide a secure base during transport. The forces and safety factors specified in paragraphs (c)(1) and (c)(2) of this section, respectively, must be taken into account in this aspect of the design. Skids, frameworks, cradles or other similar structures are acceptable.

(2) The combined stresses caused by portable tank mountings (for example, cradles, framework, etc.) and portable tank lifting and tie-down attachments must not cause stress that would damage the shell in a manner that would compromise its lading retention capability. Permanent lifting and tie-down attachments must be fitted to all portable tanks. Preferably they should be fitted to the portable tank supports but may be secured to reinforcing plates located on the shell at the points of support. Each portable tank must be designed so that the center of gravity of the filled tank is approximately centered within the points of attachment for lifting devices.

(3) In the design of supports and frameworks, the effects of environmental corrosion must be taken into account.

(4) Forklift pockets must be capable of being closed off. The means of closing forklift pockets must be a permanent part of the framework or permanently attached to the framework. Single compartment portable tanks with a length less than 3.65 m (12 ft.) need not have forklift pockets that are capable of being closed off provided that:

(i) The shell, including all the fittings, are well protected from being hit by the forklift blades; and

(ii) The distance between forklift pockets (measured from the center of each pocket) is at least half of the maximum length of the portable tank.

(5) During transport, portable tanks must be adequately protected against damage to the shell, and service equipment resulting from lateral and longitudinal impact and overturning, or the shell and service equipment must be constructed to withstand the forces resulting from impact or overturning. External fittings must be protected so as to preclude the release of the shell contents upon impact or overturning of the portable tank on its fittings. Examples of protection include:

(i) Protection against lateral impact which may consist of longitudinal bars protecting the shell on both sides at the level of the median line;

(ii) Protection of the portable tank against overturning which may consist of reinforcement rings or bars fixed across the frame;

(iii) Protection against rear impact which may consist of a bumper or frame;

(iv) Protection of the shell against damage from impact or overturning by use of an ISO frame in accordance with ISO 1496-3 (see § 171.7 of this subchapter); and

(v) Protection of the portable tank from impact or damage that may result from overturning by an insulation jacket.

(i) *Marking.* (1) Every portable tank must be fitted with a corrosion resistant metal plate permanently attached to the portable tank in a conspicuous place and readily accessible for inspection. When the plate cannot be permanently attached to the shell, the shell must be marked with at least the information required by Section VIII of the ASME Code (see § 171.7 of this subchapter). At a minimum, the following information must be marked on the plate by stamping or by any other equivalent method:

Country of manufacture

UN

Approval Country

Approval Number

Alternative Arrangements (see § 178.247(a)(2)) "AA"

Manufacturer's name or mark
Manufacturer's serial number
Approval Agency (Authorized body for the design approval)

Owner's registration number

Year of manufacture

Pressure vessel code to which the shell is designed

Test pressure _____ bar gauge.

MAWP _____ bar gauge.

External design pressure (not required for portable tanks used for refrigerated liquefied gases) _____ bar gauge.

Design temperature range _____ °C

to _____ °C. (For portable tanks used for refrigerated liquefied gases, the minimum design temperature must be marked.)

Water capacity at 20°C/ _____ liters.

Water capacity of each compartment at 20°C _____ liters.

Initial pressure test date and witness identification.

MAWP for heating/cooling system _____ bar gauge.

Shell material(s) and material standard reference(s).

Equivalent thickness in reference steel _____ mm.

Lining material (when applicable).

Date and type of most recent periodic test(s).

Month _____ Year _____ Test

pressure _____ bar gauge.

Stamp of approval agency that performed or witnessed the most recent test.

For portable tanks used for refrigerated liquefied gases:

Either "thermally insulated" or "vacuum insulated" _____.

Effectiveness of the insulation system (heat influx) _____ Watts (W).

Reference holding time _____ days or hours and initial pressure _____ bar/kPa

gauge and degree of filling _____ in kg for each refrigerated liquefied gas permitted for transportation.

(2) The following information must be marked either on the portable tank itself or on a metal plate firmly secured to the portable tank:

Name of the operator.

Name of hazardous materials being transported and maximum mean bulk temperature (except for refrigerated liquefied gases, the name and temperature are only required when the maximum mean bulk temperature is higher than 50°C).

Maximum permissible gross mass (MPGM) _____ kg.

Unladen (tare) mass _____ kg.

Note to Paragraph (i)(2): For the identification of the hazardous materials being transported refer to part 172 of this subchapter.

(3) If a portable tank is designed and approved for open seas operations, such as offshore oil exploration, in accordance with the IMDG Code, the words "OFFSHORE PORTABLE TANK" must be marked on the identification plate.

(j) *Initial inspection and test.* The initial inspection and test of a portable tank must include the following:

(1) A check of the design characteristics.

(2) An internal and external examination of the portable tank and its fittings, taking into account the hazardous materials to be transported. For UN portable tanks used for refrigerated liquefied gases, a pressure test using an inert gas may be conducted instead of a hydrostatic test. An internal inspection is not required for a portable tank used for the dedicated transportation of refrigerated liquefied gases that are not filled with an inspection opening.

(3) A pressure test as specified in paragraph (i) of this section.

(4) A leakage test.

(5) A test of the satisfactory operation of all service equipment including pressure relief devices must also be performed. When the shell and its fittings have been pressure-tested separately, they must be subjected to a leakage test after reassembly. All welds, subject to full stress level in the shell, must be inspected during the initial test by radiographic, ultrasonic, or another suitable non-destructive test method. This does not apply to the jacket.

(6) A UN portable tank that meets the definition of "container" in the CSC (see 49 CFR 450.3(a)(2)) must be subjected to an impact test using a prototype representing each design type. The prototype portable tank must be shown to be capable of absorbing the forces resulting from an impact not less than 4 times (4 g) the maximum permissible gross mass of the fully loaded portable tank at a duration typical of the mechanical shocks experienced in rail transportation. A listing of standards describing methods acceptable for performing the impact test are provided in the UN Recommendations (see § 171.7 of this subchapter). UN portable tanks used for the dedicated transportation of "Helium, refrigerated liquid," UN1963 and "Hydrogen, refrigerated liquid," UN1966 that are marked "NOT FOR RAIL TRANSPORT" in letters of a minimum height of 20 cm (8 inches) on at least two sides of the portable tank are excepted from the 4 g impact test.

(7) The following tests must be completed on a portable tank or a series of portable tanks designed and constructed to a single design type that is also a CSC container without leakage or deformation that would render the portable tank unsafe for transportation and use:

(i) *Longitudinal inertia.* The portable tank loaded to its maximum gross

weight must be positioned with its longitudinal axis vertical. It shall be held in this position for five minutes by support at the lower end of the base structure providing vertical and lateral restraint and by support at the upper end of the base structure providing lateral restraint only.

(ii) *Lateral inertia.* The portable tank loaded to its maximum gross weight must be positioned for five minutes with its transverse axis vertical. It shall be held in this position for five minutes by support at the lower side of the base structure providing vertical and lateral restraint and by support at the upper side of the base structure providing lateral restraint only.

72. Section 178.275 is added to subpart H to read as follows:

§ 178.275 Specification for UN Portable Tanks intended for the transportation of liquid and solid hazardous materials.

(a) In addition to the requirements of § 178.274, this section sets forth definitions and requirements that apply to UN portable tanks intended for the transportation of liquid and solid hazardous materials.

(b) *Definitions and requirements.*—(1) *Design pressure* means the pressure to be used in calculations required by the recognized pressure vessel code. The design pressure must not be less than the highest of the following pressures:

(i) The maximum effective gauge pressure allowed in the shell during filling or discharge; or

(ii) The sum of—

(A) The absolute vapor pressure (in bar) of the hazardous material at 65 °C, minus 1 bar (149 °F, minus 100 kPa);

(B) The partial pressure (in bar) of air or other gases in the ullage space, resulting from their compression during filling without pressure relief by a maximum ullage temperature of 65 °C (149 °F) and a liquid expansion due to an increase in mean bulk temperature of 35 °C (95 °F); and

(C) A head pressure determined on the basis of the forces specified in § 178.274(c) of this subchapter, but not less than 0.35 bar (35 kPa).

(2) *Maximum allowable working pressure (MAWP)* means a pressure that must not be less than the highest of the following pressures measured at the top of the shell while in operating position:

(i) The maximum effective gauge pressure allowed in the shell during filling or discharge; or

(ii) The maximum effective gauge pressure to which the shell is designed which must be not less than the design pressure.

(c) *Service equipment.* (1) In addition to the requirements specified in

§ 178.274, for service equipment, all openings in the shell, intended for filling or discharging the portable tank must be fitted with a manually operated stop-valve located as close to the shell as reasonably practicable. Other openings, except for openings leading to venting or pressure relief devices, must be equipped with either a stop-valve or another suitable means of closure located as close to the shell as reasonably practicable.

(2) All portable tanks must be fitted with a manhole or other inspection openings of a suitable size to allow for internal inspection and adequate access for maintenance and repair of the interior. Compartmented portable tanks must have a manhole or other inspection openings for each compartment.

(3) For insulated portable tanks, top fittings must be surrounded by a spill collection reservoir with suitable drains.

(4) Piping must be designed, constructed and installed to avoid the risk of damage due to thermal expansion and contraction, mechanical shock and vibration. All piping must be of a suitable metallic material. Welded pipe joints must be used wherever possible.

(d) *Bottom openings.* (1) Certain hazardous materials may not be transported in portable tanks with bottom openings. When the applicable T code or portable tank special provision, as referenced for materials in the § 172.101 Table of this subchapter, specifies that bottom openings are prohibited, there must be no openings below the liquid level of the shell when it is filled to its maximum permissible filling limit. When an existing opening is closed, it must be accomplished by internally and externally welding one plate to the shell.

(2) Bottom discharge outlets for portable tanks carrying certain solid, crystallizable or highly viscous hazardous materials must be equipped with at least two serially fitted and mutually independent shut-off devices. Use of only two shut-off devices is only authorized when this paragraph is referenced in the applicable T Code indicated for each hazardous material in the § 172.101 Table of this subchapter. The design of the equipment must be to the satisfaction of the approval agency and must include:

(i) An external stop-valve fitted as close to the shell as reasonably practicable; and

(ii) A liquid tight closure at the end of the discharge pipe, which may be a bolted blank flange or a screw cap.

(3) Except as provided in paragraph (c)(2) of this section, every bottom discharge outlet must be equipped with

three serially fitted and mutually independent shut-off devices. The design of the equipment must include:

(i) A self-closing internal stop-valve, which is a stop-valve within the shell or within a welded flange or its companion flange, such that:

(A) The control devices for the operation of the valve are designed to prevent any unintended opening through impact or other inadvertent act;

(B) The valve is operable from above or below;

(C) If possible, the setting of the valve (open or closed) must be capable of being verified from the ground;

(D) Except for portable tanks having a capacity less than 1,000 liters (264.2 gallons), it must be possible to close the valve from an accessible position on the portable tank that is remote from the valve itself within 30 seconds of actuation; and

(E) The valve must continue to be effective in the event of damage to the external device for controlling the operation of the valve;

(ii) An external stop-valve fitted as close to the shell as reasonably practicable;

(iii) A liquid tight closure at the end of the discharge pipe, which may be a bolted blank flange or a screw cap; and

(iv) For portable tanks used for the transportation of liquid materials that are flammable, pyrophoric, oxidizing or toxic, the remote means of closure must be capable of thermal activation. The thermal means of activation must activate at a temperature of not more than 121 °C (250 °F).

(e) *Pressure relief devices.* All portable tanks must be fitted with at least one pressure relief device. All relief devices must be designed, constructed and marked in accordance with the requirements of this subchapter.

(f) *Vacuum-relief devices.* (1) A shell which is to be equipped with a vacuum-relief device must be designed to withstand, without permanent deformation, an external pressure of not less than 0.21 bar (21.0 kPa). The vacuum-relief device must be set to relieve at a vacuum setting not greater than -0.21 bar (-21.0 kPa) unless the shell is designed for a higher external over pressure, in which case the vacuum-relief pressure of the device to be fitted must not be greater than the tank design vacuum pressure. A shell that is not fitted with a vacuum-relief device must be designed to withstand, without permanent deformation, an external pressure of not less than 0.4 bar (40.0 kPa).

(2) Vacuum-relief devices used on portable tanks intended for the transportation of hazardous materials

meeting the criteria of Class 3, including elevated temperature hazardous materials transported at or above their flash point, must prevent the immediate passage of flame into the shell or the portable tank must have a shell capable of withstanding, without leakage, an internal explosion resulting from the passage of flame into the shell.

(g) *Pressure relief devices.* (1) Each portable tank with a capacity not less than 1,900 liters (501.9 gallons) and every independent compartment of a portable tank with a similar capacity, must be provided with one or more pressure relief devices of the reclosing type. Such portable tanks may, in addition, have a frangible disc or fusible element in parallel with the reclosing devices, except when the applicable T code assigned to a hazardous material requires that the frangible disc precede the pressure relief device, according to paragraph (g)(3) of this section, or when no bottom openings are allowed. The pressure relief devices must have sufficient capacity to prevent rupture of the shell due to over pressurization or vacuum resulting from filling, discharging, heating of the contents or fire.

(2) Pressure relief devices must be designed to prevent the entry of foreign matter, the leakage of liquid and the development of any dangerous excess pressure.

(3) When required for certain hazardous materials by the applicable T code or portable tank special provision specified for a hazardous material in the § 172.101 Table of this subchapter, portable tanks must have a pressure relief device consistent with the requirements of this subchapter. Except for a portable tank in dedicated service that is fitted with an approved relief device constructed of materials compatible with the hazardous material, the relief device system must include a frangible disc preceding (such as, between the lading and the reclosing pressure relief device) a reclosing pressure relief device. A pressure gauge or suitable tell-tale indicator for the detection of disc rupture, pin-holing or leakage must be provided in the space between the frangible disc and the pressure relief device to allow the portable tank operator to check to determine if the disc is leak free. The frangible disc must rupture at a nominal pressure 10% above the start-to-discharge pressure of the reclosable pressure relief device.

(4) Every portable tank with a capacity less than 1,900 liters (501.9 gallons) must be fitted with a pressure relief device which, except as provided in paragraph (g)(3) of this section, may

be a frangible disc when this disc is set to rupture at a nominal pressure equal to the test pressure at any temperature within the design temperature range.

(5) When the shell is fitted for pressure discharge, a suitable pressure relief device must provide the inlet line to the portable tank and set to operate at a pressure not higher than the MAWP of the shell, and a stop-valve must be fitted as close to the shell as practicable to minimize the potential for damage.

(6) *Setting of pressure relief devices.* (i) Pressure relief devices must operate only in conditions of excessive rise in temperature. The shell must not be subject to undue fluctuations of pressure during normal conditions of transportation.

(ii) The required pressure relief device must be set to start to discharge at a nominal pressure of five-sixths of the test pressure for shells having a test pressure of not more than 4.5 bar (450 kPa) and 110% of two-thirds of the test pressure for shells having a test pressure of more than 4.5 bar (450 kPa). A self-closing relief device must close at a pressure not more than 10% below the pressure at which the discharge starts. The device must remain closed at all lower pressures. This requirement does not prevent the use of vacuum-relief or combination pressure relief and vacuum-relief devices.

(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). 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.

(i) *Capacity of pressure relief devices.* (1) The reclosing pressure relief device required by paragraph (g)(1) of this section must have a minimum cross sectional flow area equivalent to an orifice of 31.75 mm (1.3 inches) diameter. Vacuum-relief devices, when used, must have a cross sectional flow area not less than 284 mm² (11.2 inches²).

(2) Under conditions of complete fire engulfment of the portable tank, the combined delivery capacity of the relief

devices must be sufficient to limit the pressure in the shell to 20% above the start-to-discharge pressure specified in paragraph (g)(6) of this section. Emergency pressure relief devices may be used to achieve the full relief capacity prescribed. The total required capacity of the relief devices may be determined using the formula in paragraph (i)(2)(i)(A) of this section or the table in paragraph (i)(2)(iii) of this section.

(i)(A) To determine the total required capacity of the relief devices, which must be regarded as being the sum of the individual capacities of all the contributing devices, the following formula must be used:

$$Q = 12.4 \frac{FA^{0.82}}{LC} \sqrt{\frac{ZT}{M}}$$

Where:

Q = minimum required rate of discharge in cubic meters of air per second (m³/s) at

standard conditions: 1 bar and 0°C (273 K);

F = for uninsulated shells: 1; for insulated shells: U(649-t)/13.6 but in no case is less than 0.25 where: U = thermal conductance of the insulation, in kW·m⁻² K⁻¹, at 38°C; and t = actual temperature of the hazardous material during filling (in °C) or when this temperature is unknown, let t = 15°C. The value of F given in this paragraph (i)(2)(i)(A) for insulated shells may only be used if the insulation is in conformance with paragraph (i)(2)(iv) of this section;

A = total external surface area of shell in square meters;

Z = the gas compressibility factor in the accumulating condition (when this factor is unknown, let Z equal 1.0);

T = absolute temperature in Kelvin (°C + 273) above the pressure relief devices in the accumulating condition;

L = the latent heat of vaporization of the liquid, in kJ/kg, in the accumulating condition;

M = molecular weight of the hazardous material.

(B) The constant C, as shown in the formula in paragraph (i)(2)(i)(A) of this section, is derived from one of the following formula as a function of the ratio k of specific heats:

$$k = \frac{c_p}{c_v}$$

Where:

c_p is the specific heat at constant pressure; and

c_v is the specific heat at constant volume.

(C) When k > 1:

$$C = \sqrt{k \left(\frac{2}{k+1} \right)^{\frac{k+1}{k-1}}}$$

(D) When k = 1 or k is unknown, a value of 0.607 may be used for the constant C. C may also be taken from the following table:

C CONSTANT VALUE TABLE

| k | C | k | C | k | C |
|------|-------|------|-------|------|-------|
| 1.00 | 0.607 | 1.26 | 0.660 | 1.52 | 0.704 |
| 1.02 | 0.611 | 1.28 | 0.664 | 1.54 | 0.707 |
| 1.04 | 0.615 | 1.30 | 0.667 | 1.56 | 0.710 |
| 1.06 | 0.620 | 1.32 | 0.671 | 1.58 | 0.713 |
| 1.08 | 0.624 | 1.34 | 0.674 | 1.60 | 0.716 |
| 1.10 | 0.628 | 1.36 | 0.678 | 1.62 | 0.719 |
| 1.12 | 0.633 | 1.38 | 0.681 | 1.64 | 0.722 |
| 1.14 | 0.637 | 1.40 | 0.685 | 1.66 | 0.725 |
| 1.16 | 0.641 | 1.42 | 0.688 | 1.68 | 0.728 |
| 1.18 | 0.645 | 1.44 | 0.691 | 1.70 | 0.731 |
| 1.20 | 0.649 | 1.46 | 0.695 | 2.00 | 0.770 |
| 1.22 | 0.652 | 1.48 | 0.698 | 2.20 | 0.793 |
| 1.24 | 0.656 | 1.50 | 0.701 | | |

(ii) As an alternative to the formula in paragraph (i)(2)(i)(A) of this section, relief devices for shells used for transporting liquids may be sized in accordance with the table in paragraph (i)(2)(iii) of this section. The table in

paragraph (i)(2)(iii) of this section assumes an insulation value of F = 1 and must be adjusted accordingly when the shell is insulated. Other values used in determining the table in paragraph (i)(2)(iii) of this section are: L = 334.94

kJ/kg; M = 86.7; T = 394 K; Z = 1; and C = 0.607.

(iii) Minimum emergency vent capacity, Q, in cubic meters per air per second at 1 bar and 0°C (273 K) shown in the following table:

MINIMUM EMERGENCY VENT CAPACITY [Q Values]

| A Exposed area (square meters) | Q (Cubic meters of air per second) | A Exposed area (square meters) | Q (Cubic meters of air per second) |
|--------------------------------------|---------------------------------------|--------------------------------------|---------------------------------------|
| 2 | 0.230 | 37.5 | 2.539 |
| 3 | 0.320 | 40 | 2.677 |
| 4 | 0.405 | 42.5 | 2.814 |
| 5 | 0.487 | 45 | 2.949 |
| 6 | 0.565 | 47.5 | 3.082 |
| 7 | 0.641 | 50 | 3.215 |
| 8 | 0.715 | 52.5 | 3.346 |
| 9 | 0.788 | 55 | 3.476 |
| 10 | 0.859 | 57.5 | 3.605 |
| 12 | 0.998 | 60 | 3.733 |
| 14 | 1.132 | 62.5 | 3.860 |
| 16 | 1.263 | 65 | 3.987 |
| 18 | 1.391 | 67.5 | 4.112 |

MINIMUM EMERGENCY VENT CAPACITY—Continued
[Q Values]

| A Exposed area (square meters) | Q (Cubic meters of air per second) | A Exposed area (square meters) | Q (Cubic meters of air per second) |
|--------------------------------------|---------------------------------------|--------------------------------------|---------------------------------------|
| 20 | 1.517 | 70 | 4.236 |
| 22.5 | 1.670 | 75 | 4.483 |
| 25 | 1.821 | 80 | 4.726 |
| 27.5 | 1.969 | 85 | 4.967 |
| 30 | 2.115 | 90 | 5.206 |
| 32.5 | 2.258 | 95 | 5.442 |
| 35 | 2.400 | 100 | 5.676 |

(iv) Insulation systems, used for the purpose of reducing venting capacity, must be specifically approved by the approval agency. In all cases, insulation systems approved for this purpose must—

(A) Remain effective at all temperatures up to 649 °C (1200.2 °F); and

(B) Be jacketed with a material having a melting point of 700 °C (1292 °F) or greater.

(j) *Approval, inspection and testing.* Approval procedures for UN portable tanks are specified in § 178.273.

Inspection and testing requirements are specified in § 180.605 of this subchapter.

73. Section 178.276 is added to subpart H to read as follows:

§ 178.276 Requirements for the design, construction, inspection and testing of portable tanks intended for the transportation of non-refrigerated liquefied compressed gases.

(a) In addition to the requirements of § 178.274 applicable to UN portable tanks, the following requirements apply to UN portable tanks used for non-refrigerated liquefied compressed gases. In addition to the definitions in § 178.274, the following definitions apply:

(1) *Design pressure* means the pressure to be used in calculations required by the ASME Code, Section VIII (see § 171.7 of this subchapter). The design pressure must be not less than the highest of the following pressures:

(i) The maximum effective gauge pressure allowed in the shell during filling or discharge; or

(ii) The sum of:

(A) The maximum effective gauge pressure to which the shell is designed as defined in this paragraph under “MAWP”; and

(B) A head pressure determined on the basis of the dynamic forces specified in paragraph (h) of this section, but not less than 0.35 bar (35 kPa).

(2) *Design reference temperature* means the temperature at which the

vapor pressure of the contents is determined for the purpose of calculating the MAWP. The value for each portable tank type is as follows:

(i) Shell with a diameter of 1.5 meters (4.9 ft.) or less: 65 °C (149 °F); or

(ii) Shell with a diameter of more than 1.5 meters (4.9 ft.):

(A) Without insulation or sun shield: 60 °C (140 °F);

(B) With sun shield: 55 °C (131 °F); and

(C) With insulation: 50 °C (122 °F).

(3) *Filling density* means the average mass of liquefied compressed gas per liter of shell capacity (kg/l).

(4) *Maximum allowable working pressure (MAWP)* means a pressure that must be not less than the highest of the following pressures measured at the top of the shell while in operating position, but in no case less than 7 bar (700 kPa):

(i) The maximum effective gauge pressure allowed in the shell during filling or discharge; or

(ii) The maximum effective gauge pressure to which the shell is designed, which must be:

(A) Not less than the pressure specified for each liquefied compressed gas listed in portable tank special provision T50; and

(B) Not less than the sum of:

(1) The absolute vapor pressure (in bar) of the liquefied compressed gas at the design reference temperature minus 1 bar; and

(2) The partial pressure (in bar) of air or other gases in the ullage space which is determined by the design reference temperature and the liquid phase expansion due to the increase of the mean bulk temperature of t_r - t_f (t_f = filling temperature, usually 15 °C, t_r = 50 °C maximum mean bulk temperature).

(b) *General design and construction requirements.* (1) Shells must be of seamless or welded steel construction, or combination of both, and have a water capacity greater than 450 liters (118.9 gallons). Shells must be designed, constructed, certified and stamped in

accordance with the ASME Code, Section VIII (see § 171.7 of this subchapter).

(2) Portable tanks must be postweld heat-treated and radiographed as prescribed in Section VIII of the ASME Code, except that each portable tank constructed in accordance with part UHT of the ASME Code must be postweld heat-treated. Where postweld heat treatment is required, the portable tank must be treated as a unit after completion of all the welds in and/or to the shell and heads. The method must be as prescribed in the ASME Code. Welded attachments to pads may be made after postweld heat treatment is made. A portable tank used for anhydrous ammonia must be postweld heat-treated. The postweld heat treatment must be as prescribed in the ASME Code, but in no event at less than 1050 °F tank metal temperature. Additionally, portable tanks constructed in accordance with part UHT of the ASME Code must conform to the following requirements:

(i) Welding procedure and welder performance tests must be made annually in accordance with Section IX of the ASME Code (see § 171.7 of this subchapter). In addition to the essential variables named therein, the following must be considered to be essential variables: number of passes, thickness of plate, heat input per pass, and manufacturer's identification of rod and flux. The number of passes, thickness of plate and heat input per pass may not vary more than 25 percent from the qualified procedure. Records of the qualification must be retained for at least 5 years by the portable tank manufacturer or his designated agent and, upon request, made available to a representative of the Department of Transportation or the owner of the tank.

(ii) Impact tests must be made on a lot basis. A lot is defined as 100 tons or less of the same heat and having a thickness variation no greater than plus or minus 25 percent. The minimum impact required for full-sized specimens shall

be 20 foot-pounds (or 10 foot-pounds for half-sized specimens) at 0 °F (−17.8 °F) Charpy V–Notch in both the longitudinal and transverse direction. If the lot test does not pass this requirement, individual plates may be accepted if they individually meet this impact requirement.

(3) When the shells intended for the transportation of non-refrigerated liquefied compressed gases are equipped with thermal insulation, a device must be provided to prevent any dangerous pressure from developing in the insulating layer in the event of a leak, when the protective covering is closed it must be gas tight. The thermal insulation must not inhibit access to the fittings and discharge devices. In addition, the thermal insulation systems must satisfy the following requirements:

(i) consist of a shield covering not less than the upper third, but not more than the upper half of the surface of the shell, and separated from the shell by an air space of approximately 40 mm (1.7 inches) across; or

(ii) consist of a complete cladding of insulating materials. The insulation must be of adequate thickness and constructed to prevent the ingress of moisture and damage to the insulation. The insulation and cladding must have a thermal conductance of not more than $0.67 \text{ (W} \cdot \text{m}^{-2} \cdot \text{K}^{-1})$ under normal conditions of transportation.

(c) *Service equipment.* (1) Each opening with a diameter of more than 1.5 mm (0.1 inch) in the shell of a portable tank, except openings for pressure-relief devices, inspection openings and closed bleed holes, must be fitted with at least three mutually independent shut-off devices in series: the first being an internal stop-valve, excess flow valve, integral excess flow valve, or excess flow feature (see § 178.337–1(g)), the second being an external stop-valve and the third being a blank flange, thread cap, plug or equivalent tight liquid closure device.

(2) When a portable tank is fitted with an excess flow valve, the excess flow valve must be so fitted that its seating is inside the shell or inside a welded flange or, when fitted externally, its mountings must be designed so that in the event of impact it maintains its effectiveness. The excess flow valves must be selected and fitted so as to close automatically when the rated flow, specified by the manufacturer, is reached. Connections and accessories leading to or from such a valve must have a capacity for a flow more than the excess flow valve's rated flow.

(3) For filling and discharge openings that are located below the liquid level, the first shut-off device must be an

internal stop-valve and the second must be a stop-valve placed in an accessible position on each discharge and filling pipe.

(4) For filling and discharge openings located below the liquid level of portable tanks intended for the transportation of flammable and/or toxic liquefied compressed gases, the internal stop-valve must be a self-closing safety device that fully closes automatically during filling or discharge in the event of fire engulfment. The device shall fully close within 30 seconds of actuation and the thermal means of closure must actuate at a temperature of not more than 121 °C (250 °F). Except for portable tanks having a capacity less than 1,000 liters (264.2 gallons), this device must be operable by remote control.

(5) In addition to filling, discharge and gas pressure equalizing orifices, shells may have openings in which gauges, thermometers and manometers can be fitted. Connections for such instruments must be made by suitable welded nozzles or pockets and may not be connected by screwed connections through the shell.

(6) All portable tanks must be fitted with manholes or other inspection openings of suitable size to allow for internal inspection and adequate access for maintenance and repair of the interior.

(7) *Inlets and discharge outlets on chlorine portable tanks.* The inlet and discharge outlets on portable tanks used to transport chlorine must meet the requirements of § 178.337–1(c)(2) and must be fitted with an internal excess flow valve. In addition to the internal excess flow valve, the inlet and discharge outlets must be equipped with an external stop valve (angle valve). Excess flow valves must conform to the standards of The Chlorine Institute, Inc. (see § 171.7 of this subchapter) as follows:

(i) A valve conforming to Drawing 101–7, dated July 1993, must be installed under each liquid angle valve.

(ii) A valve conforming to Drawing 106–6, dated July 1993, must be installed under each gas angle valve. For portable tanks used to transport non-refrigerated liquefied gases.

(8) External fittings must be grouped together as close as reasonably practicable. The following openings may be installed at locations other than on the top or end of the tank:

(i) The openings for liquid level gauging devices, pressure gauges, or for safety devices, may be installed separately at the other location or in the side of the shell;

(ii) One plugged opening of 2-inch National Pipe Thread or less provided for maintenance purposes may be located elsewhere;

(iii) An opening of 3-inch National Pipe Size or less may be provided at another location, when necessary, to facilitate installation of condensing coils.

(9) Filling and discharge connections are not required to be grouped and may be installed below the normal liquid level of the tank if:

(i) The portable tank is permanently mounted in a full framework for containerized transport;

(ii) For each portable tank design, a prototype portable tank, meets the requirements of parts 450 through 453 of this title for compliance with the requirements of Annex II of the International Convention for Safe Containers; and

(iii) Each filling and discharge outlet meets the requirements of paragraph (c)(4) of this section.

(d) *Bottom openings.* Bottom openings are prohibited on portable tanks when the portable tank special provision T50 in § 172.102(c)(7) of this subchapter indicates that bottom openings are not allowed. In this case, there may be no openings located below the liquid level of the shell when it is filled to its maximum permissible filling limit.

(e) *Pressure relief devices.* (1) Portable tanks must be provided with one or more reclosing pressure relief devices. The pressure relief devices must open automatically at a pressure not less than the MAWP and be fully open at a pressure equal to 110% of the MAWP. These devices must, after discharge, close at a pressure not less than 10% below the pressure at which discharge starts and must remain closed at all lower pressures. The pressure relief devices must be of a type that will resist dynamic forces including liquid surge. A frangible disc may only be used in series with a reclosing pressure relief device.

(2) Pressure relief devices must be designed to prevent the entry of foreign matter, the leakage of gas and the development of any dangerous excess pressure.

(3) A portable tank intended for the transportation of certain liquefied compressed gases identified in portable tank special provision T50 in § 172.102 of this subchapter must have a pressure relief device which conforms to the requirements of this subchapter. Unless a portable tank, in dedicated service, is fitted with a relief device constructed of materials compatible with the hazardous material, the relief device must be comprised of a frangible disc

preceded by a reclosing device. The space between the frangible disc and the device must be provided with a pressure gauge or a suitable tell-tale indicator. This arrangement must facilitate the detection of disc rupture, pinholing or leakage which could cause a malfunction of the pressure relief device. The frangible disc must rupture at a nominal pressure 10% above the start-to-discharge pressure of the relief device.

(4) In the case of portable tanks used for more than one gas, the pressure relief devices must open at a pressure indicated in paragraph (e)(1) of this section for the gas having the highest maximum allowable pressure of the gases allowed to be transported in the portable tank.

(f) *Capacity of relief devices.* The combined delivery capacity of the relief devices must be sufficient so that, in the event of total fire engulfment, the pressure inside the shell cannot exceed 120% of the MAWP. Reclosing relief devices must be used to achieve the full relief capacity prescribed. In the case of portable tanks used for more than gas, the combined delivery capacity of the pressure relief devices must be taken for the liquefied compressed gas which requires the highest delivery capacity of the liquefied compressed gases allowed to be transported in the portable tank. The total required capacity of the relief devices must be determined according to the requirements in § 178.275(h). These requirements apply only to liquefied compressed gases which have critical temperatures well above the temperature at the accumulating condition. For gases which have critical temperatures near or below the temperature at the accumulating condition, the calculation of the pressure relief device delivery capacity must consider the additional thermodynamic properties of the gas (for example, CGA S-1.2-1980 (see § 171.7 of this subchapter).

74. A new § 178.277 is added to subpart H to read as follows:

§ 178.277 Requirements for the design, construction, inspection and testing of portable tanks intended for the transportation of refrigerated liquefied gases.

(a) In addition to the requirements of § 178.274 applicable to UN portable tanks, the following requirements and definitions apply to UN portable tanks used for refrigerated liquefied gases:

Design pressure For the purpose of this section the term “design pressure” is consistent with the definition for design pressure in the ASME Code,

Section VIII (see § 171.7 of this subchapter).

Holding time is the time, as determined by testing, that will elapse from loading until the pressure of the contents, under equilibrium conditions, reaches the lowest set pressure of the pressure limiting device(s) (for example, pressure control valve or pressure relief device). Holding time must be determined as specified in § 178.338-9.

Maximum allowable working pressure (MAWP) means the maximum effective gauge pressure permissible at the top of the shell of a loaded portable tank in its operating position including the highest effective pressure during filling and discharge;

Minimum design temperature means the temperature which is used for the design and construction of the shell not higher than the lowest (coldest) service temperature of the contents during normal conditions of filling, discharge and transportation.

Shell means the part of the portable tank which retains the refrigerated liquefied gas intended for transport, including openings and their closures, but does not include service equipment or external structural equipment.

Tank means a construction which normally consists of either:

(1) A jacket and one or more inner shells where the space between the shell(s) and the jacket is exhausted of air (vacuum insulation) and may incorporate a thermal insulation system; or

(2) A jacket and an inner shell with an intermediate layer of solid thermally insulating material (for example, solid foam).

(b) *General design and construction requirements.* (1) Portable tanks must be of seamless or welded steel construction and have a water capacity of more than 450 liters (118.9 gallons). Portable tanks must be designed, constructed, certified and stamped in accordance with Section VIII of the ASME Code (see § 171.7 of this subchapter).

(2) Portable tanks must be postweld heat treated and radiographed as prescribed in the ASME Code except that each tank constructed in accordance with part UHT of the ASME Code must be postweld heat treated. Where postweld heat treatment is required, the tank must be treated as a unit after completion of all the welds to the shell and heads. The method must be as prescribed in the ASME Code. Welded attachments to pads may be made after postweld heat treatment is made. The postweld heat treatment must be as prescribed in Section VIII of the ASME Code, but in no event at less than 1050 °F tank metal temperature.

(3) Welding procedure and welder performance tests must be made annually in accordance with Section IX of the ASME Code (see § 171.7 of this subchapter). In addition to the essential variables named in the ASME Code, the following must be considered as essential variables: number of passes, thickness of plate, heat input per pass, and the specified rod and flux. The number of passes, thickness of plate and heat input per pass may not vary more than 25% from the procedure qualification. Records of the qualification must be retained for at least 5 years by the portable tank manufacturer and made available to the approval agency and the owner of the portable tank as specified in § 178.273.

(4) Shells and jackets must be made of metallic materials suitable for forming. Jackets must be made of steel. Non-metallic materials may be used for the attachments and supports between the shell and jacket, provided their material properties at the minimum design temperature are proven to be sufficient. In choosing the material, the minimum design temperature must be taken into account with respect to risk of brittle fracture, to hydrogen embrittlement, to stress corrosion cracking and to resistance to impact.

(5) Any part of a portable tank, including fittings, gaskets and pipe-work, which can be expected normally to come into contact with the refrigerated liquefied gas transported must be compatible with that refrigerated liquefied gas.

(6) The thermal insulation system must include a complete covering of the shell with effective insulating materials. External insulation must be protected by a jacket so as to prevent the ingress of moisture and other damage under normal transport conditions.

(7) When a jacket is so closed as to be gas-tight, a device must be provided to prevent any dangerous pressure from developing in the insulation space.

(8) Materials which may react with oxygen or oxygen enriched atmospheres in a dangerous manner may not be used in portable tanks intended for the transport of refrigerated liquefied gases having a boiling point below minus 182°C at atmospheric pressure in locations with the thermal insulation where there is a risk of contact with oxygen or with oxygen enriched fluid.

(9) Insulating materials must not deteriorate to an extent that the effectiveness of the insulation system, as determined in accordance with paragraph (b)(11) of this section, would be reduced in service.

(10) A reference holding time must be determined for each refrigerated

liquefied gas intended for transport in a portable tank. The reference holding time must be determined by testing in accordance with the requirements of § 178.338–9, considering the following factors:

- (i) The effectiveness of the insulation system, determined in accordance with paragraph (b)(11) of this section;
- (ii) The lowest set pressure of the pressure limiting device;
- (iii) The initial filling conditions;
- (iv) An assumed ambient temperature of 30 °C (86 °F);
- (v) The physical properties of the individual refrigerated liquefied gas intended to be transported.

(11) The effectiveness of the insulation system (heat influx in watts) may be determined by type testing the portable tank in accordance with a procedure specified in § 178.338–9(c) or by using the holding time test in § 178.338–9(b). This test must consist of either:

(i) A constant pressure test (for example, at atmospheric pressure) when the loss of refrigerated liquefied gas is measured over a period of time; or

(ii) A closed system test when the rise in pressure in the shell is measured over a period of time.

(12) When performing the constant pressure test, variations in atmospheric pressure must be taken into account. When performing either test, corrections must be made for any variation of the ambient temperature from the assumed ambient temperature reference value of 30 °C (86 °F).

(13) The jacket of a vacuum-insulated double-wall tank must have either an external design pressure not less than 100 kPa (1 bar) gauge pressure calculated in accordance with the ASME Code or a calculated critical collapsing pressure of not less than 200 kPa (2 bar) gauge pressure. Internal and external reinforcements may be included in calculating the ability of the jacket to resist the external pressure.

Note to Paragraph (b): For the determination of the actual holding time, as indicated by paragraphs (b)(10), (11), (12), and (13), before each journey, refer to § 178.338–9(b).

(c) *Design criteria.* For shells with vacuum insulation, the test pressure must not be less than 1.3 times the sum of the MAWP and 100 kPa (1 bar). In no case may the test pressure be less than 300 kPa (3 bar) gauge pressure.

(d) *Service equipment.* (1) Each filling and discharge opening in portable tanks used for the transport of flammable refrigerated liquefied gases must be fitted with at least three mutually independent shut-off devices in series:

the first being a stop-valve situated as close as reasonably practicable to the jacket, the second being a stop-valve and the third being a blank flange or equivalent device. The shut-off device closest to the jacket must be a self-closing device, which is capable of being closed from an accessible position on the portable tank that is remote from the valve within 30 seconds of actuation. This device must actuate at a temperature of not more than 121 °C (250 °F).

(2) Each filling and discharge opening in portable tanks used for the transport of non-flammable refrigerated liquefied gases must be fitted with at least two mutually independent shut-off devices in series: the first being a stop-valve situated as close as reasonably practicable to the jacket and the second a blank flange or equivalent device.

(3) For sections of piping which can be closed at both ends and where liquid product can be trapped, a method of automatic pressure relief must be provided to prevent excess pressure build-up within the piping.

(4) Each filling and discharge opening on a portable tank must be clearly marked to indicate its function.

(5) When pressure-building units are used, the liquid and vapor connections to that unit must be provided with a valve as close to the jacket as reasonably practicable to prevent the loss of contents in case of damage to the pressure-building unit. A check valve may be used for this purpose if it is located on the vapor side of the pressure build-up coil.

(6) The materials of construction of valves and accessories must have satisfactory properties at the lowest operating temperature of the portable tank.

(7) Vacuum insulated portable tanks are not required to have an inspection opening.

(e) *Pressure relief devices.* (1) Every shell must be provided with not less than two independent reclosing pressure relief devices. The pressure relief devices must open automatically at a pressure not less than the MAWP and be fully open at a pressure equal to 110% of the MAWP. These devices must, after discharge, close at a pressure not lower than 10% below the pressure at which discharge starts and must remain closed at all lower pressures. The pressure relief devices must be of the type that will resist dynamic forces including surge.

(2) Except for portable tanks used for oxygen, portable tanks for non-flammable refrigerated liquefied gases (except oxygen) and hydrogen may in addition have frangible discs in parallel

with the reclosing devices as specified in paragraphs (e)(4)(ii) and (e)(4)(iii) of this section.

(3) Pressure relief devices must be designed to prevent the entry of foreign matter, the leakage of gas and the development of any dangerous excess pressure.

(4) *Capacity and setting of pressure relief devices.* (i) In the case of the loss of vacuum in a vacuum-insulated tank or of loss of 20% of the insulation of a portable tank insulated with solid materials, the combined capacity of all pressure relief devices installed must be sufficient so that the pressure (including accumulation) inside the shell does not exceed 120% of the MAWP.

(ii) For non-flammable refrigerated liquefied gases (except oxygen) and hydrogen, this capacity may be achieved by the use of frangible discs in parallel with the required safety-relief devices. Frangible discs must rupture at nominal pressure equal to the test pressure of the shell.

(iii) Under the circumstances described in paragraphs (e)(4)(i) and (e)(4)(ii) of this section, together with complete fire engulfment, the combined capacity of all pressure relief devices installed must be sufficient to limit the pressure in the shell to the test pressure.

(iv) The required capacity of the relief devices must be calculated in accordance with CGA Pamphlet S–1.2 (see § 171.7 of this subchapter).

75. In § 178.703, the section heading and paragraph (a)(1) introductory text are revised and in paragraph (a)(1)(ii), a new sentence is added at the end of the paragraph to read as follows:

§ 178.703 Marking of IBCs.

(a) * * *

(1) Mark every IBC in a durable and clearly visible manner. The marking may be applied in a single line or in multiple lines provided the correct sequence is followed with the information required by this section in letters, numerals and symbols of at least 12 mm in height. This minimum marking size applies only to IBCs manufactured after October 1, 2001). The following information is required in the sequence presented:

* * * * *

(ii) * * * The letter “W” must follow the IBC design type identification code on an IBC when the IBC differs from the requirements in subpart N of this part, or is tested using methods other than those specified in this subpart, and is approved by the Associate Administrator in accordance with the provisions in § 178.801(i).

* * * * *

76. In § 178.705, the section heading and paragraph (c)(1)(iv)(A) are revised and a new paragraph (c)(1)(iv)(C) is added to read as follows:

§ 178.705 Standards for metal IBCs.

* * * * *

- (c) * * *
- (1) * * *
- (iv) * * *
- (A) For a reference steel having a product of $Rm \times A_o = 10,000$, where A_o is the minimum elongation (as a percentage) of the reference steel to be

used on fracture under tensile stress, ($Rm \times A_o = 10,000 \times 145$; if tensile strength is in U.S. Standard units of pounds per square inch) the wall thickness must not be less than:

| Capacity (C) in liters ¹ | Wall thickness (T) in mm | | | |
|-------------------------------------|--------------------------|------------------------------------|------------------|------------------|
| | Types 11A, 11B, 11N | Types 21A, 21B, 21N, 31A, 31B, 31N | | |
| | | Unprotected | Protected | Unprotected |
| $C \leq 1000$ | 2.0 | 1.5 | 2.5 | 2.0 |
| $1000 < C \leq 2000$ | $T=C/2000 + 1.5$ | $T=C/2000 + 1.0$ | $T=C/2000 + 2.0$ | $T=C/2000 + 1.5$ |
| $2000 < C \leq 3000$ | $T=C/2000 + 1.5$ | $T=C/2000 + 1.0$ | $T=C/1000 + 1.0$ | $T=C/2000 + 1.5$ |

¹ Where: gallons = liters X 0.264.

* * * * *

(C) For purposes of the calculation described in paragraph (c)(1)(iv)(B) of this section, the guaranteed minimum tensile strength of the metal to be used (Rm_1) must be the minimum value according to material standards. However, for austenitic (stainless) steels, the specified minimum value for Rm , according to the material standards, may be increased by up to 15% when a greater value is provided in the material inspection certificate. When no material standard exists for the material in question, the value of Rm must be the minimum value indicated in the material inspection certificate.

* * * * *

77. In § 178.801, in paragraph (i), two sentences are added at the end of the paragraph to read as follows:

§ 178.801 General requirements.

* * * * *

(i) * * * A large packaging, as defined in § 171.8 of this subchapter, may be used if approved by the Associate Administrator. The large packaging must conform to the construction standards, performance testing and packaging marking requirements specified in the UN Recommendations.

* * * * *

78. In § 178.812, paragraph (c)(1) is revised and a new paragraph (c)(3) is added to read as follows:

§ 178.812 Top lift test.

* * * * *

(c) *Test method.* (1) A metal or flexible IBC must be lifted in the manner for which it is designed until clear of the floor and maintained in that position for a period of five minutes.

* * * * *

(3) If not tested as indicated in paragraph (c)(1) of this section, a

flexible IBC design type must be tested as follows:

- (i) Fill the flexible IBC to 95% full with a material representative of the product to be shipped.
- (ii) Suspend the flexible IBC by its lifting devices.
- (iii) Apply a constant downward force through a specially designed platen. The platen will be a minimum of 60% and a maximum of 80% of the cross sectional surface area of the flexible IBC.
- (iv) The combination of the mass of the filled flexible IBC and the force applied through the platen must be a minimum of six times the maximum net mass of the flexible IBC. The test must be conducted for a period of five minutes.
- (v) Other equally effective methods of top lift testing and preparation may be used with approval of the Associate Administrator.

* * * * *

PART 179—SPECIFICATIONS FOR TANK CARS

79. The authority citation for part 179 continues to read as follows:

Authority: 49 U.S.C. 5105–5127; 49 CFR 1.53.

§ 179.102–4 [Amended]

80. In § 179.102–4, in the introductory text, the wording “vinyl fluoride, inhibited” is revised to read “vinyl fluoride, stabilized”.

PART 180—CONTINUING QUALIFICATION AND MAINTENANCE OF PACKAGINGS

81. The authority citation for part 180 continues to read as follows:

Authority: 49 U.S.C. 5101–5127; 49 CFR 1.53.

82. Subpart G is added to part 180 to read as follows:

Subpart G—Qualification and Maintenance of Portable Tanks

- Sec.
- 180.601 Applicability.
- 180.603 Qualification of portable tanks.
- 180.605 Requirements for periodic testing, inspection and repair of portable tanks.

Subpart G—Qualification and Maintenance of Portable Tanks

§ 180.601 Applicability.

This subpart prescribes requirements, in addition to those contained in parts 107, 171, 172, 173, and 178 of this subchapter, applicable to any person responsible for the continuing qualification, maintenance or periodic retesting of a portable tank.

§ 180.603 Qualification of portable tanks.

- (a) Each portable tank used for the transportation of hazardous materials must be an authorized packaging.
- (b) To qualify as an authorized packaging, each portable tank must conform to the requirements of this subchapter and the applicable design specification to which the portable tank was constructed.
- (c) The following portable tanks are authorized for use provided they conform to all applicable safety requirements of this subchapter: 51, 56, 57, 60, IM 101, IM 102 and UN portable tanks.
- (d) A portable tank that also meets the definition of “container” in 49 CFR 450.3(a)(3) must conform to the requirements in parts 450 through 453 of this title for compliance with Annex II of the Convention for Safe Containers (CSC).
- (e) *Exemption portable tanks based on DOT 51 portable tanks.* The owner of a portable tank constructed in accordance with and used under an exemption issued prior to August 31, 1996, which was in conformance with the requirements for Specification DOT 51 portable tanks with the exception of the

location of fill and discharge outlets, shall examine the portable tank and its design to determine if it meets the outlet requirements in effect on October 1, 1996. If the owner determines that the portable tank is in compliance with all requirements of the DOT 51 specification, the exemption number stenciled on the portable tank shall be removed and the specification plate (or a plate placed adjacent to the specification plate) shall be durably marked "DOT 51-E*****" (where ***** is to be replaced by the exemption number). During the period the portable tank is in service, and for one year thereafter, the owner of the portable tank must retain on file, at its principal place of business, a copy of the last exemption in effect.

§ 180.605 Requirements for periodic testing, inspection and repair of portable tanks.

(a) A portable tank constructed in accordance with a DOT specification for which a test or inspection specified in this subpart has become due, must be tested or inspected prior to being returned for transportation.

(b) *Conditions requiring test and inspection of portable tanks.* Without regard to any other test or inspection requirements, a Specification or UN portable tank must be tested and inspected in accordance with this section prior to further use if any of the following conditions exist:

(1) The portable tank shows evidence of dents, corroded or abraded areas, leakage, or any other condition that might render it unsafe for transportation service.

(2) The portable tank has been in an accident and has been damaged to an extent that may adversely affect its ability to retain the hazardous material.

(3) The portable tank has been out of hazardous materials transportation service for a period of one year or more.

(4) The portable tank has been modified from its original design specification.

(5) The portable tank is in an unsafe operating condition based on the existence of probable cause.

(c) *Schedule for periodic inspections and tests.* Each Specification portable tank must be tested and inspected in accordance with the following schedule:

(1) Each IM or UN portable tank must be given an initial inspection and test before being placed into service, a periodic inspection and test at least once every 5 years, and an intermediate periodic inspection and test at least every 2.5 years following the initial inspection and the last 5 year periodic inspection and test.

(2) Each Specification 51 portable tank must be given a periodic inspection and test at least once every five years.

(3) Each Specification 56 or 57 portable tank must be given a periodic inspection and test at least once every 2.5 years.

(4) Each Specification 60 portable tank must be given a periodic inspection and test at the end of the first 4-year period after the original test; at least once every 2 years thereafter up to a total of 12 years of service; and at least once annually thereafter. Retesting is not required on a rubber-lined tank except before each relining.

(d) *Intermediate periodic inspection and test.* For IM and UN portable tanks the intermediate 2.5 year periodic inspection and test must include at least an internal and external examination of the portable tank and its fittings taking into account the hazardous materials intended to be transported; a leakage test; and a test of the satisfactory operation of all service equipment. Sheathing, thermal insulation, etc. need only be removed to the extent required for reliable appraisal of the condition of the portable tank. For portable tanks intended for the transportation of a single hazardous material, the internal examination may be waived if it is leakage tested in accordance with the procedures in paragraph (i) of this section prior to each filling, or if approved by the Associate Administrator. Portable tanks used for dedicated transportation of refrigerated liquefied gases that are not fitted with inspection openings are excepted from the internal inspection requirement.

(e) *Periodic inspection and test.* The 5 year periodic inspection and test must include an internal and external examination and, unless excepted, a pressure test as specified in this section. Sheathing, thermal insulation, etc. need only be removed to the extent required for reliable appraisal of the condition of the portable tank. Except for DOT Specification 56 and 57 portable tanks, reclosing pressure relief devices must be removed from the tank and tested separately unless they can be tested while installed on the portable tank. For portable tanks where the shell and equipment have been pressure-tested separately, after assembly they must be subjected together to a leakage test and effectively tested and inspected for corrosion. Portable tanks used for the transportation of refrigerated, liquefied gases are excepted from the requirement for internal inspection and the hydraulic pressure test if the portable tanks are pressure tested using an inert gas as prescribed in § 178.338-16(a) and (b) of this subchapter.

(f) *Exceptional inspection and test.* The exceptional inspection and test is necessary when a portable tank shows evidence of damaged or corroded areas, or leakage, or other conditions that indicate a deficiency that could affect the integrity of the portable tank. The extent of the exceptional inspection and test must depend on the amount of damage or deterioration of the portable tank. It must include at least the inspection and a pressure test according to paragraph (e) of this section. Pressure relief devices need not be tested or replaced unless there is reason to believe the relief devices have been affected by the damage or deterioration.

(g) *Internal and external examination.* The internal and external examinations must ensure that:

(1) The shell is inspected for pitting, corrosion, or abrasions, dents, distortions, defects in welds or any other conditions, including leakage, that might render the portable tank unsafe for transportation;

(2) The piping, valves, and gaskets are inspected for corroded areas, defects, and other conditions, including leakage, that might render the portable tank unsafe for filling, discharge or transportation;

(3) Devices for tightening manhole covers are operative and there is no leakage at manhole covers or gaskets;

(4) Missing or loose bolts or nuts on any flanged connection or blank flange are replaced or tightened;

(5) All emergency devices and valves are free from corrosion, distortion and any damage or defect that could prevent their normal operation. Remote closure devices and self-closing stop-valves must be operated to demonstrate proper operation;

(6) Required markings on the portable tank are legible and in accordance with the applicable requirements; and

(7) The framework, the supports and the arrangements for lifting the portable tank are in satisfactory condition.

(h) *Pressure test procedures for specification 51, 57, 60, IM or UN portable tanks.* (1) Each Specification 57 portable tank must be leak tested by a minimum sustained air pressure of at least 3 psig applied to the entire tank. Each Specification 51 or 56 portable tank must be tested by a minimum pressure (air or hydrostatic) of at least 2 psig or at least one and one-half times the design pressure (maximum allowable working pressure, or re-rated pressure) of the tank, whichever is greater. The leakage test for portable tanks used for refrigerated liquefied gas must be performed at 90% of MAWP. Leakage tests for all other portable tanks must be at a pressure of at least 25% of

MAWP. During each air pressure test, the entire surface of all joints under pressure must be coated with or immersed in a solution of soap and water, heavy oil, or other material suitable for the purpose of detecting leaks. The pressure must be held for a period of time sufficiently long to assure detection of leaks, but in no case less than five minutes. During the air or hydrostatic test, relief devices may be removed, but all the closure fittings must be in place and the relief device openings plugged. Lagging need not be removed from a lagged tank if it is possible to maintain the required test pressure at constant temperature with the tank disconnected from the source of pressure.

(2) Each Specification 60 portable tank must be retested by completely filling the tank with water or other liquid having a similar viscosity, the temperature of the liquid must not exceed 37.7°C (100°F) during the test, and applying a pressure of 60 psig. The portable tank must be capable of holding the prescribed pressure for at least 10 minutes without leakage, evidence of impending failure, or failure. All closures shall be in place while the test is made and the pressure shall be gauged at the top of the tank. Safety devices and/or vents shall be plugged during this test.

(3) Each Specification IM or UN portable tank, except for UN portable tanks used for non-refrigerated and refrigerated liquefied gases, and all piping, valves and accessories, except pressure relief devices, must be hydrostatically tested with water, or other liquid of similar density and viscosity, to a pressure not less than 150% of its maximum allowable working pressure. UN portable tanks used for the transportation of non-refrigerated liquefied gases must be hydrostatically tested with water, or other liquid of similar density and viscosity, to a pressure not less than 130% of its maximum allowable working pressure. UN portable tanks used for the transportation of refrigerated liquefied gases may be tested hydrostatically or pneumatically using an inert gas. For pneumatic testing, due regard for protection of all personnel must be taken because of the potential hazard involved in such a test. The pneumatic test pressure in the portable tank must be reached by gradually increasing the pressure to one-half of the test pressure. Thereafter, the

test pressure must be increased in steps of approximately one-tenth of the test pressure until the required test pressure has been reached. The pressure must then be reduced to a value equal to four-fifths of the test pressure and held for a sufficient time to permit inspection of the portable tank for leaks. The minimum test pressure for a portable tank is determined on the basis of the hazardous materials that are intended to be transported in the portable tanks. For liquid, solid and non-refrigerated liquefied gases, the minimum test pressure for specific hazardous materials are specified in the applicable T Codes assigned to a particular hazardous material in the § 172.101 Table of this subchapter. While under pressure the tank shall be inspected for leakage, distortion, or any other condition which might render the tank unsafe for service. A portable tank fails to meet the requirements of the pressure test if, during the test, there is permanent distortion of the tank exceeding that permitted by the applicable specification; if there is any leakage; or if there are any deficiencies that would render the portable tank unsafe for transportation. Any portable tank that fails must be rejected and may not be used again for the transportation of a hazardous material unless the tank is adequately repaired, and, thereafter, a successful test is conducted in accordance with the requirements of this paragraph. An approval agency shall witness the hydrostatic or pneumatic test. Any damage or deficiency that might render the portable tank unsafe for service shall be repaired to the satisfaction of the witnessing approval agency. The repaired tank must be retested to the original pressure test requirements. Upon successful completion of the hydrostatic or pneumatic test, as applicable, the witnessing approval agency shall apply its name, identifying mark or identifying number in accordance with paragraph (k) of this section.

(i) *Rejection criteria.* When evidence of any unsafe condition is discovered, the portable tank may not be returned to service until it has been repaired and the pressure test is repeated and passed.

(j) *Repair.* The repair of a portable tank is authorized, provided such repairs are made in accordance with the requirements prescribed in the specification for the tank's original design and construction. In addition to

any other provisions of the specification, no portable tank may be repaired so as to cause leakage or cracks or so as to increase the likelihood of leakage or cracks near areas of stress concentration due to cooling metal shrinkage in welding operations, sharp fillets, reversal of stresses, or otherwise. No field welding may be done except to non-pressure parts. Any cutting, burning or welding operations on the shell of an IM or UN portable tank must be done with the approval of the approval agency and be done in accordance with the requirements of this subchapter, taking into account the pressure vessel code used for the construction of the shell. A pressure test to the original test pressure must be performed after the work is completed.

(k) *Inspection and test markings.* Each IM or UN portable tank must be durably and legibly marked, in English, with the date (month and year) of the last pressure test, the identification markings of the approval agency witnessing the test, when required, and the date of the last visual inspection. The marking must be placed on or near the metal identification plate, in letters not less than 3 mm (0.118 inches) high when on the metal identification plate, and 12 mm (0.5 inches) high when on the portable tank.

(l) *Record retention.* The owner of each portable tank or his authorized agent shall retain a written record of the date and results of all required inspections and tests, including an ASME manufacturer's date report, if applicable, and the name and address of the person performing the inspection or test, in accordance with the applicable specification. The manufacturer's data report, including a certificate(s) signed by the manufacturer, and the authorized design approval agency, as applicable, indicating compliance with the applicable specification of the portable tank, must be retained in the files of the owner, or his authorized agent, during the time that such portable tank is used for such service, except for Specifications 56 and 57 portable tanks.

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Edward A. Brigham,

Acting Deputy Administrator.

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