

PART 9

Segregation

9.1.1 INTERPRETATION

Class, Division and Subsidiary Risk. For the purpose of this Part, a reference to a class of dangerous goods (for example, Class 4) is a reference to that class, to every hazard division into which that class is sub-divided (for example, Divisions 4.1, 4.2 and 4.3) and to every subsidiary risk corresponding to that class or division (for example, Subsidiary Risks 4.1, 4.2 and 4.3). A reference to a hazard division into which a class is sub-divided (for example Division 4.1) is a reference only to that division, and to the subsidiary risk (if any) corresponding to that hazard division (for example, Subsidiary Risk 4.1).

9.1.2 INCOMPATIBILITY BASED ON CLASSIFICATION

9.1.2.1 Table 9.1 gives an indication of dangerous goods compatibility for land transport purposes, based on Classes, Divisions, Subsidiary Risks and some specific types of goods.

NOTE 1: *Where it is indicated in Table 9.1 that goods of particular classification combinations are incompatible, then all goods of those combinations should be considered incompatible unless there is substantial documented evidence that particular goods are in fact compatible. This evidence could include a statement on the Safety Data Sheets* of both substances or articles that they are compatible.*

NOTE 2: *Compatibility assessment based on Table 9.1 has no validity under the IMDG Code, ICAO Rules or IATA Regulations for sea and air transport.*

NOTE 3: *Depending on other risk factors, compatibility assessment based on Table 9.1 may not be relevant to storage situations, particularly where large volumes of dangerous goods are stored and handled. Reference should be made to the Safety Data Sheets for each substance or article and risks assessed accordingly.*

9.1.2.2 Explosives

9.1.2.2.1 Except where otherwise specially provided for in this Code and the Australian Explosives Code, goods of Class 1 are incompatible with dangerous goods of other classes.

9.1.2.2.2 For the purposes of this Code, dangerous goods of Division 1.4, compatibility group S are considered compatible with other dangerous goods provided the aggregate quantity of all dangerous goods in the transport unit does not exceed 1000 kg(L).

NOTE: *The Australian Explosives Code does not restrict the transport of Division 1.4S with other dangerous goods.*

9.1.2.3 Food and food packagings

Despite an entry in Table 9.1 that food and food packagings are incompatible with dangerous goods of Class 8, food ingredients that are Class 8 dangerous goods are not considered to be incompatible with other food ingredients if the intended use of those ingredients is for the manufacture of food, or food ingredients, containing those ingredients (or like ingredients), with or without other ingredients.

* Safety Data Sheets [SDS] are also known as Material Safety Data Sheets [MSDS].

Table 9.1 Incompatibility based on Classification

Goods are considered incompatible if, in this table, any of the following conditions are met:

- (a) the primary hazard of one is incompatible with the primary hazard of the other; or
- (b) the primary hazard of one is incompatible with a subsidiary risk of the other; or
- (c) a subsidiary risk of one is incompatible with a subsidiary risk of the other.

CLASS or DIVISION	1	2.1	2.2	2.3	3	4.1	4.2	4.3	5.1	5.2	6	7 (7)	8	9	Food or Food empties	Fire-risk substances or Combustible liquids
	1 Explosives	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)		
2.1 Flammable gas	(1)	0	0 ⁽³⁾	0	0 ⁽²⁾	N	N	N	N	N	0	N	0	0	0	0
2.2 Non-flammable non-toxic gas	(1)	0 ⁽³⁾	0	0 ⁽⁴⁾	0	0	N	0	0	N	0	0	0	0	0	0
2.3 Toxic gas	(1)	0	0 ⁽⁴⁾	0	N	0	N	0	N	N	0	0	0	0	N ⁽⁸⁾	0
3 Flammable liquids	(1)	0 ⁽²⁾	0	N	0	0	N	0	N	N	0 ⁽⁶⁾	N	0	0	0	0
4.1 Flammable solids	(1)	N	0	0	0	0	N	0	N	N	0	N	0	0	0	0
4.2 Spontaneously combustible	(1)	N	N	N	N	N	0	0	N	N	0	N	0	0	0	0
4.3 Dangerous when wet	(1)	N	0	0	0	0	0	0	N	N	0	N	N	0	0	0
5.1 Oxidizing substances	(1)	N	0	N	N	N	N	N	0 ⁽⁶⁾	N	0 ⁽⁵⁾	N	N	0 ⁽⁵⁾	0	N
5.2 Organic peroxides	(1)	N	N	N	N	N	N	N	N	0	0 ⁽⁵⁾	N	N	0 ⁽⁵⁾	0	N
6 Toxic or Infectious substances	(1)	0	0	0	0 ⁽⁵⁾	0	0	0	0 ⁽⁵⁾	0 ⁽⁵⁾	0	0	0 ⁽⁶⁾	0	N ⁽⁸⁾	0
7 Radioactive material (7)	(1)	N	0	0	N	N	N	N	N	N	0	0	N	0	N ⁽⁸⁾	0
8 Corrosive substances	(1)	0	0	0	0	0	0	N	N	N	0 ⁽⁶⁾	N	0 ⁽⁶⁾	0	N ⁽⁸⁾	0
9 Miscellaneous dangerous goods	(1)	0	0	0	0	0	0	0	0 ⁽⁵⁾	0 ⁽⁵⁾	0	0	0	0	0	0

IN THIS TABLE:

- 0 means compatible unless a numbered exception applies.
 N means incompatible unless a numbered exception applies.

Exceptions:

- (1) Explosives are incompatible in transport with all other dangerous goods in all quantities except as provided in the Australian Explosives Code or, for Division 1.4S, where 9.1.2.2.2 applies.
- (2) Division 2.1 and Class 3 are incompatible in transport if both are in tanks or other receptacles with a capacity individually exceeding 500 L.
- (3) Division 2.1 is incompatible in transport with gases of Division 2.2 that have a subsidiary risk 5.1 except when all are packed in cylinders or pressure drums not exceeding 500 L capacity.
- (4) Division 2.3 is incompatible in transport with gases of Division 2.2 that have a subsidiary risk 5.1 except when all are packed in cylinders or pressure drums not exceeding 500 L capacity.
- (5) Class 5 is incompatible with those Class 6 or Class 9 materials that are fire-risk substances.
- (6) Some specific examples of these Classes or Divisions are incompatible —see Table 9.2.
- (7) See the Code of Practice for the Safe Transport of Radioactive Substances regarding the compatibility of Class 7 with undeveloped photographic film, personnel and mail.
- (8) Food and food packagings are incompatible with these classes in all quantities, except where 9.1.2.3 applies.

9.1.3 SPECIFIC EXAMPLES OF INCOMPATIBLE GOODS

Table 9.2 lists some examples of particular dangerous goods which are incompatible. The dangerous goods specified in an item in column 1 of Table 9.2 are incompatible with the dangerous goods specified in that item in column 2 of the Table.

Table 9.2 **Examples of Particular Incompatible Dangerous Goods not identified in Table 9.1**

Column 1 Dangerous Goods or Group of Dangerous Goods	Column 2 Goods Incompatible with Column 1 Group
–Ammonium nitrate	–Tetranitromethane –Dichloroisocyanuric acid –Trichloroisocyanuric acid –any: <ul style="list-style-type: none"> • bromate • chlorate • chlorite • hypochlorite • chloroisocyanurate • inorganic nitrite
–Calcium hypochlorite (Dry or Hydrated) and its mixtures	–Ammonium nitrate –Dichloroisocyanuric acid –Trichloroisocyanuric acid –any chloroisocyanurate
–Class 6	–Nitromethane
–Concentrated strong acids	–Concentrated strong alkalis
–Cyanide compounds	–Acids

9.2.1 APPLICATION AND PRINCIPLES

NOTE: *Goods segregated in accordance with this Chapter will not necessarily comply with the IMDG Code, ICAO Rules or IATA Regulations for sea and air transport.*

9.2.1.1 The segregation requirements of this chapter apply only to placard loads of dangerous goods, except:

- (a) where, in the explanatory text at the foot of Table 9.1, it is indicated that particular goods are incompatible in all quantities; and
- (b) 9.2.1.4 which applies to all quantities of dangerous goods; and
- (c) dangerous goods carried on passenger trains when 9.2.4.7 applies.

9.2.1.2 This chapter does not apply to dangerous goods transported on trains or rail wagons that are being shunted at not more than 15 kilometres per hour.

9.2.1.3 Dangerous goods must not be transported on the same road vehicle or train with incompatible goods unless the dangerous goods and the incompatible goods:

- (a) are segregated in accordance with this chapter; or
- (b) are otherwise allowed under this Code to be transported together.

9.2.1.4 An overpack, a large packaging or a segregation device must not contain dangerous goods which are incompatible with one another, except where all the dangerous goods are packed as limited quantities in accordance with Chapter 3.4, in which case 3.4.5 applies.

9.2.1.5 A transport unit must not contain dangerous goods which are incompatible with each other unless segregated in accordance with Section 9.2.2.

9.2.1.6 When interpreting the requirements of this chapter, the following principles from UN15 must be applied:

[UN 7.1.2.3]

- (a) Incompatible dangerous goods must be segregated from one another so as to effectively minimize risk in the event of accidental leakage or spillage or any other accident.
- (b) Whenever dangerous goods are stowed together, the most stringent segregation provisions for any of the goods must be applied.
- (c) For dangerous goods required to bear a subsidiary risk label, the segregation appropriate to the subsidiary hazard must be applied when it is more stringent than that required by the primary hazard.

9.2.2 SEGREGATION METHODS

9.2.2.1 Separate road vehicles

Except where otherwise specified in Section 9.2.3, dangerous goods are segregated from incompatible goods in accordance with this Code if the dangerous goods are carried on one vehicle and the incompatible goods are carried on another vehicle forming part of the same combination road vehicle.

9.2.2.2 Separate rail wagons or load platforms

Except where otherwise specified in Section 9.2.3 or 9.2.4, dangerous goods are segregated on a train from incompatible goods in accordance with this Code if the dangerous goods and the incompatible goods are carried on separate rail wagons or load platforms.

9.2.2.3 Separate freight containers

Except where otherwise specified in Section 9.2.3 or 9.2.4, dangerous goods are segregated from incompatible goods in accordance with this Code if:

- (a) either the dangerous goods or the incompatible goods are contained in a closed freight container with rigid sides and ends; or
- (b) when transported by rail in other demountable transport units such as open or curtain-sided freight containers on the same load platform of a rail wagon, there is a distance (which may be occupied by other loading) of at least 6 m, measured horizontally, between the unit loaded with the dangerous goods and the unit loaded with the incompatible goods.

9.2.2.4 Packagings for segregation

9.2.2.4.1 Dangerous goods are segregated from incompatible goods if the dangerous goods are packed in a *Packaging for Segregation* that:

- (a) has been approved for that purpose by a Competent Authority; and
- (b) has three levels of containment, comprising:
 - (i) an inner packaging; and
 - (ii) a leakproof intermediate packaging; and
 - (iii) an outer packaging; and
- (c) has been tested in accordance with Section 6.1.5 of this Code to the standard required for dangerous goods of packing group I; and
- (d) is marked with the words “Approved Packaging for Segregation”; and
- (e) if the dangerous goods are of packing group I, also complies with 9.2.2.4.2.

9.2.2.4.2 When a packaging for segregation is used for dangerous goods of packing group I:

- (a) the intermediate packaging required by 9.2.2.4.1(b)(ii) must be of metal or rigid plastics construction; and
- (b) if inert absorbent material is required, that material must be contained inside the intermediate packaging; and
- (c) the marking required by 9.2.2.4.1(d) must be supplemented with the expression “PGI”, so that it reads “Approved Packaging for Segregation, PGI”.

9.2.2.5 Large packagings

Dangerous goods are segregated from incompatible goods if the dangerous goods are packed in a large packaging in accordance with a Packing Instruction in Chapter 4.1 that is:

- (a) authorized for those goods by an entry in Column 8 of the Dangerous Goods List in Chapter 3.2; and
- (b) prefixed ‘LP’ (e.g. ‘LP01’ for many liquid dangerous goods of packing group III).

The large packaging must not contain goods that are incompatible with each other.

NOTE: 9.2.2.5 provides segregation only for the dangerous goods that are in the large packaging. If the incompatible goods are also dangerous goods, these must also be in a large packaging (where authorized), a packaging for segregation, a segregation device, or be otherwise segregated from the first dangerous goods in accordance with this Chapter.

9.2.2.6 Segregation devices

Dangerous goods of packing group II or III are segregated from incompatible goods in accordance with this Code if either the dangerous goods or the incompatible goods are packed in accordance with Section 4.4.5, in a segregation device which meets the requirements of Chapter 6.11.

9.2.3 SPECIAL SEGREGATION PROVISIONS

Despite 9.2.2.1, 9.2.2.2 and 9.2.2.3, some goods which react dangerously must not be transported on the same road vehicle or combination road vehicle or, when transported by rail, must be separated by intervening wagons or load platforms, in accordance with Table 9.3.

Table 9.3 Restricted Loads on Certain Vehicles

Row No.	Goods A Receptacle Size	Goods B Receptacle Size	Restriction	
			Road	Rail
1.	Any dangerous goods of Class 5 or Subsidiary Risk 5.1 > 500 kg(L)	Any dangerous goods of Class or Subsidiary Risk 3, or Combustible Liquid > 500 L	<i>a.</i>	<i>b.</i>
2.	Any dangerous goods of Division or Subsidiary Risk 2.1 > 500 L	Any dangerous goods of Class or Subsidiary Risk 3, 4 or 5 > 500 kg(L)	<i>a.</i>	<i>b.</i>
3.	Ammonium Nitrate of any Division in any form (including UN 0222, 1942, 2067, 2071, 2426 or 3375) > 500 L	Any sensitising or initiating agent # Any	<i>a.</i>	<i>b.</i>
4.	UN 3414 Sodium Cyanide Solution of Division 6.1 > 500 L	UN 2014, 2015 or 2984 Hydrogen Peroxide of Division 5.1 # Any	<i>a.</i>	<i>b.</i>
5.	Any Cyanide of Division 6.1 Any	Any Acid of Class 8 # Any	<i>c.</i>	<i>d.</i>
6.	Any Cyanide of Division 6.1 > 500 kg(L)	Any Acid of Class 8 > 500 L	<i>c.</i>	<i>e.</i>
7.	Any placard load of Explosives Any	Any other placard load Any	<i>f.</i>	<i>g.</i>

NOTE: A reference in this table to Goods A or Goods B: means those goods only while they are in receptacles of the sizes indicated, but does not include residues of those goods in those receptacles when they are nominally empty and this is clearly evident from the transport documentation in accordance with 11.1.3.1.

Restrictions

- a. (Road)* Dangerous goods mentioned in the column headed Goods A must not be transported on any road vehicle at the same time as goods described as Goods B in the same numbered row of this table, even if the Goods A and Goods B are in different freight containers, bulk containers, portable tanks or different vehicles making up a combination vehicle.
- b. (Rail)* A freight container or wagon transporting a placard load that includes dangerous goods described as Goods A must be separated on a train from a freight container or wagon transporting a placard load that includes Goods B in the same row of this table by at least one intervening load platform that may, subject to the other segregation provisions of this Chapter, be loaded with other dangerous goods.
- c. (Road)* A placard load on a road vehicle, including a combination vehicle, must not include at the same time, Cyanides of Division 6.1 and Acids of Class 8, in any quantity, even if they are in separate transport units or on different vehicles making up a combination vehicle, unless Packagings for Segregation are used in accordance with 9.2.2.4.
- d. (Rail)* Except where *e.* applies, a freight container or wagon transporting a placard load that includes Cyanides of Division 6.1 must be separated on a train by at least two intervening load platforms from a freight container, portable tank or wagon transporting a placard load that includes Acids of Class 8.
- e. (Rail)* A freight container or wagon transporting Cyanide of Division 6.1 in a receptacle > 500 kg(L) must be separated on a train from a freight container or wagon transporting any Acid of Class 8 in a receptacle > 500 L by at least 15 intervening load platforms that may, subject to the other segregation provisions of this Chapter, be loaded with other dangerous goods.
- f. (Road)* See Australian Explosives Code.
- g. (Rail)* A rail wagon transporting a Category 2 or 3 explosives load (see Australian Explosives Code) must be separated on a train by at least two intervening load platforms from a freight container or wagon transporting a placard load of other dangerous goods. See Australian Explosives Code for separation between placard loads of explosives.

Except where this substance is transported in a Packaging for Segregation in accordance with 9.2.2.4.

9.2.4 ADDITIONAL RAIL PROVISIONS

9.2.4.1 Except for transport in a rail tank wagon or where 9.2.4.7 applies, dangerous goods must not be transported in the nearest transport unit to either end of the train.”

9.2.4.2 Except as provided in 9.2.4.7, a placard load of dangerous goods must not be transported in the nearest transport unit to rolling stock carrying people (including a locomotive or van carrying train crew).

9.2.4.3 A rail tank wagon transporting dangerous goods of Division 2.1 must not:

- (a) despite 9.2.4.1, be the first or last wagon of a train; or
- (b) be marshalled immediately coupled to another such tank wagon unless exempted by the Competent Authority.

9.2.4.5 Dangerous goods must be separated by at least two intervening load platforms from other containers or wagons on the train which are transporting loads which could pose a significant piercing hazard, such as logs, rails, beams and pipes which are not effectively protected by bulkheads.

9.2.4.6 Dangerous goods must not be transported by rail in a bi-modal (road/rail) tank wagon unless approved by the Competent Authority and agreed by the rail track owner.

9.2.4.7 Passenger trains

9.2.4.7.1 Dangerous goods must not be taken on board a passenger train or transported in a passenger compartment or in an area designated on a passenger train for the carriage of passenger luggage, except:

- (a) medical gases that may be required for use by a passenger during the journey; and
- (b) other dangerous goods that are:
 - (i) in quantities not exceeding those specified as limited quantities for the particular substance or article in Column (7) of the Dangerous Goods List in Chapter 3.2; and
 - (ii) the personal property of a passenger on the train.

9.2.4.7.2 A rail wagon that is attached to the rear of a passenger train may transport not more than 5 tonnes of dangerous goods, other than:

- (a) Class 1 or 7; or
- (b) Division 2.1 or 2.3; or
- (c) Packing group I of any Class or Division.

9.2.4.7.3 The dangerous goods transported in the rail wagon described in 9.2.4.7.2 must be:

- (a) segregated in accordance with Section 9.2.2; and
- (b) described on transport documentation in accordance with Chapter 11.1.

9.2.4.7.4 The rail wagon described in 9.2.4.7.2 must be placarded when the dangerous goods in the wagon is a placard load.

9.2.4.8 Double stacking of freight containers.

9.2.4.8.1 Where double stacking of freight containers is permitted by the rail track owner, the following may be loaded in a vertical stack:

- (a) freight containers of dangerous goods of the same UN Number; or
- (b) dangerous goods of Class 3, 6 and 9 (mixed or in separate containers); or
- (c) a freight container of dangerous goods and a freight container of non-dangerous goods; or
- (d) freight containers that contain less than a placard load of dangerous goods.

9.2.4.8.2 The following loads of dangerous goods in freight containers may not be transported in a vertical stack:

- (a) liquid or gaseous dangerous goods in portable tanks or multiple element gas containers; or
- (b) dangerous goods of Class 1; or
- (c) freight containers known to contain food or food packaging with freight or bulk containers or portable tanks placarded with label model Nos. 2.3, 6.1, 6.2, 7(A-E), 8 or 10 (mixed class); or
- (d) dangerous goods in open or curtain-sided containers; or
- (e) all other combinations not permitted under subclause 9.2.4.8.1.

NOTE 1: *The segregation requirements of this chapter still apply.*

NOTE 2: *Placards, including labels and Emergency Information Panels when required must be visible from both sides of the rail wagon. In well wagons this may require relocating or additional placarding (see 5.3.7.2.4).*

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