DEPARTMENT OF TRANSPORTATION
HAZARDOUS MATERIALS REGULATIONS BOARD
WASHINGTON, D.C. 20590

[Docket No. HM-85; Amdt. Nos. 172-13, 173-57, 178-22]

MISCELLANEOUS AMENDMENTS TO CHAPTER

The purpose of these amendments to the Hazardous Materials Regulations of the Department of Transportation is (1) to authorize the shipment of wetted, desensitized pentaerythrite tetranitrate (PETN) in a specification 21C drum; (2) to delete unnecessary references to DOT-106A500 tanks; (3) to authorize the shipment of certain flammable liquids in a DOT-109A100ALW tank car and in certain packagings having a specification 2S inner polyethylene container; (4) to authorize the bulk shipment of certain corrosive liquids; (5) to authorize up to 1-quart bottles of bromine in a DOT-12A fiberboard box; (6) to authorize the shipment of bromine in a nickle-clad cargo tank; (7) to authorize the shipment of sodium chlorite solutions in certain cargo tanks; (8) to authorize the shipment of hydrochloric acid and sodium chlorite solutions in DOT-2E bottles packaged within DOT-12R packaging; (9) to revise section 173.287, Chromic acid solution, to clarify and add certain packaging provisions; (10) to delete the requirement that DOT-2P and DOT-2Q metal containers be equipped with safety relief devices for shipment of certain refrigerant gases; (11) to authorize the use of a specification 4BW cylinder and to increase the quantity allowable in currently authorized cylinders for the shipment of chlorpicrin and certain mixtures of chlorpicrin; and (12) to update the DOT-4L cylinder material specification and to prohibit heat treating of this material.

On May 26, 1971, the Hazardous Materials Regulations Board published a notice of proposed rule making, Docket No. HM-85; Notice No. 71-14 (36 F.R. 9602) which proposed these amendments. Interested persons were invited to give their views and several comments were received by the Board.

Two objections were received to the proposal to amend § 173.65 to authorize certain fiber drums for class A explosives. Both comments were based on difficulties reported with fiber drums containing class B propellant explosives in shipments by rail. The Board acknowledges that a problem appears to exist in the transportation of these packages by rail and currently has the matter under active study. However, the Board concludes that the amendment is warranted since the problem appears to be limited to drums containing class B propellant explosives. DOT-21C fiber drums without a requirement for the plastic bag specified herein, are currently authorized for several class A explosives under 173.65. Review of accident reports filed with the Department fails to reveal any difficulty with these packages. The Board also notes that packages containing class A explosives are required to be given more careful handling by a rail carrier.

A commenter requested that dichlorobutene be added to the table in § 173.245a. According to the rules of procedure, public notice of such an addition must be given. The Board will give consideration to including this request in a future notice of proposed rule making. Additional data are being collected on diethyl phosphorochloridothioate and dimethyl phosphorochloridothioate. These products are therefore not included in this amendment. Another commenter requested that the products listed in § 173.245a also be included in § 172.5 to be more informative. The Board agrees with this comment and has made this change.

A commenter observed that the proposed change to § 173.252(a)(5) did not cover certain larger cargo tanks now covered by special permit. To accomplish the change requested by the commenter, the weight limitation would be required to be changed from 30,000 pounds to 60,000 pounds. Such a change cannot be made without advance notice of the intended change.

One commenter noted that possible confusion might arise in the application of § 173.287 (c) and (c)(1) when read with § 173.287(b). Editorial changes have been made to clarify the intent of the Board.

A commenter expressed an opinion that it was not consistent to require DOT-2P and DOT-2Q packaging for nonflammable and nonpoisonous refrigerant gases and to provide the exemptions described under § 173.306(a)(3). Although preliminary review of the comment indicates a possible need for change, to make such an amendment would result in a substantive change which must receive the benefit of the full rule-making procedure.

As requested by a commenter, § 173.357(b)(1) was changed editorially by inverting the order of the sentences to preclude interpretation of the requirement for valve protection to apply only to cylinders having a water capacity over 275 pounds.

In its proposed changes to § 178.57-21, the Board stated that the purpose was to update the DOT-4L cylinder material specification. One commenter noted that the revision was incorrect in that the nickel content should be changed to "8.00-10.50". Also, this commenter observed that the latest standard ASTM-A480-70 was not reflected by the current table of Check Analysis Tolerances. The Board has incorporated these recommendations since they only update the specification and check analysis tolerances, consistent with recent revisions of ASTM Specifications. Section 178.57-16 has also been editorially corrected.

These amendments do not include the proposed change relating to boron tribromide. The Board has concluded that this proposal requires further study.

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

PART 172—COMMODITY LIST OF HAZARDOUS MATERIALS CONTAINING THE SHIPPING NAME OR DESCRIPTION OF ALL ARTICLES SUBJECT TO PARTS 170-189 OF THIS CHAPTER

In § 172.5 paragraph (a), the Commodity List is amended as follows:

§ 172.5 List of hazardous materials.

(a) * * *

Article	Classed as—	Exemptions and packing (see sec.)	Label required if not exempt	Maximum quantity in 1 outside container by rail express
Change				
Corrosive liquid, n.o.s.	Cor. L	173.244, 173.245, 173.245a	White	5 pints.
Add				
Ethyl chlorothiolformate. See Corrosive liquid n.o.s.				
Ethyl phosphonothioic dichloride, anhydrous. See Corrosive liquid, n.o.s.				
Ethyl phosphonous dichloride, anhydrous. See Corrosive liquid n.o.s.				
Ethyl phosphorodichloridate. See Corrosive liquid, n.o.s.				
Methyl phosphonothioic dichloride, anhydrous See Corrosive liquid, n.o.s.				
Methyl phosphonous dichloride. See Corrosive liquid, n.o.s.				
Pentaerythrite tetranitrate, desensitized, wet. See High explosives.				

PART 173—SHIPPERS

(A) In Part 173 Table of Contents, § 173.245a is added to read as follows:

Sec.
173.245a Corrosive liquids n.o.s. shipped in bulk.

(B) In § 173.65(e), the introductory text and subparagraph (1) are amended; subparagraph (4) is added to read as follows:

§ 173.65 High explosives with no liquid explosive ingredient nor any chlorate.

* * * * *

(e) Ammonium picrate, cyclotrimethylenetrinitramine, pentaerythrite tetranitrate (desensitized), picric acid, trinitrobenzene, trinitrobenzoic acid, trinitroresorcinol, trinitrotoluene, or urea nitrate, when wet with not less than 10 pounds of water to each 90 pounds of

dry material must be shipped in packagings as follows:

(1) Specification 10B (§ 178.156 of this chapter) wooden barrel or keg. Not over 50 gallons nominal capacity. Not authorized for wet desensitized pentaerythrite tetranitrate.

* * * * *

(4) Specification 21C (§ 178.224 of this chapter). Fiber drum with an inside polyethylene bag having 0.004 inch minimum thickness and liquid-tight closure. Net weight not to exceed 200 pounds. Authorized only for wet desensitized pentaerythrite tetranitrate.

* * * * *

(C) In § 173.119, paragraphs (a) (12), (b) (8), (e) (2), and (f) (3) are amended to read as follows:

§ 173.119 Flammable liquids not specifically provided for.

(a) * * *

(12) Specification 103,[1] 103W, 103ALW, 103DW, 104,[1] 104W, 105A100,[1] 105A100 ALW, 105A100W, 106A500X, 106A800 XNC, 106A800NCI,[1] 109A100ALW, 110A 500W, 111A60ALW, 111A60F1, 111A60W1, 111A100W3, 111A100W4, 111A100W6, 112A200W, 112A400F, 114A340W, ARA-III,[1] ARA-IV,[1] or ARA-IV-A[1] (§§ 179.100, 179.101, 179.200, 179.201, 179.300, 179.301 of this chapter). Tank car. For a car equipped with an expansion dome, the manway closure must be so designed that pressure will be released automatically by starting the operation of removing the manway cover. Openings in tank heads to facilitate application of lining are authorized and must be closed in an approved manner (see §§ 179.3, 179.4 of this chapter) (see § 173.432 for shipping instructions).

* * * * *

(b) * * *

(8) Specification 6D or 37M (nonreusable container) (§§ 178.102, 178.134 of this chapter). Cylindrical steel overpack with an inside specification 2S or 2SL (§§ 178.35, 178.35a of this chapter) polyethylene container. Authorized only for materials that will not react with polyethylene[1] result in container failure.

* * * * *

(e) * * *

(2) Specification 103,[1] 103W, 103ALW, 103DW, 104,[1] 104W, 105A100,[1] 105A100 ALW, 105A100W, 106A500X, 106A800 XNC, 106A800NCI,[1] 109A100ALW, 110A 500W, 111A60ALW, 111A60F1, 111A60W1, 111A100W3, 111A100W4, 111A100W6, 112A200W, 112A400F, 114A340W, ARA-III,[1] ARA-IV,[1] or ARA-IV-A[1] (§§ 179.100, 179.101, 179.200, 179.201, 179.300, 179.301 of this chapter). Tank car. A car having an expansion dome must be equipped with a manway closure, identification marks, and dome placards as prescribed in paragraphs (f) (4), (g), (h), and (h) (1) of this section. Openings in tank heads to facilitate application of lining are authorized and must be closed in an approved manner (see §§ 179.3, 179.4 of this chapter) (see Note 1 of paragraph (f) (3) of this section).

* * * * *

[1] Use of existing tank cars authorized, but new construction not authorized.

(f) * * *

(3) Specification 105A100,[1] 105A100 ALW, 105A100W, 106A500X, 106A800 XNC, 106A800NCI,[1] 109A100ALW, 110A 500W, 111A100W4, 112A200W, 112A400F, 114A340W, ARA-IV-A[1] (§§ 179.100, 179.101, 179.200, 179.201, 179.300, 179.301 of this chapter) (see Note 1). Tank car. Specification 104,[1] 104W, 111A100W3, or ARA-IV (§§ 179.200, 179.201 of this chapter) tank cars are authorized under the conditions prescribed in paragraphs (f) (4), (g), (h), and (h) (1) of this section and Note 3 of this subparagraph. Openings in tank heads to facilitate application of lining are authorized and must be closed in an approved manner (see §§ 179.3 and 179.4 of this chapter). Notes 1, 2, and 3 remain the same.

* * * * *

(D) Section 173.245a is added to read as follows:

§ 173.245a Corrosive liquids, n.o.s. shipped in bulk.

(a) Corrosive liquids, n.o.s., may not be shipped in bulk in tank cars, tank motor vehicles, or portable tanks except as follows:

Corrosive liquid	Authorized tank car	Authorized portable tank[3]
Ethyl chlorothiolformate.	.....	DOT-51, monel-clad.
Ethyl phosphonothioic dichloride, anhydrous.	103AW.....	DOT-51.
Ethyl phosphonous dichloride, anhydrous.	.....	DOT-51.
Ethyl phosphorodichloridate.	103ANW, 103AW, 111A100F2, 111A100W2.[2]	.....
Methyl phosphonothioic, dichloride, anhydrous.	103AW.....	DOT-51.
Methyl phosphonous dichloride.[1]	.....	DOT-51.

[1] In an unlined tank, must be loaded and shipped under a blanket of nonflammable, dry, inert gas, adequate to displace any significant amount of air.

[2] Specification 103ANW tank car tank must be solid nickel at least 95 percent pure; all cast metal parts of the tank in contact with the lading must have a minimum nickel content of approximately 96.7 percent. Specification 103A tank car tank must be lead-lined steel or must be made of steel at least 10 percent nickel clad; specification 103AW, 111A100F2, or 111A100W2 tank must be lead-lined steel or made of steel with a minimum thickness of nickel cladding 1/16 inch; nickel cladding in tanks must have a minimum nickel content at least 99 percent pure nickel.

[3] Tank must be equipped with a safety-relief valve set at not less than 100 psig. In addition, the relief valve must comply with § 173.315(i)(1).

(E) In § 173.252, paragraph (e) is amended; paragraphs (a) (5) and (g) (3) are added to read as follows:

§ 173.252 Bromine.

(a) * * *

(5) Specification MC 310 or MC 312 (§ 178.343 of this chapter). Tank motor vehicle. The tank must have a shell and head thickness of three-eighths-inch minimum with cladding material on the inside surface comprising at least 20 percent of the total shell or head thickness. The cladding material must conform to requirements of ASTM Specification B-162-69. The composite plate must conform to requirements of ASTM Specification A-265-69. The water weight capacity of the tank must not exceed 10,200 pounds and the maximum quantity of liquid bromine loaded into the tank must not exceed 30,000 pounds or 300 percent of the water weight capacity of the tank, whichever quantity is less. The total quantity loaded must not be less than 98 percent of the quantity the tank is authorized to carry.

* * * * *

(e) Except as provided in paragraphs (g) (2) and (3) of this section, bottles or jugs must be securely cushioned on all sides with incombustible packaging material, such as whiting, mineral wool, infusorial earth (keiselguhr), sifted ashes, powdered china clay, or similar material, at least 1 inch thick, which will not produce heat when mixed with bromine. The use of hay, sawdust, excelsior, or other organic material, either treated or untreated, as a cushioning or packaging material is prohibited.

* * * * *

(g) * * *

(3) Specification 12A (§ 178.210 of this chapter). Fiberboard box with inside glass bottles having closures meeting the requirements of paragraph (d) of this section. Each bottle must be enclosed in a tinplate slipcover metal can surrounded by incombustible cushioning material. No box may contain any bottle of a capacity greater than 1 quart. Each box may contain not more than four bottles having a capacity not exceeding 1 quart, or 12 bottles having a capacity not exceeding 8 fluid ounces. The shipper must have established that the complete package closed for shipment, with inside bottles filled with a liquid of the same specific gravity and similar viscosity as bromine, is capable of withstanding the tests prescribed in § 178.210-10 of this chapter.

* * * * *

(F) In § 173.263(a), subparagraphs (10) and (27) are amended; (29) is added to read as follows:

§ 173.263 Hydrochloric (muriatic) acid, hydrochloric (muriatic) acid mixtures, hydrochloric (muriatic) acid solutions, inhibited, sodium chlorite solutions (not exceeding 42 percent sodium chlorite), and cleaning compounds, liquid, containing hydrochloric (muriatic) acid.

(a) * * *

(10) Specfication MC 310, MC 311, or MC 312 (§ 178.343 of this chapter). Tank motor vehicle lined with rubber or equally acid-resistant material of equivalent strength and durability. An unlined specification MC 311 or MC 312 tank motor vehicle made from Type 304L or 316 stainless steel is authorized for sodium chlorite solutions not exceeding 42 percent sodium chlorite only.

* * * * *

(27) Specification 12R (§ 178.212 of this chapter). Paper-faced expanded polystyrene board box with not more than six inside glass bottles or specification 2E (§ 178.24a of this chapter) inside polyethylene bottles, not over 5 pint capacity each.

* * * * *

(29) Specification 12R (§ 178.212 of this chapter). Paper-faced expanded polystyrene board box with not more than four specification 2E (§ 178.24a of this chapter) inside polyethylene bottles, not over 1-gallon capacity each.

* * * * *

(G) Section 173.287 is amended to read as follows:

§ 173.287 Chromic acid solution.

(a) For the purposes of the regulations in this part, a chromic acid solution is a solution of chromic acid (chromium trioxide) in water, with or without other acids, containing 35 percent or more of chromic acid by weight. (For solutions containing less than 35 percent chromic acid, see paragraph (c) of this section.) Packagings authorized must be of a design and be constructed of materials that will not react dangerously with or be decomposed by the chemical solution packaged therein.

(b) Chromic acid solutions must be packaged in specification containers as follows:

(1) Specification 1A (§ 178.1 of this chapter). Glass carboy in a box.

(2) Specifications 5, 5A, 5B (§§ 178.80, 178.81, 178.82 of this chapter). Metal barrel or drum with openings not exceeding 2.3 inches in diameter. Authorized for solutions containing chromic acid only.

(3) Specification 17E (§ 178.116 of this chapter) steel drum. Authorized for solutions containing chromic acid only.

(4) Specification 12A or 12B (§§ 178.210, 178.205 of this chapter). Fiberboard box with one inside glass container not over 4 fluid ounces capacity, packed in a wax-lined cylindrical fiber carton with metal ends. The bottle closure must consist of a tightly secured, fitted, ground glass stopper. Space must remain between the bottle and the inner surface of the fiber cylinder and must be filled with closely packed asbestos in sufficient quantity to completely absorb the contents of the bottle in the event of breakage. Not authorized for solutions containing nitric acid.

(5) Specification 12R (§ 178.212 of this chapter). Paper-faced expanded polystyrene board box with inside glass bottles not over 5 pints capacity each. Not more than six 5-pint bottles may be packaged in one box. Each bottle must be well cushioned. Partitioning and cushioning must be provided to prevent bottles from shifting, or coming in contact with each other, the box wall, or the bottom. Each bottle closure must consist of a tightly secured, fitted, ground glass stopper, or a threaded-type, acid-resistant cap with a gasket or lining impervious to the acid, sufficiently resilient or cushioned to give an acidproof, leakproof closure.

(6) Specification 33A (§ 178.150 of this chapter). Polystyrene case (nonreusable container) with inside glass bottles not over 5 pints capacity each. Not more than four 5-pint bottles may be packaged in one outside container. Each bottle closure must consist of a tightly secured, fitted, ground glass stopper, or a threaded-type, acid-resistant cap with a gasket or lining impervious to the acid, sufficiently resilient or cushioned to give an acidproof, leakproof closure.

(7) Specification 29 (§ 178.226 of this chapter). Mailing tube with glass bottles not over 1 ounce capacity each. Each bottle must be well cushioned. Partitioning and cushioning must be provided to prevent bottles from shifting or coming in contact with each other or the tube wall, bottom, or top.

(c) Solutions containing chromic acid in water in concentration not exceeding 35 percent by weight, with or without other acids, and which are not otherwise regulated by Subpart E of this part, must be described as "Corrosive liquids, n.o.s." In addition to the packaging and the limitations prescribed therefor in paragraph (b) of this section, solutions of this composition may also be packaged as follows:

(1) In packaging as prescribed in § 173.245, except (a) (4), (14), (15), (18), (19), and (24).

(2) Specification 21P (§ 178.225 of this chapter). Fiber drum overpack with inside specification 2S or 2SL (§§ 178.35, 178.35a of this chapter) polyethylene container.

(3) Specifications 5, 5A, 5B (§§ 178.80, 178.81, 178.82 of this chapter). Metal barrel or drum with openings not exceeding 2.3 inches in diameter. Authorized for solutions containing chromic acid only.

(4) Specification 17E (§ 178.116 of this chapter) steel drum. Authorized for solutions containing chromic acid only.

(H) In § 173.304, paragraph (e)(1) is amended to read as follows:

§ 173.304 Charging of cylinders with liquefied compressed gas.

* * * * *

(e) * * *

(1) Specifications 2P and 2Q (§§178.33, 178.33a of this chapter). Inside metal containers packed in a strong wooden or fiberboard box of such design as to protect valves from injury or accidental functioning under conditions incident to transportation. Pressure in the container must not exceed 85 pounds per square inch absolute at 70° F. Each completed metal container filled for shipment must be heated until content reaches a minimum temperature of 130° F. without evidence of leakage, distortion, or other defect. Each outside shipping container must be plainly marked "Inside Containers Comply With Prescribed Specification."

* * * * *

(I) In § 173.357, paragraph (b)(1) is amended; Note 1 thereto is canceled as follows:

§ 173.357 Chlorpicrin and chlorpicrin mixtures containing no compressed gas or poisonous liquid, class A.

* * * * *

(b) * * *

(1) Specification 3A, 3AA, 3B, 3C, 3D, 3E, 4A, 4B, 4BA, 4BW, or 4C (§§ 178.36, 178.37, 178.38, 178.40, 178.41 178.42, 178.49, 178.50, 178.51, 178.61, 178.52 of this chapter). Metal cylinder. Valves or other closing devices must be protected by screw-on metal caps, or by packaging the cylinders in boxes or crates, to protect the valves from damage during transportation. A cylinder closed by means of a solid plug may have the closure protected by a metal collar. Cylinders having a wall thickness of less than 0.08 inch must be packaged in boxes or crates. Each cylinder having a water capacity over 275 pounds must have a minimum design pressure of 225 p.s.i.g., unless the specification requires a higher minimum design pressure. [Note 1: Canceled]

PART 178—SHIPPING CONTAINER SPECIFICATIONS

In § 178.57–11, paragraph (a) is amended; in § 178.57–16, paragraph (a) is amended; in § 178.57–21, paragraph (a), Table 1 and Note 1 are amended; footnotes 1 and 3 are canceled, footnote 2 is redesignated footnote 1 as follows:

§ 178.57 Specification 4L; welded cylinders insulated.

§ 178.57–11 Heat treatment.

Not permitted.

* * * * *

§ 178.57–16 Acceptable results for physical tests.

Physical properties must meet the limits specified in § 178.57–21(a), Table 1, for the particular steel in the annealed condition. The specimens must show at least 20 percent elongation for 2-inch gage length except that the percentage may be reduced numerically by 2 for each 7,500 pounds per square inch increment of tensile strength above 100,000 pounds per square inch to a maximum of 5 such increments. Yield strength and tensile strength must meet the requirements of § 178.57–21(a), Table 1.

* * * * *

§ 178.57–21 Authorized steels.

(a) Electric furnace steel of uniform quality. Chemical analysis must conform to ASTM A–240, Type 304 Stainless Steel. The following chemical analyses and physical properties are authorized:

TABLE 1—AUTHORIZED MATERIALS

Designation	*Chemical analysis, limits in percent, stainless steel; type 304*
Carbon[1]	0.08 maximum.
Manganese	2.00 maximum.
Phosphorus	0.045 maximum.
Sulphur	0.030 maximum.
Silicon	1.00 maximum.
Nickel	8.00–10.50.

TABLE 1—AUTHORIZED MATERIALS—Continued

Designation	Chemical analysis limits in percent, stainless steel type 304
Chromium	18.00–20.00.
Molybdenum	
Titanium	
Columbium	
	Physical properties (annealed)
Tensile strength, p.s.i. (minimum)	75,000.
Yield strength, p.s.i. (minimum)	30,000.
Elongation in 2-inch (minimum) (percent)	30.0.
Elongation other permissible gage lengths (percent)	15.0.

[1] The carbon analysis must be reported to the nearest hundredth of 1 percent.

NOTE 1: A heat of steel made under the above specifications is acceptable, even though its check chemical analysis is slightly out of the specified range, if it is satisfactory in all other respects, provided the tolerances shown in the following table are not exceeded except as approved by the Department.

CHECK ANALYSIS TOLERANCES

Elements	Limit or maximum of specified range, percent	Tolerance over the maximum limit or under the minimum limit
Carbon	To 0.030, inclusive	0.005
	Over 0.030 to 0.20, inclusive.	0.01
Manganese	To 1.00, inclusive	0.03
	Over 1.00 to 3.00, inclusive.	0.04
Phosphorus [1]	To 0.040, inclusive	0.005
	Over 0.040 to 0.20, inclusive.	0.010
Sulfur	To 0.040, inclusive	0.005
Silicon	To 1.00, inclusive	0.05
Chromium	Over 15.00 to 20.00, inclusive.	0.20
Nickel	Over 5.00 to 10.00, inclusive.	0.10
	Over 10.00 to 20.00, inclusive.	0.15

[1] Rephosphorized steels not subject to check analysis phosphorus.

This amendment is effective December 31, 1971, however, compliance with the regulations, as amended herein, is authorized immediately.

This amendment is made under the authority of sections 831–835 of title 18, United States Code, section 9 of the Department of Transportation Act (49 U.S.C. 1657), and title VI and section 902(h) of the Federal Aviation Act of 1958 (U.S.C. 1421–1430 and 1472(h)).

Issued in Washington, D.C. on October 29, 1971.

W. F. REA III,
Rear Admiral, Board Member for the U.S. Coast Guard.

MAE E. ROGERS,
Board Member for the Federal Railroad Administration.

ROBERT A. KAYE,
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