DEPARTMENT OF TRANSPORTATION

Research and Special Programs Administration

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

[Docket No. HM-181E; Notice No. 92-7]

RIN 2137-AC23

Intermediate Bulk Containers for Hazardous Materials

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

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: RSPA proposes to amend the Hazardous Materials Regulations (HMR) by adopting requirements for the construction, maintenance and use of intermediate bulk containers (IBCs) for the transportation of hazardous materials. This proposal is based on IBC specifications and performance standards contained in the United Nations Recommendation on the Transport of Dangerous Goods (UN Recommendations) and the IBC/commodity assignments set forth in the International Maritime Organization (IMO) International Maritime Dangerous Goods (IMDG) Code. The purpose of this proposal is to promote flexibility and technological innovation in the development of IBC design types, eliminate existing DOT exemptions applying to polyethylene, rigid, and flexible IBCs, provide a safer transportation system, and remove a dual domestic and international regulatory system. The adoption of these standards would enhance technological innovation particularly in the development of polyethylene and composite IBCs, resulting in higher integrity packaging.

DATES: Comments must be received by September 14, 1992.

ADDRESSES: Comments to this NPRM should be addressed to the Dockets Unit, Research and Special Programs Administration, U.S. Department of Transportation, Washington, DC 20590-0001. Comments should identify the Docket (HM-181E) and be submitted in five copies. Persons wishing to receive confirmation of receipt of their comments should include a self-addressed stamped postcard showing the docket number. The Dockets Unit is located in Room 8421 of the Nassif Building, 400 Seventh Street, SW., Washington, DC 20590-0001. Telephone: (202) 366-5046. Public dockets may be reviewed between the hours of 8:30 a.m. and 5:00 p.m., Monday through Friday except Federal holidays.

FOR FURTHER INFORMATION CONTACT: William Gramer, Office of Hazardous Materials Technology, (202) 366-4545, or John Potter, Office of Hazardous Materials Standards, RSPA, U.S. Department of Transportation, 400 Seventh Street SW., Washington, DC 20590-0001, (202) 366-4488.

SUPPLEMENTARY INFORMATION: On January 28, 1992, President Bush announced a 90-day moratorium and review of regulations to identify unnecessary and burdensome government regulations. In response to the President's announcement, DOT published on February 7, 1992, Docket RR-1, Notice 92-1 (57 FR 4744), soliciting public comments on the DOT's regulatory programs. Comments addressing the HMR were requested to be submitted to RSPA's Docket Unit. In response to that notice, RSPA received over 40 comments. Many comments addressed notices of proposed rulemaking that have not been finalized. Those comments will be given full consideration along with all other comments prior to taking final action under those dockets. Comments addressing certain other issues are under review for consideration in future rulemaking actions. RSPA also conducted a review of each of its regulations and identified the detailed specifications in Subpart H of Part 178 as an area in which the adoption of performance standards would decrease packaging costs and improve packaging efficiency. Therefore, RSPA is proposing to provide performance standards for intermediate bulk containers.

Intermediate bulk containers (IBCs) usually are reusable packagings designed to facilitate the intermodal transferring of hazardous materials. With capacities averaging between 300 and 400 gallons (a 330-gallon IBC is equal in capacity to six 55-gallon drums), IBCs fill a niche in the packaging spectrum between the 55-gallon drum and a 5,000- gallon cargo tank. Most rigid and flexible IBC types are equipped with special handling (e.g., grips or straps), stabilizing (e.g., steel cages) and load/off-load (e.g., bottom outlets) accoutrements. Although amendments to the HMR under Docket HM-181 were very comprehensive, they did not address the issue of IBCs. Commenters to the docket stated that the rulemaking would be incomplete without addressing IBCs.

IBC prototypes were first regulated in the early 1970's when the DOT adopted standards for the construction and use of metal portable tanks under DOT specifications 52, 53, 56, and 57. Although DOT specifications 52 and 53 can no longer be manufactured, all four are currently authorized packagings for hazardous materials. Since the 1970's, the IBC industry has rapidly diversified to meet new intermodal bulk distributional requirements. As a result of these changes, RSPA has granted exemptions, authorizing a broad range of non-DOT Specification IBC design types. In 1986, the UN added recommendations for IBC specifications and performance test requirements in the fourth revised edition of the UN Recommendations. In 1989, IMO became the first agency to authorize IBCs for hazardous materials transportation.

On December 24, 1990, RSPA received a petition for rulemaking from the Rigid Intermediate Bulk Container Association (RIBCA) requesting adoption of requirements for the construction, maintenance, and use of IBCs in accordance with the UN Recommendations. In addition, RIBCA requested that RSPA adopt commodity assignments based on the IMDG Code but, if possible, without the addition of another commodity table.

This proposal would extend the performance-oriented standards and principles advanced in Docket HM-181 and respond to the petition for rulemaking from RIBCA. These principles and standards include promotion of flexibility and technological innovation in the development of IBC design types, elimination of existing DOT exemptions applying to polyethylene, rigid, and flexible IBCs, and removal of a dual domestic and international regulatory system.

Elimination of exemption requirements would enhance technological innovation particularly in the development of polyethylene and composite IBCs, resulting in higher integrity packaging and a safer transportation system. The removal of these exemptions would also free manufacturers from the cost and administrative burden of filing for exemption renewals and from maintaining a continuing history of the shipping experiences of each design type. The following 111 exemptions authorizing IBCs are potentially affected by the adoption the UN performance standards for IBCs:

5520	8136	8629
6743	8146	8631
7259	8225	8653
7543	8303	8681
7622	8332	8692
7625	8351	8779
7869	8444	8784
8087	8570	8798
8094	8588	8839

8861	9319	9846
8883	9319	9889
8884	9340	9917
8910	9367	9920
8921	9374	9923
8937	9396	9938
8942	9400	9944
8982	9440	9983
9015	9498	9996
9042	9503	10021
9046	9519	10090
9052	9531	10104
9062	9533	10135
9078	9534	10273
9089	9592	10298
9092	9628	10362
9110	9637	10468
9116	9645	10476
9117	9658	10513
9118	9690	10537
9133	9692	10547
9140	9701	10562
9144	9713	10563
9150	9783	10570
9201	9789	10598
9213	9804	10633
9272	9805	10687
9289	9806	

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

In lieu of providing specific IBC/commodity assignments, RSPA proposes to establish generic IBC/commodity assignments in §§ 173.240 through 173.243. Assignments would be based on the lists of liquid and solid ("Substances Suitable for Transport in Intermediate Bulk Containers") contained in the IMDG Code. However, RSPA proposes to authorize 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.

RSPA acknowledges that generic IBC/commodity assignments may be construed as being inconsistent with the table of commodity-specific assignments in the IMDG Code. By not proposing a separate table incorporating each specific IBC/commodity assignment, RSPA would maintain its objectives in HM-181 to provide simplified, generic commodity/packaging assignments throughout the HMR. RSPA believes generic IBC/commodity assignments would avoid the confusion of cross-referencing between entries in the § 172.101 Table and separately maintained table of commodity-specific IBC assignments, and the expense of revising such a table each time a new commodity is added. To allay concerns of shippers who may wish for complete alignment of the HMR with IMDG Code IBC specifications and commodity assignments, RSPA proposes to revise § 171.12(b) to permit hazardous materials to be offered for transportation in IBCs specified in the IMDG Code when vessel transportation is involved.

RSPA also proposes to prohibit the manufacture of DOT specification 56 and 57 portable tanks after October 1, 1996. DOT specification 56 and 57 portable tanks are by definition IBCs, and RSPA sees no need to maintain two standards for metallic IBCs. However, RSPA proposes to allow continued domestic use of DOT 56 and 57 portable tanks for as long as they meet the inspection and retest provisions contained in § 173.32.

Section-by-Section Review

Section 171.7. The puncture resistance standard for fiberboard packagings (ISO 3036–1975) and quality assurance standards under ISO 9000 would be added to the Table of material incorporated by reference.

Section 171.8. A general definition of "intermediate bulk container" is proposed in this section. It includes the 3,000 liter (L) upper IBC capacity limit recommended by the UN and adopted by the IMO in the IMDG Code, and a 450 L lower capacity limit. Although a 250 L lower capacity limit for IBCs is established in paragraph 26.1.2.1 of the IMDG Code, RSPA proposes to adopt a 450 L minimum to be consistent with the definition of non-bulk packaging in § 171.8. The UN Recommendations give some support to a 450 L lower limit in paragraph 16.1.2.1, defining IBCs generally as "rigid, semirigid or flexible portable packaging, *other than those* specified in Chapter 9 * * *" And in paragraph 9.1.2, the UN states that the Recommendations "do not cover" [non-bulk] packaging "with a capacity exceeding 450 L." RSPA's proposal to adopt a 450 L lower limit is also consistent with the understanding that 99% of all IBCs produced in the U.S. exist within the 450–3000 L range.

Section 171.12. This section would be revised to authorize the use of IBCs in accordance with the IMDG Code for those shipments involving transportation by vessel.

Section 172.101. The Hazardous Materials Table would be revised to include IBC/commodity assignments.

Section 172.102. Five special provisions (B-notes) would be added in paragraph (c)(3) and referenced in column 5 of the Hazardous Materials Table prohibiting particular materials in certain or all IBCs and specifying special conditions of hazardous materials transport in IBCs. For example, a material listed in the Table with B104 referenced in column 5 would be transported in an IBC provided with a device or vent to allow venting during transport and stowed with the vent uppermost.

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

Section 173.24. A new paragraph (j) would be added specifying that when packagings are used for the transportation of liquids with a flash-point of 60.5°C (141°F) (closed cup) or lower or powders liable to dust explosion, measures must be taken to prevent a dangerous electrostatic discharge.

Section 173.32. A grandfathering provision for DOT Specification 56 and 57 portable tanks is proposed in paragraph (d). Although DOT Specification 56 and 57 portable tanks would not be allowed to be manufactured after October 1, 1996, the HMR would permit them to remain in hazardous materials service for the commodities they are currently authorized to contain.

Section 173.35. Operational requirements for the use of IBCs would be added. This new section would address the IBC filling limits, vapor pressure limits for rigid plastic or composite IBCs intended to contain liquids, and the transport of empty IBCs. Authorized use of rigid plastic IBCs and composite IBCs with plastic inner receptacles would be limited to five years. If an IBC owner can show that their IBC still provides an effective level of safety, longer periods of use may be authorized by the Associate Administrator for Hazardous Materials Safety. Before being filled and offered for transportation, every IBC and its service equipment would be visually inspected to ensure that it is free from corrosion, contamination, cracks, or other damage which would render the IBC unsafe for transportation. RSPA proposes that no rigid plastic or composite IBCs with repaired plastic components, or fiberboard, wooden or flexible IBCs, can be reused. The requirements in this section would not apply to DOT specification 56 and 57 portable tanks manufactured before October 1, 1996.

Section 173.225. This section would be revised to include organic peroxide/IBC assignments and to prescribe special conditions for certain organic peroxides transported in IBCs.

Section 173.240–243. These generic bulk packaging sections would be amended to authorize the use of IBCs for certain materials. For use in transporting

particular commodities, an IBC would be required to withstand the applicable test criteria specified in Subpart O of part 178 at the Packing Group level specified in Column 5 of the Hazardous Materials Table.

Section 178.700. The general purpose and scope of this notice pertaining to IBC standards are contained in this section and general definitions associated with IBC design types specified in §§ 178.705–710 are proposed. For example, an IBC *body* means the receptacle proper, including openings and their closures. IBC *service equipment* means filling and discharge, pressure relief, safety, heating and heat-insulating devices, and measuring instruments. IBC *structural equipment* means the reinforcing, fastening, handling, protective, or stabilizing members of the body (i.e., metal cages).

Section 178.702. IBC code designations for metallic, rigid plastic, composite, fiberboard, wooden, and flexible IBCs are proposed.

Section 178.703. Requirements for the certification marking of IBCs are proposed. The IBC certification mark is comprised of the following elements: code numbers designating IBC design type, Packing Group designation, the country authorizing allocation of the mark, name, address or symbol of the manufacturer, or the approval agency certifying compliance with Subparts N and O of part 178; and the stacking test load in kilograms (kg), the maximum permissible gross mass (for flexible IBCs, the maximum permissible load in kg). Three examples of IBC certification marking are given.

Section 178.704. General requirements applicable to manufacturers before IBCs are used in hazardous materials transport are proposed. For example, paragraph (e) would require that all IBC service equipment be positioned or protected to minimize potential loss of contents resulting from damage during IBC handling and transportation.

Sections 178.704–710. Specific IBC standards for metallic, rigid plastic, composite IBCs with plastic inner receptacles, fiberboard, wooden, and flexible IBCs are proposed. For metallic IBCs, authorized steel and aluminum construction materials would be set forth in § 178.705(c)(1). Body wall thicknesses are proposed for metallic IBCs in § 178.705(c)(1)(iv)(A). Standards for inner receptacles of composite IBCs are proposed in § 178.707(c)(3), and composite outer packagings in § 178.707(c)(4). Standards for fiberboard IBCs in § 178.708 would be similar to those for nonbulk fiberboard boxes in § 178.516. However, fiberboard IBCs would also conform to the ISO international minimum puncture resistance standard (ISO 3036–1975). Rigid and flexible IBC design types include:

(1) Metallic IBCs which are loaded or discharged by gravity (11A, 11B, 11N);

(2) Metallic IBCs which are loaded or discharged at a gauge pressure greater than 10 kPa (21A, 21B, 21N);

(3) Metallic IBCs (31A, 31B, 31N);

(4) Rigid plastic IBCs fitted with structural equipment designed to withstand the whole load when IBCs are stacked, and for solids which are loaded or discharged by gravity (11H1);

(5) Freestanding rigid plastic IBCs which are loaded or discharged by gravity (11H2);

(6) Rigid plastic IBCs fitted with structural equipment designed to withstand the whole load when IBCs are stacked loaded or discharged under pressure (21H1);

(7) Freestanding rigid plastic IBCs which are loaded or discharged under pressure (21H2);

(8) Rigid plastic IBCs fitted with structural equipment designed to withstand the whole load when IBCs are stacked (31H1);

(9) Freestanding rigid plastic IBCs (31H2);

(10) Composite IBCs with a rigid plastic inner receptacle discharged or loaded by gravity (11HZ1);

(11) Composite IBCs with flexible plastic inner receptacle loaded or discharged by gravity (11HZ2);

(12) Composite IBCs with rigid plastic inner receptacles loaded or discharged under pressure (21HZ1);

(13) Composite IBCs with flexible plastic inner receptacles loaded or discharged under pressure (21HZ2);

(14) Composite IBCs with rigid plastic inner receptacles (31HZ1);

(15) Composite IBCs with flexible inner receptacles (31HZ2);

(16) Fiberboard IBCs which are loaded or discharged by gravity (11G);

(17) Natural wood IBCs with inner liner which are loaded or discharged by gravity (11C);

(18) Plywood IBCs with inner liner which are loaded or discharged by gravity (11D);

(19) Reconstituted wood IBCs with inner liners which are loaded or discharged by gravity (11F);

(20) Woven plastic IBCs without coating or liner (13H1);

(21) Coated woven plastic IBCs (13H2);

(22) Woven plastic IBCs with liner (13H3);

(23) Coated woven plastic IBCs with liner (13H4);

(24) Plastic film IBCs (13H5);

(25) Textile IBCs without coating or liner (13L1);

(26) Coated textile IBCs (13L2);

(27) Textile IBCs with liner (13L3);

(28) Coated textile IBCs with liner (13L4);

(29) Paper multiwall IBCs for solids (13M1); and

(30) Paper multiwall water resistant IBCs (13M2).

(Note: For composite IBCs, the letter "Z" is replaced with a capital letter which indicates the material of construction of the outer packaging. For example, 31HA1 is a composite IBC with a metal outer packaging.)

Section 178.801. General IBC testing, inspection, and record-keeping requirements are proposed in this section. RSPA would require IBC design qualification testing conducted at the start of production of each new or different IBC design type, 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. RSPA also proposes to add periodic IBC design type requalification test requirements. Extending the principle established for non-bulk packagings under Docket HM–181, and in conformance with Section 16.1.4.1.1 of the UN Recommendations, RSPA believes that periodic requalification of IBC design types would provide essential quality control throughout an IBC production run, ensuring that newly manufactured IBCs maintain the integrity of original, successfully tested design types. All IBC design types would be requalified at least once every 12 months. Composite IBC design types now requalified every four months under DOT exemption would be requalified every year under this proposal. Selective testing of metallic, rigid plastic, and composite IBCs which include variations of up to a 25 percent decrease in the outer dimensions of tested IBC design types would be permitted without further testing.

RSPA proposes to require IBC manufacturers to keep records for the qualification of each IBC design type and for each periodic design requalification. Records would be maintained at each location where an IBC is manufactured and at each location where IBC design qualification and periodic design requalification testing is performed. Records 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. Manufacturer records would include specific IBC types tested, dates of tests, location of tests, results of

tests required in this part (including drop heights, hydrostatic pressures, tear propagation length, etc.), name of the person conducting the test, and name of the person responsible for testing. IBC owners would keep records of periodic retests and inspections.

Section 178.802. Requirements for the preparation of fiberboard, rigid plastic, and composite IBCs for testing are proposed. Fiberboard IBCs would be conditioned under the same temperature and relative humidity conditions as proposed for non-bulk fiberboard packagings in § 178.602(d). Although the UN recommends that manufacturers verify the compatibility of plastic construction materials with ladings intended to be contained in rigid plastic and composite IBCs, RSPA believes this is a shipper's responsibility. Therefore, RSPA proposes that the shipper compatibility requirement in § 173.24(e) be extended to IBCs.

Sections 178.803–808. Testing and certification requirements for metallic, plastic rigid, composite, fiberboard, wooden, and flexible IBC design types are proposed. Charts displaying qualification tests (specified in §§ 178.820–842) required for each IBC design type, indicated by IBC design type codes, are included.

Section 178.810. A drop test similar in many respects to requirements for non-bulk packagings in § 178.603 is proposed for all IBC design types. IBCs intended to transport liquids must be filled to at least 98% of their capacity, and 95% for solids, in preparation for the drop test. IBCs with plastic outer bodies or with plastic components would be drop tested when samples and contents have been reduced to −18 °C(0 °F) Samples of all IBC design types would be dropped onto a non-resilient, smooth, flat surface. The point of impact would be the most vulnerable part of the base of the IBC being tested. IBCs intended to carry liquids would be tested to a certain packing group level depending on the hazard of the material.

Section 178.811. A bottom lift test is proposed for IBCs designed to be lifted from the base.

Section 178.812. A top lift test is proposed for all metallic, rigid plastic, composite, and flexible IBC design types designed to be lifted from the top.

Section 178.813. A leakproofness test is proposed for the design qualification of metallic, rigid plastic, and composite IBC design types, and production units before first use, if they are intended to contain liquids or if intended for solids discharged by pressure. This test is additionally required for IBC design types and production units intended to contain solids that are loaded or discharged under pressure. The test would be performed by applying air at a gauge pressure of not less than 20 kPa (2.9 psig) for 10 minutes using suitable methods such as pressure differential or water immersion. Other methods used in accordance with Appendix B of this part may be used for rigid plastic or composite IBCs.

Section 178.814. A hydrostatic pressure design qualification test is proposed for all metallic IBC design types and all rigid plastic and composite IBC design types intended to contain liquids or intended to contain solids loaded or discharged under pressure. The test would be performed for 10 minutes at gauge pressures specified for three metallic IBC design types intended to contain liquids and four rigid plastic and composite IBC design types.

Section 178.815. RSPA proposes a stacking test for the qualification of all IBC design types designed to be stacked. Metallic IBCs would be stack tested for at least five minutes. Fiberboard, wooden, and rigid plastic and composite IBC design types fitted with structural equipment would be tested for 24 hours. Stand-alone rigid plastic and composite design types would be tested for 28 hours at 40°C (72° F). For all IBC design types, the load placed on the IBC would 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. A topple test is proposed for the qualification of all flexible IBC design types at the Packing Group levels prescribed for the drop test in § 178.820.

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

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

Section 178.819. A vibration test is proposed for the qualification of all IBC design types.

Section 180.352. Requirements for initial and periodic retest and inspection of IBCs are proposed. Initially after production and every 2.5 years thereafter, metallic, rigid plastic, and composite IBCs intended for liquids or for solids loaded or discharged by pressure would be required to withstand the 20 kPa (2.9 psig) leakproofness test prescribed in § 178.828. For these design types, external inspections must be performed after production and each 2.5 years thereafter to ensure that each IBC is properly marked, is free from damage that may reduce its structural integrity during transportation, and that IBC service equipment functions properly. Internal inspections would be required to be performed initially after production and every five years thereafter. Metallic, plastic, and composite IBCs would be inspected for cracks, warpage, and corrosion. Metallic IBCs would be inspected for corrosion of construction material below required minimum thicknesses. An IBC found with such defects would have to be removed from hazardous materials service. Flexible, fiberboard, or wooden IBCs would be inspected to ensure they are properly marked and that they meet required construction and design specifications. For example, each flexible IBC would be inspected to ensure that seams are free from defects in stitching, heat sealing, or gluing. The requirements in this section would not apply to DOT Specification 56 and 57 portable tanks.

49 App. U.S.C. 1804(a)(4) (A) and (B).

In a February 28, 1991 final rule [56 FR 8616], RSPA added a new preemption standard to § 107.202 to mirror the requirements of the Hazardous Materials Transportation Act (HMTA). Section 105(a)(5) of the HMTA, as amended by the Hazardous Materials Transportation Uniform Safety Act of 1990 (HMTUSA), provides that if DOT issues a regulation concerning any of the covered subjects after the date of enactment of the HMTUSA (November 16, 1990), DOT must determine and publish in the Federal Register the effective date of the Federal preemption. That effective date may not be earlier than the 90th day following the date of issuance and not later than two years after the date of issuance.

To the extent that the requirements of Docket HM–181E involve covered subjects, States, political subdivisions, or Indian tribes would only be allowed to establish, maintain, and enforce laws, regulations, or other requirements concerning such subjects if they are substantively the same as the requirements proposed in Docket HM–181E. In a May 13, 1992 final rule [57 FR 20424] RSPA defined the phrase "substantially the same". Therefore, RSPA is requesting public comments on the effective date for the Federal preemption of the requirements of Docket HM–181E.

Administrative Notices

A. Executive Order 12291

This rule, as proposed, does not meet the criteria specified in section 1(b) of Executive Order 12291 and is, therefore, not a major rule and is not a significant rule under the regulatory procedures of

the Department of Transportation [44 U.S.C. 11034]. This proposed rule does not require a Regulatory Impact Analysis, or an environmental assessment or impact statement under the National Environmental Policy Act [42 U.S.C. 4321 et seq.]. A regulatory evaluation is available for review in the Docket.

B. Executive Order 12612

This proposed rule has been analyzed in accordance with the principles and criteria in Executive Order 12612 and, based on information available at this time, RSPA does not believe that this notice would have sufficient Federalism implications to warrant the preparation of a Federalism Assessment.

C. Impact on Small Entities

Based on limited information concerning the size and nature of entities likely to be affected by this proposed rule, I certify this proposal will not, if promulgated, have a significant economic impact on a substantial number of small entities. This certification is subject to modification as a result of a review of comments received in response to this proposal.

D. Paperwork Reduction Act

The requirements for information collection have been approved by the Office of Management and Budget (OMB) under the provisions of the Paperwork Reduction Act of 1980 (Pub. L. 96-511) under OMB control number 2137-0018 (expiration date: July 31, 1992).

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

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

49 CFR Part 178

Hazardous materials transportation, 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 would be amended as follows:

PART 171—GENERAL INFORMATION, REGULATIONS, AND DEFINITIONS

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

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

2. In the § 171.7(a)(3) Table, the following entries are added at the end of the entries under *International Organization for Standardization* 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 Puncture resistance standard	178.708
ISO 9000 Quality assurance standard	178.801
* * * * *	

* * * * *

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

§ 171.8 Definitions and abbreviations.

* * * * *

Intermediate bulk containers (IBCs) are rigid, semi-rigid, or flexible portable packagings other than those specified in subpart L of part 178 of this subchapter that have a capacity of not more than 3000 liters (797 gallons) and not less than 450 L (119 gallons), and are designed for mechanical handling.

* * * * *

Secondary containment means placing the IBCs into freight containers or vehicles. Such freight containers or vehicles should have rigid sides or fencing at least to the height of the IBCs. For some substances and materials, a closed freight container or vehicle is specified.

* * * * *

§ 171.12 [Amended]

4. In § 171.12, paragraph (b)(5) would be amended by revising the word "Bulk" to read "bulk" and by adding the wording "Except for intermediate bulk containers which comply with the requirements of the IMDG Code," immediately preceding the word "bulk".

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

5. The authority citation for part 172 would continue 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 would be revised to read as follows:

§ 172.101 Purpose and use of hazardous materials table.

* * * * *

§ 172.101 HAZARDOUS MATERIALS TABLE

Symbols	Hazardous materials description and proper shipping names	Hazard class or division	Identification Nos.	Packing group	Label(s) required (if not excepted)	Special provisions	Packaging authorizations (§ 173. * * *)			Quantity limitations		Vessel stowage requirements	
							Exceptions	Non-bulk packaging	Bulk packaging	Passenger aircraft or railcar	Cargo aircraft only	Vessel stowage	Other stowage provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
	[Revise]												
	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	1 L	30 L	C	8, 40
	Alkali metal amides	4.3	UN1390	II	Dangerous when wet.	A6, A7, A8, A19, A20, B102.	None	212	241	15 kg	50 kg	E	40
	Allyl ethyl ether	3	UN2335	II	Flammable liquid, poison.	B101, T8	None	202	243	1 L	60 L	E	40
	Allyl iodide	3	UN1723	II	Flammable liquid, corrosive.	A3, A6, B100, N34, T18.	None	201	243	0.5 L	2.5 L	B	40
	Ammonium nitrate, liquid (*hot concentrated solution*).	5.1	UN2426		Oxidizer	B5, B100, B17, T25.	None	None	243	Forbidden	Forbidden	D	59, 60
	Benzene	3	UN1114	II	Flammable liquid.	B101, T8	150	202	242	5 L	60 L	B	40
	Benzotrichloride	6	UN2226	II	Corrosive	B2, B101, T15.	154	202	242	1 L	30 L	A	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 hypochlorite mixtures, dry, *with more than 10 per cent but not more than 39 per cent available chlorine.*	5.1	UN2208	III	Oxidizer	A1, A29, B103, N34.	152	213	240	25 kg	100 kg	A	56, 58, 69, 106
	Calcium silicide	4.3	UN1405	II	Dangerous when wet.	A19, B100	None	212	241	15 kg	50 kg	B	85, 103
				III	Dangerous when wet.	A1, A19	None	213	241	25 kg	100 kg	B	85, 103
	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	
	Chloroformates, n.o.s., *flash point not less than 23 degrees C.*	6.1	UN2742	II	Poison, corrosive.	5, B101	None	202	243	1 L	30 L	A	12, 13, 22, 25, 40, 48, 100
	Chloromethyl-chloroformate.	6.1	UN2745	II	Poison, corrosive.	B101, T18	None	202	243	1 L	30 L	A	12, 13, 22, 25, 40, 48, 100
	Chloropicrin mixtures, n.o.s.	6.1	UN1583	I	Poison	5	None	201	243	Forbidden	Forbidden	C	40
				II	Poison	B100	None	202	243	Forbidden	Forbidden	C	40

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

Symbols	Hazardous materials description and proper shipping names	Hazard class or division	Identification Nos.	Packing group	Label(s) required (if not excepted)	Special provisions	Packaging authorizations (§ 173. * * *)			Quantity limitations		Vessel stowage requirements	
							Exceptions	Non-bulk packaging	Bulk packaging	Passenger aircraft or railcar	Cargo aircraft only	Vessel stowage	Other stowage provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
				III	Keep away from food.	B100	153	203	241	Forbidden	Forbidden	C	40
	Chlorosilanes, n.o.s., *flashpoint 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. *flashpoint less than 23 degrees C.*	3	UN2985	II	Flammable liquid, corrosive.	B100, T18, T26.	None	201	243	1 L	5 L	B	40
	Cyclobutylchloroformate.	6.1	UN2744	II	Poison, corrosive.	B101, T18	None	202	243	1 L	30 L	A	12, 13, 22, 25, 40, 48, 100
	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	
	Diallylether	3	UN2360	II	Flammable liquid, poison.	B101, N12, T8.	None	202	243	1 L	60 L	E	40
	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	
	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	
	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	
	2-Ethylhexyl-chloroformate.	6.1	UN2748	II	Poison, corrosive.	B101, T42	None	202	243	1 L	30 L	A	12, 13, 25, 40, 48, 95
	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, B102.	None	213	241	25 kg	100 kg	A	
	Fluorobenzene	3	UN2387	II	Flammable liquid.	B101, T8	150	202	242	5 L	60 L	B	

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

Symbols	Hazardous materials description and proper shipping names	Hazard class or division	Identification Nos.	Packing group	Label(s) required (if not excepted)	Special provisions	Packaging authorizations (§ 173. * * *)			Quantity limitations		Vessel stowage requirements	
							Exceptions	Non-bulk packaging	Bulk packaging	Passenger aircraft or railcar	Cargo aircraft only	Vessel stowage	Other stowage provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
	Gasoline	3	UN1203	II	Flammable liquid.	B33, B101, T8.	150	202	242	5 L	60 L	E	
	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.	B100, 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 peroxyacetic 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 centhydrogen 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
	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 chlorine.*	8	UN1791	III	Corrosive	B104, N34, T7.	154	203	2412	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

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

Symbols	Hazardous materials description and proper shipping names	Hazard class or division	Identification Nos.	Packing group	Label(s) required (if not excepted)	Special provisions	Packaging authorizations (§ 173. * * *)			Quantity limitations		Vessel stowage requirements	
							Exceptions	Non-bulk packaging	Bulk packaging	Passenger aircraft or railcar	Cargo aircraft only	Vessel stowage	Other stowage provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
	Isocyanato- benzotrifluorides.	6.1	UN2285	II	Poison	5, B101, T14	None	202	243	5 L	60 L	B	25, 40, 48
	Lithium hydride, fused solid.	4.3	UN2805	II	Dangerous when wet.	A8, A19, A20, B102.	None	212	241	15 kg	50 kg	E	
	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	201	243	1 L	30 L	E	
				II	Flammable liquid.	B101, T8	150	202	242	5 L	60 L	E	
	Nitrating acid mixtures, spent *with not more than 50 percent 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, B102, N34.	None	212	241	15 kg	50 kg	D	34
	Paper, unsaturated oil treated *incompletely dried (including carbon paper).*	4.2	UN1379	III	Spontaneously combustible.	B102	None	213	241	Forbidden	Forbidden	A	
	Perchloric acid not more than 50 percent acid by mass.	8	UN1802	II	Corrosive, oxidizer.	B101, N41, T9.	None	202	243	Forbidden	30 L	C	66, 89
	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
	Phenylchloroformate	6.1	UN2746	II	Poison, corrosive.	B101, T12	None	202	243	1 L	30 L	A	12, 13, 25, 40, 48
	Propionyl chloride	3	UN1815	II	Flammable liquid, corrosive.	B100, T8, T26.	None	202	243	1 L	5 L	B	40
	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	
	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
	Toluene diisocyanate	6.1	UN2078	II	Poison	B101, T14	None	202	243	5 L	60 L	B	25, 40

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

Symbols	Hazardous materials description and proper shipping names	Hazard class or division	Identification Nos.	Packing group	Label(s) required (if not excepted)	Special provisions	Packaging authorizations (§ 173. * * *)			Quantity limitations		Vessel stowage requirements	
							Exceptions	Non-bulk packaging	Bulk packaging	Passenger aircraft or railcar	Cargo aircraft only	Vessel stowage	Other stowage provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
	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

7. In § 172.102, paragraph (c)(3) would be amended by adding Special Provisions B100, B101, B102, B103, and B104 in numerical order to read as follows:

§ 172.102 Special provisions.

* * * * *

(c) * * *

(3) * * *

Code/Special Provisions

* * * * *

B100 IBCs are not authorized.

B101 Rigid plastic and composite IBCs are not authorized

B102 Flexible, rigid plastic, composite, fiberboard, and wooden IBCs are not authorized.

B103 If an IBC packaging is used, the package must be transported in a closed transport vehicle.

B104 IBCs must be provided with a device to allow venting during transport. The inlet must be situated in the vapor space of the packaging and lading during transport.

* * * * *

8. In § 172.514, paragraph (c)(3) would be amended by replacing the period at the end of the paragraph with a semicolon; and paragraph (c)(4) would be added to read as follows:

§ 172.514 Bulk packagings other than tank cars.

* * * * *

(c) * * *

(4) All intermediate bulk containers.

PART 173—SHIPPERS—GENERAL REQUIREMENTS FOR SHIPMENTS AND PACKAGINGS

9. The authority citation for Part 173 would continue to read as follows:

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

10. In § 173.24, paragraph (j) would be added to read as follows:

§ 173.24 General requirements for packagings and packages.

* * * * *

(j) When packagings are used for the transportation of liquids with a flash-point of 60.5°C (141°F) (closed cup) or lower, or powders liable to dust explosion, measures must be taken to prevent a dangerous electrostatic discharge.

10a. In § 173.32, paragraph (d) would be revised to read as follows:

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

* * * * *

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

* * * * *

11. Section 173.35 would be added to read as follows:

§ 173.35 Hazardous materials in intermediate bulk containers (IBCs).

(a) No person may offer or accept a hazardous material for transportation in an IBC except as authorized by this subchapter. Each IBC 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 IBC, 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 and inspection have been successfully completed. This requirement does not apply to any IBC filled prior to the retest or inspection due date.

(b) Before being filled and offered for transportation, each IBC 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 IBC unsafe for transportation. No rigid plastic or composite IBCs with repaired plastic components may be reused. Fiberboard, wooden, or flexible IBCs may not be reused.

(c) A metallic IBC, or a part thereof, subject to thinning by corrosion or mechanical abrasion due to the lading, must be protected by providing the IBC, or part of the IBC, with 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, when filling IBCs with liquids, sufficient ullage must be left to ensure that, at the mean bulk temperature of 50°C (122°F), the IBC is not filled to more than 98% of its water capacity.

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

(f) During transportation—

(1) No hazardous material may remain on the outside of the IBC; and

(2) IBCs must be securely fastened to or contained within the transport unit.

(g) IBCs used for 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) Unless otherwise approved by the Associate Administrator for Hazardous Materials Safety, the authorized period of use of rigid plastic IBCs and the plastic inner receptacles of composite IBCs for the transportation of hazardous materials is five years from the date of manufacture.

(i) Liquid hazardous materials can only be offered for transportation in metallic, rigid plastic, or composite IBCs that are appropriately resistant to an increase of internal pressure likely to develop during transportation.

(1) Rigid plastic or composite IBCs must be filled only with a liquid having a vapor pressure:

(i) Such that the total guage pressure in the IBC (i.e., the vapor pressure of the filling substance plus the partial pressure of air or other inert gases, less 100 kPa (14.5 psig)) at 55°C (131°F), determined on the basis of a maximum degree of filling in accordance with paragraph (d) of this section and a filling temperature of 15°C (27°F)), will not exceed two-thirds of the marked test pressure; or

(ii) At 50°C (122°F), less than four-sevenths of the sum of the marked test pressure plus 100 kPa (14.5 psig); or

(iii) At 55°C (131°F), less than two-thirds of the sum of the marked test pressure plus 100 kPa (14.5 psig).

(2) IBCs may not be used to carry liquids having a vapor pressure of more than 110 kPa (16 psig) at 50°C (122°F) or 130 kPa (18.9 psig) at 55°C (131°F).

(j) The requirements in this section do not apply to DOT Specification 56 and 57 portable tanks.

11a. In § 173.225, the following entries in the Organic Peroxides Table in paragraph (b) would be revised, "Note 24" would be added to the "Notes" following the Organic Peroxides Table and paragraph (e)(4) would be 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	24
Dicetyl peroxydicarbonate as a stable dispersion in water.	UN3119	<=42					OP8A	30	35	24
Dilauroyl peroxide as a stable dispersion in water	UN3109	<=42					OP8A			24
Dimyristyl peroxydicarbonate as a stable dispersion in water.	UN3119	<=42					OP8A	30	35	24

Notes:

* * * * * * *

24. This material may be transported in IBCs under the provision of § 173.225(e)(4).

* * * * *

(e) * * *

(4) *Intermediate bulk containers.* Specification 31HA1 composite IBCs that are tested at the packing group II performance level in accordance with Part 178 of this subchapter.

12. In § 173.240, paragraph (d) would be added to read as follows:

§ 173.240 Bulk packaging for certain low hazard solid materials.

* * * * *

(d) *Intermediate bulk containers.* (1) The following IBCs are authorized subject to the conditions and limitations of paragraph (d)(2) of this section if they conform to the requirements in Part 178 of this subchapter at the packing group performance level specified in column 5 of the § 172.101 Table for the material being transported:

(i) Metallic IBCs which are loaded or discharged by gravity (11A, 11B, 11N);

(ii) Metallic IBCs which are loaded or discharged at a gauge pressure greater than 10 kPa (1.45 psig) (21A, 21B, 21N);

(iii) Rigid plastic IBCs fitted with structural equipment designed to withstand the whole load when IBCs are stacked, and which are loaded or discharged by gravity (11H1);

(iv) Freestanding rigid plastic IBCs which are loaded or discharged by gravity (11H2);

(v) Rigid plastic IBCs fitted with structural equipment designed to withstand the whole load when IBCs are stacked loaded or discharged under pressure (21H1);

(vi) Freestanding rigid plastic IBCs which are loaded or discharged under pressure (21H2);

(vii) Composite IBCs with a rigid plastic inner receptacle discharged or loaded by gravity (11HZ1);

(viii) Composite IBCs with flexible plastic inner receptable loaded or discharged by gravity (11HZ2);

(ix) Composite IBCs with rigid plastic inner receptacles loaded or discharged under pressure (21HZ1);

(x) Composite IBCs with flexible plastic inner receptacle or discharged under pressure (21HZ2);

(xi) Fiberboard IBCs which are loaded or discharged by gravity (11G);

(xii) Natural wood IBCs with inner liner which are loaded or discharged by gravity (11C);

(xiii) Plywood IBCs with inner liner which are loaded or discharged by gravity (11D);

(xiv) Reconstituted wood IBCs with inner liners which are loaded or discharged by gravity (11F);

(xv) Woven plastic IBCs without coating or liner (13H1);

(xvi) Coated woven plastic IBCs (13H2);

(xvii) Woven plastic IBCs with liner (13H3);

(xviii) Coated woven plastic IBCs with liner (13H4);

(xix) Plastic film IBCs (13H5);

(xx) Textile IBCs without coating or liner (13L1);

(xxi) Coated textile IBCs (13L2);

(xxii) Textile IBCs with liner (13L3);

(xxiii) Coated textile IBCs with liner (13L4);

(xxiv) Paper multiwall IBCs (13M1);

(xxv) Paper multiwall water resistant IBCs (13M2);

(xxvi) Metallic IBCs (31A, 31B, 31N);

(xxvii) Rigid plastic IBCs fitted with structural equipment designed to withstand the whole load when IBCs are stacked (31H1);

(xxviii) Freestanding rigid plastic IBCs (31H2);

(xxix) Composite IBCs with rigid plastic inner receptacles (31HZ1); and

(xxx) Composite IBCs with flexible inner receptacles (31HZ2).

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

(i) Only materials in packing group II and III may be transported in an IBC;

(ii) Materials in packing group II must be transported in an IBC which employs a secondary containment;

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

(iv) Specification 13L1 IBCs may not be used for materials meeting the definition of Division 5.1 or Division 6.1 packing group II;

(v) Divisions 4.1 and 4.3 materials in packing group II that are packed in flexible, fiberboard or wooden IBCs must be transported in closed transport vehicles;

(vi) Flexible, fiberboard or wooden IBCs that are used to transport Class 8 materials must be water resistant;

(vii) IBCs transporting Divisions 4.1, 4.2, and 4.3 materials in packing group II must be hermetically (i.e., vapor tight) sealed;

(viii) Metallic IBCs are only authorized for those liquids with a vapor pressure of equal to or less than 110 kPa (16 psig) at 50 °C (122 °F) or 130 kPa (18.9 psig) at 55 °C (131 °F);

(ix) IBCs with bottom openings may not be used for materials with a primary hazard class of 3 and a subsidiary hazard class of Division 6.1.

(3) For composite IBCs, 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 IBC with a metal outer packaging.

13. In § 173.241, paragraph (d) would be added to read as follows:

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

* * * * *

(d) *Intermediate bulk containers.* (1) The following IBCs are authorized subject to the conditions and limitations of paragraph (d)(2) of this section if they conform to the requirements in Part 178 of this subchapter at the packing group performance level specified in column 5 of the § 172.101 Table for the material being transported:

(i) For liquids and solids: (A) Metallic IBCs (31A, 31B, 31N);

(B) Rigid plastic IBCs fitted with structural equipment designed to withstand the whole load when IBCs are stacked (31H1);

(C) Freestanding rigid plastic IBCs (31H2);

(D) Composite IBCs with rigid plastic inner receptacles (31HZ1); and

(E) Composite IBCs with flexible inner receptacles (31HZ2).

(ii) For solids: (A) Metallic IBCs which are loaded or discharged by gravity (11A, 11B, 11N);

(B) Metallic IBCs which are loaded or discharged at a gauge pressure greater than 10 kPa (1.45 psi) (21A, 21B, 21N);

(C) Rigid plastic IBCs fitted with structural equipment designed to withstand the whole load when IBCs are stacked, and which are loaded or discharged by gravity (11H1);

(D) Freestanding rigid plastic IBCs which are loaded or discharged by gravity (11H2);

(E) Rigid plastic IBCs fitted with structural equipment designed to withstand the whole load when IBCs are stacked loaded or discharged under pressure (21H1);

(F) Freestanding rigid plastic IBCs which are loaded or discharged under pressure (21H2);

(G) Composite IBCs with a rigid plastic inner receptacle discharged or loaded by gravity (11HZ1);

(H) Composite IBCs with flexible plastic inner receptacle loaded or discharged by gravity (11HZ2);

(I) Composite IBCs with rigid plastic inner receptacles loaded or discharged under pressure (21HZ1);

(J) Composite IBCs with flexible plastic inner receptacle loaded or discharged under pressure (21HZ2)

(K) Fiberboard IBCs which are loaded or discharged by gravity (11G);

(L) Natural wood IBCs with inner liner which are loaded or discharged by gravity (11C);

(M) Plywood IBCs with inner liner which are loaded or discharged by gravity (11D);

(N) Reconstituted wood IBCs with inner liners which are loaded or discharged by gravity (11F);

(O) Woven plastic IBCs without coating or liner (13H1);

(P) Coated woven plastic IBCs (13H2);

(Q) Woven plastic IBCs with liner (13H3);

(R) Coated woven plastic IBCs with liner (13H4);
(S) Plastic film IBCs (13H5);
(T) Textile IBCs without coating or liner (13L1);
(U) Coated textile IBCs (13L2);
(V) Textile IBCs with liner (13L3);
(W) Coated textile IBCs with liner (13L4);
(X) Paper multiwall IBCs (13M1); and
(Y) Paper multiwall water resistant IBCs (13M2).

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

(i) Only materials in packing group II and III may be transported in an IBC;

(ii) Materials in packing group II must be transported in an IBC which employs a secondary containment;

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

(iv) Specification 13L1 IBCs may not be used for materials meeting the definition of Division 5.1 or Division 6.1 packing group II;

(v) Divisions 4.1 and 4.3 materials in packing group II that are packed in flexible, fiberboard or wooden IBCs must be transported in closed transport vehicles;

(vi) Flexible, fiberboard or wooden IBCs that are used to transport Class 8 materials must be water resistant;

(vii) IBCs transporting Divisions 4.1, 4.2, and 4.3 materials in packing group II must be hermetically (i.e., vapor tight) sealed;

(viii) Metallic IBCs are only authorized for those liquids with a vapor pressure of equal to or less than 110 kPa (16 psig) at 50 °C (122 °F) or 130 kPa (18.9 psig) at 55 °C (131 °F);

(ix) IBCs with bottom openings may not be used for materials with a primary hazard class of 3 and a subsidiary hazard class of Division 6.1.

(3) For composite IBCs, 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 IBC with a metal outer packaging.

14. In § 173.242, paragraph (d) would be 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) The following IBCs are authorized subject to the conditions and limitations of paragraph (d)(2) of this section if they conform to the requirements in part 178 of this subchapter at the packing group performance level specified in column 5 of the § 172.101 Table for the material being transported:

(i) For liquids and solids: (A) Metallic IBCs (31A, 31B, 31N);

(B) Rigid plastic IBCs fitted with structural equipment designed to withstand the whole load when IBCs are stacked (31H1);

(C) Freestanding rigid plastic IBCs (31H2);

(D) Composite IBCs with rigid plastic inner receptacles (31HZ1); and

(E) Composite IBCs with flexible inner receptacles (31HZ2).

(ii) For solids: (A) Metallic IBCs which are loaded or discharged by gravity (11A, 11B, 11N);

(B) Metallic IBCs which are loaded or discharged at a gauge pressure greater than 10 kPa (1.45 psig) (21A, 21B, 21N);

(C) Rigid plastic IBCs fitted with structural equipment designed to withstand the whole load when IBCs are stacked, and which are loaded or discharged by gravity (11H1);

(D) Freestanding rigid plastic IBCs which are loaded or discharged by gravity (11H2);

(E) Rigid plastic IBCs fitted with structural equipment designed to withstand the whole load when IBCs are stacked loaded or discharged under pressure (21H1);

(F) Freestanding rigid plastic IBCs which are loaded or discharged under pressure (21H2);

(G) Composite IBCs with a rigid plastic inner receptacle discharged or loaded by gravity (11HZ1);

(H) Composite IBCs with flexible plastic inner receptacle loaded or discharged by gravity (11HZ2);

(I) Composite IBCs with rigid plastic inner receptacles loaded or discharged under pressure (21HZ1);

(J) Composite IBCs with flexible plastic inner receptacle loaded or discharged under pressure (21HZ2);

(K) Fiberboard IBCs which are loaded or discharged by gravity (11G);

(L) Natural wood IBCs with inner liner which are loaded or discharged by gravity (11C);

(M) Plywood IBCs with inner liner which are loaded or discharged by gravity (11D);

(N) Reconstituted wood IBCs with inner liners which are loaded or discharged by gravity (11F);

(O) Woven plastic IBCs without coating or liner (13H1);

(P) Coated woven plastic IBCs (12H2);

(Q) Woven plastic IBCs with liner (13H3);

(R) Coated woven plastic IBCs with liner (13H4);

(S) Plastic film IBCs (13H5);

(T) Textile IBCs without coating or liner (13L1);

(U) Coated textile IBCs (13L2);

(V) Textile IBCs with liner (13L3);

(W) Coated textile IBCs with liner (13L4);

(X) Paper multiwall IBCs (13M1); and

(Y) Paper multiwall water resistant IBCs (13M2).

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

(i) Only materials in packing group II and III may be transported in an IBC;

(ii) Materials in packing group II must be transported in an IBC which employs a secondary containment;

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

(iv) Specification 13L1 IBCs may not be used for materials meeting the definition of Division 5.1 or Division 6.1 packing group II;

(v) Divisions 4.1 and 4.3 materials in packing group II that are packed in flexible, fiberboard or wooden IBCs must be transported in closed transport vehicles;

(vi) Flexible, fiberboard or wooden IBCs that are used to transport Class 8 materials must be water resistant;

(vii) IBCs transporting Divisions 4.1, 4.2, and 4.3 materials in packing group II must be hermetically (i.e., vapor tight) sealed;

(viii) Metallic IBCs are only authorized for those liquids with a vapor pressure of equal to or less than 110 kPa (16 psig) at 50 °C (122 °F) or 130 kPa (18.9 psig) at 55 °C (131 °F);

(ix) IBCs with bottom openings may not be used for materials with a primary hazard class of 3 and a subsidiary hazard class of Division 6.1.

(3) For composite IBCs, 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 IBC with a metal outer packaging.

15. In § 173.243, paragraph (d) would be added to read as follows:

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

* * * * *

(d) *Intermediate bulk containers.* (1) The following IBCs are authorized subject to the conditions and limitations of paragraph (d)(2) of this section if they conform to the requirements in part 178 of this subchapter at the packing group performance level specified in column 5

of the § 172.101 Table for the material being transported:

(i) For liquids and solids: (A) Metallic IBCs (31A, 31B, 31N);

(B) Rigid plastic IBCs fitted with structural equipment designed to withstand the whole load when IBCs are stacked (31H1);

(C) Freestanding rigid plastic IBCs (31H2);

(D) Composite IBCs with rigid plastic inner receptacles (31HZ1); and

(E) Composite IBCs with flexible inner receptacles (31HZ2).

(ii) For solids: (A) Metallic IBCs which are loaded or discharged by gravity (11A, 11B, 11N);

(B) Metallic IBCs which are loaded or discharged at a gauge pressure greater than 10 kPa (1.45 psig) (21A, 21B, 21N);

(C) Rigid plastic IBCs fitted with structural equipment designed to withstand the whole load when IBCs are stacked, and which are loaded or discharged by gravity (11H1);

(D) Freestanding rigid plastic IBCs which are loaded or discharged by gravity (11H2);

(E) Rigid plastic IBCs fitted with structural equipment designed to withstand the whole load when IBCs are stacked loaded or discharged under pressure (21H1);

(F) Freestanding rigid plastic IBCs which are loaded or discharged under pressure (21H2);

(G) Composite IBCs with a rigid plastic inner receptacle discharged or loaded by gravity (11HZ1);

(H) Composite IBCs with flexible plastic inner receptacle loaded or discharged by gravity (11HZ2);

(I) Composite IBCs with rigid plastic inner receptacles loaded or discharged under pressure (21HZ1);

(J) Composite IBCs with flexible plastic inner receptacle loaded or discharged under pressure (21HZ2);

(K) Fiberboard IBCs which are loaded or discharged by gravity (11G);

(L) Natural wood IBCs with inner liner which are loaded or discharged by gravity (11C);

(M) Plywood IBCs with inner liner which are loaded or discharged by gravity (11D);

(N) Reconstituted wood IBCs with inner liners which are loaded or discharged by gravity (11F);

(O) Woven plastic IBCs without coating or liner (13H1);

(P) Coated woven plastic IBCs (13H2);

(Q) Woven plastic IBCs with liner (13H3);

(R) Coated woven plastic IBCs with liner (13H4);

(S) Plastic film IBCs (13H5);

(T) Textile IBCs without coating or liner (13L1);

(U) Coated textile IBCs (13L2);

(V) Textile IBCs with liner (13L3);

(W) Coated textile IBCs with liner (13L4)

(X) Paper multiwall IBCs (13M1); and

(Y) Paper multiwall water resistant IBCs (13M2).

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

(i) Only materials in packing group II and III may be transported in an IBC;

(ii) Materials in packing group II must be transported in an IBC which employs a secondary containment;

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

(iv) Specification 13L1 IBCs may not be used for materials meeting the definition of Division 5.1 or Division 6.1 packing group II;

(v) Divisions 4.1 and 4.3 materials in packing group II that are packed in flexible, fiberboard or wooden IBCs must be transported in closed transport vehicles;

(vi) Flexible, fiberboard or wooden IBCs that are used to transport Class 8 materials must be water resistant;

(vii) IBCs transporting Divisions 4.1, 4.2, and 4.3 materials in packing group II must be hermetically (i.e., vapor tight) sealed;

(viii) Metallic IBCs are only authorized for those liquids with a vapor pressure of equal to or less than 110 kPa (16 psig) at 50 °C (122 °F) or 130 kPa (18.9 psig) at 55 °C (131 °F);

(ix) IBCs with bottom openings may not be used for materials with a primary hazard class of 3 and a subsidiary hazard class of Division 6.1.

(3) For complete IBCs, 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 IBC with a metal outer packaging.

PART 178—SPECIFICATIONS FOR PACKAGINGS

16. The authority citation for part 178 would continue to read as follows:

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

16a. Section 178.252–1 would be amended by adding paragraph (c) to read as follows:

§ 178.252–1 General requirements.

* * * * *

(c) The manufacture of these specification packagings is not allowed after October 1, 1996.

17. Section 178.253–1 would be amended by adding paragraph (c) to read as follows:

§ 178.253–1 General requirements.

* * * * *

(c) The manufacture of these specification packagings is not allowed after October 1, 1996.

17a. Subpart N would be 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 (IBCs) intended for the transport of hazardous materials. Standards for these packagings are based on the UN Recommendations.

(b) IBCs are generally defined in § 171.8 of this subchapter. The following definitions pertain to the IBC standards in this part.

(1) *Body* means the receptacle proper, including openings and their closures.

(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; for example, metal cages.

(4) *Maximum permissible gross mass* means the mass of the body and its service equipment and structural equipment and the maximum permissible load.

§ 178.702 IBC identification codes

(a) IBC code designations consist of: two numerals specified in paragraph (a)(1) of this section; and 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 IBC.

(1) IBC code number designations are presented in the following table:

Type	For solids, discharged		For liquids
	By gravity	Under pressure of more than 10 kpa (1.45 psi)	
Rigid	11	21	31
Semi-rigid	12	22	32
Flexible	13		

(2) *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 material.
L means textile.
M means paper, multiwall.
N means metal (other than steel or aluminum).

(b) For composite IBCs, two capital letters are used in sequence following the numeral indicating IBC design type. The first letter indicates the material of the IBC inner receptacle. The second letter indicates the outer IBC packaging material. The letter *z* is replaced with a capital letter which indicates the material of construction of the outer packaging. For example, 31HA1 is a composite IBC with a metal outer packaging.

§ 178.703 Marking of IBCs.

(a) The manufacturer shall: (1) Mark every IBC in a durable and clearly visible manner with the following information in the sequence presented:

(i) The United Nations symbol as illustrated in § 178.503(d)(1). For metallic IBCs on which the marking is stamped or embossed, the capital letters "UN" may be applied instead of the symbol;

(ii) The code number designating IBC design type according to § 178.702(a) (1) and (2);

(iii) A capital letter designating the packing group(s) for which the design type has been approved:

(A) Y for IBCs meeting Packing group II and III tests; and

(B) Z for IBCs meeting Packing group III tests only;

(iv) The month and year (last two digits) of manufacture;

(v) The country authorizing the allocation of the mark. The letters "USA" indicate that the IBC 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 IBCs not designed for stacking, the figure "0" must be shown; and

(viii) The maximum permissible gross mass or, for flexible IBCs, the maximum permissible load, in kg.

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

(i) For a metallic IBC containing solids discharged by gravity made from steel:

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

(iii) For a rigid plastic IBC containing liquids, made from plastic with structural equipment withstanding the stack load:

(iv) For a composite IBC containing liquids, with a rigid plastic inner receptacle and an outer steel body:

(b) *Additional marking.* In addition to markings in paragraph (a) of this section, each metallic, rigid plastic and composite IBC must be marked as follows in a place readily accessible for inspection. Where units of measure are used, they should be marked in both metric and US standard units e.g., 450 liters (119 gallons).

(1) For each rigid plastic and composite IBC, the following markings must be included on each plate:

(i) Capacity in liters (gallons) of water at 20 °C (68 °F);

(ii) Tare mass in kilograms (pounds);

(iii) Gauge test pressure in kPa or psig;

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

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

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

(i) Capacity in liters (gallons) of water at 20 °C (68 °F);

(ii) Tare mass in kilograms (pounds);

(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 or psig, if applicable;

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

(vii) Serial number assigned by the manufacturer.

(3) For each fiberboard and wooden IBC, the tare mass in kg must be shown.

(4) Each flexible IBC may be marked with a pictogram displaying recommended lifting methods.

§ 178.704 General IBC standards.

(a) IBCs must be resistant to, or protected from, deterioration due to exposure to the external environment.

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

(c) IBC packagings, 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. IBCs intended for stacking must be designed for stacking. Any lifting or securing features of IBCs must be of sufficient strength to withstand the normal conditions of handling and transport without gross distortion or failure and must be positioned so as to cause no undue stress in any part of the IBC.

(d) An IBC 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 items of 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 must be readily apparent. For IBCs containing liquids, a secondary means of sealing the discharge aperture must also be provided, e.g., by a blank flange or equivalent device.

§ 178.705 Standards for metallic IBCs.

(a) The provisions in this section apply to metallic IBCs intended to contain liquids and solids. Metallic IBC types include:

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

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

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

(b) Definitions for metallic IBCs:

(1) *A metallic IBC* means a metal body together with appropriate service and structural equipment;

(2) *Protected* means being provided with additional protection against impact, for example, a multi-layer (sandwich) or double wall construction or a frame with a metal lattice-work casing.

(c) Construction requirements for metallic IBCs are as follows:

(1) *Body.* The body must be made of ductile metallic 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 IBCs intended to contain flammable liquids must have no movable parts, such as covers, closures etc., made of unprotected steel liable to rust, which might cause a dangerous reaction from friction or percussive contact with the aluminum.

(iii) Metallic IBCs 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= guaranteed minimum tensile strength of the steel to be used, in N/mm²; if English units of pounds per square inch are used for tensile strength then the ratio becomes 10,000/(145Rm);

(B) For aluminum, the percentage elongation at fracture must not be less than 10,000/6 Rm with an absolute minimum of eight percent; if English units of pounds per square inch are used for tensile strength then the ratio becomes 10,000/(870Rm);

(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 (Rm x Ao = 69.0, if tensile strength is in English 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 (0.120)	2.5 (0.098)
>2000 and <3000	3.0 (0.120)	2.5 (0.098)	4.0 (0.160)	3.0 (0.120)

Where: A_o = minimum elongation (as a percentage) of the reference steel to be used on fracture under tensile stress (see § 178.705(c)(1)(iv)).

[1] where: gallons = liters × 0.264.

(B) For metals other than the reference steel described in paragraph (v)(A), the minimum wall thickness is given by 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 nonmetric units

$$e_1 = \frac{0.843 \times e_0}{\sqrt[3]{145 \times (Rm_1 \times A_1)}}$$

where:

e_1 = required equivalent wall thickness of the metal to be used (in mm) (if e_o is in inches, use formula for nonmetric units);

e_o = required minimum wall thickness for the reference steel (in mm) (if e_o is in inches, use formula for nonmetric units);

Rm_1 = guaranteed minimum tensile strength of the metal to be used (in N/mm²) (for nonmetric 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 § 178.705(c)(1));

Wall thickness shall not be less than 1.5 mm (0.059 inches).

(2) *Pressure relief.* The following relief requirements apply to IBCs intended for liquids:

(i) IBCs 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. This can be achieved by spring-loaded pressure relief devices or by other means of construction. Rupture discs are not allowed; and

(ii) The start to discharge pressure must not be higher than 65 kPa (9 psig) and no lower than the vapor pressure of the filling substance 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 defined in § 173.35 of this subchapter. Pressure relief devices must be fitted in the vapor space.

§ 178.706 Standards for rigid plastic IBCs.

(a) The provisions in this section apply to rigid plastic IBCs intended to contain solids or liquids. Rigid plastic IBC types include:

(1) 11H1 fitted with structural equipment designed to withstand the whole load when IBCs 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 IBCs 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 strutural equipment designed to withstand the whole load when IBCs are stacked, for liquids; or

(6) 31H2 freestanding, for liquids.

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

(c) Rigid plastic IBCs 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 complying with § 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 IBC body. Where use is made of carbon black, pigments or inhibitors, other than those used in the manufacture of the tested design type, re-testing 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 IBCs.

(4) IBCs must be capable of releasing a sufficient amount a vapor in the event of fire engulfment to ensure that no rupture of the body will occur. This can be achieved by spring-loaded pressure relief devices or by other means of construction. Rupture discs are not allowed. The device or other means of construction must be capable of releasing sufficient vapor to ensure that neither leakage nor permanent distortion of the IBC will occur if it is subjected to an internal pressure in excess of that for which it was hydraulically tested.

§ 178.707 Standards for composite IBCs.

(a) The provisions in this section apply to:

(1) Composite IBCs intended to contain solids and liquids. Composite IBC types include:

(i) 1HZ1 Composite IBCs with a rigid plastic inner receptacle for solids loaded or discharged by gravity;

(ii) 11HZ2 Composite IBCs with a flexible plastic inner receptacle for solids loaded or discharged by gravity;

(iii) 21HZ1 Composite IBCs with a rigid plastic inner receptacle for solids loaded or discharged under pressure;

(iv) 21HZ2 Composite IBCs with a flexible plastic inner receptacle for solids loaded or discharged under pressure;

(v) 31HZ1 Composite IBCs with a rigid plastic inner receptacle for liquids; or

(vi) 31HZ2 Composite IBCs 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(b) to indicate the material used for the outer packaging.

(b) Definitions for composite IBC types:

(1) A *composite IBC* consists of structural equipment in the form of a rigid outer packaging enclosing a plastic inner receptacle together with any service or other structural equipment. The inner receptacle and outer packaging are so constructed that the inner receptacle and the outer packaging form an integral packaging and are filled, stored, transported, and emptied as a unit.

(2) The term *plastic* applying in this section to inner receptacles also applies to other polymeric materials, such as polyethylene, rubber, etc.

(c) Construction requirements for composite IBCs with plastic inner receptacles are as follows:

(1) The outer packaging consists of rigid material formed so as to protect the inner receptacle from physical damage during handling and transportation, but is not intended 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 IBC 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 complying 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 protection against ultraviolet radiation is necessary, it 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) IBCs 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. This can be achieved by spring-loaded pressure relief devices or by other means of construction. Rupture discs are not allowed. The device must be capable of releasing sufficient vapor to ensure that neither leakage nor permanent distortion of the IBC will occur if it is subjected to an internal pressure in excess of that for which it was hydraulically tested.

(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 IBC 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.

(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 the construction of components of outer packaging. Outer packagings must be firmly nailed or secured to corner posts or ends or be assembled by equally similar devices.

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

(iv) Fiberboard outer packaging 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.

(iv) 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 IBC, or any detachable pallet, must be suitable for the mechanical handling of an IBC filled to its maximum permissible gross mass.

(i) The pallet or integral base must be designed to avoid any protrusion of the base of the IBC that might be liable to damage 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 IBC;

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

(iv) The bearing surfaces of IBCs intended for stacking must be designed to distribute loads in a safe manner. IBCs intended for stacking must be designed so that loads are not supported by the inner receptacle.

§ 178.708 Standards for fiberboard IBCs.

(a) The provisions of this section apply to fiberboard IBCs intended to contain solids which are loaded or discharged by gravity. Fiberboad IBCs are designated: 11G.

(b) Definitions for fiberboard IBC types:

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

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

(c) Construction requirements for fiberboard IBCs are as follows:

(1) Top lifting devices are prohibited in fiberboard IBCs.

(2) Fiberboard IBCs 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 g 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.

(i) The walls, including top and bottom, must have a minimum puncture resistance of 15J measured according to ISO International Standard 3036–1975.

(ii) Manufacturers joints in the bodies of IBCs 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 IBC 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 IBC, or any detachable pallet, must be suitable for the mechanical handling of an IBC filled to its maximum permissible gross mass.

(i) The pallet or integral base must be designed so as to avoid any protrusion of the base of the IBC that might be liable to damage 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 IBC.

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

(iv) The bearing surfaces of IBCs intended for stacking must be designed to distribute loads in a stable manner.

§ 178.709 Standards for wooden IBCs.

(a) The provisions in this section apply to wooden IBCs intended to contain solids which are loaded or discharged by gravity. Wooden IBC types include:

(1) 11C Natural wood with inner liner;

(2) 11D Plywood with inner liner; and

(3) 11F Reconstituted wood with inner liner.

(b) Definitions for wooden IBCs:

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

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

(c) Construction requirements for wooden IBCs are as follows;

(1) Top lifting devices are prohibited in wooden IBCs;

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

(i) Natural wood used in the construction of an IBC must be well seasoned, commercially dry and free from defects that would materially

lessen the strength of any part of the IBC. Each IBC part must consist of uncut wood or a piece equivalent in strength and integrity. IBC parts are equivalent to one piece when a suitable method of glued assembly is used (i.e., a Linderman 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).

(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 components of the outer packaging.

(iii) Reconstituted wood used in construction of bodies must be water resistant reconstituted wood such as hardboard or particle board.

(iv) Wooden IBCs 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 IBC 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 transport;

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

(i) The pallet or integral base must be designed to avoid any protrusion of the base of the IBC that might be liable to damage 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 IBC.

(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 IBCs intended for stacking must be designed to distribute loads in a safe manner.

§ 178.710 Standards for flexible IBCs.

(a) The provisions of this section apply to flexible IBCs intended to contain solid hazardous materials. Flexible IBC types include:

(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; and

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

(b) Definitions for flexible IBCs:

(1) *Flexible IBCs* consist of a body constructed of film, woven fabric or any other flexible material or combination thereof, together with any appropriate service equipment and handling devices.

(1) *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 IBC or formed from a continuation of the IBC body material.

(c) Construction requirements for flexible IBCs are as follows:

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

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

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

(iii) In addition to complying with the requirements of § 173.24 of this subchapter, flexible IBC bodies must be resistant to aging and degradation caused by ultraviolet radiation.

(iv) For plastic flexible IBCs, if protection against ultraviolet radiation is necessary, it 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. 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.

(v) No used material other than production residues or regrind from the same manufacturing process may be used in the manufacture of plastic flexible IBCs. 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.

(vi) When flexible IBCs are filled, the ratio of height to width shall not be more than 2:1.

18. Subpart O would be 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 IBCs 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 IBCs 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 packaging manufacturer and the person who offers

a hazardous material for transportation, to the extent that assembly functions including final closure are performed by the latter, to assure that each IBC is capable of passing the prescribed tests.

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

(1) *IBC design type* is defined by the design, size, material, thickness, manner of construction and means of filling and discharging, and may include various surface treatments.

(2) *Design qualification testing* is the performance of the drop, leakproofness, hydrostatic pressure, stacking, bottom and/or top lift, tear, topple, righting and vibration tests, as applicable, prescribed in this subpart, for each different IBC 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 IBC 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 IBC.

(5) *Production testing* is the performance of the leakproofness test prescribed in § 178.813 of this subpart on each IBC intended to contain solids discharged by gravity or intended to contain liquids.

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

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

(i) A packaging which differs only in surface treatment; and

(ii) A rigid plastic IBC or the plastic inner receptacle of a composite IBC which differs only with regard to additives which conform to §§ 178.706(c), 178.707(c) or 178.710(c) of this part; or

(iii) A packaging which differs according to § 178.801(h).

(d) *Design qualification testing.* The packaging manufacturer shall achieve successful test results for the design qualification testing at the start of production of each different IBC design type.

(e) *Periodic design requalification testing.* (1) Periodic design requalification must be conducted on each qualified IBC design type if the manufacturer is to maintain authorization for continued production. The IBC 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 (e.g., ISO 9000) that assure that proposed decreases in test frequency maintain the integrity of originally tested IBC design types; and

(ii) Demonstrations that each IBC produced is capable of withstanding higher standards (i.e., increased drop height, hydrostatic pressure, wall thickness, fabric weight, etc.).

(f) *Production testing and inspection.* (1) Production testing consists of the leakproofness test prescribed in § 178.813 and must be performed on each IBC intended to contain solids discharged by gravity or intended to contain liquids.

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

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

(h) *Selective testing of metallic, rigid plastic and composite IBCs.* Variations of up to 25 percent decreased in the outer dimensions of a tested IBC design type are permitted without further testing. In addition, the Associate Administrator for Hazardous Materials Safety may approve the selective testing of IBCs that differ only in minor respects from a tested IBC design type and which provide an equivalent or greater level of safety than the tested type.

(i) *Approval of equivalent packagings.* An IBC having standards different from those in subpart N of this part, or which is tested using methods other than those specified in this part, may be used if approved by the Associate Administrator for Hazardous Materials Safety. Such IBCs 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 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, 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 IBC 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 a IBC is required for safety reasons, the manufacturer shall design the IBC so that the treatment or coating retains its protective properties even after withstanding the tests prescribed by this subpart.

(l) *Record retention.* (1) The IBC manufacturer shall keep records for the qualification of each IBC design type and for each periodic design requalification as specified in this part. Records must be maintained at each location where the IBC is manufactured and at each location where the IBC design qualification and periodic design requalification testing is performed. Records 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. Records shall include specific IBC types tested, dates of tests, location of tests, test specifics and results (including drop heights, hydrostatic pressures, tear propagation length, etc.), name of person conducting the test, and name of person responsible for testing. Test reports for fiberboard and wooden IBC design types must include a technical description of the pallets used.

(2) The IBC owner shall keep records of periodic retests and initial and periodic inspections prescribed in § 180.352 of this subchapter. Records must include design types, dates, locations, packaging specifications, test specifics and results, and names or name of persons testing, for each packaging, and 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;

(3) The manufacturer and owner of each IBC must make all records of design qualification tests, periodic

design requalification tests, and periodic retests and inspections, available for inspection by the Associate Administrator for Hazardous Materials Safety or a designated representative.

§ 178.802 Preparation of Fiberboard IBCs for testing.

(a) Fiberboard IBCs or composite IBCs with fiberboard outer packagings must be conditioned for at least 24 hours in an atmosphere maintained:

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

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

(b) Average values should 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% relative humidity without significant impairment of test reproducibility.

§ 178.803 Testing and certification of metallic IBCs.

One IBC of each metallic design type must withstand the applicable tests in the order presented in the following table:

Tests	See	Type of IBC	
		11A, 11B, 11N	21A, 21B, 21N, 31A, 31B, 31N
Bottom lift	178.811	Required [a]	Required.[a]
Top Lift	178.812	Required [a]	Required.[a]
Stacking	178.815	Required [b]	Required.[b]
Leakproofness	178.813	Not required	Required.
Hydrostatic pressure	178.814	Not required	Required.
Drop	178.810	Required	Required.
Vibration	178.819	Required	Required.

[a] When IBCs are designed for this method of handling.
[b] When IBCs are designed to be stacked.

§ 178.804 Testing and certification of rigid plastic IBCs.

One IBC of each rigid plastic design type must withstand the applicable tests in the order presented in the following table:

Tests	See	Type of IBCs	
		11H1, 11H2	21H1, 21H2, 31H1, 31H2
Bottom Lift	178.811	Required	Required.
Top Lift	178.812	Required [a]	Required.[a]
Stacking	178.815	Required [b]	Required.[b]
Leakproofness	178.813	Not required	Required.
Hydrostatic pressure	178.814	Not required	Required.
Drop	178.810	Required	Required.
Vibration	178.819	Required	Required.

[a] When IBCs are designed to be lifted from the top.
[b] When IBCs are designed to be stacked.

§ 178.805 Testing and certification of composite IBCs.

One IBC of each composite design type must withstand the applicable tests in the order presented in the following table:

Tests	See	Type of IBCs	
		11HZ1, 11Hz2	21HZ1, 21HZ2, 31HZ1, 31HZ2
Bottom lift	178.811	Required	Required.
Top lift	178.812	Required [a]	Required.[a]
Stacking	178.815	Required [b]	Required.[b]
Leakproofness	178.813	Not required	Required.
Hydrostatic pressure	178.814	Not required	Required.
Drop	178.810	Required	Required.
Vibration	178.819	Required	Required.

[a] When IBCs are designed to be lifted from the top.
[b] When IBCs are designed to be stacked.

§ 178.806 Testing and certification of fiberboard IBCs.

One IBC of each fiberboard design type must withstand the applicable tests in the order presented in the following table:

Test	See	11G
Bottom lift	178.811	Required.
Stacking	178.815	Required.[a]

Test	See	11G
Drop	178.810	Required.
Vibration	178.819	Required.

* when IBCs are designed to be stacked.

§ 178.807 Testing and certification of wooden IBCs.

One IBC of each wooden design type must withstand the applicable tests in the order presented in the following table:

Test	See	11C, 11D, 11F
Bottom lift	178.811	Required.
Stacking	178.815	Required.*
Drop	178.810	Required.
Vibration	178.819	Required.

* when IBCs are designed to be stacked.

§ 178.808 Testing and certification of flexible IBCs.

One IBC of each rigid plastic design type must withstand the applicable tests in the order presented in the following table.

Tests	See
Top lift [1]	178.812
Tear	178.818
Stacking	178.815
Drop	178.810
Topple	178.816
Righting [1]	178.817
Vibration	178.819

[1] when IBCs are designed to be lifted from the top or the side.

§ 178.810 Drop test.

(a) *General.* The drop test must be conducted for the qualification of all IBC design types and performed periodically as specified in § 178.801.

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

(2) Fiberboard, wooden, and flexible IBCs must be filled with a solid material to not less than 95% of their capacity.

(3) Testing of rigid plastic and composite IBCs must be carried out when the temperature of the packaging and its contents have been reduced to −18 °C (0 °F) or lower. Test liquids shall be kept in the liquid state by the addition of anti-freeze, if necessary.

(c) *Test method.* Samples of all IBC 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 IBC being tested.

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

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

(ii) 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 relative density 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 relative density not exceeding 1.2, the drop heights must be those specified in paragraph (d)(1) of this section for each IBC design type; and

(ii) Where the substances to be carried have a relative density exceeding 1.2, the drop heights must be those specified in paragraph (d)(1) of this section for each IBC design type, multiplied by the ratio of the relative density of the hazardous material to be transported, rounded off to the first decimal, to 1.2 (i.e. relative density/1.2 × specified drop height).

(e) *Criteria for passing the test.* (1) For all IBC design types except flexible IBC design types, no loss of contents. A slight discharge from a closure upon impact is not considered to be a failure of the IBC provided that no further leakage occurs.

(2) For flexible IBC design types, no loss of contents. A slight discharge (e.g., from closures or stitch holes), upon impact is not considered a failure of the flexible IBC provided that no further leakage occurs after the IBC 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 IBC design types designed to be lifted from the base.

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

(c) *Test method.* All IBC 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.* No permanent deformation which renders the IBC 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 IBC design types designed to be lifted from the top.

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

(2) Flexible IBC design types must be filled to six times the maximum permissible load, the load being evenly distributed.

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

(2) Rigid plastic and composite IBC 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.* No permanent deformation which renders the IBC, 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 IBC 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 should be sealed. For metallic IBC design types, the initial test must be carried out before the fitting of any thermal insulation equipment.

(c) *Test method and pressure applied.* The test must be carried out for a period of at least 10 minutes using air at a gauge pressure of not less than 20k Pa (2.9 psig). Leakproofness of IBC 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, 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.

(d) *Criterion for passing the test.* No leakage of air.

§ 178.814 Hydrostatic pressure test.

(a) *General.* The hydrostatic pressure test must be conducted for the qualification of all metallic, rigid plastic, and composite IBC 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 metallic IBCs, the test must be carried out before the fitting of any thermal insulation equipment. For all IBCs, pressure relief devices should be removed and their apertures plugged, or should be rendered inoperative.

(c) *Test method.* The test must be carried out for a period of a least 10 minutes applying a hydraulic pressure not less than that indicated in paragraph (d) of this section. The IBCs must not be mechanically restrained during the test.

(d) *Pressure applied.* (1) For metallic IBC design types, 31A, 31B, 31N: 65 kPa (9.4 psig).

(2) For metallic IBC design types 21A, 21B, 21N, 31A, 31B, 31N: 200 kPa (29 psig) gauge pressure (for metallic design types 31A, 31B, and 31N, the tests in paragraphs (d)(1) and (d)(2) of this section must be conducted consecutively).

(3) For rigid plastic IBC design types 21H1 and 21H2 and composite IBC design types 21HZ1 and 21HZ2: 75 kPa (11 psig).

(4) For rigid plastic IBC design types 31H1 and 31H2 and composite IBC design types 31HZ1 and 31HZ2: whichever is the greater of:

(i) The total gauge pressure measured in the IBC (i.e., the vapor pressure of the filling substance and the partial pressure of the air or other inert gases, minus 100 kPa (14.5 psig)) at 55°C (131°F) multiplied by a safety factor of 1.5. This total gauge pressure should be determined on the basis of a maximum degree of filling in accordance with § 173.35(d) of this subchapter and a filling temperature of 15°C (60°F);

(ii) 1.75 times the vapor pressure at 50°C (122°F) of the substance to be transported minus 100 kPa (14.5 psig), but with a minimum test pressure of 100 kPa;

(iii) 1.5 times the vapor pressure at 55°C (131°F) of the substance to be transported minus 100 kPa (14.5 psig), but with a minimum test pressure of 100 kPa; or

(iv) Twice the static pressure of the substance to be transported, with a minimum of twice the static pressure of water.

(e) *Criteria for passing the test.* (1) For metallic IBCs, subjected to the 65 kPa (9.4 psig) test pressure specified in paragraph (d)(1) of this section: no leakage or permanent deformation which renders the IBC unsafe for transport.

(2) For metallic IBCs intended to contain liquids, when subjected to the 200 kPa (29 psig) test pressure specified in paragraph (d)(2) of this section: no leakage.

(3) For rigid plastic IBC types 21H1, 21H2, 31H1 and 31H2 and composite IBC types 21HZ1, 21HZ2, 31HZ1 and 31HZ2: no permanent deformation which renders the IBC unsafe for transport and no leakage.

§ 178.815 Stacking test.

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

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

(2) The flexible IBC must be filled to not less than 95% of its capacity and to its maximum permissible load, with the load being evenly distributed.

(c) *Test method.* (1) All 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 (see paragraph (d) of this section).

(2) Fiberboard, wooden, rigid plastic, and composite IBCs must be subjected to the test for 24 hours.

(3) Rigid plastic IBC types 11H2, 21H2, 31H2 and composite IBC types 11HZ2, 21HZ2, and 31HZ2 must be subjected to the test for 28 days at 40°C (104°F).

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

(i) One or more IBCs of the same type loaded to their maximum permissible gross mass and stacked on the test IBC; or

(ii) Appropriate weights loaded on either a flat plate or a reproduction of the base of the IBC, which is stacked on the test IBC

(d) *Calculation of superimposed test load.* For all IBCs, the load to be 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 of the IBC during transportation.

(e) *Criteria for passing the test.* (1) For metallic, rigid plastic, and flexible IBCs; No permanent deformation which renders the IBC unsafe for transport and no loss of contents.

(2) For composite, fiberboard, and wooden IBCs: No permanent deformation which renders the whole IBC including the base pallet unsafe for transport and no loss of contents.

§ 178.816 Topple Test

(a) *General.* The topple test must be conducted for the qualification of all flexible IBC design types as a design type qualification test.

(b) *Special preparation for the topple test.* The flexible IBC must be filled to not less than 95% of its capacity and to its maximum permissible load, with the load being evenly distributed.

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

(d) *Topple height.* The topple height is specified as follows:

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

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

(e) *Criteria for passing the test.* 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 IBCs designed to be lifted from the top or side.

(b) *Special preparation for the righting test.* The flexible IBC must be filled to not less than 95% of its capacity and to its maximum permissible load, with the load being evenly distributed.

(c) *Test method.* The flexible IBC, lying on its side, must be lifted at a speed of at least 0.1 m/s (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.* No damage to the IBC or its lifting devices which renders the IBC unsafe for transportation or handling.

§ 178.818 Tear test.

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

(b) *Special preparation for the tear test.* The flexible IBC must be filled to not less than 95% of its capacity and to its maximum permissible load, the load being evenly distributed.

(c) *Test method.* Once the IBC 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 IBC, halfway between the bottom surface and the top level of the contents. The IBC must then be subjected to a uniformly distributed superimposed load equivalent to twice the maximum permissible load. The load is applied for at least five minutes. An IBC 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 IBC passes if the cut does not propagate more than 25% of its original length.

§ 178.819 Vibration test.

(a) *General.* The vibration test must be conducted for the qualification of all IBC design types.

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

(2) The sample IBC must be placed on a vibrating platform that has a vertical double-amplitude (peak-to-peak displacement) of one inch. The IBC should be constrained horizontally to prevent them 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 any IBC and the platform.

(4) Immediately following the period of vibration, each IBC must be removed from the platform, turned on its side and observed for any evidence of leakage.

(5) Other methods, at least equally effective, may be used, if approved by the Associate Administrator for Hazardous Materials Safety.

(c) *Criteria for passing the test.* An IBC passes the vibration test if there is no rupture or leakage from any of the packages.

PART 180—CONTINUING QUALIFICATION AND MAINTENANCE OF PACKAGINGS

19. The authority citation for Part 180 would continue to read as follows:

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

20. A new Subpart D would be added to Part 180 to read as follows:

Subpart D—Qualification and Maintenance of Portable Tanks and Intermediate Bulk Containers

Sec.
180.350 Applicability.
180.351 Qualification of IBCs.
180.352 Requirements for retest and inspection of IBCs.

Subpart D—Qualification and Maintenance of Portable Tanks and Intermediate Bulk Containers

§ 180.350 Applicability.

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

§ 180.351 Qualification of IBCs.

(a) *General.* Each IBC used for the transport of hazardous materials must be an authorized packaging.

(b) *IBC specifications.* To qualify as an authorized packaging, each IBC 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.

(c) *Five-year limit.* Rigid plastic IBCs may not be used in hazardous materials service for more than five years. A plastic inner receptacle of a composite IBC used in hazardous materials service for five years must be replaced with a receptacle identical to the original design type, or the entire composite packaging must be removed from hazardous materials service.

§ 180.352 Requirements for retest and inspection of IBCs.

(a) *General.* Each IBC constructed in accordance with a UN standard for which a test or inspection specified in this section is required may not be filled and offered for shipment until the test or inspection has been successfully completed. This paragraph does not apply to any IBC filled prior to the test or inspection due date. The requirements in this section do not apply to Specification 56 and 57 portable tanks.

(b) *Test and inspections.* Each metallic, rigid plastic, and composite IBC 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 from the date of manufacture on each IBC intended for liquids or for solids loaded or discharged by pressure.

(2) An external visual inspection must be conducted initially after production and very 2.5 years from date of manufacture on each IBC to ensure that:

(i) The IBC is marked in accordance with requirements in § 178.703 of this subchapter. Missing or damaged markings, or markings difficult to read must be applied 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 IBC, including the outer packaging if applicable, is free from damage which reduces its structural integrity. The IBC must be externally inspected for cracks, warpage and corrosion or any other damage which might render the IBC unsafe for transportation. An IBC found with such defects must be removed from service. If possible, the inner receptacle of a composite IBC must be removed from the outer frame for inspections. Defective inner receptacles may be replaced with a receptacle meeting the original design type. For metallic IBCs, thermal insulation must be removed only to the extent necessary for proper examination of the IBC body.

(3) Each metallic IBC must be internally inspected every five years to ensure that the IBC is free from damage which reduces its structural integrity.

(i) The IBC must be internally inspected for cracks, warpage, and corrosion or any other defect which might render the IBC unsafe for transportation. An IBC found with such defects must be removed from hazardous materials service.

(ii) Metallic IBCs must be checked to insure the minimum wall thickness requirements in § 178.705(c)(1)(iv)(A) of this subchapter are met. Metallic IBCs not complying with minimum wall thickness requirements must be removed from hazardous materials service.

(c) *Visual inspection.* Each flexible, fiberboard, or wooden IBC must be visually inspected to ensure that:

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

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

(i) Each flexible IBC must be inspected to ensure that:

(A) Lifting straps if used, are securely fastened to the IBC in accordance with the design type;

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

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

(ii) Each fiberboard IBC must be inspected to ensure that:

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

(B) Seams are creased and free from scoring, cut, and scratches; and

(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 IBC is authorized for hazardous materials service.

(iii) Each wooden IBC must be inspected to ensure that:

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

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

(3) Flexible, fiberboard and wooden IBCs are prohibited from reuse.

(d) *Retest date.* The date of the most recent periodic retest must be marked on the IBC, on or near the certification plate.

(e) *Exceptions.* The requirements in this section do not apply to Specification 56 and 57 portable tanks.

(f) *Record retention.* The IBC owner shall keep records of periodic retests and initial and periodic inspections. Records must include design types, dates, locations, packaging specifications, test specifics and results, and names or name of persons testing, for each packaging, and 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.

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Alan I. Roberts,

Associate Administrotor for Hazardous Materials Safety.

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