

Storck Guide

Stowage & Segregation to IMDG Code

Applicable from 2021
Mandatory from 2022

including Amendment 40-20
27th Edition



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- 1.3.1.2.1 *General awareness/familiarization training:*
- .1 each person shall be trained in order to be familiar with the general provisions of dangerous goods transport provisions;
 - .2 such training shall include a description of the classes of dangerous goods; labelling, marking, placarding, packing, stowage, segregation and compatibility provisions; a description of the purpose and content of dangerous goods transport documents (such as the Multimodal Dangerous Goods Form and the Container/Vehicle Packing Certificate); and a description of available emergency response documents.
- 1.3.1.2.2 *Function-specific training:* Each person shall be trained in specific dangerous goods transport provisions which are applicable to the function that person performs. An indicative list, for guidance purposes only, of some of the functions typically found in dangerous goods transport operations by sea and training requirements is given in paragraph 1.3.1.6.
- 1.3.1.3 Records of training received according to this chapter shall be kept by the employer and made available to the employee or competent authority, upon request. Records shall be kept by the employer for a period of time established by the competent authority.
- 1.3.1.4 *Safety training:* Commensurate with the risk of exposure in the event of a release and the functions performed, each person should be trained in:
- .1 methods and procedures for accident avoidance, such as proper use of package-handling equipment and appropriate methods of stowage of dangerous goods;
 - .2 available emergency response information and how to use it;
 - .3 general dangers presented by the various classes of dangerous goods and how to prevent exposure to those hazards, including, if appropriate, the use of personal protective clothing and equipment; and
 - .4 immediate procedures to be followed in the event of an unintentional release of dangerous goods, including any emergency response procedures for which the person is responsible and personal protection procedures to be followed.
- 1.3.1.5 Recommended training needs for shore-side personnel involved in the transport of dangerous goods under the IMDG Code**

The following indicative table is for information purposes only as every entity is arranged differently and may have varied roles and responsibilities within that entity.

Function	Specific training requirements	Numbers in this column refer to the list of related codes and publications in 1.3.1.7
1 Classify dangerous goods and identify proper shipping name	Classification requirements, in particular – the structure of the description of substances – the classes of dangerous goods and the principles of their classification – the nature of the dangerous substances and articles transported (their physical, chemical and toxicological properties) – the procedure for classifying solutions and mixtures – identification by proper shipping name – use of Dangerous Goods List	.1, .4, .5 and .12
2 Pack dangerous goods	Classes Packaging requirements – type of packages (IBC, large packaging, tank container and bulk container) – UN marking for approved packagings – segregation requirements – limited quantities and excepted quantities Marking and labelling First aid measures Emergency response procedures Safe handling procedures	.1 and .4
3 Mark, label or placard dangerous goods	Classes Marking, labelling and placarding requirements – primary and subsidiary hazard labels – marine pollutants – limited quantities and excepted quantities	.1

7.1 GENERAL STOWAGE PROVISIONS

7.1.1 Introduction

This chapter contains the general provisions for the stowage of dangerous goods in all types of ships. Specific provisions applicable to, container ships, ro-ro ships, general cargo ships and barge carrying ships, are stipulated in chapters 7.4 to 7.7.

7.1.2 Definitions

Note 1: The term “magazine” is no longer used in the context of the IMDG Code. A magazine that is not a fixed part of the ship shall meet the provisions for a closed cargo transport unit for class 1 (see 7.1.2). A magazine that is a fixed part of the ship such as compartment, below deck area or hold shall meet the provisions of 7.6.2.4.

Note 2: Cargo holds cannot be interpreted as closed cargo transport units.

Clear of living quarters means that packages or cargo transport units shall be stowed a minimum distance of 3 m from accommodation, air intakes, machinery spaces and other enclosed work areas.

Closed cargo transport unit for class 1 means a unit which fully encloses the contents by permanent structures, can be secured to the ship's structure and is, except for division 1.4, structurally serviceable as defined in this section. Cargo transport units with fabric sides or tops are not closed cargo transport units. The floor of any closed cargo transport unit shall either be constructed of wood, closed-boarded, or so arranged that goods are stowed on sparred gratings, wooden pallets or dunnage.

Combustible material means material which may or may not be dangerous goods but which is easily ignited and supports combustion. Examples of combustible materials include wood, paper, straw, vegetable fibres, products made from such materials, coal, lubricants, and oils. This definition does not apply to packaging material or dunnage.

Potential sources of ignition means, but is not limited to, open fires, machinery exhausts, galley uptakes, electrical outlets and electrical equipment including those on refrigerated or heated cargo transport units unless they are of certified safe type.⁸⁾

Protected from sources of heat means that packages and cargo transport units shall be stowed at least 2.4 m from heated ship structures, where the surface temperature is liable to exceed 55°C. Examples of heated structures are steam pipes, heating coils, top or side walls of heated fuel and cargo tanks, and bulkheads of machinery spaces. In addition, packages not loaded inside a cargo transport unit and stowed on deck shall be shaded from direct sunlight. The surface of a cargo transport unit can heat rapidly when in direct sunlight in nearly windless conditions and the cargo may also become heated. Depending on the nature of the goods in the cargo transport unit and the planned voyage precautions shall be taken to ensure that exposure to direct sunlight is reduced.

Stowage means the proper placement of dangerous goods on board a ship in order to ensure safety and environmental protection during transport.

Stowage on deck means stowage on the weather deck. For open ro-ro cargo spaces see 7.5.2.6.

Stowage under deck means any stowage that is not on the weather deck. For hatchless container ships see 7.4.2.1.

Structurally serviceable for class 1 means the cargo transport unit shall not have major defects in its structural components, e.g. top and bottom rails, top and bottom end rails, door sill and header, floor cross-members, corner posts, and corner fittings in a freight container. Major defects are: dents or bends in the structural members greater than 19 mm in depth, regardless of length; cracks or breaks in structural members; more than one splice (e.g., a lapped splice) in top or bottom end rails or door headers; more than two splices in any top or bottom side rail or any splice in a door sill or corner post; door hinges and hardware that are seized, twisted, broken, missing or otherwise inoperative; gaskets and seals that do not seal; or, for freight containers, any distortion of the overall configuration great enough to prevent proper alignment of handling equipment, mounting and securing on chassis or vehicle, or insertion into ship's cells. In addition, deterioration in any component of the cargo transport unit, regardless of the material of construction, such as rusted-out metal in sidewalls or disintegrated fibreglass, is unacceptable. Normal wear, however, including oxidation (rust), slight dents and scratches and other damage that does not affect serviceability or the weathertight integrity of the units, is acceptable.

8) For cargo spaces, refer to SOLAS II-2/19.3.2 and for refrigerated or heated cargo transport units refer to Recommendations published by the International Electrotechnical Commission, in particular IEC 60079.

7.6.3.5.2 Segregation table

	Dangerous goods in packaged form																	
Bulk materials (classified as dangerous goods)	CLASS	1.1 1.2 1.5	1.3 1.6	1.4	2.1	2.2 2.3	3	4.1	4.2	4.3	5.1	5.2	6.1	6.2	7	8	9	
Flammable solids	4.1	4	3	2	2	2	2	X	1	X	1	2	X	3	2	1	X	
Substances liable to spontaneous combustion	4.2	4	3	2	2	2	2	1	X	1	2	2	1	3	2	1	X	
Substances which, in contact with water, emit flammable gases	4.3	4	4	2	2	X	2	X	1	X	2	2	X	2	2	1	X	
Oxidizing substances (agents)	5.1	4	4	2	2	X	2	1	2	2	X	2	1	3	1	2	X	
Toxic substances	6.1	2	2	X	X	X	X	X	1	X	1	1	X	1	X	X	X	
Radioactive material	7	2	2	2	2	2	2	2	2	2	1	2	X	3	X	2	X	
Corrosive substance	8	4	2	2	1	X	1	1	1	1	2	2	X	3	2	X	X	
Miscellaneous dangerous substances and articles	9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Materials hazardous only in bulk (MHB)		X	X	X	X	X	X	X	X	X	X	X	X	3	X	X	X	

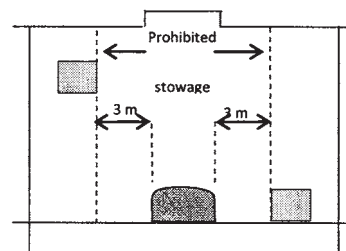
Numbers and symbols relate to the following terms, as defined in this chapter:

7.6.3.5.3 Definitions of the segregation terms

“Away from”:

1

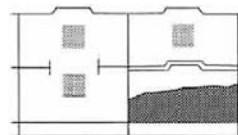
Effectively segregated so that incompatible materials cannot interact dangerously in the event of an accident but may be transported in the same compartment or hold or *on deck* provided a minimum horizontal separation of 3 m, projected vertically, is provided.



“Separated from”:

2

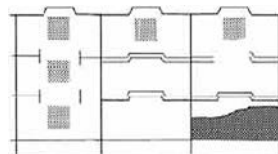
In different holds when stowed *under deck*. Provided an intervening deck is resistant to fire and liquid, a vertical separation, i.e. in different compartments, may be accepted as equivalent to this segregation.



“Separated by a complete compartment or hold from”:

3

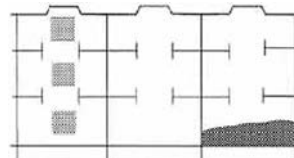
Either a vertical or a horizontal separation. If the decks are not resistant to fire and liquid, then only a longitudinal separation, i.e. by an intervening complete compartment, is acceptable.



“Separated longitudinally by an intervening complete compartment or hold from”:

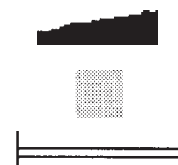
4

Vertical separation alone does not meet this requirement.



Legend

- (1) Reference bulk material.....
- (2) Package containing incompatible goods.....
- (3) Deck resistant to fire and liquid



Note: Vertical lines represent transverse watertight bulkheads between cargo spaces.

Class 4.1

UN-No.	Subsidiary risk(s)	Stow. Cat.	Stowage and handling Segregation Further informations
3230		D	- Protected from sources of heat - Stow "separated from" acids and alkalis Solid
3231		D	- Protected from sources of heat - Shall be transported under temperature control - For packages carrying a subsidiary hazard label of class 1, segregation as for class 1, division 1.3. However, in relation to goods of class 1, segregation as for the primary hazard - Stow "separated from" acids and alkalis Liquid See entry in Dangerous Goods List (Chapter 3.2) of the IMDG-Code SP 181, SP 194, SP 923
3232		D	- Protected from sources of heat - Shall be transported under temperature control - For packages carrying a subsidiary hazard label of class 1, segregation as for class 1, division 1.3. However, in relation to goods of class 1, segregation as for the primary hazard - Stow "separated from" acids and alkalis Solid See entry in Dangerous Goods List (Chapter 3.2) of the IMDG-Code SP 181, SP 194, SP 923
3233		D	- Protected from sources of heat - Shall be transported under temperature control - Stow "separated from" acids and alkalis Liquid See entry in Dangerous Goods List (Chapter 3.2) of the IMDG-Code SP 194, SP 923
3234		D	- Protected from sources of heat - Shall be transported under temperature control - Stow "separated from" acids and alkalis Solid See entry in Dangerous Goods List (Chapter 3.2) of the IMDG-Code SP 194, SP 923
3235		D	- Protected from sources of heat - Shall be transported under temperature control - Stow "separated from" acids and alkalis Liquid See entry in Dangerous Goods List (Chapter 3.2) of the IMDG-Code SP 194, SP 923

UN-No.	Subsidiary risk(s)	Stow. Cat.	Stowage and handling Segregation Further informations
3236		D	- Protected from sources of heat - Shall be transported under temperature control - Stow "separated from" acids and alkalis Solid See entry in Dangerous Goods List (Chapter 3.2) of the IMDG-Code SP 194, SP 923
3237		D	- Protected from sources of heat - Shall be transported under temperature control - Stow "separated from" acids and alkalis Liquid See entry in Dangerous Goods List (Chapter 3.2) of the IMDG-Code SP 194, SP 923
3238		D	- Protected from sources of heat - Shall be transported under temperature control - Stow "separated from" acids and alkalis Solid See entry in Dangerous Goods List (Chapter 3.2) of the IMDG-Code SP 194, SP 923
3239		D	- Protected from sources of heat - Shall be transported under temperature control - Stow "separated from" acids and alkalis Liquid See entry in Dangerous Goods List (Chapter 3.2) of the IMDG-Code SP 194, SP 923
3240		D	- Protected from sources of heat - Shall be transported under temperature control - Stow "separated from" acids and alkalis Solid See entry in Dangerous Goods List (Chapter 3.2) of the IMDG-Code SP 194, SP 923
3241		C	- Protected from sources of heat - Clear of living quarters - Keep as cool as reasonably practicable - During transport, it should be stowed (or kept) in a cool ventilated place
3242		D	- Stow "separated from" class 5.1 - Stow "separated from" acids and alkalis

	ON DECK OR UNDER DECK	ON DECK ONLY	PROHIBITED
CARGO SHIPS:	A, B, E	C, D	
PASSENGER SHIPS:	A	B, C	D, E

CLASS 5.1 – Oxidizing Agents



General segregation from other classes

Substances of this class have to be segregated from other classes as indicated below

class risk	1.1 1.2 1.5	1.3 1.6	1.4	2.1	2.2	2.3	3	4.1	4.2	4.3	5.1	5.2	6.1	6.2	7	8	9
 5.1	4	4	2	2	X	X	2	1	2	2	X	2	1	3	1	2	X
 + 	4	4	2	2	X	X	2	1	2	2	1	2	1	3	2	2	X
 + 	4	4	2	2	1	2	2	1	2	2	2	2	1	3	2	2	X
 + 	4	4	2	2	X	X	2	1	2	2	2	2	1	3	2	2	X
 + 	4	4	2	2	X	X	2	1	2	2	1	2	1	3	1	2	X
 + 	4	4	2	2	X	X	2	1	2	2	2	2	1	3	2	2	X

X	means: Segregation, if any, is shown in the Dangerous Goods List	1	means: Away from	2	means: Separated from	3	means: Separated by a complete compartment or hold from	4	means: Separated longitudinally by an intervening complete compartment or hold from
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For definition of above segregation symbols and numbers see:
Chapters 7.4 (Container Ships), 7.5 (Ro-Ro Ships), 7.6 (General Cargo Ships) and 7.7 (Barge Carrying Ships)

Class 5.1

UN-No.	Subsidiary risk(s)	Stow. Cat.	Stowage and handling Segregation Further informations
1439		A	• Stow “separated from” strong acids <i>Ammonium compounds</i>
1442		E	• Stow “separated from” cyanides and peroxides <i>Ammonium compounds</i> <i>Perchlorates</i>
1444		A	<i>Ammonium compounds</i>
1445		A	• Stow “separated from” ammonium compounds and cyanides <i>Chlorates</i> Solid

UN-No.	Subsidiary risk(s)	Stow. Cat.	Stowage and handling Segregation Further informations
1446		A	
1447		A	• Stow “separated from” ammonium compounds and cyanides <i>Perchlorates</i> Solid
1448		D	• Stow “separated from” ammonium compounds, cyanides and peroxides <i>Permanganates</i>

5.1

Class 6.1



UN-No.	Subsidiary risk(s)	Stow. Cat.	Stowage and handling Segregation Further informations
1163		D	- Clear of living quarters - Segregation as for class 3 - Stow "away from" class 4.1 and 8 - Stow "separated from" acids <i>Alkalies</i> Flashpoint: -18 °C MARINE POLLUTANT mark
1181		A	Flashpoint: 54 °C
1182		D	- Clear of living quarters - Segregation as for class 3 - Stow "away from" class 4.1 - Stow "separated from" alkalis and cyanides <i>Acids</i> Flashpoint: 16 °C
1185		D	- Protected from sources of heat - Clear of living quarters Flashpoint: -13 °C SP 386
1199		A	Flashpoint: 48 °C
1238		D	- Clear of living quarters - Segregation as for class 3 - Stow "away from" class 4.1 - Stow "separated from" alkalis and cyanides <i>Acids</i> Flashpoint: 5 °C
1239		D	Clear of living quarters Flashpoint: below -18 °C
1244		D	- Clear of living quarters - Segregation as for class 3 - Stow "away from" class 4.1 and 8 - Stow "separated from" acids <i>Alkalies</i> Flashpoint: 20 °C
1251		D	- Protected from sources of heat - Clear of living quarters - Segregation as for class 3 - Stow "away from" class 4.1 Flashpoint: -7 °C SP 386
1259		D	- Clear of living quarters - Stow "separated longitudinally by an intervening complete compartment or hold from" class 1 Flashpoint: below -20 °C MARINE POLLUTANT mark
1510		D	- Clear of living quarters - Stow "separated from" class 4.1

UN-No.	Subsidiary risk(s)	Stow. Cat.	Stowage and handling Segregation Further informations
1541		D	- Protected from sources of heat - Clear of living quarters - Stow "separated from" acids and alkalis <i>Cyanides</i> MARINE POLLUTANT mark
1544 (I) (II) (III)		A	Solid
1545		D	- Protected from sources of heat - Clear of living quarters Flashpoint: 46 °C SP 386
1546		A	Stow "separated from" alkalis <i>Ammonium compounds</i>
1547		A	- Clear of living quarters - Stow "separated from" acids MARINE POLLUTANT mark
1549		A	Solid
1553		B	Stow "away from" powdered metals Liquid
1554		A	Solid
1555		A	- Protected from sources of heat - Clear of living quarters - Keep as cool as reasonably practicable
1556 (I) (II) (III)		B	- Clear of living quarters - For arsenic sulphides, "separated from" acids Liquid
1557 (I) (II) (III)		A	For arsenic sulphides, "separated from" acids Solid
1560		B	Clear of living quarters
1565		A	- Clear of living quarters - Stow "separated from" acids <i>Cyanides</i> MARINE POLLUTANT mark
1567		A	- Keep as dry as reasonably practicable - Stow "separated from" goods of classes 2.1 and 3 - In addition: from goods of classes 2.1 and 3 when stowed on deck of a containership a minimum distance of two container spaces athwartship shall be maintained, when stowed on ro-ro ships a distance of 6 m athwartship shall be maintained
1569		D	Clear of living quarters Flashpoint: 45 °C MARINE POLLUTANT mark
1572		E	Stow "separated from" acids, alkalis and cyanides <i>Acids</i>
1573		A	MARINE POLLUTANT mark

	ON DECK OR UNDER DECK	ON DECK ONLY	PROHIBITED
CARGO SHIPS:	A, B, E	C, D	
PASSENGER SHIPS:	A	B, C	D, E