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Subpart D—General Segregation Requirements

§ 176.80 Applicability.

(a) This subpart sets forth segregation requirements in addition to any segregation requirements set forth elsewhere in this subchapter.

(b) Hazardous materials in limited quantities when loaded in transport vehicles and freight containers, are excepted from the segregation requirements of this subpart and any additional segregation specified in this subchapter for transportation by vessel.

[Amdt. 176–1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176–3, 42 FR 57967, Nov. 7, 1977]

§ 176.83 Segregation.

(a) *General.* (1) The requirements of this section apply to all cargo spaces on deck or under deck of all types of vessels, and to all cargo transport units.

(2) Segregation is obtained by maintaining certain distances between incompatible hazardous materials or by requiring the presence of one or more steel bulkheads or decks between them or a combination thereof. Intervening spaces between such hazardous materials may be filled with other cargo which is not incompatible with the hazardous materials.

(3) The general requirements for segregation between the various classes of dangerous goods are shown in the segregation table. In addition to these general requirements, there may be a need to segregate a particular material from other materials which would contribute to its hazard. Such segregation requirements are indicated by code numbers in Column 10B of the § 172.101 Table.

(4) Segregation is not required:

(i) Between hazardous materials of different classes which comprise the same substance but vary only in their water content (for example, sodium sulfide in Division 4.2 or Class 8) or quantity for Class 7 materials; or

(ii) Between hazardous materials of different classes which comprise a group of substances that do not react dangerously with each other. The following materials are grouped by compatibility:

(A) Hydrogen peroxide, aqueous solutions *with not less than 8 percent but less than 20 percent hydrogen peroxide (stabilized as necessary)*; Hydrogen peroxide, aqueous solutions *with not less than 20 percent but not more than 40 percent hydrogen peroxide;* Hydrogen peroxide, aqueous solutions *with more than 40 percent but not more than 60 percent hydrogen peroxide;* Hydrogen peroxide and peroxyacetic acid mixtures, stabilized *with acids, water and not more than 5 percent peroxyacetic acid;* Organic peroxide type D, liquid; Organic peroxide type E, liquid; Organic peroxide type F, liquid; and

(B) Dichlorosilane, Silicon tetrachloride, and Trichlorosilane.

(5) Whenever hazardous materials are stowed together, whether or not in a cargo transport unit, the segregation of such hazardous materials from others must always be in accordance with the most restrictive requirements for any of the hazardous materials concerned.

(6) When the § 172.101 Table or § 172.402 requires packages to bear a subsidiary hazard label or labels, the segregation appropriate to the subsidiary hazards must be applied when that segregation is more restrictive than that required by the primary hazard. For the purposes of this paragraph, the segregation requirements corresponding to an explosive subsidiary hazard are—except for organic peroxides which are those corresponding to Division 1.3—those for Division 1.4 (explosive) materials.

(7) Where, for the purposes of segregation, terms such as ''away from'' a particular hazard class are used in the § 172.101 Table, the segregation requirement applies to:

(i) All hazardous materials within the hazard class; and

(ii) All hazardous materials for which a secondary hazard label of that class is required.

(8) Notwithstanding the requirements of paragraphs (a)(6) and (a)(7) of this section, hazardous materials of the same class may be stowed together without regard to segregation required by secondary hazards (subsidiary risk label(s)), provided the substances do

not react dangerously with each other and cause:

(i) Combustion and/or evolution of considerable heat;

(ii) Evolution of flammable, toxic or asphyxiant gases;

(iii) The formation of corrosive substances; or

(iv) The formation of unstable substances.

(9) Stowage in a shelter-'tween deck cargo space is not considered to be ''on deck'' stowage.

(10) Where the code in column (10B) of the §172.101 Table specifies that ''Segregation as for. . .'' applies, the segregation requirements applicable to that class in the §176.83(b) General Segregation Table must be applied. However, for the purposes of paragraph (a)(8) of this section, which permits substances of the same class to be stowed together provided they do not react dangerously with each other, the segregation requirements of the class as represented by the primary hazard class in the §172.101 Table entry must be applied.

(11) Certain exceptions from segregation for waste cyanides or waste cyanide mixtures or solutions transported with acids; waste Division 4.2 materials transported with Class 8 liquids; and waste Division 6.1 Packing Group I, Hazard Zone A material transported with waste Class 3 material, Class 8 liquids, and Division 4.1, 4.2, 4.3, 5.1 or 5.2 material are set forth in §173.12(e) of this subchapter.

(b) *General Segregation Table.* The following table sets forth the general requirements for segregation between the various classes (divisions) of hazardous materials. Certain divisions are listed as separate hazard classes for the purpose of this table (*e.g.*, ''2.1'' and ''2.2''). The properties of materials within each class may vary greatly and may require greater segregation than is reflected in this table. If the §172.101 Table sets forth particular requirements for segregation, they take precedence over these general requirements.

TABLE 176.83(b)—GENERAL SEGREGATION REQUIREMENTS FOR HAZARDOUS MATERIALS

[Segregation must also take account of a single secondary hazard label, as required by paragraph (a)(6) of this section.]

Class	1.1 1.2 1.5	1.3	1.4 1.6	2.1	2.2	2.3	3	4.1	4.2	4.3	5.1	5.2	6.1	6.2	7	8	9
Explosives, 1.1, 1.2, 1.5	(*)	(*)	(*)	4	2	2	4	4	4	4	4	4	2	4	2	4	X
Explosives, 1.3	(*)	(*)	(*)	4	2	2	4	3	3	4	4	4	2	4	2	2	X
Explosives, 1.4, 1.6	(*)	(*)	(*)	2	1	1	2	2	2	2	2	2	X	4	2	2	X
Flammable gases 2.1	4	4	2	X	X	X	2	1	2	X	2	2	X	4	2	1	X
Non-toxic, non-flammable gases 2.2	2	2	1	X	X	X	1	X	1	X	X	1	X	2	1	X	X
Poisonous gases 2.3	2	2	1	X	X	X	2	X	2	X	X	2	X	2	1	X	X
Flammable liquids 3	4	4	2	2	1	2	X	X	2	1	2	2	X	3	2	X	X
Flammable solids 4.1	4	3	2	1	X	X	X	X	1	X	1	2	X	3	2	1	X
Spontaneously combustible substances 4.2	4	3	2	2	1	2	2	1	X	1	2	2	1	3	2	1	X
Substances which are dangerous when wet 4.3	4	4	2	X	X	X	1	X	1	X	2	2	X	2	2	1	X
Oxidizing substances 5.1	4	4	2	2	X	X	2	1	2	2	X	2	1	3	1	2	X
Organic peroxides 5.2	4	4	2	2	1	2	2	2	2	2	2	X	1	3	2	2	X
Poisons 6.1	2	2	X	X	X	X	X	X	1	X	1	1	X	1	X	X	X
Infectious substances 6.2	4	4	4	4	2	2	3	3	3	2	3	3	1	X	3	3	X
Radioactive materials 7	2	2	2	2	1	1	2	2	2	2	1	2	X	3	X	2	X
Corrosives 8	4	2	2	1	X	X	X	1	1	1	2	2	X	3	2	X	X
Miscellaneous dangerous substances 9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Numbers and symbols relate to the following terms as defined in this section:
1—''Away from.''
2—''Separated from.''
3—''Separated by a complete compartment or hold from.''
4—''Separated longitudinally by an intervening complete compartment or hold from.''
X—The segregation, if any, is shown in the §172.101 table.
*—See §176.144 of this part for segregation within Class 1.

(c) *Segregation requirements for breakbulk cargo.* (1) The requirements of this paragraph apply to the segregation of packages containing hazardous materials and stowed as breakbulk cargo;

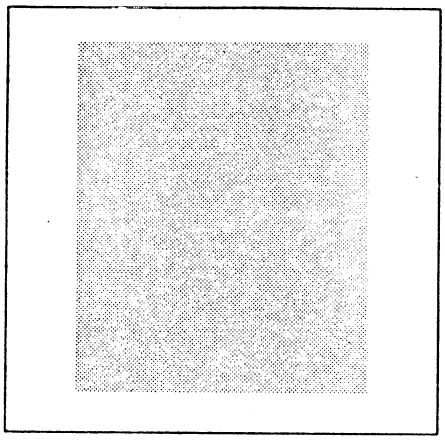
(2) Definition of the segregation terms:

(i) Legend:

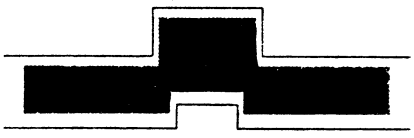
(A) Package containing incompatible goods.



(B) Reference package.

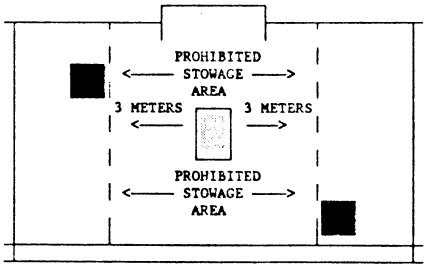


(C) Deck resistant to fire and liquid.

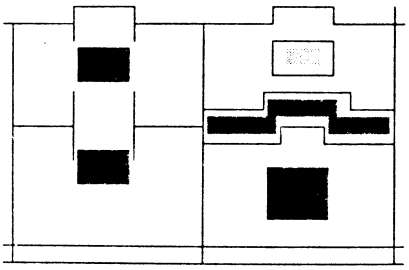


NOTE: Full vertical lines represent transverse bulkheads between compartments or holds resistant to fire and liquid.

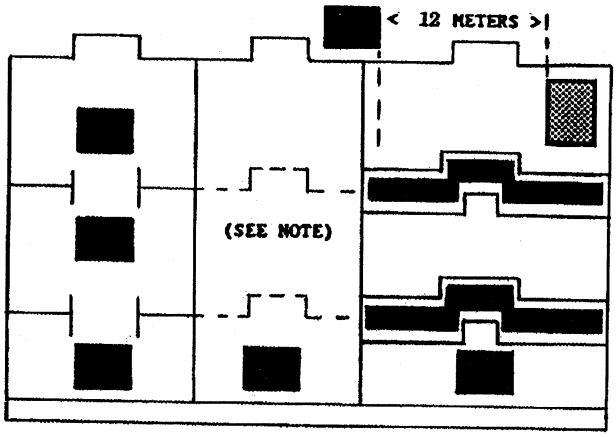
(ii) *''Away from'':* Effectively segregated so that the incompatible materials cannot interact dangerously in the event of an accident but may be carried in the same compartment or hold or on deck provided a minimum horizontal separation of 3 m (10 feet) projected vertically is obtained.



(iii) *''Separated From'':* In different compartments or holds when stowed under deck. If the intervening deck is resistant to fire and liquid, a vertical separation (i.e., in different compartments) is acceptable as equivalent to this segregation. For ''on deck'' stowage, this segregation means a separation by a distance of at least 6 m (20 feet) horizontally.

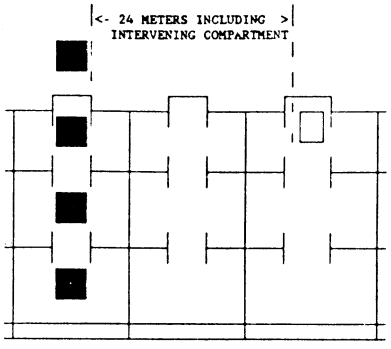


(iv) *''Separated by a complete compartment or hold from''*: Either a vertical or horizontal separation. If the intervening decks are not resistant to fire and liquid, then only a longitudinal separation (i.e., by an intervening complete compartment or hold) is acceptable. For ''on deck'' stowage, this segregation means a separation by a distance of at least 12 m (39 feet) horizontally. The same distance must be applied if one package is stowed ''on deck'', and the other one in an upper compartment.



NOTE: One of the two decks must be resistant to fire and liquid.

(v) ''*Separated longitudinally by an intervening complete compartment or hold from*'': Vertical separation alone does not meet this requirement. Between a package ''under deck'' and one ''on deck'' a minimum distance of 24 m (79 feet) including a complete compartment must be maintained longitudinally. For ''on deck'' stowage, this segregation means a separation by a distance of at least 24 m (79 feet) longitudinally.



(d) *Segregation in cargo transport units:* Two hazardous materials for which any segregation is required may not be stowed in the same cargo transport unit.

(e) *Segregation of hazardous materials stowed as breakbulk cargo from those packed in cargo transport units:* (1) Hazardous materials stowed as breakbulk cargo must be segregated from materials packed in open cargo transport units in accordance with paragraph (c) of this section.

(2) Hazardous materials stowed as breakbulk cargo must be segregated from materials packed in closed cargo transport units in accordance with paragraph (c) of this section, except that:

(i) Where ''away from'' is required, no segregation between packages and the closed cargo transport units is required; and

(ii) Where ''separated from'' is required, the segregation between the packages and the closed cargo transport units may be the same as for ''away from''.

(f) *Segregation of cargo transport units on board container vessels:* (1) Except for hatchless container ships, this paragraph applies to segregation of cargo transport units that are carried on board container vessels, or on other types of vessels, provided these cargo spaces are properly fitted for permanent stowage of containers during transport.

(2) For container vessels which have cargo spaces used for breakbulk cargo or any other method of stowage, the appropriate paragraph of this section applies to the relevant cargo space.

(3) *Segregation Table.* Table §176.83(f) sets forth the general requirements for segregation between cargo transport units on board container vessels.

(4) In table §176.83(f), a *container space* means a distance of not less than 6 m (20 feet) fore and aft or not less than 2.5 m (8 feet) athwartship.

TABLE 176.83(f)—SEGREGATION OF CONTAINERS ON BOARD CONTAINER SHIPS

Segregation requirement	Vertical			Horizontal						
	Closed versus closed	Closed versus open	Open versus open		Closed versus closed		Closed versus open		Open versus open	
					On deck	Under deck	On deck	Under deck	On deck	Under deck
1. "Away from"	One on top of the other permitted.	Open on top of closed permitted. Otherwise as for open versus open.	Not in the same vertical line unless segregated by a deck.	Fore and aft ...	No restriction	No restriction	No restriction	No restriction	One container space.	One container space or one bulkhead.
				Athwartships ..	No restriction	No restriction	No restriction	No restriction	One container space.	One container space.
2. "Separated from".	Not in the same vertical line unless segregated by a deck.	As for open versus open.	Not in the same vertical line unless segregated by a deck.	Fore and aft ...	One container space.	One container space or one bulkhead.	One container space.	One container space or one bulkhead.	One container space..	One bulkhead.
				Athwartships ..	One container space.	One container space.	One container space.	Two container spaces.	Two container spaces..	One bulkhead.
3. "Separated by a complete compartment or hold from".	Not in the same vertical line unless segregated by a deck.	As for open versus open.	Not in the same vertical line unless segregated by a deck.	Fore and aft ...	One container space.	One bulkhead	One container space.	One bulkhead	Two container spaces.	Two bulkheads.
				Athwartships ..	Two container spaces.	One bulkhead	Two container spaces.	One bulkhead	Three container spaces.	Two bulkheads.
4. "Separated longitudinally by an intervening complete compartment or hold from".	Prohibited	.....	.....	Fore and aft ...	Four container spaces.	One bulkhead and four container spaces*.	Four container spaces.	Two bulkheads.	Four container spaces.	Two bulkheads.
				Athwartships ..	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited.

*Containers not less than 6 m (20 feet) from intervening bulkhead.

NOTE: All bulkheads and decks must be resistant to fire and liquid.

(g) *Segregation of cargo transport units on board trailerships and trainships:* (1) The requirements of this paragraph apply to the segregation of cargo transport units which are carried on board trailerships and trainships or in ''roll-on/roll-off'' cargo spaces.

(2) For trailerships and trainships which have spaces suitable for breakbulk cargo, containers, or any other method of stowage, the appropriate paragraph of this section applies to the relevant cargo space.

(3) *Segregation Table.* Table §176.83(g) sets forth the general requirements for segregation between transport units on board trailerships and trainships.

TABLE 176.83(g)—SEGREGATION OF CARGO TRANSPORT UNITS ON BOARD TRAILERSHIPS AND TRAINSHIPS.

Segregation requirement		Closed versus closed		Closed versus open		Open versus open	
		On deck	Under deck	On deck	Under deck	On deck	Under deck
1. ''Away From''	Fore and aft	No restriction	No restriction	No restriction	No restriction	At least 3 m	At least 3 m.
	Athwartships	No restriction	No restriction	No restriction	No restriction	At least 3 m	At least 3 m.
2. ''Separated from''.	Fore and aft	At least 6 m	At least 6 m or one bulkhead.	At least 6 m	At least 6 m or one bulkhead.	At least 6 m	At least 12 m or one bulkhead
	Athwartships	At least 3 m	At least 3 m or one bulkhead.	At least 3 m	At least 6 m or one bulkhead.	At least 6 m	At least 12 m or one bulkhead
3. ''Separated by a complete compartment or hold from''.	Fore and aft	At least 12 m	At least 24 m + deck.	At least 24 m	At least 24 m + deck.	At least 36 m	Two decks or two bulkheads.
	Athwartships	At least 12 m	At least 24 m + deck.	At least 24 m	At least 24 m + deck.	At least 36 m	Prohibited.
4. ''Separated longitudinally by an intervening complete compartment or hold from''.	Fore and aft	At least 36 m	Two bulkheads or at least 36 m + two decks.	At least 36 m	At least 48 m including two bulkheads.	At least 48 m	Prohibited.
	Athwartships	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited.

NOTE: All bulkheads and decks must be resistant to fire and liquid.

(h) *Segregation on board barge carrying vessels:* (1) The requirements of this section apply to the segregation in shipborne barges as well as to the segregation between shipborne barges carried on board vessels specially designed and equipped to carry such barges.

(2) On barge-carrying vessels which incorporate other stowage spaces or any other method of stowage, barges containing hazardous materials must be segregated from hazardous materials not stowed in barges as prescribed in paragraphs (b) and (j) of this section.

(i) *Segregation in shipborne barges:* Hazardous materials transported in shipborne barges must be segregated as prescribed in paragraphs (a), (b), and (c) of this section.

(j) *Segregation between shipborne barges on barge-carrying vessels:* (1) When a shipborne barge is loaded with two or more hazardous materials with different requirements for segregation, the most stringent applicable segregation requirement must be applied.

(2) ''Away from'' and ''separated from'' require no segregation between shipborne barges.

(3) For barge-carrying vessels with vertical holds, ''Separated by a complete compartment or hold from'' means that separate holds are required. On barge-carrying vessels having horizontal barge levels, separate barge levels are required and the barges may not be in the same vertical line.

(4) ''Separated longitudinally by an intervening complete compartment or hold from'' means, for barge-carrying vessels with vertical holds, that separation by an intervening hold or engine room is required. On barge-carrying vessels having horizontal barge levels, separate barge levels and a longitudinal separation by at least two intervening barge spaces are required.

(k) *Segregation requirements for ferry vessels:* A ferry vessel (when operating either as a passenger or cargo vessel) that cannot provide the separation required in this section may carry incompatible hazardous materials in separate transport vehicles if they are stowed to give the maximum possible separation.

(l) *Segregation of containers on board hatchless (open-top) container ships:* (1) This paragraph applies to the segregation of cargo transport units that are transported on board hatchless container ships provided that the cargo spaces are properly fitted to give permanent stowage of the cargo transport units during transport.

(2) For container ships that have both hatchless container spaces and other spaces suitable for breakbulk cargo, conventional container stowage, or any other method of stowage, the appropriate requirements of this section apply to the relevant cargo space.

(3) *Segregation Table.* Table §176.83(l)(3) sets forth the general requirements for segregation of cargo transport units on board hatchless container ships.

(4) In Table §176.83(l)(3), a container space means a distance of not less than 6 m (20 feet) fore and aft or not less than 2.5 m (8 feet) athwartship.

TABLE § 176.83(L)(3)—SEGREGATION OF CARGO TRANSPORT UNITS ON BOARD HATCHLESS CONTAINER SHIPS

Segregation requirement	Vertical			Horizontal						
	Closed versus closed	Closed versus open	Open versus open		Closed versus closed		Closed versus open		Open versus open	
					On deck	Under deck	On deck	Under deck	On deck	Under deck
1. "Away from"	On top of the other permitted.	Open on top of closed permitted.	.....	Fore and aft	No restriction	No restriction	No restriction	No restriction	One container space.	One container space or one bulkhead.
		Otherwise as for "Open versus open".	.....	Athwart ships.	No restriction	No restriction	No restriction	No restriction	One container space.	One container space.
2. "Separated from" ...	.....	.....	Not in the same vertical line.	Fore and aft	One container space.	One container space or one bulkhead.	One container space.	One container space or one bulkhead.	One container space and not in or above same hold.	One bulkhead.
	Not in the same vertical line.	As for "Open versus open".	.....	Athwart ships.	One container space.	One container space.	Two container spaces.	Two container spaces.	Two container spaces and not in or above same hold.	One bulkhead.
3. "Separated by a complete compartment or hold from".	.....	.....	.....	Fore and aft	One container space and not in or above same hold.	One bulkhead	One container space and not in or above same hold.	One bulkhead	Two container spaces and not in or above same hold.	Two bulkheads.
				Athwart ships.	Two container spaces and not in or above same hold.	One bulkhead	Two container spaces and not in or above same hold.	One bulkhead	Three container spaces and not in or above same hold.	Two bulkheads.
4. "Separated longitudinally by an intervening complete compartment or hold from".	Prohibited ...	Prohibited ...	.....	Fore and aft	Minimum horizontal distance of 24 m and not in or above same hold.	One bulkhead and minimum horizontal distance of 24 m*.	Minimum horizontal distance of 24 m and not in or above same hold.	Two bulkheads.	Minimum horizontal distance of 24 m and not in or above same hold.	Two bulkheads.
				Athwart ships.	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited.

* Containers not less than 6 m (20 feet) from intervening bulkhead.
Note: All bulkheads and decks must be resistant to fire and liquid.

(m) *Provisions for segregation groups:* (1) For the purpose of segregation, materials having certain similar chemical properties have been grouped together in segregation groups. The segregation groups (such as ''acids'', ''chlorates'', ''permanganates'') and the entries allocated to each of these groups include the substances identified in section 3.1.4 of the IMDG Code. When column (10B) of the §172.101 Table refers to a numbered stowage provision set forth in §176.84(b) such as ''Stow 'away from' acids'', that particular stowage/segregation requirement applies to all the materials allocated to the respective segregation group.

(2) Not all hazardous materials falling within a segregation group are listed by name in the regulations. These materials are shipped under ''n.o.s.'' entries. Although these ''n.o.s.'' entries are not listed themselves in the above groups, the shipper must decide whether allocation under a segregation group is appropriate. Mixtures, solutions or preparations containing hazardous materials falling within a segregation group and shipped under an ''n.o.s.'' entry are also considered to fall within that segregation group.

(3) The segregation groups described above do not address materials which fall outside the classification criteria of the hazardous materials regulations although it is recognized that some non-hazardous materials have certain chemical properties similar to hazardous materials listed in the segregation groups. A shipper or the person responsible for packing the materials into a cargo transport unit who does have knowledge of the chemical properties of such non-hazardous materials may identify a relevant segregation group and apply the segregation requirements for that segregation group.

[Amdt. 176–30, 55 FR 52690, Dec. 21, 1990]

EDITORIAL NOTE: For FEDERAL REGISTER citations affecting §176.83, see the List of CFR Sections Affected, which appears in the Finding Aids section of the printed volume and at *www.fdsys.gov*.

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

(a) *General.* When Column 10B of the §172.101 Table refers to a numbered or alpha-numeric stowage provision for water shipments, the meaning and requirements of that provision are set forth in this section. Terms in quotation marks are defined in §176.83. Other terms used in the table in this section such as ''acids'', ''chlorates'' and ''permanganates'' indicate different chemical groups referred to here as segregation groups. Materials falling within a segregation group are considered to have certain similar chemical properties and, although not exhaustive in nature, the materials belonging to each group include those substances identified in section 3.1.4 of the IMDG Code as set forth in §176.83(m).

(b) *Table of provisions:*

Code	Provisions
1	[Reserved]
2	Temperature controlled material.
3	Do not stow with high explosives.
4	Stow ''Separated from'' liquid organic materials.
5	Stow ''Separated from'' powdered metals and their compounds.
6	Emergency temperature material.
7	[Reserved]
8	Glass carboys not permitted on passenger vessels.
9	Glass carboys not permitted under deck.
10	Glass bottles not permitted under deck.
11	Keep away from heat and open flame.
12	Keep as cool as reasonably practicable.
13	Keep as dry as reasonably practicable.
14	For metal drums, stowage permitted under deck on cargo vessels.
15	May be stowed in portable magazine or metal locker.
16	No other cargo may be stowed in the same hold with this material.
17	Segregation same as for flammable gases but ''away from'' dangerous when wet.
18	Prohibited on any vessel carrying explosives (except explosives in Division 1.4, Compatibility group S).
19	Protect from sparks and open flames.
20	Segregation same as for corrosives.
21	Segregation same as for flammable liquids.
22	Segregation same as for flammable liquids if flash point is below 60 °C (140 °F).
23	Segregation same as for flammable liquids if flash point is between 23 °C (73 °F) and 60 °C (140 °F).
24	Segregation same as for flammable solids.
25	Shade from radiant heat.
26	Stow ''away from'' acids.[2]
27	Stow ''away from'' alkaline compounds. [2]
28	Stow ''away from'' flammable liquids.
29	Stow ''away from'' ammonium compounds.
30	Stow ''away from'' animal or vegetable oils.
31	Stow ''away from'' combustible materials.
32	Stow ''away from'' copper, its alloys and its salts.
33	Stow ''away from'' fluorides.
34	Stow ''away from'' foodstuffs.
35	Stow ''away from'' all odor-absorbing cargo.

Code	Provisions
36	Stow ''away from'' heavy metals and their compounds.
37	Stow ''away from'' hydrazine.
38	Stow ''away from'' all other corrosives.
39	Stow ''away from'' liquid halogenated hydrocarbons.
40	Stow ''clear of living quarters''.
41	Stow ''away from'' mercury and its compounds.
42	Stow ''away from'' nitric acids and perchloric acids not exceeding 50 percent acid by weight.
43	Stow ''away from'' organic materials.
44	Stow ''away from'' oxidizers.
45	Stow ''away from'' permanganates.
46	Stow ''away from'' powdered metals.
47	Stow ''away from'' sodium compounds.
48	Stow ''away from'' sources of heat.
49	Stow ''away from'' corrosives.
50	Stow ''away from'' sources of heat where temperatures in excess of 55 °C (131 °F) for a period of 24 hours or more will be encountered.
51	Stow ''separated from'' acetylene.
52	Stow ''separated from'' acids.[1, 2]
53	Stow ''separated from'' alkaline compounds.[2]
54	Stow ''separated from'' animal or vegetable oils.
55	Stow ''separated from'' ammonia.
56	Stow ''separated from'' ammonium compounds.
57	Stow ''separated from'' chlorine.
58	Stow ''separated from'' cyanides.
59	Stow ''separated from'' combustible materials.
60	Stow ''separated from'' chlorates, chlorites, hypochlorites, nitrites, perchlorates, permanganates, and metallic powders.
61	Stow ''separated from'' corrosive materials.
62	Stow ''separated from'' diborane.
63	Stow ''separated from'' diethylene triamine.
64	Stow ''separated from'' explosives.
65	Stow ''separated from'' flammable substances.
66	Stow ''separated from'' flammable solids.
67	Stow ''separated from'' halides.
68	Stow ''separated from'' hydrogen.
69	Stow ''separated from'' hydrogen peroxide.
70	Stow ''separated from'' mercury salts.
71	Stow ''separated from'' nitric acid.
72	Stow ''separated from'' nitrogen compounds.
73	Stow ''separated from'' chlorates.
74	Stow ''separated from'' oxidizers.
75	Stow ''separated from'' permanganates.
76	Stow ''separated by a complete compartment or hold from'' organic peroxides.
77	Stow ''separated longitudinally by a complete compartment or hold from'' explosives.
78	Stow ''separated longitudinally by an intervening complete compartment or hold from'' explosives.
79	The maximum net quantity in one package for this material shipped aboard a passenger vessel is limited to 22.7 kg (50 pounds).
80	Toy torpedoes must not be packed with other special fireworks.
81	Under deck stowage permitted only if an indicating substance such as chloropicrin has been added.
82	Under deck stowage is permitted only if containing not more than 36 percent by weight of hydrazine.
83	[Reserved]
84	Under deck stowage must be in well-ventilated space.
85	Under deck stowage must be in mechanically ventilated space.
86	Stow ''separated by a complete compartment or hold from'' explosives Division 1.3.
87	Stow ''separated from'' Class 1 (explosives) except Division 1.4.
88	Stow ''separated by a complete compartment or hold from'' Class 1 (explosives) except Division 1.4.
89	Segregation same as for oxidizers.
90	Stow ''separated from'' radioactive materials.
91	Stow ''separated from'' flammable liquids.
92	Stow ''separated from'' powdered materials.
93	Stow not accessible to unauthorized persons on passenger vessels.
94	Plastic jerricans and plastic drums not permitted under deck.
95	Stow ''separated from'' foodstuffs.
96	Glass carboys not permitted under deck on passenger vessels.
97	Stow ''away from'' azides.
98	Stow ''away from'' all flammable materials.
99	Only new metal drums permitted on passenger vessels.
100	Stow ''away from'' flammable solids.
101	Stow ''separated from'' iron oxide.
102	Stow ''separated from'' all odor absorbing cargoes.
103	Only to be loaded under dry weather conditions.
104	Stow ''separated from'' bromine.
105	As approved by the Competent Authority of the country concerned.
106	Stow ''separated from'' powdered metal.
107	Stow ''separated from'' peroxides and superoxides.
108	The transport temperature should be indicated on the tank.
109	Label as a flammable liquid if flash point is 60 °C (140 °F) or below.
110	Packaging Group II if concentration does not exceed 70 percent acid.
111	If concentration exceeds 50 percent acid, notes 66, 74, 89, and 90 apply.
112	Packaging Group II for concentrations not less that 50 percent and Packaging Group III for concentrations less than 50 percent.
113	Packaging Group II if concentrations does not exceed 60 percent acid.
114	Corrosive subsidiary risk label required unless concentration is less than 80 percent.
115	If packaged in glass or earthenware inner packagings in wooden or fiberboard outer packagings, the maximum quantity on any vessel is 500 kg (equivalent to 450 L).
116	In a cargo space capable of being opened up in an emergency. The possible need to open hatches in case of fire to provide maximum ventilation and to apply water in an emergency and the consequent risk to the stability of the ship through flooding of the cargo space should be considered before loading.

Code	Provisions
117	In a clean cargo space capable of being opened up in an emergency. In the case of bagged fertilizer in freight containers, it is sufficient if in the case of an emergency, the cargo is accessible through free approaches (hatch entries) and mechanical ventilation enables the master to exhaust any gases or fumes resulting from decomposition. The possible need to open hatches in case of fire to provide maximum ventilation and to apply water in an emergency and the consequent risk to the stability of the ship through flooding of the cargo space should be considered before loading.
118	Stowage—Category D, Category E freight containers and pallet boxes only. Ventilation may be required. The possible need to open hatches in a case of fire to provide maximum ventilation and to supply water in an emergency, and the consequent risk to the stability of the ship through flooding of the cargo space, should be considered before loading.
119	Double strip stowage recommended.
120	Provide good surface and through ventilation.
121	Packaging group III when the flash point of the flammable liquid is 23 °C (73 °F) or above.
122	Stow ''separated from'' infectious substances.
123	Stow ''away from'' infectious substances.
124	Stow ''separated from'' bromates.
125	Segregation same as for flammable liquids, but also ''away from'' flammable solids.
126	Segregation same as for Class 9, miscellaneous hazardous materials.
127	For packages carrying a subsidiary risk of Class 1 (explosives), segregation same as for Class 1, Division 1.3.
128	Stow in accordance with the IMDG Code, Sub-section 7.1.10.3 (incorporated by reference; see § 171.7 of this subchapter).
129	Stowage Category A applies, except for uranyl nitrate hexahydrate solution for which Category D applies.
130	Stowage Category A applies, except for uranyl nitrate hexahydrate solution, uranium metal hexahydrate solution, uranium metal pyrophoric and thorium metal pyrophoric for which Category D applies.
131	Stowage Category A applies, except for uranyl nitrate hexahydrate solution, uranium metal pyrophoric and thorium metal pyrophoric for which Category D applies, and taking into account any supplementary requirements specified in the transport documents.
132	Stowage A applies, taking into account any supplementary requirements specified in the transport documents.
133	Stow ''separated from'' sulfur.
134	Stow ''separated from'' UN2716.
135	Stow ''Separated from'' mercury and mercury compounds.
136	Stow ''Separated from'' carbon tetrachloride.
137	For arsenic sulphides, Stow ''separated from'' acids.
138	Stow ''Separated from'' peroxides.
141	Stow ''away from'' radioactive materials.
142	Packages in cargo transport units must be stowed so as to allow for adequate air circulation throughout the cargo.
144	When stowed under deck, mechanical ventilation shall be in accordance with SOLAS, Chapter II–2/Regulation 19 (IBR, see § 171.7 of this subchapter) for flammable liquids with flashpoint below 23 °C (73 °F).
145	Stow ''separated from'' ammonium compounds except for UN1444.
146	Category B stowage applies for unit loads in open cargo transport units.
M1—M6	[Reserved]

[1] For waste cyanides or waste cyanide mixtures or solutions, refer to § 173.12(e) of this subchapter.

[2] Class 8 materials in PG II or III that otherwise are required to be segregated from one another may be transported in the same cargo transport unit, whether in the same packaging or not, provided the substances do not react dangerously with each other to cause combustion and/or evolution of considerable heat, or of flammable, toxic or asphyxiant gases, or the formation of corrosive or unstable substances; and the package does not contain more than 30 L (7.8 gallons) for liquids or 30 kg (66 lbs.) for solids.

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

(2) The following notes in column 10B of the § 172.101 Table apply to the transport of Class 1 (explosive) materials by vessel:

Notes	Provisions
5E	Stow ''away from'' lead and its compounds.
7E	Stowage category ''04'' for projectiles or cartridges for guns, cannons or mortars; Stowage category ''08'' for other types.
8E	When under deck, special stowage is required.
14E	On deck, cargo transport unit must be steel.
15E	On deck, cargo transport unit must be leakproof.
17E	On deck stowage is recommended.
19E	''Away from'' explosives containing chlorates or perchlorates.
20E	Stowage category ''03'' for projectiles or cartridges for guns, cannons or mortars; Stowage category ''07'' for other types; magazines must be of steel construction that prevents leakage.
21E	Cargo space ventilation must be carefully controlled to avoid excessive condensation.
22E	''Away from'' ammonium compounds and explosives containing ammonium compounds or salts.
23E	''Separated from'' Division 1.4 and ''separated longitudinally by an intervening complete compartment or hold from'' Division 1.1, 1.2, 1.3, 1.5, and 1.6 except from explosives of compatibility group J.
26E	Stowage category ''13'' and, for on deck stowage, non-metallic lining of closed cargo transport unit is required when not in effectively sealed, sift-proof packages; Stowage category ''10'' permitted when in effectively sealed, sift-proof packages.
27E	For closed cargo transport units, a non-metallic lining is required.

[Amdt. 176–30, 55 FR 52693, Dec. 21, 1990, as amended at 56 FR 66282, Dec. 20, 1991; Amdt. 176–43, 62 FR 24742, May 6, 1997; 66 FR 33438, June 21, 2001; 66 FR 45185, 45384, Aug. 28, 2001; 67 FR 15744, Apr. 3, 2002; 68 FR 45040, July 31, 2003; 69 FR 76183, Dec. 20, 2004; 70 FR 3310, Jan. 24, 2005; 71 FR 78634, Dec. 29, 2006; 74 FR 2268, Jan. 14, 2009; 76 FR 3384, Jan. 19, 2011]

Subpart E—Special Requirements for Transport Vehicles Loaded With Hazardous Materials and Transported on Board Ferry Vessels

§ 176.88 Applicability.

The requirements in this subpart are applicable to transport vehicles containing hazardous materials being transported on board ferry vessels and are in addition to any prescribed elsewhere in this subchapter. Vessels in a service similar to a ferry service, but not over a designated ferry route, may be treated as a ferry vessel for the purpose of this subpart if approved in writing by the District Commander.

[Amdt. 176–1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176–1A, 41 FR 40690, Sept. 20, 1976]

§ 176.89 Control of transport vehicles.

(a) A transport vehicle containing hazardous materials may be transported on board a ferry vessel, subject to the following conditions:

(1) The operator or person in charge of the vehicle shall deliver to the vessel's representative a copy of the shipping papers and certificate required by §§ 176.24 and 176.27;

(2) The vehicle shall be placed at the location indicated by the vessel's representative;

(3) The parking brakes of the vehicle shall be set securely to prevent movement;

(4) The motor of a highway vehicle shall be shut off and not restarted until the vessel has completed its voyage and docked;

(5) All vehicle lights shall be cut off and not relighted until the vessel has completed its voyage and docked;

(6) The operator of a highway vehicle shall remain with the vehicle;

(7) No repairs or adjustments must be made to the vehicle while it is on the vessel;

(8) No hazardous materials are to be released from the vehicle; and

(9) Any instructions given by the vessel's representative during the voyage, and during ''roll on'' and ''roll off'' operations must be observed.

(b) Smoking by any person in or around a vehicle is prohibited.

§ 176.90 Private automobiles.

A private automobile which is carrying any Class 1 (explosive) material (except permitted fireworks or small arms ammunition) may not be transported on a passenger-carrying ferry vessel unless the Class 1 (explosive) material is in compliance with packaging, labeling, marking, and certification requirements of this subchapter. Permitted fireworks and small arms ammunition may be carried without the required packaging, labeling, marking, or certification if they are in tight containers.

[Amdt. 176–1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176–30, 55 FR 52695, Dec. 21, 1990]

§ 176.91 Motorboats.

A motorboat may be transported on board a ferry vessel with gasoline in the tank and two other containers not exceeding 23 L (six gallons) capacity each if they are in the motorboat, closed, and in good condition.

[Amdt. 176–1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176–30, 55 FR 52695, Dec. 21, 1990]

§ 176.92 Cylinders laden in vehicles.

Any cylinder of Class 2 (compressed gas) material which is required to have a valve protection cap fitted in place may be transported on board a ferry vessel without having the valve protection cap in place when it is laden in a transport vehicle and is not removed from the vehicle while on the vessel.

[Amdt. 176–1, 41 FR 16110, Apr. 15, 1976, as amended by Amdt. 176–30, 55 FR 52695, Dec. 21, 1990]

§ 176.93 Vehicles having refrigerating or heating equipment.

(a) A transport vehicle fitted with refrigerating or heating equipment using a flammable liquid or Division 2.1 (flammable gas) material, or diesel oil