

(iii) 0.5 kg (1.1 pounds) in the case of Division 2.2 gases. Division 2.2 gases with subsidiary risks and refrigerated liquefied gases are not authorized;

(iv) A total quantity of not more than the aggregate of that permitted in paragraphs (c)(2)(i) through (iii) of this section, for each category of material in the package, when a package contains hazardous materials in two or more of the categories in paragraphs (c)(2)(i) through (iii) of this section; and

(d) Except for transportation by aircraft, when a package contains hazardous materials in two or more of the categories listed in paragraph (c)(1) of this section the total quantity required by § 172.202(c) of this subchapter to be entered on the shipping paper must be either the aggregate quantity, or the estimated quantity, of all hazardous materials, expressed as net mass.

[87 FR 44995, July 26, 2022]

§ 173.223 Packagings for certain flammable solids.

(a) Packagings for “Musk xylene,” “5-tert-Butyl-2,4,6-trinitro-m-xylene,” “Azodicarbonamide,” or “Isosorbide-5-mononitrate,” when offered for transportation or transported by rail, highway, or vessel, must conform to the general packaging requirements of subpart B of part 173, and to the requirements of part 178 of this subchapter at the Packing Group III performance level and may only be transported in the following packagings:

(1) Fiberboard box (4G) with a single inner plastic bag, and a maximum net mass of not more than 50 kg (110 lbs).

(2) Fiberboard box (4G) or fiber drum (1G), with a plastic inner packaging not exceeding 5 kg (11 lbs), and a maximum net mass of not more than 25 kg (55 lbs).

(3) Fiber drum (1G), and a maximum net mass of not more than 50 kg (110 lbs), that may be fitted with a coating or lining.

(b) [Reserved]

[Doc. No. 2002–13658, 68 FR 45035, July 31, 2003; 75 FR 5394, Feb. 2, 2010]

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

(a) *General.* When the § 172.101 table of this subchapter specifies that a Division 4.1 material be packaged in accordance with this section, only packagings which conform to the provisions of this section may be used. Each packaging must conform to the general packaging requirements of subpart B of this part and the applicable requirements of part 178 of this subchapter. Non-bulk packagings must meet Packing Group II performance levels. To avoid unnecessary confinement, metallic non-bulk packagings meeting Packing Group I are not authorized. Self-reactive materials which require temperature control are subject to the provisions of § 173.21(f). Packagings required to bear a Class 1 subsidiary label must conform to §§ 173.60 through 173.62.

(b) *Self-Reactive Materials Table.* The Self-Reactive Materials Table specifies, by technical name, those self-reactive materials that are authorized for transportation and not subject to the approval provisions of § 173.124(a)(2)(iii). A self-reactive material identified by technical name in the following table is authorized for transportation only if it conforms to all applicable provisions of the table. The column headings of the Self-Reactive Materials Table are as follows:

(1) *Technical name.* Column 1 specifies the technical name.

(2) *ID number.* Column 2 specifies the identification number which is used to identify the proper shipping name in the § 172.101 table.

(3) *Concentration of self-reactive material.* Column 3 specifies the concentration (percent) limitations, if any, in mixtures or solutions for the self-reactive material. Limitations are given as minimums, maximums, or a range, as appropriate. A range includes the lower and upper limits (i.e., “53–100” means from, and including, 53 percent to, and including 100 percent).

(4) *Packing method.* Column 4 specifies the highest packing method which is authorized for the self-reactive material. A packing method corresponding to a smaller package size may be used, but a packing method corresponding to

a larger package size may not be used. The Table of Packing Methods in §173.225(d) defines the packing methods. Bulk packagings for Type F self-reactive substances are authorized by §173.225(f) for IBCs and §173.225(h) for bulk packagings other than IBCs. The formulations listed in §173.225(f) for IBCs and in §173.225(g) for portable tanks may also be transported packed in accordance with packing method OP8, with the same control and emergency temperatures, if applicable. Additional bulk packagings are author-

ized if approved by the Associate Administrator.

(5) *Control temperature.* Column 5 specifies the control temperature in °C. Temperatures are specified only when temperature controls are required (see §173.21(f)).

(6) *Emergency temperature.* Column 6 specifies the emergency temperature in °C. Temperatures are specified only when temperature controls are required (see §173.21(f)).

(7) *Notes.* Column 7 specifies other applicable provisions, as set forth in notes following the table.

SELF-REACTIVE MATERIALS TABLE

Self-reactive substance (1)	Identification No. (2)	Concentration (%) (3)	Packing method (4)	Control temperature (°C) (5)	Emergency temperature (6)	Notes (7)
Acetone-pyrogallol copolymer 2-diazo-1-naphthol-5-sulphonate.	3228	100	OP8	.		
Azodicarbonamide formulation type B, temperature controlled.	3232	<100	OP5	.....	.....	1
Azodicarbonamide formulation type C	3224	<100	OP6	.		
Azodicarbonamide formulation type C, temperature controlled.	3234	<100	OP6	.....	.....	1
Azodicarbonamide formulation type D	3226	<100	OP7	.		
Azodicarbonamide formulation type D, temperature controlled.	3236	<100	OP7	.....	.....	1
2,2'-Azodi(2,4-dimethyl-4-methoxyvaleronitrile)	3236	100	OP7	-5	+5.	
2,2'-Azodi(2,4-dimethylvaleronitrile)	3236	100	OP7	+10	+15.	
2,2'-Azodi(ethyl 2-methylpropionate)	3235	100	OP7	+20	+25.	
1,1-Azodi(hexahydrobenzonitrile)	3226	100	OP7	.		
2,2-Azodi(isobutyronitrile)	3234	100	OP6	+40	+45.	
2,2'-Azodi(isobutyronitrile) as a water based paste.	3224	≤50	OP6	.		
2,2-Azodi(2-methylbutyronitrile)	3236	100	OP7	+35	+40.	
Benzene-1,3-disulphonylhydrazide, as a paste	3226	52	OP7	.		
Benzene sulphonylhydrazide	3226	100	OP7	.		
4-(Benzyl(ethyl)amino)-3-ethoxybenzenediazonium zinc chloride.	3226	100	OP7	.		
4-(Benzyl(methyl)amino)-3-ethoxybenzenediazonium zinc chloride.	3236	100	OP7	+40	+45.	
3-Chloro-4-diethylaminobenzenediazonium zinc chloride.	3226	100	OP7	.		
2-Diazo-1-Naphthol sulphonic acid ester mixture.	3226	<100	OP7	.....	.....	4
2-Diazo-1-Naphthol-4-sulphonyl chloride	3222	100	OP5	.		
2-Diazo-1-Naphthol-5-sulphonyl chloride	3222	100	OP5	.		
2,5-Dibutoxy-4-(4-morpholinyl)-Benzenediazonium, tetrachlorozincate (2:1).	3228	100	OP8	.		
2,5-Diethoxy-4-morpholinobenzenediazonium zinc chloride.	3236	67 – 100 ...	OP7	+35	+40.	
2,5-Diethoxy-4-morpholinobenzenediazonium zinc chloride.	3236	66	OP7	+40	+45.	
2,5-Diethoxy-4-morpholinobenzenediazonium tetrafluoroborate.	3236	100	OP7	+30	+35.	
2,5-Diethoxy-4-(phenylsulphonyl)benzenediazonium zinc chloride.	3236	67	OP7	+40	+45.	
2,5-Diethoxy-4-(4-morpholinyl)-benzenediazonium sulphate.	3226	100	OP7	.		
Diethylene glycol bis(allyl carbonate) + Diisopropylperoxydicarbonate.	3237	≥88 + ≤12	OP8	-10	0.	
2,5-Dimethoxy-4-(4-methylphenylsulphonyl)benzenediazonium zinc chloride.	3236	79	OP7	+40	+45.	

SELF-REACTIVE MATERIALS TABLE—Continued

Self-reactive substance	Identification No.	Concentration (%)	Packing method	Control temperature (°C)	Emergency temperature	Notes
(1)	(2)	(3)	(4)	(5)	(6)	(7)
4-Dimethylamino-6-(2-dimethylaminoethoxy)toluene-2-diazonium zinc chloride.	3236	100	OP7	+40	+45.	2
4-(Dimethylamino)-benzenediazonium trichlorozincate (-1).	3228	100	OP8	.	.	
N,N'-Dinitroso-N, N'-dimethyl-terephthalamide, as a paste.	3224	72	OP6	.	.	
N,N'-Dinitrosopentamethylenetetramine	3224	82	OP6	.....	.....
Diphenyloxide-4,4'-disulphonyldiazide	3226	100	OP7	.	.	
Diphenyloxide-4,4'-disulphonyldiazide	3226	100	OP7	.	.	
4-Dipropylaminobenzenediazonium zinc chloride.	3226	100	OP7	.	.	
2-(N,N-Ethoxycarbonylphenylamino)-3-methoxy-4-(N-methyl-N-cyclohexylamino)benzenediazonium zinc chloride.	3236	63–92	OP7	+40	+45.	
2-(N,N-Ethoxycarbonylphenylamino)-3-methoxy-4-(N-methyl-N-cyclohexylamino)benzenediazonium zinc chloride.	3236	62	OP7	+35	+40.	5
N-Formyl-2-(nitromethylene)-1,3-perhydrothiazine.	3236	100	OP7	+45	+50.	
2-(2-Hydroxyethoxy)-1-(pyrrolidin-1-yl)benzene-4-diazonium zinc chloride.	3236	100	OP7	+45	+50.	
3-(2-Hydroxyethoxy)-4-(pyrrolidin-1-yl)benzenediazonium zinc chloride.	3236	100	OP7	+40	+45.	
2-(N,N-Methylaminoethylcarbonyl)-4-(3,4-dimethyl-phenylsulphonyl)benzene diazonium zinc chloride.	3236	96	OP7	+45	+50.	
4-Methylbenzenesulphonyldiazide	3226	100	OP7	.	.	
3-Methyl-4-(pyrrolidin-1-yl)benzenediazonium tetrafluoroborate.	3234	95	OP6	+45	+50.	
4-Nitrosophenol	3236	100	OP7	+35	+40.	
Phosphorothioic acid, O-[(cyanophenyl methylene) azanyl] O,O-diethyl ester.	3227	82–91	OP8	.....	.....
Self-reactive liquid, sample	3223	.....	OP2	.....	.....
Self-reactive liquid, sample, temperature control.	3233	.....	OP2	.....	.....
Self-reactive solid, sample	3224	.....	OP2	.....	.....
Self-reactive solid, sample, temperature control	3234	.....	OP2	.....	.....
Sodium 2-diazo-1-naphthol-4-sulphonate	3226	100	OP7	.	.	
Sodium 2-diazo-1-naphthol-5-sulphonate	3226	100	OP7	.	.	
Tetramine palladium (II) nitrate	3234	100	OP6	+30	+35.	

Notes:

1. The emergency and control temperatures must be determined in accordance with § 173.21(f).
2. With a compatible diluent having a boiling point of not less than 150 °C.
3. Samples may only be offered for transportation under the provisions of paragraph (c)(3) of this section.
4. This entry applies to mixtures of esters of 2-diazo-1-naphthol-4-sulphonic acid and 2-diazo-1-naphthol-5-sulphonic acid.
5. This entry applies to the technical mixture in n-butanol within the specified concentration limits of the (Z) isomer.

(c) *New self-reactive materials, formulations and samples.* (1) Except as provided for samples in paragraph (c)(3) or (4) of this section, no person may offer, accept for transportation, or transport a self-reactive material which is not identified by technical name in the Self-Reactive Materials Table of this section, or a formulation of one or more self-reactive materials which are identified by technical name in the table, unless the self-reactive material is assigned a generic type and shipping

description and is approved by the Associate Administrator under the provisions of § 173.124(a)(2)(iii).

(2) Except as provided by an approval issued under § 173.124(a)(2)(iii), intermediate bulk and bulk packagings are not authorized.

(3) Samples of new self-reactive materials or new formulations of self-reactive materials identified in the Self-Reactive Materials Table in paragraph (b) of this section, for which complete test data are not available, and which

are to be transported for further testing or product evaluation, may be assigned an appropriate shipping description for Self-reactive materials Type C, packaged and offered for transportation under the following conditions:

(i) Data available to the person offering the material for transportation must indicate that the sample would pose a level of hazard no greater than that of a self-reactive material Type B and that the control temperature, if any, is sufficiently low to prevent any dangerous decomposition and sufficiently high to prevent any dangerous phase separation;

(ii) The sample must be packaged in accordance with packing method OP2;

(iii) Packages of the self-reactive material may be offered for transportation and transported in a quantity not to exceed 10 kg (22 pounds) per transport vehicle; and

(iv) One of the following shipping descriptions must be assigned:

(A) Self-reactive, liquid, type C, 4.1, UN 3223.

(B) Self-reactive, solid, type C, 4.1, UN 3224.

(C) Self-reactive, liquid, type C, temperature controlled, 4.1, UN 3233.

(D) Self-reactive, solid, type C, temperature controlled, 4.1, UN 3234.

(4) Samples of organic substances carrying functional groups listed in tables A6.1 and/or A6.2 in Annex 6 (Screening Procedures) of the UN Manual of Tests and Criteria (IBR, see § 171.7 of this subchapter) may be transported under UN 3224 or UN 3223, as applicable, of Division 4.1 provided that:

(i) The samples do not contain any:

(A) Known explosives;

(B) Substances showing explosive effects in testing;

(C) Compounds designed with the view of producing a practical explosive or pyrotechnic effect;

(D) Components consisting of synthetic precursors of intentional explosives;

(ii) For mixtures, complexes or salts of inorganic oxidizing substances of Division 5.1 with organic material(s), the concentration of the inorganic oxidizing substance is:

(A) Less than 15 percent, by mass, if assigned to Packing Group I or II; or

(B) Less than 30 percent, by mass, if assigned to Packing Group III;

(iii) Available data does not allow a more precise classification;

(iv) The sample is not packed together with other goods;

(v) Must be packaged as follows:

(A) The quantity per individual inner cavity does not exceed 0.01 g for solids or 0.01 mL for liquids and the maximum net quantity per outer packaging does not exceed 20 g for solids or 20 mL for liquids, or in the case of mixed packing the sum of grams and mL does not exceed 20:

(1) The samples are carried in microtiter plates or multi-titer plates made of plastics, glass, porcelain or stoneware as an inner packaging;

(2) only combination packaging with outer packaging comprising boxes (4A, 4B, 4N, 4C1, 4C2, 4D, 4F, 4G, 4H1 and 4H2) are permitted; or

(B) The maximum content of each inner packaging does not exceed 1 g for solids or 1 mL for liquids and the maximum net quantity per outer packaging does not exceed 56 g for solids or 56 mL for liquids, or in the case of mixed packing the sum of grams and mL does not exceed 56:

(1) The individual substance is contained in an inner packaging of glass or plastics of maximum capacity of 30 mL placed in an expandable polyethylene foam matrix of at least 130 mm thickness having a density of 18 ± 1 g/L;

(2) Within the foam carrier, inner packagings are segregated from each other by a minimum distance of 40 mm and from the wall of the outer packaging by a minimum distance of 70 mm. The package may contain up to two layers of such foam matrices, each carrying up to twenty-eight inner packagings;

(3) The outer packaging consists only of corrugated fiberboard boxes (4G) having minimum dimensions of 60 cm (length) by 40.5 cm (width) by 30 cm (height) and minimum wall thickness of 1.3 cm.

(vi) When dry ice or liquid nitrogen is optionally used as a coolant for quality control measures, all applicable requirements of this subchapter must be met. Interior supports must be provided to secure the inner packagings in the original position after the ice or

dry ice has dissipated. If ice is used, the outside packaging or overpack must be leakproof. If dry ice is used, the requirements in §173.217 must be met. The inner and outer packagings must maintain their integrity at the temperature of the refrigerant used as well as the temperatures and the pressures which could result if refrigeration were lost.

[Amdt. 173–241, 59 FR 67511, Dec. 29, 1994]

EDITORIAL NOTE: For FEDERAL REGISTER citations affecting §173.224, see the List of CFR Sections Affected, which appears in the Finding Aids section of the printed volume and at www.govinfo.gov.

§ 173.225 Packaging requirements and other provisions for organic peroxides.

(a) *General.* When the §172.101 table specifies that an organic peroxide must be packaged under this section, the organic peroxide must be packaged and offered for transportation in accordance with the provisions of this section. Each packaging must conform to the general requirements of subpart B of part 173 and to the applicable requirements of part 178 of this subchapter. Non-bulk packagings must meet Packing Group II performance levels. To avoid unnecessary confinement, metallic non-bulk packagings meeting Packing Group I are not authorized. No used material, other than production residues or regrind from the same production process, may be used in plastic packagings. Organic peroxides that require temperature control are subject to the provisions of §173.21(f). When an IBC or bulk packaging is authorized and meets the requirements of paragraph (f) or (h) of this section, respectively, lower control temperatures than those specified for non-bulk packaging may be required. An organic peroxide not identified in paragraph (c), (e), or (g) of this section by technical name, or not assigned to a generic type in accordance with the provisions in paragraph (b)(3) of this section, must conform to the provisions of paragraph (c) of §173.128.

(b) *New organic peroxides, formulations and samples.* (1) Except as provided for samples in paragraph (b)(2) of this section, no person may offer for transportation an organic peroxide that is not

identified by technical name in the Organic Peroxides Table, Organic Peroxide IBC Table, or the Organic Peroxide Portable Tank Table of this section, or a formulation of one or more organic peroxides that are identified by technical name in one of those tables, unless the organic peroxide is assigned a generic type and shipping description and is approved by the Associate Administrator under the provisions of §173.128(d) of this subchapter.

(2) *Samples.* Samples of new organic peroxides or new formulations of organic peroxides identified in the Organic Peroxides Table in paragraph (c) of this section, for which complete test data are not available, and that are to be transported for further testing or product evaluation, may be assigned an appropriate shipping description for organic peroxide Type C, packaged and offered for transportation, under the following conditions:

(i) Data available to the person offering the material for transportation must indicate that the sample would pose a level of hazard no greater than that of an organic peroxide Type B and that the control temperature, if any, is sufficiently low to prevent any dangerous decomposition and sufficiently high to prevent any dangerous phase separation;

(ii) The sample must be packaged in accordance with packing method OP2, for a liquid or solid, respectively;

(iii) Packages of the organic peroxide may be offered for transportation and transported in a quantity not to exceed 10 kg (22 pounds) per transport vehicle; and

(iv) One of the following shipping descriptions must be assigned:

(A) Organic peroxide Type C, liquid, 5.2, UN 3103;

(B) Organic peroxide Type C, solid, 5.2, UN 3104;

(C) Organic peroxide Type C, liquid, temperature controlled, 5.2, UN 3113; or

(D) Organic peroxide Type C, solid, temperature controlled, 5.2, UN 3114.

(3) *Mixtures.* Mixtures of organic peroxides individually identified in the Organic Peroxides Table in paragraph (c) of this section may be classified as the same type of organic peroxide as that of the most dangerous component and be transported under the conditions for