DEPARTMENT OF TRANSPORTATION

Research and Special Programs Administration

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

[Docket No. HM-181E; Amdt. Nos. 171-126, 172-136, 173-238, 178-103, 180-5]

RIN 2137-AC23

Intermediate Bulk Containers for Hazardous Materials

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

ACTION: Final rule.

SUMMARY: RSPA is amending the Hazardous Materials Regulations to include requirements for the construction, maintenance and use of intermediate bulk containers (IBCs) for the transportation of hazardous materials. The amendments are based on standards contained in the United Nations Recommendations on the Transport of Dangerous Goods (UN Recommendations) and the commodity assignments set forth in the International Maritime Organization's (IMO's) International Maritime Dangerous Goods (IMDG) Code. This final rule establishes safety standards for IBCs; allows for flexibility and technological innovation in the development of IBC design types; eliminates the need for most DOT exemptions applying to polyethylene, rigid, and flexible IBCs; enhances safety; and harmonizes domestic provisions for IBCs with international provisions.

DATES: *Effective:* September 30, 1994.

Compliance date: Compliance with the regulations, as amended herein, is authorized as of August 12, 1994.

Incorporation by reference: The incorporation by reference of certain publications listed in these amendments has been approved by the Director of the Federal Register as of September 30, 1994.

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SUPPLEMENTARY INFORMATION:

I. Background

On August 14, 1992, RSPA published in the **Federal Register** a notice of proposed rulemaking (NPRM) (Docket No. HM-181E; Notice 92-7; 57 FR 36694) proposing to amend the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) by incorporating requirements for the construction, maintenance and use of intermediate bulk containers (IBCs) for the transport of hazardous materials. Requirements in this final rule continue the process initiated under Docket No. HM-181 (55 FR 52402-52720, Dec. 21, 1990; 56 FR 66124-66287 Dec. 20, 1991) of adopting performance-oriented packaging standards based, in part, on UN Recommendations. This final rule also responds to a petition for rulemaking (P-1103) from the Rigid Intermediate Bulk Container Association (RIBCA) requesting adoption of IBC requirements based on the UN Recommendations.

The construction and design testing requirements for IBCs contained in this final rule are based, in large part, on standards specified in Chapter 16 of the UN Recommendations. These standards include definitions, specifications, performance test requirements, inspection, and periodic testing of metal, rigid plastic, composite, fiberboard, wooden, and flexible IBCs.

A major benefit of this final rule is the elimination of the need for a number of exemptions. RSPA believes that regulating the manufacture and use of IBCs under the HMR will enhance technological innovation, particularly in the development of polyethylene and composite IBCs. The elimination of the need for IBC exemptions also frees manufacturers from the cost and administrative burdens associated with obtaining, using and renewing exemptions.

Two commenters urged RSPA to grandfather existing plastic and composite IBCs currently under exemptions that withstand performance test requirements proposed in the NPRM. RSPA recognizes the need for a policy which eliminates unnecessary exemptions but permits the manufacture and use of IBCs that already meet UN standards or offer an equivalent level of safety. Therefore, in this final rule, RSPA is establishing four options to address IBC packagings currently manufactured and used under terms of an exemption:

(1) RSPA will consider renewing the terms of a DOT exemption IBC in accordance with the provisions in subpart B of part 107 until October 1, 1996. With a two-year exemption term, IBCs could be used until October 1, 1998.

(2) Exemption IBC packagings meeting new construction and design type test standards adopted in subparts N and O of part 178 in this final rule may be remarked and certified as UN standard packagings. In such cases, exemptions would no longer be needed.

(3) Under the approval of equivalent packagings provided in § 178.801(i), an exemption intermediate bulk container which differs from the standards in subpart N of this part, or which is tested using methods other than those specified in subpart O of this part, may be approved as a UN standard packaging by the Associate Administrator for Hazardous Materials Safety. Such intermediate bulk containers must be shown to be equally effective, and testing methods used must be equivalent. The exemption numbers must be retained for reference.

(4) Exemptions issued for IBC packagings after the effective date of this final rule will be based on the construction and testing standards established in subparts N and O to part 178 in this final rule.

Although not a complete list, the following 128 exemptions authorizing IBCs are potentially affected by the adoption of the UN IBC standards:

5520	9092	9920
6743	9110	9923
7259	9116	9938
7543	9117	9944
7622	9133	9983
7625	9140	9996
7869	9144	10021
8087	9150	10090
8094	9201	10104
8136	9213	10135
8146	9272	10172
8225	9289	10273
8303	9319	10298
8332	9340	10318
8351	9367	10340
8444	9374	10362
8570	9398	10468
8588	9400	10476
8629	9440	10513
8631	9498	10537
8653	9503	10547
8681	9519	10562
8692	9531	10563
8779	9533	10570
8784	9534	10598
8798	9592	10633
8839	9628	10679
8861	9637	10687
8871	9645	10694
8883	9658	10725
8884	9690	10738
8910	9692	10764
8921	9701	10775
8937	9713	10811
8942	9783	10826
8982	9789	10828
9015	9804	10837
9042	9805	10841
9046	9806	10852
9052	9819	10864
9062	9846	10894
9078	9889	10897
9089	9917	

II. Summary of Rulemaking Actions in Response to Comments

Seventy-three commenters responded to the NPRM. Commenters unanimously supported general adoption of IBC standards based on Chapter 16 of the

UN Recommendations, but with modifications for domestic transportation. One commenter said that adoption of international IBC standards "will not only ensure safety and facilitate transport but will improve competitiveness of American industries engaged both in the sale of hazardous materials, and of hazardous materials packagings, in the global marketplace." Other specific comments are addressed in Part III, Review by Section. Based on the merits of comments, RSPA is: (1) limiting the applicability of "secondary protection" to IBCs intended for vessel transportation, in accordance with the IMDG Code (RSPA also is requiring Packing Group I and II hazardous materials in certain IBC types to be further packed in closed transport vehicles); (2) permitting replacement of repaired add-on plastic components; (3) revising the definition of IBC "body" by excluding service equipment, thus permitting more flexibility in what previously were considered design-type changes, without requalification testing; (4) establishing a vibration test requirement for rigid IBCs and a vibration capability standard for flexible IBCs; and (5) setting forth in a single table in § 178.803 the IBC design qualification testing proposed in §§ 178.810–819 for the certification of metal, rigid plastic, composite, fiberboard, wooden, and flexible IBC types.

RSPA also is adopting certain recommendations approved for the Eighth revised edition of the UN Recommendations during the 17th session of the UN Committee of Experts (December 7–16, 1992). These include authorization of Packing Group I solids in IBCs, with certain quantity restrictions; addition of a Packing Group I drop test, and deletion of the 10-minute hold on production line leakproofness testing.

RSPA is establishing generic IBC commodity assignments in §§ 173.240 through 173.243 with certain special provisions in § 172.102. Generally, IBC commodity assignments are based on the lists of liquid and solid "Substances Suitable for Transport in Intermediate Bulk Containers," contained in the IMDG Code. However, RSPA is authorizing the use of IBCs for some materials that are not allowed by the IMDG Code to be transported in any IBC or in a specific IBC type.

Because DOT Specification 56 (DOT 56) and 57 (DOT 57) portable tanks are functionally IBCs, these design-types will be covered by the provisions of this rule. This coverage will obviate the necessity to maintain these older standards for metal IBCs. Consequently, RSPA is not authorizing the manufacture of DOT 56 and 57 portable tanks after October 1, 1996. However, RSPA will permit continued domestic use of DOT 56 and 57 portable tanks for as long as they meet the retest provisions contained in § 173.32(e).

For reasons discussed in Part III, Review by Section, RSPA is not adopting commenters' suggestions to: (1) remove the proposed 450-liter (119-gallon) lower IBC capacity limit, (2) authorize non-specification IBCs, (3) remove testing requirements for periodic design requalification by incorporating quality assurance programs based on documentation, or (4) permit reuse of flexible IBCs. RSPA also is not adopting the five-year limit on plastic IBC service proposed in §§ 173.35(h) and 180.351(c).

III. Review by Section

Part 171

Section 171.7. A puncture-resistance standard for fiberboard packagings (ISO 3036–1975) is added to the table of material incorporated by reference in paragraph (a), as approved by the Federal Register. RSPA believes that approved changes in the frequency of IBC design requalification testing must be based on a detailed quality assurance program, but not on any particular set of quality assurance standards. RSPA believes that limiting quality assurance standards to those set forth in ISO 9000 by itself would not be adequate. Therefore, reference to the quality assurance standard under ISO 9000 in proposed § 178.801(a)(2)(i) is deleted.

Section 171.8. A definition of "intermediate bulk container" is added in this section to mean a rigid or flexible portable packaging, other than a cylinder or portable tank, which is designed for mechanical handling. The proposed reference to "semi-rigid" IBCs is not adopted because specifications have yet to be developed for this type of IBC construction.

IBC capacity limits have been removed from the general IBC definition in this section and are placed in the IBC standards in § 178.700(c)(1). The definition "UN standard packaging" is revised to include reference to newly added subparts N and O of Part 178. In this final rule, "secondary containment" applies only to IBCs intended to be transported by vessel which may require "secondary protection," as specified in Section 26 of the IMDG Code. Therefore, the definition "secondary containment" is removed. (See discussion in the preamble to § 173.240–243).

Section 171.12. This section is revised to authorize the use of IBCs in accordance with the IMDG Code for shipments involving transportation by vessel. RIBCA suggested that RSPA amend paragraph (b)(5) to require rigid IBCs to pass the vibration test in proposed § 178.819. RIBCA said this test "needs to apply to all IBCs being transported in this country." This suggestion is not adopted. In final rules under Docket HM–181, RSPA did not require that imported non-bulk packagings be capable of passing the vibration standard in § 178.608, unless they are filled or refilled in the U.S. In this final rule, USA-marked rigid IBCs, and foreign-manufactured rigid IBCs filled in the U.S., must withstand the vibration test in § 178.819. Flexible IBCs must be capable of withstanding this test.

Part 172

Sections 172.101–102. The Hazardous Materials Table (HMT) is revised by adding special provisions B100, B101, B103 and B104 as proposed. These special provisions prohibit the transportation of particular materials in certain or all IBCs, and set forth special conditions for use of IBCs. In this final rule, Special Provision B101 is revised to authorize metal IBCs for certain liquid and solid materials. Proposed B102 is incorporated into B101, and is not adopted. IBC authorizations pertaining to six materials under Special provisions B101 and B100 have been revised in this final rule. Five dual hazard materials proposed to be authorized only in metal IBCs under Special provision B101 also are authorized generically for metal IBCs § 173.243. To remove this redundancy, the references to B101 for these materials have been removed from the § 172.101 Table.

For consistency with the IMDG Code, in this final rule, RSPA is prohibiting the use of IBCs for several Division 4.3 and Division 4.2 Packing Group I materials that were inadvertently authorized in the notice. Also for consistency with the IMDG Code, RSPA is adding additional IBC use limitations and operating requirements in Special provisions B105, B106, B108, B109 and B110. For example, B106 requires that IBCs be "vapor tight" (i.e., IBCs that will prevent any vapor from entering or escaping during transportation. A vapor tight IBC must be capable of passing the leakproofness test in 178.813). Special provision B108 requires that materials in Division 4.3 Packing Group III be in sift-proof, water resistant flexible, fiberboard or wooden IBCs packed in a closed transport vehicle. Special provision B110 authorizes IBCs for Bromobenzyl cyanides, solid and

Divinyl ether, inhibited only if packaged in accordance with § 173.242(d). These materials inadvertently reference §§ 173.240 and 173.241.

Section 172.322. In response to a petition for reconsideration received under Docket HM–211 addressing marine pollutants, this section is revised to provide a partial exception from the marine pollutant marking requirements for small bulk packagings (packages with capacities of up to 3,785 liters [1,000 gallons]). Consistent with recently adopted marine pollutant requirements for other bulk packages, IBCs (limited to an upper capacity of 3,000 liters, 793 gallons) require two, instead of four, marine pollutant markings.

Section 172.514. Paragraph (c)(4) is added, as proposed, to require all IBCs to be labeled or placarded on two opposite sides.

Part 173

Section 173.24. Paragraph (d) is revised to require IBCs manufactured under performance-oriented standards to conform to subparts N and O of part 178. The requirement that measures must be taken to prevent electrostatic discharge proposed in paragraph (j) of this section, has been moved in this final rule to § 173.35(k).

Section 173.32. A grandfather provision for DOT 56 and 57 portable tanks is added in paragraph (d). DOT 56 and 57 portable tanks may not be manufactured after September 30, 1996. DOT 56 and 57 portable tanks manufactured before October 1, 1996, may continue in hazardous materials service for the commodities currently authorized as long as they meet the retest requirements in paragraph (e) of this section.

One commenter pointed out that the retest requirements (every two years) for DOT 52, 53, 56 and 57 portable tanks in § 173.32(e)(1)(ii) should be made consistent with the 2.5 year retest and inspection requirements in (b)(1) and (b)(2) for all other IBCs intended for liquids or for solids loaded and discharged under pressure. The commenter said "this consistency would be most helpful in establishing general retest procedures at user sites." RSPA agrees that, for consistency with retest period requirements for metal, rigid plastic and composite IBCs in § 180.352, DOT 52, 53, 56 and 57 portable tanks should be retested every 2.5 years. Paragraph (e)(1)(ii) is revised accordingly.

Dual-marked portable tanks certified to both pre-October 1, 1996 DOT 56 or 57 specifications and the metal IBC standards adopted in this final rule must conform to the pre-October 1, 1996 retest requirements in § 173.32(e) and the metal IBC retest and inspection requirements adopted in subpart D to part 180 of this final rule.

Section 173.35. This section contains operational requirements for the use of IBCs. IBC filling limits and vapor pressure limits for rigid plastic or composite IBCs intended to contain liquids or solids are addressed. Under this section, each IBC and its service equipment, before being filled and offered for transportation, must be visually inspected to ensure that it is free from corrosion, contamination, cracks, or other damage which would render it unsafe for transportation. Operational requirements prescribed in this section apply only to IBCs manufactured in accordance with subparts N and O of part 178. For DOT 52, 53, 56 and 57 portable tanks, operational requirements remain in § 173.32. DOT 56 and 57 portable tanks manufactured before October 1, 1996 continue to be subject to requirements in § 173.32 for the service life of these units.

Commenters opposed the proposed ban, in paragraph (b), on the use of rigid plastic or composite IBCs with repaired plastic components. RIBCA contended that "precluding replacement or repair of any damaged plastic component would quickly remove IBCs from service long before they have served their useful lives." RIBCA added that many plastic components are satisfactorily replaced or repaired. RIBCA suggested that paragraph (b) be amended to read: "no rigid plastic or composite IBC with a repaired plastic body (except for openings and closures) may be reused," but that it allow such essential plastic parts as closures, pallets, valve door or leg, to be replaced.

Consistent with a new UN-recommended definition of "IBC body" as the "receptacle proper" that does not include service equipment (see § 178.700(c)(1)), RSPA agrees that no repair of a rigid plastic IBC body or plastic inner receptacle should be permitted. RSPA agrees, therefore, proposed paragraph (b) is revised in this final rule to permit repair or replacement of add-on plastic components. Under this revision, for example, repair of a threaded opening considered part of the IBC body is not permitted. Conversely replacement of service equipment, such as a screw-on plastic closure with stripped threads, is permitted.

Several commenters, including the Chlorobenzene Producers Association (CPA), asked RSPA to remove the proposed provision in paragraph (b) forbidding reuse of flexible IBCs. CPA said such a prohibition is wasteful and unnecessary and there is no basis for rejecting the inspection and reuse alternative for flexible IBCs. CPA asserted that a ban on flexible IBC reuse would aggravate U.S. solid waste disposal problems and that the ban "conflicts with goals of waste minimization." Another commenter said that "economics, safety and environmental concerns all point to reusability." CPA added that a categorical ban on flexible IBC reuse also would retard innovation in the development of flexible IBC design types, including development of durable, reusable construction materials.

RSPA does not agree that reuse of flexible IBCs should be permitted. Flexible IBCs have not been permitted to be reused in the past under provisions of exemptions or approvals. RSPA does not have evidence that fiberboard, wooden or flexible IBCs are designed to be, or are suitable for, reuse in hazardous materials service. Therefore, as proposed in paragraph (b), fiberboard, wooden and flexible IBCs may not be reused for hazardous materials.

One commenter said proposed paragraph (c), requiring added thickness to compensate for IBC body thinning by corrosion or mechanical abrasion, does not go far enough. The commenter recommended that shippers be required to "verify lading compatibility to the IBC material of construction." The commenter said that allowing an increased thickness to compensate for corrosion "could lead to the failure or leakage of a metallic IBC." The commenter added that rates of corrosion are "affected by temperature, pressure, etc., and therefore, added thickness may not be enough to prevent a leaker."

RSPA disagrees. Shippers currently are required to comply with general requirements in subpart B of part 173 to assure the integrity of all hazardous materials packagings under conditions normally incident to transportation. Section 173.24(e)(1) specifically requires that all packagings be compatible with their lading. Failure to comply with compatibility requirements in § 173.24(e)(1) may result in a thinning of the IBC body below thickness standards specified in § 178.705(c) for metal IBCs, possibly resulting in leakage. RSPA believes that increasing IBC body thickness is necessary to ensure design-type integrity. Therefore, as proposed, RSPA is adopting paragraph (c) requiring that a metal IBC, subject to thinning by mechanical abrasion or corrosion due to

the lading, be protected by providing a suitable increase in thickness of material, a lining or some other suitable method of protection.

Three commenters, including the National Agricultural Chemicals Association (NACA), opposed the five-year authorized period for use of rigid plastic IBCs and plastic inner receptacles of composite IBCs proposed in paragraph (h). One commenter said that a use restriction should not be included in a final rule without further input from industry regarding what a suitable in-use life should be for plastic IBCs, following the approach taken for non-bulk plastic packagings. For domestic uses of plastic IBCs, RSPA concurs with these commenters and, therefore, is not adopting the five-year use restriction for rigid plastic IBCs and inner plastic receptacles of composite IBCs proposed in paragraph (h). Internationally, the five-year use restriction may still be applied.

Proposed paragraph (i) is adopted as paragraph (h) and is clarified to distinguish between the use of gauge and absolute pressures when determining suitability of plastic and composite IBCs for liquid hazardous materials based on their vapor pressures. The test pressure marked on the IBC is a gauge pressure. Gauge pressure consists only of the vapor pressure of the hazardous material in the IBC that exceeds atmospheric pressure. Absolute pressure consists of ambient atmospheric pressure plus the vapor pressure of the hazardous material in the IBC. Vapor pressure of the hazardous material is the pressure exerted on the IBC by gases emitted by the material.

RIBCA pointed out that proposed vapor pressure requirements in paragraph (i)(2) apply to all IBCs, whereas in proposed paragraph (d)(2)(viii) in §§ 173.241 and 173.242, identical requirements apply only to metal IBCs. Accordingly, paragraph (h)(2) in this final rule applies the 110 kPa (16 psi) vapor pressure restriction only to metal IBCs. There is a test pressure limit for metal IBCs of 200 kPa (29 psig) which must not be exceeded by the vapor pressure of any material times a factor of safety of 1.5 or 1.75 depending on temperature.

Consistent with recommendations in the Eighth revised edition of the UN Recommendations, RSPA also is adding paragraph (j), which establishes a maximum capacity of 1.5 cubic meters (17.7 cubic feet) for rigid plastic, composite, flexible, fiberboard, and wooden IBCs authorized to transport Packing Group I solids. For metal IBCs, the maximum allowable capacity for Packing Group I solids remains at 3 cubic meters (35.3 cubic feet). No Packing Group I liquid is authorized in IBCs (see paragraph (d)(2)(i) in §§ 173.242 and 173.243).

Several commenters urged RSPA not to adopt proposed paragraph (j) in § 173.24 pertaining to the prevention of electrostatic discharge. They claimed that the discharge danger occurs only in plant operations and not during transportation. One commenter asserted that the wording of proposed paragraph (j) "establishes a new requirement applicable to all packagings." RSPA agrees that prevention against electrostatic discharge is not required during transportation, although a danger does exist during loading and unloading operations. Accordingly, RSPA is revising the requirement proposed in paragraph (j) to prevent electrostatic discharge only during the loading and unloading of flammable liquids and powders that could result in an explosion. This requirement applies to IBCs used in all modes, not just highway (see § 177.837(h)). Because this is an operational requirement, the provision proposed in § 173.24(j) is moved to § 173.35 and adopted as paragraph (k).

Section 173.225. As proposed, RSPA is adopting a modified form of Table 11.4 in the UN Recommendations, authorizing four organic peroxide materials in 31HA1 composite IBCs. Special conditions for certain organic peroxides transported in IBCs also are prescribed. One commenter requested an extension of organic peroxide authorizations in IBCs to include all organic peroxides in the Type F and G categories, liquids and solids, if they meet the definitions for those categories in § 173.128. RSPA agrees that type F organic peroxides currently authorized for bulk packagings are suitable for IBCs. Therefore, RSPA is amending footnote 14 to the Organic Peroxides Table in § 173.225 to authorize IBCs for Type F organic peroxides. Because Type G organic peroxides are not subject to the requirements of this section, there are no IBC restrictions that apply to this material.

Sections 173.240–243. These generic bulk packaging sections are amended to authorize IBCs for certain solids and liquids and in §§ 173.242 and 173.243 to prohibit the use of IBCs for Packing Group I. In §§ 173.242 and 173.243, RSPA is authorizing Packing Group I solids in both metal IBCs with capacities of up to 3 cubic meters (35.4 cubic feet) and non-metal IBCs with capacities up to 1.5 cubic meters (17.7 cubic feet).

Commenters urged RSPA to authorize non-specification IBCs consistent with existing packaging provisions which permit non-specification portable tanks for low-hazard materials, and with § 173.150(f)(3), which allows combustible materials meeting no other hazard class criteria to be shipped in non-specification bulk containers. These requests are not adopted. RSPA believes that IBCs should meet the performance standards adopted in this rule as a condition for use. Therefore, metal, rigid plastic, composite, fiberboard, wooden and flexible IBC types authorized in §§ 173.240(d) and 173.241(d) must be constructed as prescribed in subpart N, and tested in accordance with subpart O, of part 178.

The NPRM inadvertently proposed that certain dual-hazard materials be authorized for transport in all rigid IBCs. The generic authorizations proposed in § 173.243 for these materials deviate from the level of containment intended for these materials. Therefore, consistent with RSPA's policy, as stated in Docket HM–181, to emphasize package integrity as a principal means of maintaining hazardous materials transportation safety, § 173.243(d)(1) is revised to limit multiple-hazard materials to metal IBCs.

One commenter noted that, under the proposed regulation, materials having a subsidiary hazard of Class 3, but with a flash point higher than 100° F or having a subsidiary hazard of Division 6.1, Packing Group III, would no longer be authorized in DOT 57 portable tanks. The commenter urged RSPA to address this situation in this rulemaking. Under HM–181, most liquid multiple-hazard materials are assigned packagings in § 173.243, which does not specifically list the DOT 57 portable tank. RSPA recognizes that in HM–181, certain materials with low subsidiary hazards of flammability and toxicity have been assigned packaging in § 173.243 (generic authorizations for certain high hazard liquids and dual hazard(s)) for the transport of these materials. Therefore, in § 173.243(e) of this final rule, a dual hazard material with a subsidiary hazard of either Class 3 with a flash point exceeding 100 °F or Division 6.1, Packing Group III, may be packaged in accordance with § 173.242.

In this final rule, specific IBC requirements for Division 4.3 DANGEROUS WHEN WET materials are provided under Special Provisions in the § 172.101 Table. Therefore, generic IBC authorizations and operating requirements for these materials in proposed paragraphs (d)(2)(v) and (d)(2)(vii) in §§ 173.240, 173.241, 173.242 and 173.243 are not adopted

(see previous discussion under § 172.101).

Commenters opposed the broad applicability of the proposed "secondary containment" requirement as proposed in the NPRM, which stated that freight containers or vehicles containing IBCs "should have rigid sides or fencing at least to the height of the IBCs." Several commenters asserted that applying such a requirement to IBCs shipped by surface transportation would create hardships for retail dealers and farmers. RIBCA said the proposed definition of "secondary containment" would preclude the use of IBCs or greatly increase handling costs. Commenters urged RSPA to narrow the applicability of "secondary containment" to vessel transportation and to use the term "secondary protection," consistent with the IMDG Code. RSPA concurs. Accordingly, in this final rule, the proposed requirement that materials in Packing group II be transported in IBCs employing secondary containment are removed. IBCs containing hazardous materials intended for transportation may require secondary protection in accordance with Section 26 of the IMDG Code. However, RSPA believes that, consistent with the terms in many existing IBC exemptions, medium-level and higher hazard materials in certain IBC types must be protected from environmental exposure. Since the broad applicability for "secondary containment" has not been adopted for highway and rail transportation, RSPA is adding §§ 173.242(d)(2)(iv) and 173.243(2)(iii) requiring flexible, fiberboard, wooden and composite IBCs with fiberboard outer bodies for Packing Group I materials and in §§ 173.240(d)(2)(ii), 173.241(d)(2)(iii) for Packing Group II materials in flexible, fiberboard and wooden IBCs must be transported in closed freight containers or closed transport vehicles. Because a general standard is established in § 178.704 requiring all IBCs be sift-proof and water resistant, RSPA is not adopting proposed paragraph (d)(2)(vi) in §§ 173.240, 173.241, 173.242 and 173.243 requiring flexible, fiberboard or wooden IBCs used to transport Class 8 materials to be water resistant. In §§ 173.240, 173.242, 173.242 and 173.243 proposed paragraph (d)(2)(ix) prohibiting the use of bottom outlets on IBCs containing materials with a primary hazard class of 3 and a subsidiary hazard class of Division 6.1 is not adopted in this final rule. RSPA believes prohibiting the use of bottom outlets on IBCs goes beyond existing requirements in the HMR and would not be consistent with other packaging authorizations. If use of bottom outlets on IBCs containing these materials presents a safety concern, this issue can be considered in a future rulemaking.

Part 178

Sections 178.251, 178.252 and 178.253 are removed since the manufacture of DOT 56 and 57 metal portable tanks is prohibited after September 30, 1996 (see § 173.32 (d)).

Section 178.700. The purpose and scope of IBC standards and general definitions associated with IBCs are contained in this section, generally as proposed. In response to commenter requests, RSPA is revising the definition of IBC "body" in paragraph (c)(1) by adopting terms originally proposed by the U.S. and now contained in the Eighth revised edition of the UN Recommendations: an IBC body means "the receptacle proper, including openings and their closures, but does not include service equipment. * * *" As a result of this change, IBC "service equipment" (i.e., filling and discharge; pressure relief, safety heating and heat-insulating devices, and measuring instruments) is no longer considered part of the IBC body. This section also defines IBC "structural equipment" as the reinforcing, fastening, handling, protective, or stabilizing members of the body (e.g., metal cages) as well as stacking load-bearing structural members. Also in the definition of IBC body, as proposed, RSPA is adopting IBC volumetric capacity limits of not more than 3 cubic meters (3,000 liters, 793 gallons or 35.3 cubic feet) and not less than 0.45 cubic meters (450 liters, 119 gallons or 5.3 cubic feet).

The proposed 450-liter (119-gallon) lower IBC capacity limit drew substantial comment. Commenters suggested that RSPA either eliminate the lower capacity limit or, at a minimum, establish a 250-liter (66-gallon) lower limit consistent with Section 26.1.2.1 of the IMDG Code. RIBCA questioned the need for a lower limit and stated that small IBCs under 450 liter (119-gallon) capacity already are authorized under exemptions. For example, DOT E–9690 authorizes 415.8-liter (110-gallon) IBCs. RIBCA noted that small IBCs have been used for years in agricultural and water treatment operations. RIBCA added that allowing small IBCs into the U.S. under § 171.12, but not allowing U.S. manufacturers to market small IBCs domestically, creates competitive disadvantages.

Commenter requests to remove the IBC lower capacity limit are not adopted in this final rule. RSPA is not authorizing IBCs with capacities less than 450 liters (119 gallons) because RSPA believes that differing non-bulk and IBC construction standards, performance and reuse requirements could create safety inequities in the use of these two packaging categories. For example, a drum manufacturer might call a drum or jerrican an IBC to gain certain kinds of regulatory relief. Metal and plastic drums and jerricans intended for reuse must meet minimum thickness standards in § 173.28(b)(4), while no such standards are proposed for stand-alone or composite IBCs. Metal and plastic drums designed for limited hazardous materials service must be leakproofness-tested before each reuse (§ 173.28(b)(2)). IBCs would be subject to a completely different retest and inspection scheme requiring leakproofness testing every 2.5 years (§ 180.352) In addition, drop, stacking, and hydrostatic pressure design performance requirements for non-bulk packagings in subpart M of part 178 substantially differ from those proposed for IBCs in subpart O of part 178.

Although IBCs with capacities below 450 liters (119 gallons) represent only a small percentage of the total number of IBCs in domestic service, RSPA recognizes that IBC manufacturers and users may occasionally need a full capacity range of IBC design types. In this final rule, therefore, a provision in paragraph § 178.801(i) provides for the manufacture and use of IBCs which differ from the standards in subpart N, including IBCs with capacities less than 450 liters (119 gallons), if approved by the Associate Administrator for Hazardous Materials Safety. RSPA notes that IBCs with lower capacities may continue to be used for import and export shipments, as provided in § 171.12.

RSPA is not adopting a proposal by the Oregon Trucking Association and several Oregon-based carriers to include a rubber bladder bag among the UN-recommended IBC design types RSPA is adopting in this final rule. Although bladder bags are designed for mechanical handling (as are IBCs), they do not meet any of the material-of-construction standards for the flexible IBCs that were proposed in subpart N of part 178. Flexible IBC standards were developed with the intent that these packagings would contain dry materials. Standards for flexible IBCs intended for liquids do not appear in the UN Recommendations and were not considered in this rulemaking. Bulk bladder bags may be used for hazardous materials requiring specification packaging only if specifically authorized under an exemption issued in

accordance with subpart B of 49 CFR, part 107

Section 178.702. This section, adopted as proposed, contains IBC code designations for metal, rigid plastic, composite, fiberboard, wooden, and flexible IBCs.

Section 178.703. Certification and additional marking requirements for IBCs are set forth in this section. The IBC certification mark is comprised of the following elements: UN symbols, code numbers designating IBC type, Packing Group designation, month and year of manufacture, the country authorizing allocation of the mark, name and address or symbol of the manufacturer or the approval agency certifying compliance with subparts N and O of part 178, the stacking test load in kilograms (kg), and the maximum permissible gross mass (for flexible IBCs, the "maximum net mass" as defined in § 171.8 in kilograms (kg)). RSPA is adding a new paragraph (a)(1)(iii)(A), establishing the mark "X" for IBCs meeting Packing Group I, II and III performance test standards.

Four examples of IBC certification marking are provided in § 178.703(a)(2) (i) through (iv). Two examples of additional markings are given in § 178.703(b)(3) (i) and (ii).

One commenter asked RSPA to allow manufacturers or others certifying flexible IBCs to omit the "UN-in-a-circle" symbol because "such symbols are difficult to reproduce" on flexible IBCs. The commenter noted that this option already is provided for metal IBCs. This request is not adopted because RSPA is not aware that use of the "UN-in-a-circle" has been a problem for manufacturers of flexible IBCs in other countries.

In paragraphs (b)(1)(i) and (b)(2)(i) among additional marking requirements, rigid, composite and metal IBCs must be marked for "rated" capacity. Rated capacity is capacity normally used compared to "maximum capacity," which is defined in § 171.8 as "the maximum inner volume of receptacles or packagings."

RIBCA commented that paragraph (b), requiring additional marks to be located "in a place readily accessible for inspection," could lead to enforcement problems "because there is no possible way to find a location that will assure that under all circumstances in usage the markings would always be visible for inspection." RIBCA said the phrase "for inspection" conveys an "operational intent" that "could be used by inspectors" in the field. RIBCA suggested that RSPA follow the general policy established for drums in § 178.503(a) and carried over in the proposed § 178.703(a): "in addition to markings in paragraph (a) of this section, each metallic, rigid plastic and composite IBC" be marked "in a durable and clearly visible manner. This request is not adopted because for larger packages (e.g., IBCs), the phrase "readily accessible for inspection" is necessary to ensure that the mark can be seen by an inspector without lifting the package.

RIBCA objected to the paragraph (b)(1) proposal to require use of specification plates for rigid plastic and composite IBCs. It contended that required use of plates "can lead to less desirable and less permanent means of marking." RIBCA noted that paragraph (a) does not require markings on a plate. RIBCA suggested that the markings set forth in paragraph (a) for each rigid plastic and composite IBC "be grouped together in one location *" but without required use of a plate.

RSPA agrees and, accordingly, is revising proposed paragraph (b) by requiring additional markings to be placed near the certification mark specified in paragraph (a). The wording "on each plate," applying to rigid plastic and composite IBCs, is removed from paragraph (b)(1). Section 180.352(d) is revised to require the retest date to be marked as provided in paragraph (b) of this section (i.e., near the certification mark specified in paragraph (a)).

Section 178.704. This section contains general requirements applicable to manufacturers of IBCs. Each IBC must be resistant to, or protected from, deterioration due to exposure to the external environment. Intermediate bulk containers intended for solid hazardous materials must be sift-proof and water-resistant. One commenter asked RSPA to clarify the requirement in proposed paragraph (b) that "all service equipment must be so positioned or protected as to minimize potential loss of contents resulting from damage during IBC handling and transportation." The commenter asked if proposed paragraph (b) requires shippers to position IBCs "over a containment pad during loading and unloading." The commenter said that such a requirement "would create numerous difficulties." RSPA does not consider this requirement to apply to shipper IBC handling and operations since the positioning of service equipment referred to in paragraph (b) is a design requirement applicable to manufacturers.

Section 178.705. This section contains standards for metal IBCs and is adopted as proposed. Metal IBC design types are designated by code number, definitions, and construction requirements. Authorized steel and aluminum construction materials are set forth in paragraph (c)(1). Minimum body wall thicknesses are specified in paragraph (c)(1)(iv). Ratios expressing required tensile strength for steel and aluminum IBC construction materials in paragraphs (c)(1)(iii) (A) and (B) and the paragraph (c)(1)(iv)(B) formula for determining the minimum wall thickness of metals other than the reference steel described in paragraph (iii)(A) of this section, are corrected for U.S. standard units.

In response to requests by commenters and an amendment approved for the Eighth revised edition of the UN Recommendations, RSPA has replaced the word "metallic" with the word "metal" with respect to metal IBCs. One commenter asked RSPA to clarify the difference between the terms "sandwich" and "double wall" in the definition of "protected" in proposed paragraph (b)(2). A double-wall metal IBC consists of two metal walls with space between. A "sandwich" configuration consists of two metal walls with material such as foam or insulation between.

The same commenter asked if liners or bags placed inside metal IBCs meet the definition of "protected." The definition of "protected" is derived from section 16.2.2.3 of the UN Recommendations and means any two-ply (double wall) or multiple (sandwich) barrier applied *externally*. The construction materials of additional "protection" are not specified, and could include materials other than the material of construction of the IBC in question. For these reasons, RSPA believes liners or bags placed inside metal IBCs do not meet the intent of the definition of "protected" in paragraph (b)(2). In this final rule, in paragraph (b)(2) the definition of "protected" is clarified to mean "providing the IBC body with additional "external protection against impact and abrasion."

Commenters asserted that the use of the term "metallic IBCs" without qualification may lead to the interpretation "that all components (of such IBCs) must have metal properties." RSPA concurs with a suggestion to solve this problem by revising paragraph (c)(1)(iii) to more specifically refer to "metals used" in fabricating the metal IBC body.

RSPA also concurs with RIBCA s request to authorize "frangible" pressure relief devices for the release of vapor to ensure no rupture of the IBC body will occur. RIBCA contended that frangible pressure relief devices have been authorized for DOT 57 portable tanks for years. RSPA notes that

§ 178.253–4(a) requires each DOT 57 portable tank to be "equipped with at least one pressure relief device such as a * * frangible disc * *" Section 16.2.3.7.1 of the UN Recommendations ("release of vapor * * can be achieved by conventional pressure relief devices") can also be interpreted as including frangible relief devices. Accordingly, §§ 178.705(c)(2)(i), 178.706(c)(4) and 178.707(c)(3)(iv) are revised to include frangible relief devices.

Section 178.706 This section, adopted as proposed, contains standards for rigid plastic IBCs including design types designated by code number, general definitions and construction requirements. Commenters asked RSPA to delete proposed §§ 178.706(c)(3) and 178.707(c)(3)(iii), prohibiting the employment of used plastic materials other than production residue or regrind materials from the same manufacturing process in the production of rigid plastic IBCs or plastic inner receptacles. The National Agrichemical Retailers Association (NARA) claimed that this prohibition, without justification, "would prevent the environmentally sound practice of recycling mini-bulk/IBCs into new IBC containers." The request to delete this prohibition is not adopted. Consistent with requirements in § 178.509(b)(1) for plastic drums and jerricans § 178.522(b)(1) for composite packagings with inner plastic receptacles, RSPA believes contaminated plastic material obtained through recycling should not be used to construct that portion of the packaging in contact with the hazardous materials lading.

Commenters expressed concern that proposed venting requirements in § 178.706(c)(4) for rigid plastic IBCs and § 178.707(c)(3)(iv) for composite IBCs are inconsistent with UN recommendations. They referred to RSPA's proposed venting standard to prevent rupturing of plastic and composite IBC bodies in a fire engulfment situation, a standard not recommended by the UN in Sections 16.4.3.5 and 16.5.3.2.5. One commenter said the UN "does not link venting capacity to fire engulfment," and that the UN requires only that plastic and composite IBCs be provided with sufficient venting capacity to prevent rupture of the IBC body if subjected to an internal pressure in excess of which it was hydraulically tested. RIBCA commented that it is "unlikely a plastic tank completely enveloped in fire could maintain its liquid retention properties throughout the fire regardless of the size of any vent. Eventually, failure will take place but not due to pressure. The tank will eventually leak due to melting."

Commenters said RSPA's proposals to require relief devices or other means of plastic and composite IBC construction to ensure that leakage or permanent distortion does not occur also are inconsistent with UN recommendations. They asserted that the venting requirements in these sections ought to apply only to preventing rupture of the IBC body in emergency situations and that IBC body distortion should not be related to emergency relief capabilities. RIBCA said that RSPA should rely on the shipper visual inspection requirements in § 173.35 to control whether an IBC may be reused. Commenters also noted that §§ 178.706(c)(4) and 178.707(c)(3)(iv) address all plastic IBCs and not specifically rigid plastic and composite IBCs intended to transport liquids, as recommended by the UN.

RSPA concurs with these commenters on the issue of venting plastic and composite IBCs to prevent rupture in a fire engulfment situation. Accordingly, references to "fire engulfment" are removed from §§ 178.706(c)(4) and 178.707(c)(3)(iv). RSPA agrees that venting requirements in §§ 178.706 and 178.707 should apply only to prevention of IBC rupture in emergency situations and that the "no-leakage or no-permanent deformation" criteria more appropriately apply to IBC design qualification as criteria for passing the hydrostatic pressure test adopted in § 178.814. Therefore, references to leakage or permanent deformation linked to venting requirements in §§ 178.706(c)(4) and 178.707(c)(3)(iv) are removed. In this final rule, RSPA is not specifying IBC venting capacities such as those found in § 178.253–4(c) for DOT 57 portable tanks. However, pressure relief capacity must be sufficient to prevent rupture of the IBC body. Sections 178.706(c)(4) and 178.707(c)(3)(iv) are revised to apply specifically to rigid plastic and composite IBCs respectively, which are intended for the transportation of liquids.

Section 178.707. Standards for composite IBCs are set forth in this section and are adopted as proposed. Standards include design types designated by code number, general definitions and construction requirements. RSPA is adding a new definition of "rigid" inner receptacle to definitions for the composite IBC types in paragraph (b)(3) to clarify the distinction between rigid and flexible inner receptacles. The new definition states that a "rigid" inner receptacle is one which retains its general shape when empty without closures in place and without benefit of the outer casing. Standards are added for inner receptacles of composite IBCs in paragraph (c)(3), and for composite outer packagings in paragraph (c)(4).

Section 178.708. Standards for fiberboard IBCs are set forth in this section and adopted as proposed. Fiberboard IBC standards are similar to those for fiberboard boxes in § 178.516. However, in this final rule, standards for fiberboard IBCs also include ISO minimum puncture resistance (ISO 3036–1975).

Section 178.709. Standards for wooden IBCs are contained in this section and adopted as proposed.

Section 178.710. Standards for flexible IBCs are adopted as proposed. They include flexible IBC design types designated by code number, definitions and construction standards. Consistent with the Eighth Revised Edition of the UN Recommendations, the definition in paragraph (b)(1) of this section is revised to read "Flexible IBCs consist of a body constructed of film, woven plastic, woven fabric, paper, or combination thereof, together with any appropriate service equipment and handling devices, and if necessary an inner coating or liner."

Section 178.801. General IBC testing, inspection and recordkeeping provisions are set forth in this section and adopted as proposed. They include requirements for manufacturer responsibility, IBC design qualification testing at the start of production of each different IBC design type, periodic design requalification testing, production testing and inspection performed on each newly manufactured IBC and periodic retest and inspection of each IBC conducted at least every 2.5 years (in this final rule, § 173.32 is amended to extend the 2.5-year periodic retest and inspection requirement to DOT–52,–53,–56 and –57 portable tanks constructed before October 1, 1996). The definition of "IBC design type" is modified in this final rule by the removal of "means of filling and discharge" from the definition and addition of "representative service equipment." Reference to packaging which can differ only in its lesser external dimensions (i.e., height, width, length) without further testing is added to the definition of "different IBC design type." In this final rule, RSPA is extending the quality control principle established for non-bulk packagings under Docket HM–181 to IBCs. Consistent with Section 16.1.4.1.1 of the UN Recommendations, RSPA is requiring periodic requalification of IBC design types throughout a production

run sufficient to ensure that newly manufactured IBCs maintain the integrity of original, successfully tested design types. All IBC design types must be requalified at least once every 12 months.

This section also requires persons who certify IBC design types to keep records of the qualification of each IBC design type and of each periodic design requalification. Records must be maintained at each location where an IBC is manufactured and at each location where IBC design qualification or periodic design requalification testing is performed. They must be maintained for as long as IBCs are manufactured in accordance with each qualified design type and for at least 2.5 years thereafter. Certification records must include the following information: name and address of test facility, name and address of the IBC certifier, a unique test report identification, date of test report, manufacturer of the IBC, description of the IBC design type (e.g., dimensions, materials, closures, thickness, representative service equipment, etc.), maximum IBC capacity, characteristics of test contents, and test descriptions and results (including drop heights, hydrostatic pressures, tear propagation length, etc.). The test report must be signed with the name of the person conducting the test, and the name of the person responsible for testing.

This section elicited comments concerning design-type definition, design qualification testing, periodic design requalification, production testing, selective testing and other issues under general requirements. RIBCA urged RSPA to reevaluate what constitutes an IBC design type change in terms of minor changes (such as changes to service equipment), requiring design type requalification. RIBCA contended that requirements in proposed paragraphs (c)(1) and (c)(7) involving "IBC design type" and "different IBC design type" would "have the effect of making a new design type in each instance that an IBC appurtenance is changed, a gasket material is replaced, a valve unit is changed in style, e.g., from ball to gate, etc." RIBCA requested revision of paragraph (c)(7) to exclude service equipment from design changes requiring design requalification.

RSPA agrees with RIBCA's concerns regarding the definition of "IBC design type" and "different IBC design type." Service equipment is the IBC component most likely to undergo design change during short production runs. Accordingly, RSPA is revising the proposed definition of IBC "body" in § 178.700(c)(1) by clarifying that the receptacle "does not include service equipment." Furthermore, RSPA is amending paragraph § 178.801(c)(1) in this section by removing the phrase "means of filling and discharging" and adding a new paragraph § 178.801(c)(7)(iv) stating that a different IBC design type does not apply to "service equipment. RSPA is adopting RIBCA's request to revise paragraph § 178.801(d) by adding that service equipment associated with any IBC design type should be considered "representative" and not design-type specific (for example, safety devices, such as pressure relief valves must have identical venting capacity and integrity or valve protection must have equal or greater integrity). RSPA also is referring to "representative" service equipment as part of the definition of "IBC design type" in paragraph (c)(1) and is requiring in paragraph (l) that "representative service equipment" be described in each design type test report. Consistent with § 178.601(d) for non-bulk packagings, RSPA is revising proposed paragraph (d) to require the design qualification testing of each "new or different" IBC design type.

Commenters asserted that proposed paragraph (h), allowing a 25-percent reduction of exterior IBC dimensions without retesting, is too restrictive. One commenter suggested that RSPA adopt UN Recommendations which do not limit variation of external dimensions (e.g., 25 percent), "so long as materials of construction and thickness are not changed." RIBCA added that manufacturers are permitted under exemptions to produce smaller IBCs with greater than 25 percent reduction of external dimensions (the IBCs being identical in other respects). RSPA concurs with these commenters and, accordingly, proposed paragraph (h) is revised in paragraph (c)(7)(iii) in this final rule by removing the proposed 25 percent restriction and to permit variation of a tested IBC design type without further testing, provided the IBC differs only in its lesser external dimensions while materials of construction and material thicknesses or fabric weight remain the same. In paragraph (h) of this final rule provides that other minor design variations may be permitted without further testing provided selective testing demonstrates an equivalent or greater level of safety than the design type tested and which has been approved by the Associate Administrator for Hazardous Materials Safety.

The Flexible Intermediate Bulk Container Association (FIBCA) asked RSPA to extend to flexible IBC design types the 25 percent allowable decreased variance in external dimensions without further testing proposed for rigid IBC design types. As discussed above, RSPA concurs, provided that no loss of original design type integrity occurs (e.g., no change in sewing pattern, fabric weight, etc.). Accordingly paragraph (c)(7)(iii) includes all IBCs.

Four commenters asserted that, in the NPRM, RSPA departed from the quality assurance program suggested in Section 16.1.4.1.1 of the UN Recommendations by establishing a requirement that each IBC design type be retested every 12 months, similar to the periodic design retest requirement for drums. RIBCA said periodic design qualification is not recommended in Chapter 16 of the UN Recommendations because IBC design type qualification is much more expensive than it is for drums (for which, in Section 9.7.1.3, the UN recommends periodic testing). On average, RIBCA said its member manufacturers spend $5,147 to qualify each design type. In one year, RIBCA said the total cost for members was $4,990,000 for qualifying 970 different design types. "This is nearly $5 million of test costs spread over 15 manufacturers."

RIBCA said imposing on IBC manufacturers a requalification scheme that is more suited to non-bulk packaging production runs is counterproductive and cost-inefficient. RIBCA noted that IBC production rates differ markedly from rates for steel and plastic drums. "The numbers manufactured for [an IBC] design usually become smaller each year * Each such order, often for 5, 10 or 20 tanks, would be accompanied by very high and inordinate design-qualification costs when compared to non-bulk packaging on a per unit sold basis." One commenter added that, under requirements in paragraph (e), "every conceivable gasket type, fitting type and fitting configuration used on an IBC will have to be tested in their various combinations and retested every 12 months. This would entail hundreds of design qualification tests every year." RIBCA maintained that once an IBC design type is proven, "the passage of time (e.g., 12 months) is irrelevant." RIBCA said "re-proving" an IBC design "demonstrates nothing about the design * It would only indicate that either the method of production failed to yield an acceptable product or that the original design (procedure) was not followed."

Commenters urged RSPA to consider a quality assurance program where IBC manufacturers would be required to demonstrate and document, as RIBCA suggested, a "continuing adherence to

minimum requirements of a qualified design." They said that a periodic internal audit, properly documented, would accomplish this. RIBCA claimed that its members already are committed to such a program. RIBCA suggested revisions to paragraph (e) to require "an ongoing design and manufacturing process evaluation * * * recorded annually, based on the date of the original design certification for each design type * * * *" Another commenter agreed with RIBCA that a 12-month requalification period makes sense for high-volume, non-bulk packagings but not for "specialty-type containers" produced in low volumes. The commenter said that the one-time-per-year requalification which RSPA proposes "must be based on an average number of units produced by an average IBC manufacturer in one year." The commenter asked, "to be fair, why not give the manufacturer the option of one year or a certain amount of containers produced (based on this average number of containers produced by an average company over one year)?"

RSPA agrees in principle that, under a performance-based system, good quality assurance practices are essential to maintain the integrity of each production unit manufactured to a certified IBC design type. RSPA encourages the development of sound quality assurance programs. For this final rule, however, RSPA has determined that 12-month periodic design qualification testing involving samples taken from the production line is necessary as the minimum requirement. Paragraph (e)(2) provides an approval process for the development of programs requiring less actual testing if a quality assurance program is maintained and higher design and construction standards are demonstrated. Under current exemptions, IBC design types generally must be requalified every four months. RSPA believes that the 12-month periodic design requalification requirement in this final rule offers manufacturers significant relief while not compromising transportation safety.

In response to a commenter's request, RSPA is revising requirements for the production test proposed in paragraph (f)(1) by adding paragraph (f)(1)(i) stating that IBCs need not have fitted closures. RSPA is adding paragraph (f)(1)(ii) providing that inner receptacles of composite IBCs can be leakproofness tested without outer IBC bodies, provided that test results are not affected. These provisions are consistent with production leakproofness testing requirements for non-bulk packagings in § 178.604. Furthermore, the UN Recommendations do not specify (in Section 16.1.4.2.4) how IBCs are to be prepared for production leakproofness testing.

Noting that many third-party testing agencies lack expertise in testing IBCs, RIBCA requested a revision to proposed paragraphs (j) and (j)(2) to permit manufacturers to monitor tests being performed by third-party agencies and report on inadequate procedures. Although RSPA agrees that IBC manufacturers should be permitted to participate in, or monitor the development of, sound third-party testing, RSPA sees no need to establish by regulation the right of manufacturers to visit IBC test laboratories. This issue can be resolved by contractual or other agreements between the manufacturer and a third-party agency. Therefore, this request is not adopted.

RIBCA questioned the effectiveness of RSPA s requirement in proposed paragraph (k) that the inner coating of an IBC must withstand subpart O tests. RIBCA said "the ensuing crush patterns" resulting from the drop test makes it "difficult to assure * * * if the coating is still protective." RIBCA requested a clarifying sentence emphasizing that after withstanding the tests, "no immediate hazard is created by contact of the contents with any material of construction in the tank." This comment is not accepted. Consistent with requirements for non-bulk packagings requiring coatings in § 178.601(j), RSPA believes a criterion stating that coatings retain their protective properties after withstanding subpart O performance tests is necessary to ensure the integrity of IBC construction.

Section 178.802. This section establishes requirements for the preparation of fiberboard IBCs or composite IBCs with fiberboard outer packagings for design qualification testing. Fiberboard IBCs must be conditioned under the same temperature and relative humidity conditions as required for non-bulk fiberboard packagings in § 178.602(d). In this final rule, paragraph (c) is added permitting fiberboard IBCs, or composite IBCs with fiberboard outer packagings, to be conditioned at ambient temperature "for purposes of periodic design requalification only." This is consistent with a similar provision in 173.602(d)(3) for the periodic retesting of non-bulk fiberboard packaging design types.

Section 178.803. Design qualification testing specified in §§ 178.810–819 for the certification of metal, rigid plastic, composite, fiberboard, wooden, and flexible IBC types is set forth in a single table in this section. Separate tables specifying the order of tests for each IBC design type category proposed in §§ 178.804–178.808 are not adopted.

RIBCA and other commenters recommended that the vibration test be placed first in the order of tests in a single table. RIBCA pointed out that the vibration test "would seem to be most suitably placed before tests that would result in damage to a unit." Referring to the order of tests proposed in § 178.808 for flexible IBCs, FIBCA asked RSPA to delete the phrase "* * * must withstand the applicable tests in the order presented * * * *" It contended that the tear test (second in order of tests), involving a four-inch knife cut, would render the test sample unsuitable for the remaining tests. RSPA concurs with these recommendations and, accordingly, the vibration test is placed first.

Based on the merits of comments stating that the vibration test is unnecessary for the certification of flexible IBCs, Note 1 to the table now specifies that flexible IBCs must only "be capable" of withstanding the vibration test (see discussion in § 178.819). In response to a comment from RIBCA urging RSPA to permit the use of another IBC of the same design type for the drop test, RSPA is adding note 4 applicable to metal and composite IBC design types which states that, "another intermediate bulk container of the same design type may be used for the drop test set forth in § 178.810." Consistent with a revision approved for the Eighth revised edition of the UN Recommendations, RSPA is adding note 5, permitting use of a different flexible IBC for each test.

Section 178.810. A drop test similar in many respects to requirements for non-bulk packagings in § 178.603 is adopted as proposed for all IBC design types. In preparation for the drop test, IBCs intended to transport liquids must be filled to at least 98 percent of their capacity, and to at least 95 percent of their capacity if intended to transport solids. Before being drop tested, rigid plastic IBCs and composite IBCs with inner plastic receptacles must be conditioned for testing by reducing the temperature of the packaging and its contents to −18 °C (0 °F) or lower. Test liquids must be kept in the liquid state by the addition of anti-freeze, if necessary. Test samples of all IBC design types must be dropped onto a rigid, non-resilient, smooth, flat horizontal surface; the point of impact must be the most vulnerable part of the base of the IBC undergoing the test. Drop heights are dependent upon the Packing Group to which the IBC is being

tested and certified. A Packing Group I drop test is adopted in paragraph (d)(1)(i) of this final rule for IBCs intended for certain high-hazard solid materials.

One commenter proposed a one-meter puncture drop test to "verify the ability of an IBC to withstand worst-case situations in handling and transportation." RSPA acknowledges that this suggested test represents good industry practice to verify that an IBC exceeds the minimum IBC drop test requirements we are adopting in this final rule. However, RSPA believes that any proposal for additional required testing should be done through notice and comment, and that there is not sufficient justification or evaluation of the proposed test to warrant further action at this time.

Section 178.811. The requirement for a bottom lift test for IBCs designed to be lifted from the base is adopted as proposed.

Section 178.812. A top lift test is adopted as proposed for all metal, rigid plastic and composite IBC design types designed to be lifted from the top. In this final rule, the top lift test is applicable to flexible IBCs designed to be lifted from the top or side. FIBCA referred to other, equally effective methods to top-lift flexible IBCs and suggested that platen plate hydraulic loading testing methods, now utilized in Europe, should be acceptable to RSPA. As provided in § 178.801(i), manufacturers may use other top lift methods for flexible IBCs, if they demonstrate equal effectiveness.

Section 178.813. The leakproofness test is adopted as proposed for the design qualification of metal, rigid plastic, and composite IBC design types, and rigid IBC production units, if they are intended to contain liquids or if they are intended to contain solids loaded or discharged under pressure. The test must be performed by applying air at a gauge pressure of not less than 20 kPa (2.9 psig). Other methods of leakproofness testing, if at least equally effective, may be used in accordance with Appendix B of part 178, or if approved by the Associate Administrator for Hazardous Materials Safety, as provided in § 178.801(i).

RIBCA objected to the proposed ten-minute hold in applying air pressure during production line leakproofness testing. RIBCA said a ten-minute hold "would introduce an unacceptable delay in modern production lines." RIBCA added that a ten-minute hold in production lines using blow-molded techniques would literally shut down production "because of the number of units coming off-line in these higher-speed production systems."

RSPA acknowledges RIBCA's concern and, consistent with a revision approved for the Eighth revised edition of the UN Recommendations, is revising proposed paragraph (c) by not adopting a ten-minute hold requirement. The final rule provides that the test "must be carried out for a suitable length of time * * *" to determine if there are leaks.

Section 178.814. The hydrostatic pressure design qualification test is adopted as proposed for all metal, rigid plastic and composite IBC design types intended to contain liquids or intended to contain solids loaded or discharged under pressure. The test must be performed for ten minutes at gauge pressures specified for three metal IBC design types intended to contain liquids and four rigid plastic and four composite IBC design types.

Consistent with a proposal accepted for the 8th revised edition of the UN Recommendations, a new paragraph (d)(3) is added, requiring metal IBCs of type 21A, 21B and 21N intended for transportation of Packing Group I solids to be tested at 250 kPa (36 psig) gauge pressure. Proposed paragraphs (d)(3) and (d)(4) are renumbered (d)(4) and (d)(5), respectively, and adopted as proposed.

RIBCA suggested a revision of paragraph (b) by adding a requirement to replace vented closures with similar non-vented closures or to seal vents before conducting the hydrostatic test, consistent with preparations for conducting the leakproofness test in § 178.813(b), which requires sealed vents. RSPA agrees and is revising paragraph (b) to also require vented closures to be removed and their openings plugged. RSPA acknowledges RIBCA's concerns that the choice of hydrostatic test methods proposed in paragraph (d)(4) would invariably result in shippers being forced to choose higher test pressure values for shipment of low-pressure materials in rigid plastic IBCs. Accordingly, in this final rule, RSPA is adjusting the choice of test pressure values by adding the following language in paragraph (d)(5): "* * * whichever is the greater of."

Paragraph (d)(5) also is revised in this final rule to more clearly distinguish between the use of gauge and absolute pressures when determining hydrostatic test pressure to be applied to the IBC. The test pressure marked on the IBC is a gauge pressure as specified in § 178.703(b)(1)(iii). Gauge pressure consists only of the pressure in the IBC that exceeds atmospheric pressure. Absolute pressure consists of ambient atmospheric pressure plus the vapor pressure of the hazardous material in the IBC. Vapor pressure of the hazardous material is the pressure exerted on the IBC by vapors or gases emitted by the material. Paragraphs (d)(5)(i) (B) and (C) are clarified to show that, because vapor pressure of the hazardous material is described in absolute terms, the pressure applied for the hydrostatic test is determined by subtracting atmospheric pressure from absolute pressure. Methods using absolute pressure set forth in paragraphs (d)(5)(i) (B) and (C) can be used when the vapor pressure of a substance is available in technical literature. Hydrostatic test pressure for these methods must be at least 100 kPa (14.5 psig). The method in paragraph (d)(5)(i)(A) for determining hydrostatic test pressure applied is useful when the vapor pressure of a mixture or substance is unknown and may be experimentally determined.

One commenter pointed out that the leakproofness test should be conducted after the hydrostatic pressure test "to indicate whether a potential path for vapor loss has been opened in the structure by the hydrostatic testing. A leakproofness test of at least 30 percent of the hydrostatic pressure after the hydrostatic pressure test would ensure that the package can maintain complete integrity against both liquid and vapor loss in a worst-case situation." RSPA believes tests performed in the order recommended by that commenter will adequately ensure IBC integrity. Therefore, in the table for testing and certification of IBCs established in § 178.803, the leakproofness test precedes the hydrostatic pressure test.

RIBCA urged RSPA to not regard IBC "deformation" as a failure of the hydrostatic pressure test and disqualification of the design type. RIBCA said that leakage alone must be the pass/fail criterion for the hydrostatic test. Referring to criteria in paragraphs (e) (1) and (3) which, for most rigid IBCs, allow "no permanent deformation which renders the IBC unsafe for transport," RIBCA said significant deformation of metal and composite IBCs begins to take place "at quite low pressures," and added that "no existing DOT 57 or composite IBC can pass this test."

As proposed in paragraph (e)(1), RSPA believes that any hydrostatic pressure test resulting either in permanent distortion or leakage, either of which renders an IBC design type unsafe for transport constitutes failure of this test and disqualifies the tested design type. Therefore, RIBCA's suggestion is not adopted. In this final

rule, pass/fail criteria for the hydrostatic test are retained as proposed.

Section 178.815. As proposed, the stacking test must be conducted for the qualification of all intermediate bulk container design types designed to be stacked. All stacked IBCs must be placed on their base on level, hard ground and subjected to a uniformly distributed superimposed test load for a period of at least five minutes. Fiberboard, wooden, and composite IBC design types with outer packagings constructed of materials other than plastic must withstand this test for 24 hours. Stand-alone rigid plastic and composite design types with outer plastic packagings must be tested for 28 days at 40 °C (104 °F). For all IBC design types, the load placed on the IBC must be 1.8 times the combined maximum permissible gross mass of the number of similar IBCs that may be stacked on top during transport.

Section 178.816. The topple test is adopted as proposed for the qualification of all flexible IBC design types. However, a topple height for Packing Group I has been added, consistent with the Packing Group levels prescribed for the drop test in § 178.810.

Section 178.817 The righting test is adopted as proposed for the qualification of all flexible IBC design types designed to be lifted from the top or side.

Section 178.818. The tear test is adopted as proposed for the qualification of all flexible IBC design types.

Section 178.819. The vibration test is adopted as proposed as a requirement for the qualification of rigid IBC design types. A vibration capability standard is adopted in this final rule for the qualification of flexible IBC design types. The proposal to require vibration testing for all IBC design types drew comment from flexible IBC manufacturers, who asserted that hundreds of millions of flexible IBCs have been successfully used without having been vibration-tested. Because flexible IBC design types were never subjected to vibration testing, one commenter asserted there is no basis for establishing what reasonable vibration test criteria would be. FIBCA pointed out that no other nation requires this test for flexible IBCs, nor do the UN Recommendations address this issue. FIBCA said that including the vibration test requirement in subpart O violates principles stated in the preamble to the NPRM, "for removing a dual domestic and international regulatory system." One commenter asked if foreign UN-marked flexible IBCs that are not vibration-tested relinquish UN certification in the U.S. Other commenters asked RSPA to introduce this additional testing only when a vibration standard is adopted in the UN Recommendations on a universal basis.

RSPA notes that DOT exemptions for flexible IBCs have not required vibration testing and agrees with commenters that a mandatory vibration test should not be required for flexible IBCs. Therefore, paragraph (a) is revised to exclude flexible IBCs from mandatory vibration testing. However, flexible IBCs must be capable of withstanding the vibration test. RSPA also is adding note 1 to the table of "Testing and Certification of IBCs" in § 178.803, which will now require flexible IBCs to be "capable of withstanding the vibration test."

RIBCA supported the proposed mandatory test for rigid IBCs but not requirements in paragraph (b)(4) to turn IBCs on their sides following the test. RIBCA asserted that the greatest vulnerability in a vertical peak-to-peak vibration test (which RIBCA termed a "repeated jolt test") are bottom openings and not the top of IBCs, "unless they are of the open-head style in which the ring closure may leak if it has not been properly secured." RIBCA suggested a revision of pass/fail criteria to reflect this position.

RSPA agrees that the wide structural variability of IBCs, including location of closures, valves, etc., represents a different range of stress vulnerabilities and vibration test outcomes than are experienced by non-bulk packagings for which the side turn is required in § 178.608(b)(4). RSPA also recognizes that IBC size and stacking characteristics ensure that an upright position in the transportation environment normally will be maintained. Therefore, proposed paragraph (b)(4) is not adopted. Paragraph (c) is clarified to state that an IBC passes the vibration test if there is no rupture or leakage.

Part 180

Section 180.350. This section is adopted as proposed.

Section 180.351. General requirements for the qualification of IBCs are adopted as proposed. Many comments were received addressing the five-year plastic IBC use limit proposed in paragraph (c). One commenter pointed out that proposed paragraph (c) is inconsistent with proposed § 173.35(h) in that it omits consideration by the Associate Administrator for Hazardous Materials Safety for approving a longer service life for plastic and composite IBCs. One commenter advised RSPA to restrict the limit to plastic IBCs constructed of certain materials showing patterns of structural failure due to ultraviolet (UV) degradation. The commenter said the five-year limit should specifically apply to "Carbon Black stabilized IBCs and possibly other plastic packagings."

RIBCA asserted that requiring, after five years, that a plastic unit be replaced "by a receptacle identical to the one that was employed five years previously is almost impossible to meet." RIBCA added that it is "unlikely that material of construction (i.e., resins) will not have undergone some modifications or adjustments in that time." RIBCA suggested that paragraph (c) be revised to read "a receptacle meeting the original design type" of the IBC. RIBCA said the phrase "original" design type "implies no changes when we believe that the intent is not to have changes that alter the design type of the IBC in which a new inner receptacle is placed."

As stated above in the preamble to § 173.35, RSPA is not adopting a five-year rigid plastic and composite IBC use restriction. Accordingly, proposed paragraph (c) in this section is not adopted.

Section 180.352. Requirements for initial and periodic retest and inspection of IBCs are adopted as proposed. Initially after production and every 2.5 years thereafter, metal, rigid plastic, and composite IBCs intended for liquids or intended for solids loaded or discharged by pressure must withstand the 20 kPa (2.9 psig) leakproofness test prescribed in § 178.813. For these IBC types, external inspections must be performed after production and each 2.5 years thereafter to ensure that each IBC is properly marked and free from damage that may reduce its structural integrity during transportation, and that IBC service equipment functions properly Internal inspections are required to be performed initially on metal IBCs after production and every five years thereafter. Metal, plastic, and composite IBCs are to be inspected at least every five years for cracks, warpage, and corrosion. Metal IBCs must be inspected at least every five years for corrosion of wall material below required minimum thicknesses. An IBC found with such defects must be removed from hazardous materials service. Inspection of flexible, fiberboard or wooden IBCs is necessary to ensure that these IBCs are properly marked and that they continue to meet required construction and design specifications. For example, each flexible IBC must be inspected to ensure that seams are free from defects in stitching, heat sealing, or gluing. The

requirements in this section do not apply to DOT 56 or 57 portable tanks. IBC owners or lessees must maintain records of periodic retests and initial and periodic inspections for each IBC in continuous hazardous materials service.

Four commenters questioned whether the test and inspection requirements in this section apply "before each use" of an IBC, or every 2.5 years from the date of manufacture of the IBC. The periodic retest requirements in this section do not apply to IBCs before every reuse. This section sets forth periodic test and inspection requirements. A shipper cannot reuse an IBC intended for liquids or intended for solids that are loaded or discharged by pressure if that IBC has not been leakproofness tested every 2.5 years as specified in paragraph (b)(1) of this section. For clarity, RSPA is revising the first sentence in paragraph (a) to read, "Each intermediate bulk container constructed in accordance with a UN standard for which a test or inspection specified in paragraphs (b)(1), (b)(2) and (b)(3) of this section is required may not be filled * * *" IBCs must meet standards prescribed in this final rule at all times in hazardous materials service without regard to the 2.5-year retest and inspection period.

NARA asserted that the required leakproofness retest "will pose difficulties for retail dealers, custom applicators, farmers who handle a number of IBC/mini-bulks with various dates of manufacture." NARA said that wide IBC distribution and "the marketing system" for IBCs in agricultural use make it "extremely difficult for IBC owners to conduct the leakproofness test." NARA suggested a "more stringent visual inspection" in place of the leakproofness retest. This suggestion is not adopted. RSPA believes that a visual inspection alone is insufficient to establish the leakproofness integrity of these IBCs.

Four commenters were unclear about the applicability of proposed paragraph (b)(1). One commenter said the paragraph could be interpreted to mean IBCs intended for liquids and solids that are only loaded and unloaded under pressure must be leakproofness retested. NACA asked RSPA to make paragraph (b)(1) consistent with § 178.813(a). RSPA concurs and, accordingly, is clarifying paragraph (b)(1) to show that the leakproofness test every 2.5 years does not have to be performed on IBCs intended to contain solids that are not loaded or discharged under pressure.

One commenter asked RSPA to revise paragraph (b)(2)(iii) by deleting the requirement of removing the inner receptacle of a composite IBC for inspections. This suggestion is not adopted. RSPA believes that the inner unit must be removed, if possible, to allow inspectors to examine the external condition of the inner receptacle. RSPA is clarifying paragraph (b)(2)(iii) to state that the inner receptacle of a composite IBC must be removed from the outer IBC body unless the inner unit is bonded to the outer body or unless the outer body is constructed in such a way (e.g., a welded or riveted cage) that removal of the inner receptacle is not possible without damaging or destroying the outer body.

RIBCA's concerns regarding the marking of retest data on a rigid plastic or composite IBC if no certification plate is fitted are addressed in revisions to § 178.703(b) requiring retest data "to be placed near" the UN certification marking required in § 178.703(a). Paragraph (d) is revised to require the retest date to be marked as "provided in § 178.703(b)."

NACA asserted that the "burden of recordkeeping for potentially hundreds of thousands of tanks * * * seems to serve no safety benefit," and recommended deletion of paragraph (e). RSPA believes that the record retention requirements in paragraph (e) are consistent with the recordkeeping requirements for other types of packagings, e.g., cargo tanks and non-bulk packagings, and are essential in demonstrating compliance with the requirement in this final rule. Therefore, NACA's comment is not adopted.

IV Regulatory Analyses and Notices

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 was not reviewed by the Office of Management and Budget. The rule is not considered significant under the Regulatory Policies and Procedures of the Department of Transportation (44 FR 11034).

Executive Order 12612

This final rule has been analyzed in accordance with the principles and criteria contained in Executive Order 12612 ("Federalism"). The Hazardous Materials Transportation Act contains an express preemption provision (49 App. U.S.C. 1804(a)(4)) that preempts State, local, and Indian tribe requirements on certain covered subjects unless they are "substantively" the same as the HMR. Covered subjects are:

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

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

(iii) The preparation, execution, and use of shipping documents pertaining to hazardous materials and requirements respecting the number, content, and placement of such documents;

(iv) The written notification, recording, and reporting of the unintentional release in transportation of hazardous materials; or

(v) The design, manufacturing, fabrication, marking, maintenance, reconditioning, repairing, or testing of a package or container which is represented, marked, certified, or sold as qualified for use in the transportation of hazardous materials.

This final rule addresses covered subjects, under item (ii) and (v) above and, therefore, preempts State, local, or Indian tribe requirements not meeting the "substantively the same" standard. The HMTA (49 App. U.S.C. 1804(a)(5)), as amended, provides that if DOT issues a regulation concerning any of the covered subjects, after November 16, 1990, DOT must determine and publish in the **Federal Register** the effective date of Federal preemption. That 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. RSPA has determined that the effective date of Federal preemption for these requirements will be January 13, 1995. Thus, RSPA lacks discretion in this area, and preparation of a federalism assessment is not warranted.

Regulatory Flexibility Act

I certify that this final rule will not have a significant economic impact on a substantial number of small entities. Although this rule applies to certain shippers and carriers of hazardous materials in intermediate bulk containers, some of whom may be small entities, its economic impacts are minimal.

Paperwork Reduction Act

The information collection requirements contained in this rule have been approved by the Office of Management and Management and Budget under the provisions of the Paperwork Reduction Act of 1980 (44 U.S.C. 3504(h)) and assigned control number 2137–0510.

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.

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

Hazardous materials transportation, Hazardous waste, Labels, 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 178

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

49 CFR Part 180

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

In consideration of the foregoing, 49 CFR parts 171, 172, 173, 178, and 180 are amended as follows:

PART 171—GENERAL INFORMATION, REGULATIONS, AND DEFINITIONS

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

Authority: 49 App. U.S.C. 1802, 1803, 1804, 1805, 1808, and 1818; 49 CFR Part 1.

2. In § 171.7 a new entry ISO 3036–1975 is added following the last entry under *International Organization for Standardization* in the Table of material incorporated by reference in paragraph (a)(3), to read as follows:

§ 171.7 Reference material.

(a)

(3) *Table of material incorporated by reference.*

Source and name of material	49 CFR reference
International Organization for Standardization:	
ISO 3036–1975(E) Board—Determination of puncture resistance	178.708

3. In § 171.8, the definition of "Intermediate bulk container" is added in appropriate alphabetic order, and the definition of "UN standard packaging" is revised to read as follows:

§ 171.8 Definitions and abbreviations.

Intermediate bulk container (IBC) means a rigid or flexible portable packaging, other than a cylinder or portable tank, which is designed for mechanical handling. Standards for intermediate bulk containers manufactured in the United States are set forth in subparts N and O of part 178 of this subchapter.

UN standard packaging means a specification packaging conforming to applicable requirements in subparts L and M, or N and O of part 178 of this subchapter.

*

4. In § 171.12, paragraph (b)(5) is revised to read as follows:

§ 171.12 Import and export shipments.

(b)

(5) Except for packagings conforming to the requirements of Chapter 26 of the IMDG Code, bulk packagings must conform to the requirements of this subchapter.

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

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

Authority: 49 App. U.S.C. 1803, 1804, 1805, 1808; 49 CFR Part 1, unless otherwise noted.

6. In § 172.101, the following entries in the Hazardous Materials Table are revised to read as follows:

§ 172.101 Purpose and use of hazardous materials table.

SECTION 172 101 HAZARDOUS MATERIALS TABLE

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or division	Identification numbers	Packing group	Label(s) required (if not excepted)	Special provisions	(8) Packaging authorizations (§173 * *)			(9) Quantity limitations		(10) Vessel stowage requirements	
							Exceptions	Non bulk packaging	Bulk packaging	Passenger aircraft or rail car	Cargo aircraft only	Vessel stowage	Other stowage provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
	Acetyl chloride	3	UN1717	II	FLAMMABLE LIQUID, CORROSIVE	A3 A6 A7, B100 N34 T18 T26	None	202	243	1 L	5 L	B	40
	Acetyl iodide	8	UN1898	II	CORROSIVE	B2 B101 T9	154	202	242	1L	30 L	C	8, 40
	Alkali metal amides	4 3	UN1390	II	DANGEROUS WHEN WET	A6, A7 A8, A19 A20, B101 B106	None	212	241	15 kg	50 kg	E	40
	Alkaline earth metal alloys n o s	4 3	UN1393	II	DANGEROUS WHEN WET	A19 B100	None	212	241	15 kg	50 kg	E	
	Allyl iodide	3	UN1723	II	FLAMMABLE LIQUID, CORROSIVE	A3 A6 B100 N34 T18	None	201	243	0 5 L	2 5 L	B	40
	Aluminum bromide anhydrous	8	UN1725	II	CORROSIVE	B106	154	212	240	15 kg	50 kg	A	40
	Aluminum carbide	4 3	UN1394	II	DANGEROUS WHEN WET	A20 B101 B106 N41	None	212	242	15 kg	50 kg	A	
	Aluminum chloride anhydrous	8	UN1726	II	CORROSIVE	B106	154	212	240	15 kg	50 kg	A	40
	Aluminum ferrosilicon powder	4 3	UN1395	II	DANGEROUS WHEN WET	A19 B108	None	212	242	15 kg	50 kg	A	40 85 103
	Aluminum hydride	4 3	UN2463	I	DANGEROUS WHEN WET	A19 B100 N40	None	211	242	Forbidden	15 kg	E	
	Aluminum phosphide	4 3	UN1397	I	DANGEROUS WHEN WET POISON	A8 A19 B100 N40	None	211	242	Forbidden	15 kg	E	40 85
	Aluminum powder uncoated	4 3	UN1396	II	DANGEROUS WHEN WET	A19 A20 B108	None	212	242	15 kg	50 kg	A	39
	Ammonium hydrogen fluoride solid	8	UN1727	II	CORROSIVE	B106 N34	154	212	240	15 kg	50 kg	A	25 26 40
	Ammonium nitrate liquid *(hot concentrated solution)*	5 1	UN2426		OXIDIZER	B5, B100 B17 T25	None	None	243	Forbidden	Forbidden	D	59 60
	Antimony trichloride solid	8	UN1733	II	CORROSIVE	B106	154	212	240	15 kg	50 kg	A	40
	Barium	4 3	UN1400	II	DANGEROUS WHEN WET	A19 B100	None	212	241	15 kg	50 kg	E	
	Benzene	3	UN1114	II	FLAMMABLE LIQUID	B101 T8	150	202	242	5 L	60 L	B	40
	Benzotrichloride	8	UN2226	II	CORROSIVE	B2 B101 T15	154	202	242	1 L	30 L	A	40

SECTION 172.101 HAZARDOUS MATERIALS TABLE—Continued

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or division	Identification numbers	Packing group	Label(s) required (if not excepted)	Special provisions	(8) Packaging authorizations (§ 173.* *)			(9) Quantity limitations		(10) Vessel stowage requirements	
							Exceptions	Non-bulk packaging	Bulk packaging	Passenger aircraft or rail car	Cargo aircraft only	Vessel stowage	Other stowage provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
	Bifluoride n o s *solid*	8	UN1740	II	CORROSIVE	B106 N3 N34	None	212	240	15 kg	50 kg	A	25, 26 40
	Bromobenzyl cyanides *solid*	6 1	UN1694	I	POISON	B110 T18	None	211	241	Forbidden	50 kg	D	12 40
	Butyl vinyl ether inhibited	3	UN2352	II	FLAMMABLE LIQUID	B101 T7	150	202	242	5 L	60 L	B	40
	n-Butylamine	3	UN1125	II	FLAMMABLE LIQUID	B101 T8	150	202	242	5 L	60 L	B	40
	Butyryl chloride	3	UN2353	II	FLAMMABLE LIQUID, CORROSIVE	B100 T9 T26	None	202	243	1 L	5 L	C	40
	Calcium	4 3	UN1401	II	DANGEROUS WHEN WET	B100	None	212	241	15 kg	50 kg	E	
	Calcium carbide	4 3	UN1402	II	DANGEROUS WHEN WET	A1, A8 B55, B101 B106 N34	None	212	241	15 kg	50 kg	B	
	Calcium cyanamide *with more than 0 1 percent of calcium carbide*	4 3	UN1403	III	DANGEROUS WHEN WET	A1 A19 B105	None	213	241	25 kg	100 kg	A	
	Calcium hydride	4 3	UN1404	I	DANGEROUS WHEN WET	A19 B100 N40	None	211	242	Forbidden	15 kg	E	
	Calcium hypochlorite mixtures dry *with more than 10 percent but not more than 39 per cent available chloride*	5 1	UN2208	III	OXIDIZER	A1 A29 B103 N34	152	213	240	25 kg	100 kg	A	56, 58 69, 106
	Calcium manganese silicon	4 3	UN2844	III	DANGEROUS WHEN WET	A1, A19 B105 B106	None	213	241	25 kg	100 kg	A	85 103
	Calcium phosphide	4 3	UN1360	I	DANGEROUS WHEN WET POISON	A8 A19 B100 N40	None	211	242	Forbidden	15 kg	E	40 85
	Calcium silicide	4 3	UN1405	II	DANGEROUS WHEN WET	A19 B106 B108	None	212	241	15 kg	50 kg	B	85 103
	Cerium, *turnings or gritty powder*	4 3	UN3078	II	DANGEROUS WHEN WET	A1, B105 B106 B109	None	213	242	15 kg	50 kg	E	
	Cesium *or caesium*	4 3	UN1407	I	DANGEROUS WHEN WET	A19 B100 N34, N40	None	211	242	Forbidden	15 kg	D	
	Chloral anhydrous inhibited	6 1	UN2075	II	POISON	B101 T14	None	212	243	25 kg	100 kg	D	40

Chlorobutanes	3	UN1127	II	FLAMMABLE LIQUID	B101 T8	150	202	242	5 L	60 L	B	
Chloropicrin mixtures n o s	6 1	UN1583	I	POISON	5 B100	None	201	243	Forbidden	Forbidden	C	40
			II	POISON	B100	None	202	243	Forbidden	Forbidden	C	40
			III	KEEP AWAY FROM FOOD	B100	153	203	241	Forbidden	Forbidden	C	40
Chlorosilanes n o s *flash point not less than 23 degrees C*	8	UN2986	II	CORROSIVE FLAMMABLE LIQUID	B100	None	202	243	1 L	30 L	C	23 40
Chlorosilanes n o s *flash point less than 23 degrees C*	3	UN2985	II	FLAMMABLE LIQUID, CORROSIVE	B100 T18 T26	None	201	243	1 L	5 L	B	40
Chromium trioxide anhydrous	5 1	UN1463	II	OXIDIZER CORROSIVE	B106	None	212	242	5 kg	25 kg	A	
Corrosive solids flammable n o s	8	UN2921	I	CORROSIVE FLAMMABLE SOLID	B106	None	211	242	1 kg	25 kg	B	12, 24 25 48
Corrosive solids oxidizing n o s	8	UN3084	I	CORROSIVE OXIDIZER	B100	None	211	240	1 kg	25 kg	C	89
			II	CORROSIVE OXIDIZER	B100	None	212	240	15 kg	50 kg	C	89
Corrosive solids self heating n o s	8	UN3095	I	CORROSIVE, SPONTANEOUSLY COMBUSTIBLE	B100	None	211	243	1 kg	25 kg	C	
			II	CORROSIVE, SPONTANEOUSLY COMBUSTIBLE		None	212	242	15 kg	50 kg	E	
Corrosive solids which in contact with water emit flammable gases n o s	8	UN3096	I	CORROSIVE, DANGEROUS WHEN WET	B105	None	211	243	1 kg	25 kg	E	
			II	CORROSIVE, DANGEROUS WHEN WET	B105	None	212	242	15 kg	50 kg	E	
Cyclohexane	3	UN1145	II	FLAMMABLE LIQUID	B101 T8	150	202	242	5 L	60 L	E	
Cyclohexene	3	UN2256	II	FLAMMABLE LIQUID	B101 T7	150	202	242	5 L	60 L	E	
Cyclohexylamine	8	UN2357	II	CORROSIVE FLAMMABLE LIQUID	B100 T8 T26	None	202	243	1 L	30 L	A	12 21 40 48
Cyclopentane	3	UN1146	II	FLAMMABLE LIQUID	B101 T14	150	202	242	5 L	60 L	E	
Cyclopentene	3	UN2246	II	FLAMMABLE LIQUID	B101 T13	150	202	242	5 L	60 L	E	
1 1 Dichloroethane	3	UN2362	II	FLAMMABLE LIQUID	B101 T7	150	202	242	5 L	60 L	B	40
Diethyl sulfate	6 1	UN1594	II	POISON	B101 T14	None	202	243	5 L	60 L	C	
Diethyl sulfide	3	UN2375	II	FLAMMABLE LIQUID	B101 T14	None	202	243	1 L	60 L	E	

SECTION 172 101 HAZARDOUS MATERIALS TABLE—Continued

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or division	Identification numbers	Packing group	Label(s) required (if not excepted)	Special provisions	(8) Packaging authorizations (§ 173 ***)			(9) Quantity limitations		(10) Vessel stowage requirements	
							Exceptions	Non-bulk packaging	Bulk pack aging	Passenger aircraft or rail car	Cargo aircraft only	Vessel stowage	Other stowage provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
	Diethylamine	3	UN1154	II	FLAMMABLE LIQUID	B101 N34 T8	150	202	242	5 L	60 L	E	
	Diethyldichlorosilane	8	UN1767	II	CORROSIVE FLAMMABLE LIQUID.	A7, B6, N34 B100 T8 T26	None	202	243	Forbidden	30 L	C	21 40
	Diisopropyl ether	3	UN1159	II	FLAMMABLE LIQUID	B101 T8	150	202	242	5 L	60 L	E	40
	Diisopropylamine	3	UN1158	II	FLAMMABLE LIQUID.	B101 T8	150	202	242	5 L	60 L	B	
	Dimethyl sulfide	3	UN1164	II	FLAMMABLE LIQUID	B100 T14	None	201	243	1 L	30 L	E	40
	Dinitrotoluenes molten	6 1	UN1600	II	POISON	B100 T14	None	202	243	Forbidden	Forbidden	C	
	Divinyl ether inhibited	3	UN1167	I	FLAMMABLE LIQUID	B110 T14	None	202	241	5L	60L	e	40
	Ethyl bromide	6 1	UN1891	II	POISON	B100 T17	None	202	243	5 L	60 L	B	40
	Ethyl butyl ether	3	UN1179	II	FLAMMABLE LIQUID	B1 B101 T1	150	202	242	5 L	60 L	B	
	Ethyl propyl ether	3	UN2615	II	FLAMMABLE LIQUID	B101 T8	150	202	242	5 L	60 L	E	
	Ethyltrichlorosilane	3	UN1196	II	FLAMMABLE LIQUID, CORROSIVE	A7, B100, N34 T15 T26	None	201	243	Forbidden	2 5 L	B	40
	Ferrous metal borings shavings turnings *or* cuttings *in a form liable to self-heating*	4 2	UN2793	III	SPONTANEOUSLY COMBUSTIBLE	A1 A19 B101	None	213	241	25 kg	100 kg	A	
	Flammable solids corrosive n o s	4 1	UN2925	II	FLAMMABLE SOLID CORROSIVE	B106	None	212	242	15 kg	50 kg	D	40
				III	FLAMMABLE SOLID CORROSIVE	A1 B106	151	213	242	25 kg	100 kg	D	40
	Flammable solids poisonous n o s	4 1	UN2926	II	FLAMMABLE SOLID POISON	B106	None	212	242	15 kg	50 kg	B	40
				III	FLAMMABLE SOLID KEEP AWAY FROM FOOD	A1 B106	151	213	242	25 kg	100 kg	B	40
	Fluoroacetic acid	6 1	UN2642	I	POISON	B100	None	211	242	1 kg	15 kg	E	
	Fluorobenzene	3	UN2387	II	FLAMMABLE LIQUID.	B101 T8	150	202	242	5 L	60 L	B	
	Gasoline	3	UN1203	II	FLAMMABLE LIQUID	B33 B101 T8	150	202	242	5 L	60 L	E	

Hafnium powder dry	4.2	UN2545	I	SPONTANEOUSLY COMBUSTIBLE	B100	None	211	242	Forbidden	Forbidden	D	
			II	SPONTANEOUSLY COMBUSTIBLE	A19, A20 B100 N34	None	212	241	15 kg	50 kg	D	
			III	SPONTANEOUSLY COMBUSTIBLE	B100	None	213	241	25 kg	100 kg	D	
n Heptene	3	UN2278	II	FLAMMABLE LIQUID	B101 T8	150	202	242	5 L	60 L	B	
Hexadienes	3	UN2458	II	FLAMMABLE LIQUID	B101 T7	None	202	242	5 L	60 L	B	
Hexamethylene diisocyanate	6.1	UN2281	II	POISON	B101 T14	None	202	243	5 L	60 L	B	13 40
Hexamethyleneimine	3	UN2493	II	FLAMMABLE LIQUID, CORROSIVE	B101 T8	None	202	243	1 L	5 L	B	40
Hexanes	3	UN1208	II	FLAMMABLE LIQUID	B101 T8	150	202	242	5 L	60 L	E	
1 Hexene	3	UN2370	II	FLAMMABLE LIQUID	B101 T8	150	202	242	5 L	60 L	E	
Hydrogen peroxide and peroxy acetic acid mixtures *with acids water and not more than 5 per cent peroxyacetic acid stabilized*	5.1	UN3149	II	OXIDIZER CORROSIVE	A2, A3 A6, B12 B53 B104 T14	None	202	243	1 L	5 L	D	25, 66 75, 106
Hydrogen peroxide aqueous solutions *with more than 40 per cent but not more than 60 per cent hydrogen peroxide (stabilized as necessary)*	5.1	UN2014	II	OXIDIZER CORROSIVE	12, A3 A6, B12, B53 B80 B81 B85 B104 T14 T37	None	202	243	Forbidden	Forbidden	D	25, 66 75, 106
Hydrogen peroxide aqueous solutions *with not less than 8 per cent but less than 20 per cent hydrogen peroxide (stabilized as necessary)*	5.1	UN2984	III	OXIDIZER	17, A1 B104 T8 T37	152	203	241	2.5 L	30 L	B	25, 75 106

SECTION 172 101 HAZARDOUS MATERIALS TABLE—Continued

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or division	Identification numbers	Packing group	Label(s) required (if not excepted)	Special provisions	(8) Packaging authorizations (§173 * *)			(9) Quantity limitations		(10) Vessel stowage requirements	
							Exceptions	Non-bulk packaging	Bulk packaging	Passenger aircraft or rail car	Cargo aircraft only	Vessel stowage	Other stowage provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
	Hydrogen peroxide aqueous solutions *with not less than 20 per cent but not more than 40 per cent hydrogen peroxide (stabilized as necessary)*	5.1	UN2014	II	OXIDIZER CORROSIVE	A2, A3 A6, B12 B53 B104 T14 T37	None	202	243	1 L	5 L	D	25, 66 75, 106
	Hypochlorite solutions *with more than 5 per cent but less than 16 per cent available chloride*	8	UN1791	III	CORROSIVE	B104 N34 T7	154	203	242	5 L	60 L	B	26
	Isobutylamine	3	UN1214	II	FLAMMABLE LIQUID	B101 T8	150	202	242	5 L	60 L	B	40
	Isobutyryl chloride	3	UN2395	II	FLAMMABLE LIQUID, CORROSIVE	B100, T9 T26	None	202	243	1 L	5 L	C	40
	Isocyanatobenzotrifluorides	6.1	UN2285	II	POISON	5 B101 T14	None	202	243	5 L	60 L	B	25 40 48
	Lithium	4.3	UN1415	II	DANGEROUS WHEN WET	A7 A19 B100 N45	None	212	244	Forbidden	50 kg	E	
	Lithium aluminum hydride	4.3	UN1410	I	DANGEROUS WHEN WET	A19 B100 N40	None	211	242	Forbidden	15 kg	E	
	Lithium ferrosilicon	4.3	UN2830	II	DANGEROUS WHEN WET	A19 B105 B106	None	212	241	15 kg	50 kg	E	40, 85 103
	Lithium hydride	4.3	UN1414	I	DANGEROUS WHEN WET	A19 B100 N40	None	211	242	Forbidden	15 kg	E	
	Lithium hydride fused solid	4.3	UN2805	II	DANGEROUS WHEN WET	A8, A19 A20, B101 B106	None	212	241	15 kg	50 kg	E	
	Lithium silicon	4.3	UN1417	II	DANGEROUS WHEN WET	A19 A20 B100	None	212	241	15 kg	50 kg	A	85 103
	Magnesium aluminum phosphide	4.3	UN1419	I	DANGEROUS WHEN WET POISON	A19 B100 N34 N40	None	211	242	Forbidden	15 kg	E	40 85
	Magnesium granules coated *particle size not less than 149 microns*	4.3	UN2950	III	DANGEROUS WHEN WET	A1 A19 B108	None	213	240	25 kg	100 kg	A	
	Magnesium hydride	4.3	UN2010	I	DANGEROUS WHEN WET	A19 B100, N40	None	211	242	Forbidden	15 kg	E	

Magnesium powder *or* Magnesium alloys powder	4 3	UN1418	II	DANGEROUS WHEN WET SPONTANEOUSLY COMBUSTIBLE.	A19 B56 B100	None	212	241	15 kg	50 kg	A	39
Magnesium silicide	4 3	UN2624	II	DANGEROUS WHEN WET	A19, A20 B105 B106	None	212	241	15 kg	50 kg	B	85 103
Maneb *or* Maneb preparations *with not less than 60 percent maneb.*	4 2	UN2210	III	SPONTANEOUSLY COMBUSTIBLE DANGEROUS WHEN WET	A1 A19 B105	None	213	242	25 kg	100 kg	A	34
Maneb stabilized *or* Maneb preparations stabilized *against self-heating*	4 3	UN2968	III	DANGEROUS WHEN WET	A1 A19 B108	None	213	242	25 kg	100 kg	B	34
Methyl acetate	3	UN1231	II	FLAMMABLE LIQUID	B101 T8	150	202	242	5 L	60 L	B	
Methyl allyl chloride	3	UN2554	II	FLAMMABLE LIQUID	B101 T8	150	202	242	5 L	60 L	E	
Methyl bromoacetate	6 1	UN2643	II	POISON	B100 T8	None	202	243	5 L	60 L	D	40
Methyl tert-butyl ether	3	UN2398	II	FLAMMABLE LIQUID	B101 T14	150	202	242	5 L	60 L	E	
Methyl propionate	3	UN1248	II	FLAMMABLE LIQUID	B101 T2	150	202	242	5 L	60 L	B	
Methyltetrahydrofuran	3	UN2536	II	FLAMMABLE LIQUID	B101 T7	150	202	242	5 L	60 L	B	
Natural gasoline	3	UN1257	I	FLAMMABLE LIQUID	T8	150	202	242	1 L	30 L	E	
			II	FLAMMABLE LIQUID	B101T8	150	202	242	5L	60L	E	
Nitrating acid mixtures spent *with not more than 50 per cent nitric acid*	8	UN1826	II	CORROSIVE	B2, B100 T12 T27	None	158	242	Forbidden	30 L	D	40
p-Nitrosodimethylaniline	4 2	UN1369	II	SPONTANEOUSLY COMBUSTIBLE	A19, A20 B101 N34	None	212	241	15 kg	50 kg	D	34
Osmium tetroxide	6 1	UN2471	I	POISON	A8 B100 N33 N34	None	211	242	5 kg	50 kg	B	40
Paper unsaturated oil treated *in completely dried (including carbon paper)*	4 2	UN1379	III	SPONTANEOUSLY COMBUSTIBLE	B101 B106	None	213	241	Forbidden	Forbidden	A	
Phenacyl bromide	6 1	UN2645	II	POISON	B106	None	212	242	25 kg	100 kg	B	40 48
Phenol molten	6 1	UN2312	II	POISON	B14 B100 T8	None	202	243	Forbidden	Forbidden	B	40
Phenyl isocyanate	6 1	UN2487	II	POISON	B101	None	227	244	5 L	60 L	D	40
Phosphorus oxybromide	8	UN1939	II	CORROSIVE	B8 B106 N41 N43	None	212	240	Forbidden	50 kg	C	12 40 48
Phosphorus pentabromide	8	UN2691	II	CORROSIVE	A7 B106 N34	154	212	240	Forbidden	50 kg	B	12 40 48
Phosphorus pentachoride	8	UN1806	II	CORROSIVE	A7 B106 N34	None	212	240	Forbidden	50 kg	C	40

SECTION 172.101 HAZARDOUS MATERIALS TABLE—Continued

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or division	Identification numbers	Packing group	Label(s) required (if not excepted)	Special provisions	(8) Packaging authorizations (§ 173.**)			(9) Quantity limitations		(10) Vessel stowage requirements	
							Exceptions	Non bulk packaging	Bulk packaging	Passenger aircraft or rail car	Cargo aircraft only	Vessel stowage	Other stowage provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
	Phosphorus pentasulfide *free from yellow or white phosphorus*	4.3	UN1340	II	DANGEROUS WHEN WET	A20 B59 B100	None	212	242	15 kg	50 kg	B	74
	Poisonous solids flammable n.o.s.	6.1	UN2930	I	POISON, FLAMMABLE SOLID	B106	None	211	242	1 kg	15 kg	B	
				II	POISON, FLAMMABLE SOLID	B106	None	212	242	15 kg	50 kg	B	
	Poisonous solids self heating n.o.s.	6.1	UN3124	I	POISON, SPONTANEOUSLY COMBUSTIBLE	A5 B100	None	211	241	5 kg	15 kg	C	
	Poisonous solids which in contact with water emit flammable gases n.o.s.	6.1	UN3125	I	POISON, DANGEROUS WHEN WET	A5 B101	None	211	241	5 kg	15 kg	E	
					POISON, DANGEROUS WHEN WET	B100	None	212	242	15 kg	50 kg	E	
	Potassium	4.3	UN2257	II	DANGEROUS WHEN WET	A19 A20 B27, B100, N6 N34 T15 T26	None	212	244	Forbidden	50 kg	D	
	Potassium bifluoride *solid*	8	UN1811	II	CORROSIVE POISON	B106 N3 N34 T8	154	212	242	15 kg	50 kg	A	25 26 40 95
	Potassium sulfide anhydrous *or* Potassium sulfide *with less than 30 percent water of crystallization*	4.2	UN1382	II	SPONTANEOUSLY COMBUSTIBLE	A19 A20 B16 B106 N34	None	212	241	15 kg	50 kg	A	
	Propionyl chloride	3	UN1815	II	FLAMMABLE LIQUID, CORROSIVE	B100 T8 T26	None	202	243	1 L	5 L	B	40
	Rubidium	4.3	UN1423	I	DANGEROUS WHEN WET	22 A7 A19 B100 N34 N40 N45	None	211	242	Forbidder	15 kg	E	
	Self heating substances solid n.o.s.	4.2	UN3088	II	SPONTANEOUSLY COMBUSTIBLE	B101	None	212	241	25 kg	100 kg	C	
				III	SPONTANEOUSLY COMBUSTIBLE	B101	None	213	241	25 kg	100 kg	C	

Sodium	4 3	UN1428	II	DANGEROUS WHEN WET	A7, A8, A19, A20 B9, B28, B48 B68 B100, N34 T15 T29 T46	None	212	244	Forbid-den	50 kg	D	
Sodium aluminum hydride	4 3	UN2835	II	DANGEROUS WHEN WET	A8, A19 A20 B100	None	212	242	Forbid-den	50 kg	E	
Sodium dithionite *or* Sodium hy drosulfite	4.2	UN1384	II	SPONTAN EOUSLY COMBUSTIBLE	A19 A20 B106	None	212	241	15 kg	50 kg	E	13
Sodium hydride	4 3	UN1427	I	DANGEROUS WHEN WET	A19 B100 N40	None	211	242	Forbid den	15 kg	E	
Sodium hydrogen fluoride	8	UN2439	II	CORROSIVE	B106 N3 N34	154	212	240	15 kg	50 kg	A	12, 25 26 40 48
Sodium sulfide anhydrous *or* Sodium sulfide *with less than 30 per cent water crystalliza tion*	4 2	UN1385	II	SPONTAN EOUSLY COMBUSTIBLE	A19, A20 B106 N34	None	212	241	15 kg	50 kg	A	
Stannic phosphide	4 3	UN1433	I	DANGEROUS WHEN WET	A19 B100 N40	None	211	242	Forbid den	15 kg	E	40 85
Substances which in contact with water emit flam mable gases solid corrosive n o s	4 3	UN3131	I	DANGEROUS WHEN WET, CORROSIVE	N40 B100	None	211	242	Forbid-den	15 kg	E	
			II	DANGEROUS WHEN WET, CORROSIVE	B100	None	212	242	15 kg	50 kg	E	
			III	DANGEROUS WHEN WET, CORROSIVE	B100	None	213	241	25 kg	100 kg	E	
Substances which in contact with water emit flam mable gases solid flammable n o s	4 3	UN3132	I	DANGEROUS WHEN WET, FLAMMABLE SOLID	N40 B100	None	211	242	Forbid den	15 kg	E	
			II	DANGEROUS WHEN WET, FLAMMABLE SOLID	B100	None	212	242	15 kg	50 kg	E	
			III	DANGEROUS WHEN WET, FLAMMABLE SOLID	B100	None	213	241	25 kg	100 kg	E	
Substances which in contact with water emit flam mable gases solid n o s	4 3	UN2813	I	DANGEROUS WHEN WET	N40 B100	None	211	242	Forbid den	15 kg	E	40
			II	DANGEROUS WHEN WET	B100	None	212	242	15 kg	50 kg	E	40

SECTION 172 101 HAZARDOUS MATERIALS TABLE—Continued

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or division	Identification numbers	Packing group	Label(s) required (if not excepted)	Special provisions	(8) Packaging authorizations (§173 * *)			(9) Quantity limitations		(10) Vessel stowage requirements	
							Exceptions	Non-bulk packaging	Bulk packaging	Passenger aircraft or rail car	Cargo aircraft only	Vessel stowage	Other stowage provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
				III	DANGEROUS WHEN WET	B100	None	213	241	25 kg	100 kg	E	40
	Substances which in contact with water emit flammable gases solid poisonous n o s	4 3	UN3134	I	DANGEROUS WHEN WET POISON	A5 N40 B101	None	211	242	Forbidden	15 kg	E	
				II	DANGEROUS WHEN WET POISON	B105	None	212	242	15 kg	50 kg	E	
				III	DANGEROUS WHEN WET POISON	B105	None	213	241	25 kg	100 kg	E	
	Substances which in contact with water emit flammable gases solid self-heating n o s	4 3	UN3135	I	DANGEROUS WHEN WET SPONTANEOUSLY COMBUSTIBLE	B100 N40	None	211	242	Forbidden	15 kg	E	
				II	DANGEROUS WHEN WET SPONTANEOUSLY COMBUSTIBLE	B100	None	212	242	15 kg	50 kg	E	
				III	DANGEROUS WHEN WET SPONTANEOUSLY COMBUSTIBLE	B100	None	213	241	25 kg	100 kg	E	
	Thiophene	3	UN2414	II	FLAMMABLE LIQUID	B101 T2	150	202	242	5 L	60 L	B	40
	Thiophosphoryl chloride	8	UN1837	II	CORROSIVE	A3, A7 B2, B8, B25 B101 N34 T12	None	202	242	Forbidden	30 L	C	8 40
	Titanium tricloride mixtures	8	UN2869	II	CORROSIVE	A7 B106 N34	154	212	240	15 kg	50 kg	A	40
	Toluene diisocyanate	6 1	UN2078	II	POISON	B101 T14	None	202	243	5 L	60 L	B	25 40
	Triethylamine	3	UN1296	II	FLAMMABLE LIQUID	B101 T8	150	202	242	5 L	60 L	B	40
	Vinyl ethyl ether inhibited	3	UN1302	II	FLAMMABLE LIQUID	A3 B100 T14	None	201	243	1 L	30 L	E	
	Vinylpyridenes inhibited	6 1	UN3073	II	POISON, FLAMMABLE LIQUID	B100 T8	None	212	243	5 L	60 L	B	40

Zinc ashes	4 3	UN1435	III	DANGEROUS WHEN WET	A1 A19 B108	None	213	241	25 kg	100 kg	A
Zinc powder *or* Zinc dust	4 3	UN1436	I	DANGEROUS WHEN WET SPONTANE OUSLY COM BUSTIBLE	B100	None	211	242	Forbid-den	15 kg	A
			II	DANGEROUS WHEN WET SPONTANE OUSLY COM BUSTIBLE	B108	None	212	242	15 kg	50 kg	A
			III	DANGEROUS WHEN WET SPONTANE OUSLY COM BUSTIBLE	B108	None	213	242	25 kg	100 kg	A

7 In § 172.102, in paragraph (c)(3) Special Provisions B100, B101, B103, B104, B105, B106, B108, B109 and B110 are added in appropriate alpha-numeric order to read as follows:

§ 172.102 Special provisions.

(c)
(3) *

Code/Special Provisions

B100 Intermediate bulk containers are not authorized.
B101 Authorized only in metal intermediate bulk containers.
B103 If an intermediate bulk container is used, the package must be transported in a closed freight container or transport vehicle.
B104 Intermediate bulk containers must be provided with a device to allow venting during transport. The inlet to the pressure relief valve must communicate with the vapor space of the packaging and lading during transport.
B105 Authorized only in rigid intermediate bulk containers.
B106 Authorized in intermediate bulk containers that are vapor tight.
B108 Authorized in sift-proof, water-resistant flexible, fiberboard or wooden intermediate bulk containers; packed in a closed transport vehicle.
B109 Not authorized in flexible intermediate bulk containers.
B110 Authorized in intermediate bulk containers only in accordance with § 173.242(d) of this subchapter.

8. In § 172.322, paragraphs (b) and (e)(2) are revised to read as follows:

§ 172.322 Marine pollutants.

(b) A bulk packaging that contains a marine pollutant must—

(1) Be marked with the MARINE POLLUTANT mark on at least two opposing sides or two ends other than the bottom if the packaging has a capacity of less than 3,785 L (1,000 gallons). The mark must be visible from the direction it faces. The mark may be displayed in black lettering on a square-on-point configuration having the same outside dimensions as a placard; or

(2) Be marked on each end and each side with the MARINE POLLUTANT mark if the packaging has a capacity of 3,785 L (1,000 gallons) or more. The mark must be visible from the direction it faces. The mark may be displayed in black lettering on a square-on-point configuration having the same outside dimensions as a placard.

(e)

(2) The symbol, letters and border must be black and the background white, or the symbol, letters, border and background must be of contrasting color to the surface to which the mark is affixed. Each side of the mark must be—

(i) At least 100 mm (3.9 inches) for marks applied to:

(A) Non-bulk packagings, except in the case of packagings which, because of their size, can only bear smaller marks; or

(B) Bulk packagings with a capacity of less than 3785 L (1,000 gallons); or

(ii) At least 250 mm (9.8 inches) for marks applied to all other bulk packagings.

9. In § 172.514, paragraph (c)(3) is amended by removing the period at the end of the paragraph and replacing it with "; and" and paragraph (c)(4) is added to read as follows:

§ 172.514 Bulk packagings other than tank cars.

(c)

(4) An intermediate bulk container.

PART 173—SHIPPERS—GENERAL REQUIREMENTS FOR SHIPMENTS AND PACKAGINGS

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

Authority: 49 App. U.S.C. 1803, 1804, 1805, 1806, 1807 1808, 1817; 49 CFR part 1, unless otherwise noted.

§ 173.24 [Amended]

11. In § 173.24, the third sentence of paragraph (d) is amended by replacing "subpart L with "subpart L or subpart N" and replacing "subpart M" with "subpart M or subpart O, as appropriate,"

12. In § 173.32, paragraphs (d) and (e)(1)(ii) are revised to read as follows:

§ 173.32 Qualification, maintenance and use of portable tanks other than Specification IM portable tanks.

(d) *Use of Specification 52, 53, 56 and 57 portable tanks.* Continued use of an existing portable tank constructed to DOT Specification 52 or 53 is authorized only for a tank constructed before June 1, 1972. Continued use of an existing portable tank constructed to DOT Specification 56 or 57 is authorized only for a tank constructed before October 1, 1996.

(e)

(1)

(ii) Specifications 52, 53, 56 and 57 portable tanks (§§ 178.251, 178.252, 178.253 of this subchapter): At least once every 2.5 years.

13. Section 173.35 is added to read as follows:

§ 173.35 Hazardous materials in intermediate bulk containers.

(a) No person may offer or accept a hazardous material for transportation in an intermediate bulk container except as authorized by this subchapter. Each intermediate bulk container used for the transportation of hazardous materials must conform to the requirements of its specification and regulations for the transportation of the particular commodity. A specification intermediate bulk container, for which the prescribed periodic retest or inspection under subpart D of part 180 of this subchapter is past due, may not be filled and offered for transportation until the retest or inspection have been successfully completed. This requirement does not apply to any intermediate bulk container filled prior to the retest or inspection due date.

(b) Before being filled and offered for transportation, each intermediate bulk container and its service equipment must be visually inspected to ensure that it is free from corrosion, contamination, cracks, or other damage which would render the intermediate bulk container unsafe for transportation. No rigid plastic or composite intermediate bulk container with repaired bodies may be reused; however, plastic components, such as closures, valves, or legs, may be replaced. Fiberboard, wooden, or flexible intermediate bulk containers may not be reused.

(c) A metal intermediate bulk container, or a part thereof, subject to thinning by mechanical abrasion or corrosion due to the lading, must be protected by providing a suitable increase in thickness of material, a lining or some other suitable method of protection. Increased thickness for corrosion or abrasion protection must be added to the wall thickness specified in § 178.705(c)(1)(iv) of this subchapter.

(d) Notwithstanding requirements in § 173.24b of this subpart, when filling an intermediate bulk container with liquids, sufficient ullage must be left to ensure that, at the mean bulk temperature of 50 °C (122 °F), the intermediate bulk container is not filled to more than 98 percent of its water capacity.

(e) Where two or more closure systems are fitted in series, the system nearest to the hazardous material being carried must be closed first.

(f) During transportation—

(1) No hazardous material may remain on the outside of the intermediate bulk container; and

(2) Each intermediate bulk container must be securely fastened to or contained within the transport unit.

(g) Each intermediate bulk container used for transportation of solids which may become liquid at temperatures likely to be encountered during transportation must also be capable of containing the substance in the liquid state.

(h) Liquid hazardous materials may only be offered for transportation in a metal, rigid plastic, or composite intermediate bulk container that is appropriately resistant to an increase of internal pressure likely to develop during transportation.

(1) A rigid plastic or composite intermediate bulk container may only be filled with a liquid having a vapor pressure less than or equal to the greater of the following two values: the first value is determined from any of the methods in paragraphs (h)(1) (i), (ii) or (iii) of this section. The second value is determined by the method in paragraph (h)(1)(iv) of this section.

(i) The gauge pressure (pressure in the intermediate bulk container above ambient atmospheric pressure) measured in the intermediate bulk container at 55 °C (131 °F). This gauge pressure must not exceed two-thirds of the marked test pressure and must be determined after the intermediate bulk container was filled and closed at 15 °C (60 °F) to less than or equal to 98 percent of its capacity.

(ii) The absolute pressure (vapor pressure of the hazardous material plus atmospheric pressure) in the intermediate bulk container at 50 °C (122 °F). This absolute pressure must not exceed four-sevenths of the sum of the marked test pressure and 100 kPa (14.5 psi).

(iii) The absolute pressure (vapor pressure of the hazardous material plus atmospheric pressure) in the intermediate bulk container at 55 °C (131 °F). This absolute pressure must not exceed two-thirds of the sum of the marked test pressure and 100 kPa (14.5 psi).

(iv) Twice the static pressure of the substance, measured at the bottom of the intermediate bulk container. This value must not be less than twice the static pressure of water.

(2) Gauge pressure (pressure in the intermediate bulk container above ambient atmospheric pressure) in metal intermediate bulk containers must not exceed 110 kPa (16 psig) at 50 °C (122 °F) or 130 kPa (18.9 psig) at 55 °C (131 °F).

(i) The requirements in this section do not apply to DOT–56 or –57 portable tanks.

(j) No intermediate bulk container may be filled with a Packing Group I liquid. Rigid plastic, composite, flexible, wooden or fiberboard intermediate bulk containers used to transport Packing Group I solid materials may not exceed 1.5 cubic meters (17.7 cubic feet) capacity. For Packing Group I solids, a metal intermediate bulk container may not exceed 3 cubic meters (35.3 cubic feet) capacity.

(k) When an intermediate bulk container is used for the transportation of liquids with a flashpoint of 60.5 °C (141 °F) (closed cup) or lower, or powders with the potential for dust explosion, measures must be taken during product loading and unloading to prevent a dangerous electrostatic discharge.

14. In § 173.225, in paragraph (b) the following entries in the Organic Peroxides Table, and Note 14 following the Table are revised, and a new paragraph (e)(5) is added to read as follows:

§ 173.225 Packaging requirements and other provisions for organic peroxides.

(b)

ORGANIC PEROXIDES TABLE

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)
[Revised]										
Di (4 tert-butycyclohexyl) peroxydicarbonate *as a stable dispersion in water*	UN3119	=42					OP8A	30	35	14
Dicetyl peroxydicarbonate *as a stable dispersion in water*	UN3119	=42					OP8A	30	35	14
Dilauroyl peroxide *as a stable dispersion in water*	UN3109	=42					OP8A			14
Dimyristyl peroxydicarbonate *as a stable dispersion in water*	UN3119	=42					OP8A	20	25	14

Notes:

14 For domestic shipments this material may be transported in an intermediate bulk container or bulk packaging under the provisions of § 173 225(e)(3)(ii)

(e) *Bulk packagings for organic peroxides.* *

(5) *Intermediate bulk containers.* Specification 31HA1 composite intermediate bulk containers that are tested at the Packing Group II performance level in accordance with subpart O of part 178 of this subchapter.

16. In § 173.240, paragraph (d) is added to read as follows:

§ 173.240 Bulk packaging for certain low hazard solid materials.

*

(d) *Intermediate bulk containers.* Intermediate bulk containers are authorized subject to the conditions and limitations of this paragraph and paragraph (d)(2) of this section provided they conform to the requirements in subpart O of part 178 of this subchapter at the Packing Group performance level specified in column 5 of the § 172.101 Table of this subchapter for the material being transported.

(1) The following are authorized:

(i) Composite: 11HZ1, 11HZ2, 21HZ1, 21HZ2, 31HZ1, or 31HZ2. For composite intermediate bulk containers, the letter "Z" must be replaced with a capital letter which indicates the material of construction of the outer packaging. For example 21HA1 is a composite intermediate bulk container with a metal outer packaging (see § 178.702 of this subchapter);

(ii) Fiberboard: 11G,

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

(iv) Metal: 11A, 11B, 11N, 21A, 21B, 21N, 31A, 31B, or 31N;

(v) Rigid plastic: 11H1, 11H2, 21H1, 21H2, 31H1, or 31H2; or

(vi) Wooden intermediate bulk containers: 11C, 11D, or 11F

(2) The following conditions and limitations apply to the use of intermediate bulk containers:

(i) Flexible, fiberboard and wooden intermediate bulk containers are intended for the transport of solids only and may not be used for liquids or materials that may become liquid during transportation; or

(ii) Flexible, fiberboard, or wooden intermediate bulk containers containing materials in Packing Group II must be packed in a closed freight container or a closed transport vehicle.

17 In § 173.241, paragraph (d) is added to read as follows:

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

(d) *Intermediate bulk containers* (1, Intermediate bulk containers are authorized subject to the conditions and limitations of this paragraph and paragraph (d)(2) of this section provided they conform to the requirements in subpart O of part 178 of this subchapter at the Packing Group performance level specified in column 5 of the § 172.101 Table of this subchapter for the material being transported.

(i) The following are authorized for liquids or solids:

(A) Composite: 31HZ1 or 31HZ2; For each composite intermediate bulk container, the letter "Z" must be replaced with a capital letter which indicates the material of construction of the outer packaging. For example, 31HA1 is a composite intermediate bulk container with a metal outer packaging (see § 178.702 of this subchapter);

(B) Metal: 31A, 31B, or 31N; or

(C) Rigid plastic: 31H1 or 31H2.

(ii) The following are authorized for solids only:

(A) Composite: 11HZ1, 11HZ2, 21HZ1, or 21HZ2. For each composite intermediate bulk container, the letter "Z" must be replaced with a capital letter which indicates the material of construction of the outer packaging. For example, 21HA1 is a composite intermediate bulk container with a metal outer packaging (see § 178.702 of this subchapter);

(B) Fiberboard: 11G,

(C) Flexible: 13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, or 13M2;

(D) Metal: 11A, 11B, 11N, 21A, 21B, or 21N;

(E) Rigid plastic: 11H1, 11H2, 21H1, or 21H2; or

(F) Wooden: 11C, 11D, or 11F

(2) The following conditions and limitations apply to the use of intermediate bulk containers:

(i) Flexible, fiberboard and wooden intermediate bulk containers are intended for the transport of solids only and may not be used for liquids or materials that may become liquid during transportation;

(ii) Only liquids with a vapor pressure less than or equal to 110 kPa (16 psig) at 50 °C (122 °F), or 130 kPa (18.9 psig) at 55 °C (131 °F), are authorized in metal intermediate bulk containers; or

(iii) Flexible, fiberboard, or wooden intermediate bulk containers containing materials in Packing Group II must be packed in a closed freight container or a closed transport vehicle.

18. In § 173.242, paragraph (d) is added to read as follows:

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

(d) *Intermediate bulk containers.* (1) Intermediate bulk containers are authorized subject to the conditions and limitations of this paragraph and paragraph (d)(2) of this section provided they conform to the requirements in subpart O of part 178 of this subchapter at the Packing Group performance level specified in column 5 of the § 172.101 Table of this subchapter for the material being transported.

(i) The following are authorized for liquids or solids:

(A) Composite intermediate bulk containers: 31HZ1 or 31HZ2; for each composite intermediate bulk container, the letter "Z" must be replaced with a capital letter which indicates the material of construction of the outer packaging. For example, 21HA1 is a composite intermediate bulk container with a metal outer packaging (see § 178.702 of this subchapter);

(B) Metal: 31A, 31B, or 31N; or

(C) Rigid plastic: 31H1 or 31H2;

(ii) The following are authorized for solids only·

(A) Composite: 11HZ1, 11HZ2, 21HZ1, or 21HZ2. For each composite intermediate bulk container, the letter "Z" must be replaced with a capital letter which indicates the material of construction of the outer packaging. For example, 21HA1 is a composite intermediate bulk container with a metal outer packaging (see § 178.702 of this subchapter);

(B) Fiberboard: 11G,

(C) Flexible: 13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, or 13M2;

(D) Metal: 11A, 11B, 11N, 21A, 21B, or 21N;

(E) Rigid plastic: 11H1, 11H2, 21H1, or 21H2; or

(F) Wooden intermediate bulk containers: 11C, 11D, or 11F

(2)Intermediate bulk containers are authorized subject to the following conditions and limitations:

(i) No Packing Group I liquids or materials classified as Division 4.2 Packing Group I are authorized in intermediate bulk containers. Packing Group I solids are only authorized in metal intermediate bulk containers with capacities up to 3 cubic meters (35.4 cubic feet) and in rigid plastic, composite and wooden intermediate bulk containers with capacities of up to 1.5 cubic meters (17.7 cubic feet);

(ii) Flexible, fiberboard and wooden intermediate bulk containers are intended for the transport of solids only and may not be used for liquids or materials that may become liquid during transportation;

(iii) Only liquids with a vapor pressure less than or equal to 110 kPa (16 psig) at 50 °C (122 °F), or 130 kPa (18.9 psig) at 55 °C (131 °F), are

authorized in metal intermediate bulk containers; or

(iv) Flexible, fiberboard, or wooden intermediate bulk containers and composite intermediate bulk containers, with a fiberboard outer body containing materials in Packing Group I must be packed in a closed freight container or a closed transport vehicle. Flexible, fiberboard, or wooden intermediate bulk containers containing materials in Packing Group II must be packed in a closed freight container or a closed transport vehicle.

19. In § 173.243, the section heading is revised and paragraphs (d) and (e) are added to read as follows:

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

(d) *Intermediate bulk containers.* (1) Metal intermediate bulk containers (31A, 31B, 31N) are authorized subject to the conditions and limitations of paragraph (d)(2) of this section provided they conform to the requirements in subpart O of part 178 of this subchapter at the Packing Group performance level specified in column 5 of the § 172.101 Table of this subchapter for the material being transported.

(2) Intermediate bulk containers are authorized subject to the following conditions and limitations:

(i) No Packing Group I liquids or materials classified as Division 4.2 Packing Group I are authorized in intermediate bulk containers. Packing Group I solids are only authorized in metal intermediate bulk containers with capacities up to 3 cubic meters (35.4 cubic feet); and in rigid plastic, composite and wooden intermediate bulk containers with capacities of up to 1.5 cubic meters (17.7 cubic feet);

(ii) Only liquids with a vapor pressure less than or equal to 110 kPa (16 psig) at 50 °C (122 °F), or 130 kPa (18.9 psig) at 55 °C (131 °F), are authorized in metal intermediate bulk containers; or

(iii) Flexible, fiberboard, or wooden intermediate bulk containers and composite intermediate bulk containers, with a fiberboard outer body, containing materials in Packing Group I must be packed in a closed freight container or a closed transport vehicle. Flexible, fiberboard, or wooden intermediate bulk containers containing materials in Packing Group II must be packed in a closed freight container or a closed transport vehicle.

(e) A dual hazard material may be packaged in accordance with § 173.242 if:

(1) The subsidiary hazard is Class 3 with a flash point greater than 38 °C (100°F); or

(2) The subsidiary hazard is Division 6.1, Packing Group III.

PART 178—SPECIFICATIONS FOR PACKAGINGS

20. The authority citation for part 178 continues to read as follows:

Authority: 49 U.S.C. App. 1803, 1804, 1805, 1806, 1808; 49 CFR part 1.

Subpart H—[Amended]

21. In subpart H, §§ 178.251, 178.251–1 through 178.251–7 178.252, 178.252–1 through 178.252–3, 178.253, and 178.253–1 through 178.253–5 are removed and reserved.

22. Subpart N is added to part 178 to read as follows:

Subpart N—Intermediate Bulk Container Performance-Oriented Standards

Sec.

Subpart N—Intermediate Bulk Container Performance-Oriented Standards

§ 178.700 Purpose, scope and definitions.

(a) This subpart prescribes requirements applying to intermediate bulk containers intended for the transportation of hazardous materials. Standards for these packagings are based on the UN Recommendations.

(b) Terms used in this subpart are defined in § 171.8 of this subchapter and in paragraph (c) of this section.

(c) The following definitions pertain to the intermediate bulk container standards in this subpart.

(1) *Body* means the receptacle proper (including openings and their closures, but not including service equipment), which has a volumetric capacity of not more than 3 cubic meters (3,000 liters, 793 gallons or 35.3 cubic feet) and not less than 0.45 cubic meters (450 liters, 119 gallons or 5.3 cubic feet).

(2) *Service equipment* means filling and discharge, pressure relief, safety heating and heat-insulating devices and measuring instruments.

(3) *Structural equipment* means the reinforcing, fastening, handling, protective or stabilizing members of the body or stacking load bearing structural members (such as metal cages).

(4) *Maximum permissible gross mass* means the mass of the body, its service equipment, structural equipment and the maximum net mass (see § 171.8 of this subchapter).

§ 178.702 Intermediate bulk container identification codes.

(a) Intermediate bulk container code designations consist of: two numerals specified in paragraph (a)(1) of this section; followed by the capital letter(s) specified in paragraph (a)(2) of this section; followed, when specified in an individual section, by a numeral indicating the category of intermediate bulk container.

(1) Intermediate bulk container code number designations are as follows:

Type	For solids, discharged		For liquids
	by gravity	Under pressure of more than 10 kPa (1.45 psi)	
Rigid	11	21	31
Flexible	13		

(2) Intermediate bulk container code letter designations are as follows:

A means steel (all types and surface treatments).

"B" means aluminum.

"C" means natural wood.

"D" means plywood.
"F" means reconstituted wood.
"G" means fiberboard.
"H" means plastic.
"L" means textile.
"M" means paper, multiwall.
"N" means metal (other than steel or aluminum).

(b) For composite intermediate bulk containers, two capital letters are used in sequence following the numeral indicating intermediate bulk container design type. The first letter indicates the material of the intermediate bulk container inner receptacle. The second letter indicates the material of the outer intermediate bulk container. For example, 31HA1 is a composite intermediate bulk container with a plastic inner receptacle and a steel outer packaging.

§ 178.703 Marking of intermediate bulk containers.

(a) The manufacturer shall:

(1) Mark every intermediate bulk container in a durable and clearly visible manner (applied in a single line or in multiple lines provided the correct sequence is followed) with the following information in the sequence presented:

(i) The United Nations symbol as illustrated in § 178.503(d)(1). For metal intermediate bulk containers on which the marking is stamped or embossed, the capital letters 'UN' may be applied instead of the symbol.

(ii) The code number designating intermediate bulk container design type according to § 178.702(a) (1) and (2).

(iii) A capital letter identifying the performance standard under which the design type has been successfully tested, as follows:

(A) X—for intermediate bulk containers meeting Packing Group I, II and III tests;

(B) Y—for intermediate bulk containers meeting Packing Group II and III tests; and

(C) Z—for intermediate bulk containers meeting only Packing Group III tests.

(iv) The month (designated numerically) and year (last two digits) of manufacture.

(v) The country authorizing the allocation of the mark. The letters 'USA indicate that the intermediate bulk container is manufactured and marked in the United States in compliance with the provisions of this subchapter.

(vi) The name and address or symbol of the manufacturer or the approval agency certifying compliance with subparts N and O of this part. Symbols, if used, must be registered with the Associate Administrator for Hazardous Materials Safety.

(vii) The stacking test load in kilograms (kg). For intermediate bulk containers not designed for stacking, the figure "0" must be shown.

(viii) The maximum permissible gross mass or, for flexible intermediate bulk containers, the maximum net mass, in kg.

(2) The following are examples of symbols and required markings:

(i) For a metal intermediate bulk container containing solids discharged by gravity made from steel:

BILLING CODE 4910-60-P

11A/Y/02 92/USA/ABC/5500/1500

BILLING CODE 4910-60-C

(ii) For a flexible intermediate bulk container containing solids discharged by gravity and made from woven plastic with a liner:

BILLING CODE 4910-60-P

13H3/Z/03 92/USA/ABC/0/1500

BILLING CODE 4910-60-C

(iii) For a rigid plastic intermediate bulk container containing liquids, made from plastic with structural equipment withstanding the stack load and with a manufacturer's symbol in place of the manufacturer's name and address:

BILLING CODE 4910-60-P

31H1/Y/04 93/USA/M9399/10800/1200

BILLING CODE 4910-60-C

(iv) For a composite intermediate bulk container containing liquids, with a rigid plastic inner receptacle and an outer steel body and with the symbol of a DOT approved third-party test laboratory:

BILLING CODE 4910-60-P

31HA1/Y/05 93/USA/+ZT1235/10800/1200

BILLING CODE 4910-60-C

(b) *Additional marking.* In addition to markings required in paragraph (a) of this section, each intermediate bulk container must be marked as follows in a place near the markings required in paragraph (a) of this section that is readily accessible for inspection. Where units of measure are used, the metric unit indicated (e.g., 450 liters) must also appear.

(1) For each rigid plastic and composite intermediate bulk container, the following markings must be included:

(i) Rated capacity in liters of water at 20 °C (68 °F);

(ii) Tare mass in kilograms;

(iii) Gauge test pressure in kPa;

(iv) Date of last leakproofness test, if applicable (month and year); and

(v) Date of last inspection (month and year).

(2) For each metal intermediate bulk container, the following markings must be included on a metal corrosion-resistant plate:

(i) Rated capacity in liters of water at 20 °C (68 °F);

(ii) Tare mass in kilograms;

(iii) Date of last leakproofness test, if applicable (month and year);

(iv) Date of last inspection (month and year);

(v) Maximum loading/discharge pressure, in kPa, if applicable;

(vi) Body material and its minimum thickness in mm; and

(vii) Serial number assigned by the manufacturer.

(3) Markings required by paragraph (b)(1) or (b)(2) of this section may be preceded by the narrative description of the marking, e.g. "Tare Mass: *" where the "* *" are replaced with the tare mass in kilograms of the intermediate bulk container.

(4) For each fiberboard and wooden intermediate bulk container, the tare mass in kg must be shown.

(5) Each flexible intermediate bulk container may be marked with a pictogram displaying recommended lifting methods.

§ 178.704 General intermediate bulk container standards.

(a) Each intermediate bulk container must be resistant to, or protected from, deterioration due to exposure to the external environment. Intermediate bulk containers intended for solid hazardous materials must be sift-proof and water-resistant.

(b) All service equipment must be so positioned or protected as to minimize potential loss of contents resulting from damage during intermediate bulk container handling and transportation.

(c) Each intermediate bulk container, including attachments, and service and structural equipment, must be designed to withstand, without loss of hazardous materials, the internal pressure of the contents and the stresses of normal handling and transport. An intermediate bulk container intended for stacking must be designed for stacking. Any lifting or securing features of an intermediate bulk container must be of sufficient strength to withstand the normal conditions of handling and transportation without gross distortion or failure and must be positioned so as to cause no undue stress in any part of the intermediate bulk container.

(d) An intermediate bulk container consisting of a packaging within a framework must be so constructed that:

(1) The body is not damaged by the framework;

(2) The body is retained within the framework at all times; and

(3) The service and structural equipment are fixed in such a way that they cannot be damaged if the connections between body and frame allow relative expansion or movement.

(e) Bottom discharge valves must be secured in the closed position and the discharge system suitably protected from damage. Valves having lever closures must be secured against accidental opening. The open or closed position of each valve must be readily apparent. For each intermediate bulk container containing a liquid, a secondary means of sealing the discharge aperture must also be provided, e.g., by a blank flange or equivalent device.

(f) Intermediate bulk container design types must be constructed in such a way as to be bottom-lifted or top-lifted as specified in §§ 178.811 and 178.812.

§ 178.705 Standards for metal intermediate bulk containers.

(a) The provisions in this section apply to metal intermediate bulk containers intended to contain liquids and solids. Metal intermediate bulk container types are designated:

(1) 11A, 11B, 11N for solids that are loaded or discharged by gravity

(2) 21A, 21B, 21N for solids that are loaded or discharged at a gauge pressure greater than 10 kPa (1.45 psig).

(3) 31A, 31B, 31N for liquids or solids.

(b) Definitions for metal intermediate bulk containers:

(1) *Metal intermediate bulk container* means an intermediate bulk container with a metal body, together with appropriate service and structural equipment.

(2) *Protected* means providing the intermediate bulk container body with additional external protection against impact and abrasion. For example, a multi-layer (sandwich) or double wall construction or a frame with a metal lattice-work casing.

(c) Construction requirements for metal intermediate bulk containers are as follows:

(1) *Body.* The body must be made of ductile metal materials. Welds must be made so as to maintain design type integrity of the receptacle under conditions normally incident to transportation.

(i) The use of dissimilar metals must not result in deterioration that could affect the integrity of the body.

(ii) Aluminum intermediate bulk containers intended to contain flammable liquids must have no movable parts, such as covers and closures, made of unprotected steel

liable to rust, which might cause a dangerous reaction from friction or percussive contact with the aluminum.

(iii) Metals used in fabricating the body of a metal intermediate bulk container must meet the following requirements:

(A) For steel, the percentage elongation at fracture must not be less than 10,000/Rm with a minimum of 20 percent; where Rm = minimum tensile strength of the steel to be used, in N/mm^2. if U.S. Standard units of pounds per square inch are used for tensile strength then the ratio becomes 10,000 x (145/Rm).

(B) For aluminum, the percentage elongation at fracture must not be less than 10,000/(6Rm) with an absolute minimum of eight percent; if U.S. Standard units of pounds per square inch are used for tensile strength then the ratio becomes 10,000 x 145/(6Rm).

(C) Specimens used to determine the elongation at fracture must be taken transversely to the direction of rolling and be so secured that:

$Lo = 5d$

or

$Lo = 5.65\sqrt{A}$

where: Lo = gauge length of the specimen before the test

d = diameter

A = cross-sectional area of test specimen.

(iv) Minimum wall thickness:

(A) For a reference steel having a product of Rm x Ao = 10,000, where Ao = minimum elongation (as a percentage) of the reference steel to be used on fracture under tensile stress, (Rm x Ao = 10,000 x 145; if tensile strength is in U.S. Standard units of pounds per square inch) the wall thickness must not be less than:

Capacity in liters [1]	Wall thickness in mm (inches)			
	Types 11A, 11B, 11N.		Types 21A, 21B, 21N, 31A, 31B, 31N	
	Unprotected	Protected	Unprotected	Protected
>450 and ≦1000	2.0 (0.079)	1.5 (0.059)	2.5 (0.098)	2.0 (0.079)
>1000 and ≦2000	2.5 (0.098)	2.0 (0.079)	3.0 (0.118)	2.5 (0.098)
>2000 and ≦3000	3.0 (0.118)	2.5 (0.098)	4.0 (0.157)	3.0 (0.118)

[1] Where: gallons = liters x 0.264.

(B) For metals other than the reference steel described in paragraph (c)(1)(iii)(A) of this section, the minimum wall thickness is the greater of 1.5 mm (0.059 inches) or as determined by use of the following equivalence formula:

Formula for metric units

$$e_1 = \frac{21.4 \times e_0}{\sqrt[3]{Rm_1 \times A_1}}$$

Formula for U.S. Standard units

$$e_1 = \frac{544 \times e_0}{\sqrt[3]{(Rm_1 \times A_1)/145}}$$

where:

e_1 = required equivalent wall thickness of the metal to be used (in mm or if e_o is in inches, use formula for U.S. Standard units).

e_o = required minimum wall thickness for the reference steel (in mm or if e_o is in inches, use formula for U.S. Standard units).

Rm_1 = guaranteed minimum tensile strength of the metal to be used (in N/mm^2 or for U.S. Standard units, use pounds per square inch).

A_1 = minimum elongation (as a percentage) of the metal to be used on fracture under tensile stress (see paragraph (c)(1) of this section).

(2) *Pressure relief.* The following pressure relief requirements apply to intermediate bulk containers intended for liquids:

(i) Intermediate bulk containers must be capable of releasing a sufficient amount of vapor in the event of fire engulfment to ensure that no rupture of the body will occur due to pressure build-up. This can be achieved by spring-loaded or frangible pressure relief devices or by other means of construction.

(ii) The start-to-discharge pressure may not be higher than 65 kPa (9 psig) and no lower than the vapor pressure of the hazardous material plus the partial pressure of the air or other inert gases, minus 100 kPa (14.5 psig) at 55 °C (131 °F), determined on the basis of a maximum degree of filling as specified in § 173.35(d) of this subchapter. Pressure relief devices must be fitted in the vapor space.

§ 178.706 Standards for rigid plastic intermediate bulk containers.

(a) The provisions in this section apply to rigid plastic intermediate bulk containers intended to contain solids or liquids. Rigid plastic intermediate bulk container types are designated:

(1) 11H1 fitted with structural equipment designed to withstand the whole load when intermediate bulk containers are stacked, for solids which are loaded or discharged by gravity.

(2) 11H2 freestanding, for solids which are loaded or discharged by gravity.

(3) 21H1 fitted with structural equipment designed to withstand the whole load when intermediate bulk containers are stacked, for solids which are loaded or discharged under pressure.

(4) 21H2 freestanding, for solids which are loaded or discharged under pressure.

(5) 31H1 fitted with structural equipment designed to withstand the whole load when intermediate bulk containers are stacked, for liquids.

(6) 31H2 freestanding, for liquids.

(b) Rigid plastic intermediate bulk containers consist of a rigid plastic body which may have structural equipment, together with appropriate service equipment.

(c) Rigid plastic intermediate bulk containers must be manufactured from plastic material of known specifications and be of a strength relative to its capacity and to the service it is required to perform. In addition to conformance to § 173.24 of this subchapter, plastic materials must be resistant to aging and to degradation caused by ultraviolet radiation.

(1) If protection against ultraviolet radiation is necessary it must be provided by the addition of a pigment

or inhibiter such as carbon black. These additives must be compatible with the contents and remain effective throughout the life of the intermediate bulk container body. Where use is made of carbon black, pigments or inhibitors, other than those used in the manufacture of the tested design type, retesting may be omitted if changes in the carbon black content, the pigment content or the inhibitor content do not adversely affect the physical properties of the material of construction.

(2) Additives may be included in the composition of the plastic material to improve the resistance to aging or to serve other purposes, provided they do not adversely affect the physical or chemical properties of the material of construction.

(3) No used material other than production residues or regrind from the same manufacturing process may be used in the manufacture of rigid plastic intermediate bulk containers.

(4) Rigid plastic intermediate bulk containers intended for the transportation of liquids must be capable of releasing a sufficient amount of vapor to prevent the body of the intermediate bulk container from rupturing if it is subjected to an internal pressure in excess of that for which it was hydraulically tested. This may be achieved by spring-loaded or frangible pressure relief devices or by other means of construction.

§ 178.707 Standards for composite intermediate bulk containers.

(a) The provisions in this section apply to:

(1) Composite intermediate bulk containers intended to contain solids and liquids. Composite intermediate bulk container types are designated:

(i) 11HZ1 Composite intermediate bulk containers with a rigid plastic inner receptacle for solids loaded or discharged by gravity.

(ii) 11HZ2 Composite intermediate bulk containers with a flexible plastic inner receptacle for solids loaded or discharged by gravity.

(iii) 21HZ1 Composite intermediate bulk containers with a rigid plastic inner receptacle for solids loaded or discharged under pressure.

(iv) 21HZ2 Composite intermediate bulk containers with a flexible plastic inner receptacle for solids loaded or discharged under pressure.

(v) 31HZ1 Composite intermediate bulk containers with a rigid plastic inner receptacle for liquids.

(vi) 31HZ2 Composite intermediate bulk containers with a flexible plastic inner receptacle for liquids.

(2) The marking code in paragraph (a)(1) of this section must be completed by replacing the letter Z by a capital letter in accordance with § 178.702(a)(2) to indicate the material used for the outer packaging.

(b) Definitions for composite intermediate bulk container types:

(1) A *composite intermediate bulk container* is an intermediate bulk container which consists of a rigid outer packaging enclosing a plastic inner receptacle together with any service or other structural equipment. The outer packaging of a composite intermediate bulk container is designed to bear the entire stacking load. The inner receptacle and outer packaging form an integral packaging and are filled, stored, transported, and emptied as a unit.

(2) The term plastic means polymeric materials (i.e., plastic or rubber).

(3) A "rigid" inner receptacle is an inner receptacle which retains its general shape when empty without closures in place and without benefit of the outer casing. Any inner receptacle that is not "rigid" is considered to be "flexible."

(c) Construction requirements for composite intermediate bulk containers with plastic inner receptacles are as follows:

(1) The outer packaging must consist of rigid material formed so as to protect the inner receptacle from physical damage during handling and transportation, but is not required to perform the secondary containment function. It includes the base pallet where appropriate. The inner receptacle is not intended to perform a containment function without the outer packaging.

(2) A composite intermediate bulk container with a fully enclosing outer packaging must be designed to permit assessment of the integrity of the inner container following the leakproofness and hydraulic tests.

(3) The inner receptacle must be manufactured from plastic material of known specifications and be of a strength relative to its capacity and to the service it is required to perform. In addition to conformance with the requirements of § 173.24 of this subchapter, the material must be resistant to aging and to degradation caused by ultraviolet radiation.

(i) If necessary, protection against ultraviolet radiation must be provided by the addition of pigments or inhibitors such as carbon black. These additives must be compatible with the contents and remain effective throughout the life of the inner receptacle. Where use is made of carbon black, pigments, or inhibitors, other than those used in the manufacture of the tested design type, retesting may be omitted if the carbon black content, the pigment content, or the inhibitor content do not adversely affect the physical properties of the material of construction.

(ii) Additives may be included in the composition of the plastic material of the inner receptacle to improve resistance to aging, provided they do not adversely affect the physical or chemical properties of the material.

(iii) No used material other than production residues or regrind from the same manufacturing process may be used in the manufacture of inner receptacles.

(iv) Composite intermediate bulk containers intended for the transportation of liquids must be capable of releasing a sufficient amount of vapor to prevent the body of the intermediate bulk container from rupturing if it is subjected to an internal pressure in excess of that for which it was hydraulically tested. This may be achieved by spring-loaded or frangible pressure relief devices or by other means of construction.

(4) The strength of the construction material comprising the outer packaging and the manner of construction must be appropriate to the capacity of the composite intermediate bulk container and its intended use. The outer packaging must be free of any projection that might damage the inner receptacle.

(i) Outer packagings of natural wood must be constructed of well seasoned wood that is commercially dry and free from defects that would materially lessen the strength of any part of the outer packaging. The tops and bottoms may be made of water-resistant reconstituted wood such as hardboard or particle board. Materials other than natural wood may be used for construction of structural equipment of the outer packaging.

(ii) Outer packagings of plywood must be made of well-seasoned, rotary cut, sliced, or sawn veneer, commercially dry and free from defects that would materially lessen the strength of the casing. All adjacent plies must be glued with water-resistant adhesive. Materials other than plywood may be used for construction of structural equipment of the outer packaging. Outer packagings must be firmly nailed or secured to corner posts or ends or be assembled by equally suitable devices.

(iii) Outer packagings of reconstituted wood must be constructed of water-resistant reconstituted wood such as hardboard or particle board. Materials other than reconstituted wood may be used for the construction of structural equipment of reconstituted wood outer packaging.

(iv) Fiberboard outer packagings must be constructed of strong, solid, or double-faced corrugated fiberboard (single or multiwall).

(A) Water resistance of the outer surface must be such that the increase in mass, as determined in a test carried out over a period of 30 minutes by the Cobb method of determining water absorption, is not greater than 155 grams per square meter (0.0316 pounds per square foot—see ISO International Standard 535–1976 (E)). Fiberboard must have proper bending qualities. Fiberboard must be cut, creased without cutting through any thickness of fiberboard, and slotted so as to permit assembly without cracking, surface breaks, or undue bending. The fluting of corrugated fiberboard must be firmly glued to the facings.

(B) The ends of fiberboard outer packagings may have a wooden frame or be constructed entirely of wood. Wooden battens may be used for reinforcements.

(C) Manufacturers' joints in the bodies of outer packagings must be taped, lapped and glued, or lapped and stitched with metal staples.

(D) Lapped joints must have an appropriate overlap.

(E) Where closing is effected by gluing or taping, a water-resistant adhesive must be used.

(F) All closures must be sift-proof.

(v) Outer packagings of plastic materials must be constructed in accordance with the relevant provisions of paragraph (c)(3) of this section.

(5) Any integral pallet base forming part of an intermediate bulk container, or any detachable pallet, must be suitable for the mechanical handling of an intermediate bulk container filled to its maximum permissible gross mass.

(i) The pallet or integral base must be designed to avoid protrusions that may cause damage to the intermediate bulk container in handling.

(ii) The outer packaging must be secured to any detachable pallet to ensure stability in handling and transportation. Where a detachable pallet is used, its top surface must be free from sharp protrusions that might damage the intermediate bulk container.

(iii) Strengthening devices, such as timber supports to increase stacking performance, may be used but must be external to the inner receptacle.

(iv) The load-bearing surfaces of intermediate bulk containers intended for stacking must be designed to distribute loads in a stable manner. An intermediate bulk container intended for stacking must be designed so that loads are not supported by the inner receptacle.

§ 178.708 Standards for fiberboard intermediate bulk containers.

(a) The provisions of this section apply to fiberboard intermediate bulk containers intended to contain solids that are loaded or discharged by gravity. Fiberboard intermediate bulk containers are designated: 11G.

(b) Definitions for fiberboard intermediate bulk container types:

(1) *Fiberboard intermediate bulk containers* consist of a fiberboard body with or without separate top and bottom caps, appropriate service and structural equipment, and if necessary an inner liner (but no inner packaging).

(2) *Liner* means a separate tube or bag, including the closures of its openings, inserted in the body but not forming an integral part of it.

(c) Construction requirements for fiberboard intermediate bulk containers are as follows:

(1) Top lifting devices are prohibited in fiberboard intermediate bulk containers.

(2) Fiberboard intermediate bulk containers must be constructed of strong, solid or double-faced corrugated fiberboard (single or multiwall) that is appropriate to the capacity of the outer packaging and its intended use. Water resistance of the outer surface must be such that the increase in mass, as determined in a test carried out over a period of 30 minutes by the Cobb method of determining water absorption, is not greater than 155 grams per square meter (0.0316 pounds per square footsee ISO 535–1976(E)). Fiberboard must have proper bending qualites. Fiberboard must be cut, creased without cutting through any thickness of fiberboard, and slotted so as to permit assembly without cracking, surface breaks, or undue bending. The fluting of corrugated fiberboard must be firmly glued to the facings.

(i) The walls, including top and bottom, must have a minimum puncture resistance of 15 Joules (11 foot-pounds of energy) measured according to ISO 3036, incorporated by reference in § 171.7 of this subchapter.

(ii) Manufacturers' joints in the bodies of intermediate bulk containers must be made with an appropriate overlap and be taped, glued, stitched with metal staples or fastened by other means at least equally effective. Where joints are made by gluing or taping, a water-resistant adhesive must be used. Metal staples must pass completely through all pieces to be fastened and be formed or protected so that any inner liner cannot be abraded or punctured by them.

(3) The strength of the material used and the construction of the liner must be appropriate to the capacity of the intermediate bulk container and the intended use. Joints and closures must be sift-proof and capable of withstanding pressures and impacts liable to occur under normal conditions of handling and transport.

(4) Any integral pallet base forming part of an intermediate bulk container, or any detachable pallet, must be suitable for the mechanical handling of an intermediate bulk container filled to its maximum permissible gross mass.

(i) The pallet or integral base must be designed to avoid protrusions that may cause damage to the intermediate bulk container in handling.

(ii) The outer packaging must be secured to any detachable pallet to ensure stability in handling and transport. Where a detachable pallet is used, its top surface must be free from sharp protrusions that might damage the intermediate bulk container.

(iii) Strengthening devices, such as timber supports to increase stacking performance, may be used but must be external to the inner liner.

(iv) The load-bearing surfaces of intermediate bulk containers intended for stacking must be designed to distribute loads in a stable manner.

§ 178.709 Standards for wooden intermediate bulk containers.

(a) The provisions in this section apply to wooden intermediate bulk containers intended to contain solids that are loaded or discharged by gravity. Wooden intermediate bulk container types are designated:

(1) 11C Natural wood with inner liner.

(2) 11D Plywood with inner liner.

(3) 11F Reconstituted wood with inner liner.

(b) Definitions for wooden intermediate bulk containers:

(1) *Wooden intermediate bulk containers* consist of a rigid or collapsible wooden body together with an inner liner (but no inner packaging) and appropriate service and structural equipment.

(2) *Liner* means a separate tube or bag, including the closures of its openings, inserted in the body but not forming an integral part of it.

(c) Construction requirements for wooden intermediate bulk containers are as follows:

(1) Top lifting devices are prohibited in wooden intermediate bulk containers.

(2) The strength of the materials used and the method of construction must be appropriate to the capacity and intended use of the intermediate bulk container.

(i) Natural wood used in the construction of an intermediate bulk

container must be well-seasoned, commercially dry, and free from defects that would materially lessen the strength of any part of the intermediate bulk container. Each intermediate bulk container part must consist of uncut wood or a piece equivalent in strength and integrity. Intermediate bulk container parts are equivalent to one piece when a suitable method of glued assembly is used (i.e., a Lindermann joint, tongue and groove joint, ship lap or rabbet joint, or butt joint with at least two corrugated metal fasteners at each joint, or when other methods at least equally effective are used). Materials other than natural wood may be used for the construction of structural equipment of the outer packaging.

(ii) Plywood used in construction of bodies must be at least 3-ply. Plywood must be made of well-seasoned, rotary-cut, sliced or sawn veneer, commercially dry, and free from defects that would materially lessen the strength of the body. All adjacent plies must be glued with water-resistant adhesive. Materials other than plywood may be used for the construction of structural equipment of the outer packaging.

(iii) Reconstituted wood used in construction of bodies must be water resistant reconstituted wood such as hardboard or particle board. Materials other than reconstituted wood may be used for the construction of structural equipment of the outer packaging.

(iv) Wooden intermediate bulk containers must be firmly nailed or secured to corner posts or ends or be assembled by similar devices.

(3) The strength of the material used and the construction of the liner must be appropriate to the capacity of the intermediate bulk container and its intended use. Joints and closures must be sift-proof and capable of withstanding pressures and impacts liable to occur under normal conditions of handling and transportation.

(4) Any integral pallet base forming part of an intermediate bulk container, or any detachable pallet, must be suitable for the mechanical handling of an intermediate bulk container filled to its maximum permissible gross mass.

(i) The pallet or integral base must be designed to avoid protrusions that may cause damage to the intermediate bulk container in handling.

(ii) The outer packaging must be secured to any detachable pallet to ensure stability in handling and transportation. Where a detachable pallet is used, its top surface must be free from sharp protrusions that might damage the intermediate bulk container.

(iii) Strengthening devices, such as timber supports to increase stacking performance, may be used but must be external to the inner liner.

(iv) The load-bearing surfaces of intermediate bulk containers intended for stacking must be designed to distribute loads in a stable manner.

§ 178.710 Standards for flexible intermediate bulk containers.

(a) The provisions of this section apply to flexible intermediate bulk containers intended to contain solid hazardous materials. Flexible intermediate bulk container types are designated:

(1) 13H1 woven plastic without coating or liner.

(2) 13H2 woven plastic, coated.

(3) 13H3 woven plastic with liner.

(4) 13H4 woven plastic, coated and with liner.

(5) 13H5 plastic film.

(6) 13L1 textile without coating or liner.

(7) 13L2 textile, coated.

(8) 13L3 textile with liner.

(9) 13L4 textile, coated and with liner.

(10) 13M1 paper, multiwall.

(11) 13M2 paper, multiwall, water resistant.

(b) Definitions for flexible intermediate bulk containers:

(1) *Flexible intermediate bulk containers* consist of a body constructed of film, woven plastic, woven fabric, paper, or combination thereof, together with any appropriate service equipment and handling devices, and if necessary an inner coating or liner.

(2) *Woven plastic* means a material made from stretched tapes or monofilaments.

(3) *Handling device* means any sling, loop, eye, or frame attached to the body of the intermediate bulk container or formed from a continuation of the intermediate bulk container body material.

(c) Construction requirements for flexible intermediate bulk containers are as follows:

(1) The strength of the material and the construction of the flexible intermediate bulk container must be appropriate to its capacity and its intended use.

(2) All materials used in the construction of flexible intermediate bulk containers of types 13M1 and 13M2 must, after complete immersion in water for not less than 24 hours, retain at least 85 percent of the tensile strength as measured originally on the material conditioned to equilibrium at 67 percent relative humidity or less.

(3) Seams must be stitched or formed by heat sealing, gluing or any equivalent method. All stitched seam-ends must be secured.

(4) In addition to conformance with the requirements of § 173.24 of this subchapter, flexible intermediate bulk containers must be resistant to aging and degradation caused by ultraviolet radiation.

(5) For plastic flexible intermediate bulk containers, if necessary, protection against ultraviolet radiation must be provided by the addition of pigments or inhibitors such as carbon black. These additives must be compatible with the contents and remain effective throughout the life of the inner receptacle. Where use is made of carbon black, pigments, or inhibitors, other than those used in the manufacture of the tested design type, retesting may be omitted if the carbon black content, the pigment content or the inhibitor content does not adversely affect the physical properties of the material of construction. Additives may be included in the composition of the plastic material to improve resistance to aging, provided they do not adversely affect the physical or chemical properties of the material.

(6) No used material other than production residues or regrind from the same manufacturing process may be used in the manufacture of plastic flexible intermediate bulk containers. This does not preclude the re-use of component parts such as fittings and pallet bases, provided such components have not in any way been damaged in previous use.

(7) When flexible intermediate bulk containers are filled, the ratio of height to width may not be more than 2:1.

23. Subpart O is added to part 178 to read as follows:

Subpart O—Testing of Intermediate Bulk Containers

Sec.

Subpart O—Testing of Intermediate Bulk Containers

§ 178.800 Purpose and scope.

This subpart prescribes certain testing requirements for intermediate bulk containers identified in subpart N of this part.

§ 178.801 General requirements.

(a) *General.* The test procedures prescribed in this subpart are intended to ensure that intermediate bulk containers containing hazardous materials can withstand normal conditions of transportation and are considered minimum requirements. Each packaging must be manufactured and assembled so as to be capable of successfully passing the prescribed tests and of conforming to the requirements of § 173.24 of this subchapter at all times while in transportation.

(b) *Responsibility.* It is the responsibility of the intermediate bulk container manufacturer, the person certifying compliance with subparts N and O of this part, and the person who offers a hazardous material for transportation (to the extent that assembly functions, including final closure, are performed by the offeror), to assure that each intermediate bulk container is capable of passing the prescribed tests.

(c) *Definitions.* For the purpose of this subpart:

(1) *Intermediate bulk container design type* refers to intermediate bulk container which does not differ in structural design, size, material of construction, wall thickness, manner of construction and representative service equipment.

(2) *Design qualification testing* is the performance of the drop, leakproofness, hydrostatic pressure, stacking, bottom-lift or top-lift, tear, topple, righting and vibration tests, as applicable, prescribed in this subpart, for each different intermediate bulk container design type, at the start of production of that packaging.

(3) *Periodic design requalification test* is the performance of the applicable tests specified in paragraph (c)(2) of this section on an intermediate bulk container design type, in order to requalify the design for continued production at the frequency specified in paragraph (e) of this section.

(4) *Production inspection* is the inspection that must initially be conducted on each newly manufactured intermediate bulk container.

(5) *Production testing* is the performance of the leakproofness test in accordance with paragraph (f) of this section on each intermediate bulk container intended to contain solids discharged by pressure or intended to contain liquids.

(6) *Periodic retest and inspection* is performance of the applicable test and inspections on each intermediate bulk container at the frequency specified in § 180.352 of this subchapter.

(7) *Different intermediate bulk container design type* is one that differs from a previously qualified intermediate bulk container design type in structural design, size, material of construction, wall thickness, or manner of construction, but does not include:

(i) A packaging which differs in surface treatment;

(ii) A rigid plastic intermediate bulk container or composite intermediate bulk container which differs with regard to additives used to comply with §§ 178.706(c), 178.707(c) or 178.710(c);

(iii) A packaging which differs only in its lesser external dimensions (i.e., height, width, length) provided materials of construction and material thicknesses or fabric weight remain the same;

(iv) A packaging which differs in service equipment.

(d) *Design qualification testing.* The packaging manufacturer shall achieve successful test results for the design qualification testing at the start of production of each new or different intermediate bulk container design type. The service equipment selected for this design qualification testing shall be representative of the type of service equipment that will be fitted to any finished intermediate bulk container body under the design. Application of the certification mark by the manufacturer shall constitute certification that the intermediate bulk container design type passed the prescribed tests in this subpart.

(e) *Periodic design requalification testing.* (1) Periodic design requalification must be conducted on each qualified intermediate bulk container design type if the manufacturer is to maintain authorization for continued production. The intermediate bulk container manufacturer shall achieve successful test results for the periodic design requalification at sufficient frequency to ensure each packaging produced by the manufacturer is capable of passing the design qualification tests. Design requalification tests must be conducted at least once every 12 months.

(2) Changes in the frequency of design requalification testing specified in paragraph (e)(1) of this section are authorized if approved by the Associate Administrator for Hazardous Materials Safety. These requests must be based on:

(i) Detailed quality assurance programs that assure that proposed decreases in test frequency maintain the integrity of originally tested intermediate bulk container design types; and

(ii) Demonstrations that each intermediate bulk container produced is capable of withstanding higher standards (e.g., increased drop height, hydrostatic pressure, wall thickness, fabric weight).

(f) *Production testing and inspection.* (1) Production testing consists of the leakproofness test prescribed in § 178.813 of this subpart and must be performed on each intermediate bulk container intended to contain solids discharged by pressure or intended to contain liquids. For this test:

(i) The intermediate bulk container need not have its closures fitted.

(ii) The inner receptacle of a composite intermediate bulk container may be tested without the outer intermediate bulk container body, provided the test results are not affected.

(2) Applicable inspection requirements in § 180.352 of this subchapter must be performed on each intermediate bulk container initially after production.

(g) *Test samples.* The intermediate bulk container manufacturer shall conduct the design qualification and periodic design requalification tests prescribed in this subpart using random samples of intermediate bulk containers, according to the appropriate test section.

(h) *Selective testing of intermediate bulk containers.* Variation of a tested intermediate bulk container design type is permitted without further testing, provided selective testing demonstrates an equivalent or greater level of safety than the design type tested and which has been approved by the Associate Administrator for Hazardous Materials Safety

(i) *Approval of equivalent packagings.* An intermediate bulk container which differs from the standards in subpart N of this part, or which is tested using methods other than those specified in this subpart, may be used if approved by the Associate Administrator for Hazardous Materials Safety. Such intermediate bulk containers must be shown to be equally effective, and testing methods used must be equivalent.

(j) *Proof of compliance.* Notwithstanding the periodic design requalification testing intervals specified in paragraph (e) of this section, the Associate Administrator for Hazardous Materials Safety or a

designated representative, may at any time require demonstration of compliance by a manufacturer, through testing in accordance with this subpart, that packagings meet the requirements of this subpart. As required by the Associate Administrator for Hazardous Materials Safety, or a designated representative, the manufacturer shall either:

(1) Conduct performance tests or have tests conducted by an independent testing facility in accordance with this subpart; or

(2) Make a sample intermediate bulk container available to the Associate Administrator for Hazardous Materials Safety, or a designated representative, for testing in accordance with this subpart.

(k) *Coatings.* If an inner treatment or coating of an intermediate bulk container is required for safety reasons, the manufacturer shall design the intermediate bulk container so that the treatment or coating retains its protective properties even after withstanding the tests prescribed by this subpart.

(l) *Record retention.* (1) The person who certifies an intermediate bulk container design type shall keep records of design qualification tests for each intermediate bulk container design type and for each periodic design requalification as specified in this part. These records must be maintained at each location where the intermediate bulk container is manufactured and at each location where design qualification and periodic design requalification testing is performed. These records must be maintained for as long as intermediate bulk containers are manufactured in accordance with each qualified design type and for at least 2.5 years thereafter. These records must include the following information: name and address of test facility; name and address of the person certifying the intermediate bulk container; a unique test report identification; date of test report; manufacturer of the intermediate bulk container; description of the intermediate bulk container design type (e.g., dimensions, materials, closures, thickness, representative service equipment, etc.); maximum intermediate bulk container capacity; characteristics of test contents; test descriptions and results (including drop heights, hydrostatic pressures, tear propagation length, etc.). Each test report must be signed with the name of the person conducting the test, and name of the person responsible for testing.

(2) The person who certifies each intermediate bulk container must make all records of design qualification tests and periodic design requalification tests available for inspection by a representative of the Department upon request.

§ 178.802 Preparation of fiberboard intermediate bulk containers for testing.

(a) Fiberboard intermediate bulk containers and composite intermediate bulk containers with fiberboard outer packagings must be conditioned for at least 24 hours in an atmosphere maintained:

(1) At 50 percent ± 2 percent relative humidity and at a temperature of 23° ± 2 °C (73°F ± 4 °F); or

(2) At 65 percent ± 2 percent relative humidity, and at a temperature of 20° ± 2 °C (68 °F ± 4 °F), or 27 °C ± 2 °C (81 °F ± 4 °F).

(b) Average values for temperature and humidity must fall within the limits in paragraph (a) of this section. Short-term fluctuations and measurement limitations may cause individual measurements to vary by up to ± 5 percent relative humidity without significant impairment of test reproducibility

(c) For purposes of periodic design requalification only fiberboard intermediate bulk containers or composite intermediate bulk containers with fiberboard outer packagings may be at ambient conditions.

§ 178.803 Testing and certification of intermediate bulk containers.

Tests required for the certification of each intermediate bulk container design type are specified in the following table. The letter X indicates that one intermediate bulk container (except where noted) of each design type must be subjected to the tests in the order presented:

Intermediate bulk container (IBC) type	Metal IBCs	Rigid plastic IBCs	Composite IBCs	Fiberboard IBCs	Wooden IBCs	Flexible IBCs
Vibration	X	X	X	X	X	X[1,5]
Bottom lift	X[2]	X[2]	X[2]	X	X	
Top lift	X[2]	X[2]	X[2]			X[2,5]
Stacking	X	X	X	X	X	X[5]
Leakproofness	X[3]	X[3]	X[3]			
Hydrostatic	X[3]	X[3]	X[3]			
Drop	X	X	X	X	X	X[5]
Topple						X[5]
Righting						X[2,5]
Tear						X[5]

Notes: 1. Flexible intermediate bulk containers must be capable of withstanding the vibration test.
2. Only if intermediate bulk containers are designed to be handled this way.
3. The leakproofness and hydrostatic pressure tests are required for intermediate bulk containers intended to contain liquids or which are intended to contain solids loaded or discharged under pressure.
4. Another intermediate bulk container of the same design type may be used for the drop test set forth in § 178.810.
5. A different flexible intermediate bulk container may be used for each test.

§ 178.810 Drop test.

(a) *General.* The drop test must be conducted for the qualification of all intermediate bulk container design types and performed periodically as specified in § 178.801(e) of this subpart.

(b) *Special preparation for the drop test.* (1) Metal, rigid plastic, and composite intermediate bulk containers intended to contain solids must be filled to not less than 95 percent of their capacity or if intended to contain liquids, to not less than 98 percent of their capacity. Pressure relief devices must be removed and their apertures plugged or rendered inoperative.

(2) Fiberboard, wooden, and flexible intermediate bulk containers must be filled with a solid material to not less than 95 percent of their capacity

(3) Rigid plastic intermediate bulk containers and composite intermediate bulk containers with plastic inner receptacles must be conditioned for testing by reducing the temperature of the packaging and its contents to –18 °C (0 °F) or lower. Test liquids must be

kept in the liquid state. Anti-freeze should be used, if necessary.

(c) *Test method.* Samples of all intermediate bulk container design types must be dropped onto a rigid, non-resilient, smooth, flat and horizontal surface. The point of impact must be the most vulnerable part of the base of the intermediate bulk container being tested. Following the drop, the intermediate bulk container must be restored to the upright position for observation.

(d) *Drop height.* (1) For all intermediate bulk containers, drop heights are specified as follows:

(i) Packing Group I: 1.8 m (5.9 feet).

(ii) Packing Group II: 1.2 m (3.9 feet).

(iii) Packing Group III: 0.8 m (2.6 feet).

(2) Drop tests are to be performed with the solid or liquid to be transported or with a non-hazardous material having essentially the same physical characteristics.

(3) The specific gravity and viscosity of a substituted non-hazardous material used in the drop test for liquids must be similar to the hazardous material intended for transportation. Water also may be used for the liquid drop test under the following conditions:

(i) Where the substances to be carried have a specific gravity not exceeding 1.2, the drop heights must be those specified in paragraph (d)(1) of this section for each intermediate bulk container design type; and

(ii) Where the substances to be carried have a specific gravity exceeding 1.2, the drop heights must be as follows:

(A) Packing Group I: SG x 1.5 m (4.9 feet).

(B) Packing Group II: SG x 1.0 m (3.3 feet).

(C) Packing Group III: SG x 0.67 m (2.2 feet).

(e) *Criteria for passing the test.* For all intermediate bulk container design types there may be no loss of contents. A slight discharge from a closure upon impact is not considered to be a failure of the intermediate bulk container provided that no further leakage occurs. A slight discharge (e.g., from closures or stitch holes) upon impact is not considered a failure of the flexible intermediate bulk container provided that no further leakage occurs after the intermediate bulk container has been raised clear of the ground.

§ 178.811 Bottom lift test.

(a) *General.* The bottom lift test must be conducted for the qualification of all intermediate bulk container design types designed to be lifted from the base.

(b) *Special preparation for the bottom lift test.* The intermediate bulk container must be loaded to 1.25 times its maximum permissible gross mass, the load being evenly distributed.

(c) *Test method.* All intermediate bulk container design types must be raised and lowered twice by a lift truck with the forks centrally positioned and spaced at three quarters of the dimension of the side of entry (unless the points of entry are fixed). The forks must penetrate to three quarters of the direction of entry. The test must be repeated from each possible direction of entry.

(d) *Criteria for passing the test.* For all intermediate bulk container design types designed to be lifted from the base, there may be no permanent deformation which renders the intermediate bulk container unsafe for transportation and no loss of contents.

§ 178.812 Top lift test.

(a) *General.* The top lift test must be conducted for the qualification of all intermediate bulk container design types designed to be lifted from the top or, for flexible intermediate bulk containers, from the side.

(b) *Special preparation for the top lift test.* (1) Metal, rigid plastic, and composite intermediate bulk container design types must be loaded to twice the maximum permissible gross mass.

(2) Flexible intermediate bulk container design types must be filled to six times the maximum net mass, the load being evenly distributed.

(c) *Test method.* (1) A metal or flexible intermediate bulk container must be lifted in the manner for which it is designed until clear of the floor and maintained in that position for a period of five minutes. For flexible intermediate bulk container design types, other methods of top lift testing and preparation at least equally effective may be used (see § 178.801(i)).

(2) Rigid plastic and composite intermediate bulk container design types must be:

(i) Lifted by each pair of diagonally opposite lifting devices, so that the hoisting forces are applied vertically for a period of five minutes; and

(ii) Lifted by each pair of diagonally opposite lifting devices, so that the hoisting forces are applied towards the center at 45° to the vertical, for a period of five minutes.

(d) *Criteria for passing the test.* For all intermediate bulk container design types designed to be lifted from the top, there may be no permanent deformation which renders the intermediate bulk container, including the base pallets when applicable, unsafe for transportation, and no loss of contents.

§ 178.813 Leakproofness test.

(a) *General.* The leakproofness test must be conducted for the qualification of all intermediate bulk container design types and on all production units intended to contain liquids or intended to contain solids that are loaded or discharged under pressure.

(b) *Special preparation for the leakproofness test.* Vented closures must either be replaced by similar non-vented closures or the vent must be sealed. For metal intermediate bulk container design types, the initial test must be carried out before the fitting of any thermal insulation equipment.

(c) *Test method and pressure applied.* The leakproofness test must be carried out for a suitable length of time using air at a gauge pressure of not less than 20 kPa (2.9 psig). Leakproofness of intermediate bulk container design types must be determined by coating the seams and joints with a heavy oil, a soap solution and water, or other methods suitable for the purpose of detecting leaks. Other methods, if at least equally effective, may be used in accordance with Appendix B of this part, or if approved by the Associate Administrator for Hazardous Materials Safety, as provided in § 178.801(i)).

(d) *Criterion for passing the test.* For all intermediate bulk container design types intended to contain liquids or intended to contain solids that are loaded or discharged under pressure, there may be no leakage of air from the intermediate bulk container.

§ 178.814 Hydrostatic pressure test.

(a) *General.* The hydrostatic pressure test must be conducted for the qualification of all metal, rigid plastic, and composite intermediate bulk container design types intended to contain liquids or intended to contain solids loaded or discharged under pressure.

(b) *Special preparation for the hydrostatic pressure test.* For metal intermediate bulk containers, the test must be carried out before the fitting of any thermal insulation equipment. For all intermediate bulk containers, pressure relief devices and vented closures must be removed and their apertures plugged or rendered inoperative.

(c) *Test method.* Hydrostatic gauge pressure must be measured at the top of the intermediate bulk container. The test must be carried out for a period of at least 10 minutes applying a hydrostatic gauge pressure not less than that indicated in paragraph (d) of this section. The intermediate bulk containers may not be mechanically restrained during the test.

(d) *Hydrostatic gauge pressure applied.* (1) For metal intermediate bulk container design types, 31A, 31B, 31N: 65 kPa gauge pressure (9.4 psig).

(2) For metal intermediate bulk container design types 21A, 21B, 21N, 31A, 31B, 31N: 200 kPa (29 psig). For metal intermediate bulk container design types 31A, 31B and 31N, the tests in paragraphs (d)(1) and (d)(2) of this section must be conducted consecutively.

(3) For metal intermediate bulk containers design types 21A, 21B, and 21N, for Packing Group I solids: 250 kPa (36 psig) gauge pressure.

(4) For rigid plastic intermediate bulk container design types 21H1 and 21H2 and composite intermediate bulk container design types 21HZ1 and 21HZ2: 75 kPa (11 psig).

(5) For rigid plastic intermediate bulk container design types 31H1 and 31H2 and composite intermediate bulk container design types 31HZ1 and 31HZ2: whichever is the greater of:

(i) The pressure determined by any one of the following methods:

(A) The gauge pressure (pressure in the intermediate bulk container above ambient atmospheric pressure) measured in the intermediate bulk container at 55 °C (131 °F) multiplied by a safety factor of 1.5. This pressure must be determined on the basis of the intermediate bulk container being filled and closed to no more than 98 percent capacity at 15 °C (60 °F);

(B) If absolute pressure (vapor pressure of the hazardous material plus atmospheric pressure) is used, 1.5 multiplied by the vapor pressure of the hazardous material at 55 °C (131 °F) minus 100 kPa (14.5 psi). If this method is chosen, the hydrostatic test pressure applied must be at least 100 kPa gauge pressure (14.5 psig); or

(C) If absolute pressure (vapor pressure of the hazardous material plus atmospheric pressure) is used, 1.75 multiplied by the vapor pressure of the hazardous material at 50 °C (122 °F) minus 100 kPa (14.5 psi). If this method is chosen, the hydrostatic test pressure applied must be at least 100 kPa gauge pressure (14.5 psig); or

(ii) Twice the greater of: (A) The static pressure of the hazardous material on the bottom of the intermediate bulk container filled to 98 percent capacity; or

(B) The static pressure of water on the bottom of the intermediate bulk container filled to 98 percent capacity.

(e) *Criteria for passing the test(s).* (1) For metal intermediate bulk containers, subjected to the 65 kPa (9.4 psig) test pressure specified in paragraph (d)(1) of this section, there may be no leakage or permanent deformation that would make the intermediate bulk container unsafe for transportation.

(2) For metal intermediate bulk containers intended to contain liquids, when subjected to the 200 kPa (29 psig) and the 250 kPa (36 psig) test pressures specified in paragraphs (d)(2) and (d)(3) of this section, respectively, there may be no leakage.

(3) For rigid plastic intermediate bulk container types 21H1, 21H2, 31H1, and 31H2, and composite intermediate bulk container types 21HZ1, 21HZ2, 31HZ1, and 31HZ2, there may be no leakage and no permanent deformation which renders the intermediate bulk container unsafe for transportation.

§ 178.815 Stacking test.

(a) *General.* The stacking test must be conducted for the qualification of all intermediate bulk container design types intended to be stacked.

(b) *Special preparation for the stacking test.* (1) All intermediate bulk containers except flexible intermediate bulk container design types must be loaded to their maximum permissible gross mass.

(2) The flexible intermediate bulk container must be filled to not less than 95 percent of its capacity and to its maximum net mass, with the load being evenly distributed.

(c) *Test method.* (1) All intermediate bulk containers must be placed on their base on level, hard ground and subjected to a uniformly distributed superimposed test load for a period of at least five minutes (see paragraph (d) of this section).

(2) Fiberboard, wooden, and composite intermediate bulk containers with outer packagings constructed of other than plastic materials must be subjected to the test for 24 hours.

(3) Rigid plastic intermediate bulk container types and composite intermediate bulk container types with plastic outer packagings (11HH1, 11HH2, 21HH1, 21HH2, 31HH1 and 31HH2) must be subjected to the test for 28 days at 40 °C (104 °F).

(4) For all intermediate bulk containers, the load must be applied by one of the following methods:

(i) One or more intermediate bulk containers of the same type loaded to their maximum permissible gross mass and stacked on the test intermediate bulk container; or

(ii) The calculated superimposed test load weight loaded on either a flat plate or a reproduction of the base of the intermediate bulk container, which is stacked on the test intermediate bulk container.

(d) *Calculation of superimposed test load.* For all intermediate bulk containers, the load to be placed on the intermediate bulk container must be 1.8 times the combined maximum permissible gross mass of the number of similar intermediate bulk containers that may be stacked on top of the intermediate bulk container during transportation.

(e) *Criteria for passing the test.* (1) For metal, rigid plastic, and composite intermediate bulk containers there may be no permanent deformation which renders the intermediate bulk container unsafe for transportation and no loss of contents.

(2) For fiberboard and wooden intermediate bulk containers there may be no loss of contents and no permanent deformation which renders the whole intermediate bulk container, including the base pallet, unsafe for transportation.

(3) For flexible intermediate bulk containers, there may be no deterioration which renders the intermediate bulk container unsafe for transportation and no loss of contents.

§ 178.816 Topple test.

(a) *General.* The topple test must be conducted for the qualification of all flexible intermediate bulk container design types.

(b) *Special preparation for the topple test.* The flexible intermediate bulk container must be filled to not less than 95 percent of its capacity and to its maximum net mass, with the load being evenly distributed.

(c) *Test method.* A flexible intermediate bulk container must be toppled onto any part of its top upon a rigid, non-resilient, smooth, flat, and horizontal surface.

(d) *Topple height.* For all flexible intermediate bulk containers, the topple height is specified as follows:

(1) Packing Group I: 1.8 m (5.9 feet).

(2) Packing Group II: 1.2 m (3.9 feet).

(3) Packing Group III: 0.8 m (2.6 feet).

(e) *Criteria for passing the test.* For all flexible intermediate bulk containers, there may be no loss of contents. A slight discharge (e.g., from closures or stitch holes) upon impact is not considered to be a failure, provided no further leakage occurs.

§ 178.817 Righting test.

(a) *General.* The righting test must be conducted for the qualification of all flexible intermediate bulk containers designed to be lifted from the top or side.

(b) *Special preparation for the righting test.* The flexible intermediate bulk container must be filled to not less

than 95 percent of its capacity and to its maximum net mass, with the load being evenly distributed.

(c) *Test method.* The flexible intermediate bulk container, lying on its side, must be lifted at a speed of at least 0.1 m/second (0.33 ft/s) to an upright position, clear of the floor, by one lifting device, or by two lifting devices when four are provided.

(d) *Criterion for passing the test.* For all flexible intermediate bulk containers, there may be no damage to the intermediate bulk container or its lifting devices which renders the intermediate bulk container unsafe for transportation or handling.

§ 178.818 Tear test.

(a) *General.* The tear test must be conducted for the qualification of all flexible intermediate bulk container design types.

(b) *Special preparation for the tear test.* The flexible intermediate bulk container must be filled to not less than 95 percent of its capacity and to its maximum net mass, the load being evenly distributed.

(c) *Test method.* Once the intermediate bulk container is placed on the ground, a 100-mm (4-inch) knife score, completely penetrating the wall of a wide face, is made at a 45° angle to the principal axis of the intermediate bulk container, halfway between the bottom surface and the top level of the contents. The intermediate bulk container must then be subjected to a uniformly distributed superimposed load equivalent to twice the maximum net mass. The load must be applied for at least five minutes. An intermediate bulk container which is designed to be lifted from the top or the side must, after removal of the superimposed load, be lifted clear of the floor and maintained in that position for a period of five minutes.

(d) *Criterion for passing the test.* The intermediate bulk container passes the tear test if the cut does not propagate more than 25 percent of its original length.

§ 178.819 Vibration test.

(a) *General.* The vibration test must be conducted for the qualification of all rigid intermediate bulk container design types. Flexible intermediate bulk container design types must be capable of withstanding the vibration test.

(b) *Test method.* (1) A sample intermediate bulk container, selected at random, must be filled and closed as for shipment.

(2) The sample intermediate bulk container must be placed on a vibrating platform that has a vertical double-amplitude (peak-to-peak displacement) of one inch. The intermediate bulk container must be constrained horizontally to prevent it from falling off the platform, but must be left free to move vertically bounce and rotate.

(3) The test must be performed for one hour at a frequency that causes the package to be raised from the vibrating platform to such a degree that a piece of material of approximately 1.6-mm (0.063-inch) thickness (such as steel strapping or paperboard) can be passed between the bottom of the intermediate bulk container and the platform. Other methods at least equally effective may be used (see § 178.801(i)).

(c) *Criteria for passing the test.* An intermediate bulk container passes the vibration test if there is no rupture or leakage.

PART 180—CONTINUING QUALIFICATION AND MAINTENANCE OF PACKAGINGS

24. The authority citation for part 180 continues to read as follows:

Authority: 49 App. U.S.C. 1803; 49 CFR part 1.

25. A new Subpart D is added to part 180 to read as follows:

Subpart D—Qualification and Maintenance of Intermediate Bulk Containers

Sec.

Subpart D—Qualification and Maintenance of Intermediate Bulk Containers

§ 180.350 Applicability.

This subpart prescribes requirements, in addition to those contained in parts 107 171, 172, 173, and 178 of this chapter, applicable to any person responsible for the continuing qualification, maintenance, or periodic retesting of an intermediate bulk container.

§ 180.351 Qualification of intermediate bulk containers.

(a) *General.* Each intermediate bulk container used for the transportation of hazardous materials must be an authorized packaging.

(b) *Intermediate bulk container specifications.* To qualify as an authorized packaging, each intermediate bulk container must conform to this subpart, the applicable requirements specified in part 173 of this subchapter, and the applicable requirements of subparts N and O of part 178 of this subchapter.

§ 180.352 Requirements for retest and inspection of intermediate bulk containers.

(a) *General.* Each intermediate bulk container constructed in accordance with a UN standard for which a test or inspection specified in paragraphs (b)(1), (b)(2) and (b)(3) of this section is required may not be filled and offered for transportation or transported until the test or inspection has been successfully completed. This paragraph does not apply to any intermediate bulk container filled prior to the test or inspection due date. The requirements in this section do not apply to DOT 56 and 57 portable tanks.

(b) *Test and inspections for metal, rigid plastic, and composite intermediate bulk containers.* Each intermediate bulk container is subject to the following test and inspections:

(1) The leakproofness test prescribed in § 178.813 of this subchapter must be conducted every 2.5 years starting from the date of manufacture marked on each intermediate bulk container intended to contain liquids or intended to contain solids that are loaded or discharged under pressure.

(2) An external visual inspection must be conducted initially after production and every 2.5 years starting from the date of manufacture on each intermediate bulk container to ensure that:

(i) The intermediate bulk container is marked in accordance with requirements in § 178.703 of this subchapter. Missing or damaged markings, or markings difficult to read must be restored or returned to original condition.

(ii) Service equipment is fully functional and free from damage which may cause failure. Missing, broken, or damaged parts must be repaired or replaced.

(iii) The intermediate bulk container including the outer packaging if applicable, is free from damage which reduces its structural integrity. The intermediate bulk container must be externally inspected for cracks, warpage, corrosion or any other damage which might render the intermediate bulk container unsafe for transportation. An intermediate bulk container found with such defects must be removed from service. The inner receptacle of a composite intermediate bulk container must be removed from the outer intermediate bulk container body for inspection unless the inner receptacle is bonded to the outer body or unless the outer body is constructed in such a way (e.g., a welded or riveted cage) that

removal of the inner receptacle is not possible without impairing the integrity of the outer body. Defective inner receptacles must be replaced with a receptacle meeting the design type of the intermediate bulk container or the entire intermediate bulk container must be replaced. For metal intermediate bulk containers, thermal insulation must be removed to the extent necessary for proper examination of the intermediate bulk container body.

(3) Each metal intermediate bulk container must be internally inspected at least every five years to ensure that the intermediate bulk container is free from damage which might reduce its structural integrity.

(i) The intermediate bulk container must be internally inspected for cracks, warpage, and corrosion or any other defect that might render the intermediate bulk container unsafe for transportation. An intermediate bulk container found with such defects must be removed from hazardous materials service until restored to the original design type of the intermediate bulk container.

(ii) Metal intermediate bulk containers must be inspected to ensure the minimum wall thickness requirements in § 178.705(c)(1)(iv)(A) of this subchapter are met. Metal intermediate bulk containers not conforming to minimum wall thickness requirements must be removed from hazardous materials service.

(c) *Initial visual inspection for flexible, fiberboard, or wooden intermediate bulk containers.* Each intermediate bulk container must be visually inspected prior to first use, by the person who places hazardous materials in the intermediate bulk container, to ensure that:

(1) The intermediate bulk container is marked in accordance with requirements in § 178.703 of this subchapter. Additional marking allowed for each design type may be present. Required markings that are missing, damaged or difficult to read must be restored or returned to original condition.

(2) Proper construction and design specifications have been met.

(i) Each flexible intermediate bulk container must be inspected to ensure that:

(A) Lifting straps if used, are securely fastened to the intermediate bulk container in accordance with the design type.

(B) Seams are free from defects in stitching, heat sealing or gluing which would render the intermediate bulk container unsafe for transportation of hazardous materials. All stitched seam-ends must be secure.

(C) Fabric used to construct the intermediate bulk container is free from cuts, tears and punctures. Additionally, fabric must be free from scoring which may render the intermediate bulk container unsafe for transport.

(ii) Each fiberboard intermediate bulk container must be inspected to ensure that:

(A) Fluting or corrugated fiberboard is firmly glued to facings.

(B) Seams are creased and free from scoring, cuts, and scratches.

(C) Joints are appropriately overlapped and glued, stitched, taped or stapled as prescribed by the design. Where staples are used, the joints must be inspected for protruding staple-ends which could puncture or abrade the inner liner. All such ends must be protected before the intermediate bulk container is authorized for hazardous materials service.

(iii) Each wooden intermediate bulk container must be inspected to ensure that:

(A) End joints are secured in the manner prescribed by the design.

(B) Intermediate bulk container walls are free from defects in wood. Inner protrusions which could puncture or abrade the liner must be covered.

(d) *Retest date.* The date of the most recent periodic retest must be marked as provided in § 178.703(b) of this subchapter.

(e) *Record retention.* The intermediate bulk container owner or lessee shall keep records of periodic retests and initial and periodic inspections. Records must include design types and packaging specifications, test and inspection dates, name and address of test and inspection facilities, names or name of any persons conducting tests or inspections, and test or inspection specifics and results. Records must be kept for each packaging at each location where periodic tests are conducted, until such tests are successfully performed again or for at least 2.5 years from the date of the last test. These records must be made available for inspection by a representative of the Department on request.

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Ana Sol Gutiérrez,

Acting Administrator, Research and Special Programs Administration.

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