

**PART II RULE FOR THE CONSTRUCTION
AND CLASSIFICATION OF SHIPS IDENTIFIED
BY THEIR MISSION**

**TITLE 31 SELECTION OF SHIP TYPE FOR
LIQUID BULK CARGOES**

SECTION 1 NAVAL ARCHITECTURE

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CHAPTER A SCOPE

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A1. APPLICATION

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A1. APPLICATION

100. Cargo types

101. **Carriage of bulk chemicals and vegetable oils:** The present Title applies to all ships regardless of size, including those of less than 500 gross tonnages, engaged in the carriage of flammable, noxious and harmful liquid substances (NHLS), as follows:

- a. products having significant fire hazards;
- b. products having significant hazards in addition to or other than flammability.
 - b.1. liquids that have been reviewed and determined not to present safety and pollution hazards to such an extent as to warrant the application of the IMO IBC Code, found in chapter 18 of that Code;
 - b.2. liquids covered by the IBC Code are those having a vapour pressure not exceeding 0.28 MPa absolute at a temperature of 37.8°C;
 - b.3. for the purpose of the 1974 SOLAS Convention, the IBC Code applies to ships which are engaged in the carriage of products included in chapter 17 of the IBC Code on the basis of their safety characteristics and identified as such by an entry of S or S/P in column d;
 - b.4. for the purposes of MARPOL 73/78, the present Chapter applies to NLS tankers, as defined in regulation 1.16.2 of Annex II thereof, which are engaged in the carriage of Noxious Liquid Substances identified as such by an entry of X, Y or Z in the IBC Code, column c of chapter 17.

102. **Carriage of liquefied gases in bulk:** This Title applies to ships regardless of their size, including those of less than 500 gross tonnage, engaged in carriage of liquefied gases having a vapour pressure exceeding 2.8 bar absolute at a temperature of 37.8°C, and other products as shown in chapter 19 of the IMO IGC Code, when carried in bulk.

103. **Carriage of flammable liquids:** This Title applies to all ships destined to the transportation of:

- a. Oil or petroleum in bulk, IMDG Class 3, for flammable products having a flash point of 60°C, closed cup test, or below but not under 23°C;
- b. Oil or petroleum products having a flash point, closed cup test, exceeding 60°C but under 100°C;

A2. DEFINITIONS

100. Definitions used in this Title

101. **IMDG Code** means the IMO International Maritime Dangerous Goods (IMDG) Code adopted by the Maritime Safety Committee of the Organization by resolution MSC.122(75), as may be amended by the Organization.

102. **MARPOL 73/78** means the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, as amended.

103. **ICLL:** IMO International Convention for Load Line

104. **IBC Code** IMO International Bulk Chemical Code

105. **IGC Code** IMO International Code for the carriage of liquefied gases in bulk.

106. **Noxious Liquid Substance** means any substance indicated in the Pollution Category column of chapters 17 or 18 of the International Bulk Chemical Code, or the current MEPC.2/Circular or provisionally assessed under the provisions of regulation 6.3 of MARPOL Annex II as falling into categories X, Y or Z.

107. **Low flash point liquids:** liquids having a flashpoint below 60 ° C.

Guidance

For the purpose of the regulations of MARPOL 73/78 Convention Annex II, Noxious Liquid Substances shall be divided into four categories as follows:

.1 Category X: Noxious Liquid Substances which, if discharged into the sea from tank cleaning or de-ballasting operations, are deemed to present a major hazard to either marine resources or human health and, therefore, justify the prohibition of the discharge into the marine environment;

.2 Category Y: Noxious Liquid Substances which, if discharged into the sea from tank cleaning or de-ballasting operations, are deemed to present a hazard to either marine resources or human health or cause harm to amenities or other legitimate uses of the sea and therefore justify a limitation on the quality and quantity of the discharge into the marine environment;

.3 **Category Z:** *Noxious Liquid Substances which, if discharged into the sea from tank cleaning or de-ballasting operations, are deemed to present a minor hazard to either marine resources or human health and therefore justify less stringent restrictions on the quality and quantity of the discharge into the marine environment;*

.4 **Other Substances:** *substances indicated as OS (Other Substances) in the pollution category column of chapter 18 of the International Bulk Chemical Code which have been evaluated and found to fall outside Category X, Y or Z above because they are, at present, considered to present no harm to marine resources, human health, amenities or other legitimate uses of the sea when discharged into the sea from tank cleaning of de-ballasting operations. The discharge of bilge or ballast water or other residues or mixtures containing only substances referred to as “Other Substances” shall not be subject to any requirements of the Annex.*

End of guidance

Guidance

According to IMO Resolution MSC.157(78) adopted on 20 May 2004)

Provisions for high consequence dangerous goods

For the purposes of this section, high consequence dangerous goods are those which have the potential for misuse in a terrorist incident and which may, as a result, produce serious consequences such as mass casualties or mass destruction.

The following is an indicative list of high consequence dangerous goods:

Indicative list of high consequence dangerous goods

Class 1, Division 1.1 explosives

Class 1, Division 1.2 explosives

Class 1, Division 1.3 compatibility group C explosives

Class 1, Division 1.4 UN Nos. 0104, 0237, 0255, 0267, 0289, 0361, 0365, 0366, 0440, 0441, 0455, 0456 and 0500

Class 1, Division 1.5 explosives

Class 2.1 Flammable gases in quantities greater than 3000 ℓ in a road tank vehicle, a railway tank wagon or a portable tank

Class 2.3 Toxic gases

Class 3 Flammable liquids of packing groups I and II in quantities greater than 3000 ℓ in a road tank vehicle, a railway tank wagon or a portable tank

Class 3 Desensitized liquid explosives

Class 4.1 Desensitized solid explosives

Class 4.2 Goods of packing group I in quantities greater than 3000 kg or 3000 ℓ in a road tank vehicle, a railway tank wagon, a portable tank or a bulk container

Class 4.3 Goods of packing group I in quantities greater than 3000 kg or 3000 ℓ in a road tank vehicle, a railway tank wagon, a portable tank or a bulk container

Class 5.1 Oxidizing liquids of packing group I in quantities greater than 3000 ℓ in a road tank vehicle, a railway tank wagon or a portable tank

Class 5.1 Perchlorates, ammonium nitrate, ammonium nitrate fertilizers and ammonium nitrate emulsions or suspensions or gels in quantities greater than 3000 kg or 3000 ℓ in a road tank vehicle, a railway tank wagon, a portable tank or a bulk container

Class 6.1 Toxic substances of packing group I

Class 6.2 Infectious substances of category A (UN Nos. 2814 and 2900)

Class 7 – Radioactive materials – transportation according to the Nuclear Energy (in Brazil, CNEN; international INF). See note below.

Class 8 Corrosive substances of packing group I in quantities greater than 3000 kg or 3000 ℓ in a road tank vehicle, a railway tank wagon, a portable tank or a bulk container

Note: For dangerous goods of Class 7, high consequence radioactive material is that with an activity equal to or greater than a transport security threshold of 3 000 A2 per single package except for the following radionuclides where the transport security threshold is given in Table 1.4.2 of item 1.4.3.1.3 of the IMDG Code.

End of guidance

CHAPTER B DOCUMENTS, REGULATIONS AND STANDARDS

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- B1. DOCUMENTATION TO BE SUBMITTED**
- B2. REGULATIONS**
- B3. TECHNICAL STANDARDS**

B1. DOCUMENTATION TO BE SUBMITTED

100. Documentation for reference – See Part II, Title 11, Section 1

200. Documentation for approval

201. In addition to the requirements of Part II, Title 11, Section 1 the documentation for approval referent to this Title is to be in accordance with the type of substance to be carried, and is described in the relevant Title.

300. Documentation for construction

301. See corresponding Title for the type of product to be carried.

**CHAPTER D
ACTIVITIES AND SERVICES**

CHAPTER CONTENTS

D1. ACTIVITIES/SERVICES

D1. ACTIVITIES AND SERVICES

100. Scope

101. The carriage of liquids in bulk is regulated by the following features:

- a. Classification of the product;
- b. Category of the product;
- c. Pressure at which the liquids are carried;
- d. Topology of the hull / container configuration.

200. Classes of dangerous bulk liquids in ships

201. The classes of LHNS (liquid harmful or noxious substances) are listed MARPOL Convention Annex II and in the IMO IMDG Code for all vessels.

202. Flammable liquids are classified by IMO IMDG (International maritime dangerous goods code).

203. Other may bulk liquid substances may be carried in ships depending on the ship's type and the classification of the product.

204. Table T.D1.203.1 presents a summary of the classes of liquefied dangerous goods in bulk covered by this Section:

**TABELA T.D1.203.1 - CLASSES DE
MERCADORIAS PERIGOSAS LÍQUIDAS A
GRANEL**

Classe	Produtos
2	Liquefied or dissolved liquefied gases under pressure
3	Flammable liquids
6.1	Noxious substances
8	Corrosive substances

300. Class notations of flammable liquids Class 3

301. Are the following (Table T.D1.301.1):

**TABLE T.D1.301.1 – CLASS NOTATION OF THE
FLAMMABLE LIQUIDS CLASS 3**

Category	Flash point f (°C)	Vapour pressure at 50 °C p (bar)	Obs.
K3	60 ≤ f ≤ 100	Atmospheric	
K2	23 ≤ f ≤ 60	Atmospheric	

**CHAPTER E
CONFIGURATIONS**

E1. CONFIGURATIONS

E1. CONFIGURATIONS

100. Hull types for transport pressures

100. General IMO instruments

101. The present topic refers to general IMO instruments applied to the different types of vessels covered by this Section. The detailed references are included in each relevant Title.

- a. SOLAS Chapter II-1, Regulations 4.1, 4.2, 5-1 and 19;
- b. Res. MSC.143(77) "Adoption of amendments to the Protocol of 1988 relating to the International Convention on Load Lines, 1966", Regulations 27(2), 27(3), 27(11), 27(12) and 27(13) 1);
- c. Res. MSC.281(85) "Explanatory Notes to the SOLAS Chapter II-1 Subdivision and Damage Stability Regulations" - special attention should be paid to Guidelines for the Preparation of

- Subdivision and Damage Stability Calculations specified in the Appendix;
- d. Res. MSC.245(83) "Recommendation on a Standard Method for Evaluating Cross-Flooding Arrangements";
- e. MSC.1/Circ.1245 "Guidelines for Damage Control Plans and Information to the Master";
- f. And
- f.1. MSC.1/Circ.1229 "Guidelines for the Approval of Stability Instruments", paragraph 4.

200. Configuration

201. Ships destined to carry chemical products

subject to Title 33 shall be designed to one of the following standards:

- a. A **type 1** ship is a chemical tanker intended to transport IBC Code chapter 17 products with very severe environmental and safety hazards which require maximum preventive measures to preclude an escape of such cargo.
- b. A **type 2** ship is a chemical tanker intended to transport IBC Code chapter 17 products with appreciably severe environmental and safety hazards which require significant preventive measures to preclude an escape of such cargo.
- c. A **type 3** ship is a chemical tanker intended to transport IBC Code chapter 17 products with sufficiently severe environmental and safety hazards which require a moderate degree of containment to increase survival capability in a damaged condition.
- d. Thus, a type 1 ship is a chemical tanker intended for the transportation of products considered to present the greatest overall hazard and type 2 and type 3 for products of progressively lesser hazards. Accordingly, a type 1 ship shall survive the most severe standard of damage and its cargo tanks shall be located at the maximum prescribed distance inboard from the shell plating.

202. **Ships destined to carry liquefied gases in bulk** subject to Title 34 should be designed to one of the following standards:

- a. A **type 1G** ship' is a gas carrier intended to transport products indicated in IGC Code chapter 19 which require maximum preventive measures to preclude the escape of such cargo.

- b. A **type 2G** ship' is a gas carrier intended to transport products indicated in IGC Code chapter 19 which require significant preventive measures to preclude the escape of such cargo.

- c. A **type 2PG** ship' is a gas carrier of 150 m in length or less intended to transport products indicated in chapter 19 which require significant preventive measures to preclude escape of such cargo, and where the products are carried in independent type C tanks designed (see IGC Code 4.2.4.4) for a MARVS of at least 7 bar gauge and a cargo containment system design temperature of -55°C or above. Note that a ship of this description but over 150 m in length is to be considered a type 2G ship.

- d. A **type 3G** ship' is a gas carrier intended to carry products indicated in IGC Code chapter 19 which require moderate preventive measures to preclude the escape of such cargo.

- e. Thus a type 1G ship is a gas carrier intended for the transportation of products considered to present the greatest overall hazard and types 2G/2PG and type 3G for products of progressively lesser hazards. Accordingly, a type 1G ship should survive the most severe standard of damage and its cargo tanks should be located at the maximum prescribed distance inboard from the shell plating.

- f. The ship type required for individual products is indicated in the IGC Code in column "c" in the table of chapter 19.

203. **Ships destined to carry flammable liquids:** subject to Title 32 should be designed to the standards of the MARPOL 73/78 convention, Chapter 19.

300. Constructive topology [IACS Rec 110]

301. Double hull is required from the conditions of location of tanks according to damage stability, depending survival conditions on the products to carry, as indicated in Titles 32, 33 and 34 of these Rules.

302. The requirements below apply for new oil tankers, chemical tankers and gas carriers contracted for construction on or after 1st January 2010 subject to review of impact on ships undergoing approval and delivering after said date.

303. The topology must be in compliance with the damage stability requirements given in Table T.E1.203.1 and illustrated by figures F.E1.203.1 and F.E1.203.2.

TABLE T.E1.303.1 – CONSTRUCTIVE TOPOLOGY

1	Side damage	MARPOL / IBC / IGC	ILLC (Type A ships)
1.1	Longitudinal extent	1/3 L or 14,5 metres, whichever is less <i>See notes 2 and 3</i>	Single compartment between adjacent transverse bulkheads as specified in ILLC paragraph 12 ⁽¹⁾
1.2	Transverse extent	B/5 or 11,5 metres whichever is less (measured inboard from the ship's side at right angles to the centreline at the level of the summer load line)	B/5 or 11,5 metres whichever is less (measured inboard from the side of the ship perpendicular to the centreline at the level of the summer load line) ⁽¹⁾
1,3	Vertical extent	Upwards without limit (measured from the moulded line of the bottom shell plating at centreline)	From base upwards without limit
2 Bottom damage		MARPOL / IBC / IGC	
		For 0,3 L from the forward perpendicular of the ship	Any part of the ship
2.1	Longitudinal extent	1/3 L or 14,5 metres, whichever is less. <i>See notes 2 and 3</i>	1/3 L or 5 metres, whichever is less <i>See notes 2 and 3</i>
2.2	Transverse extent	B/6 or 10 metres, whichever is less	B/6 or 5 metres, whichever is less
2.3	Vertical extent	MARPOL / IBC: B/15 or 6 metres, whichever is less (measured from the moulded line of the bottom shell plating at centreline) IGC: B/15 or 2 metres, whichever is less (measured from the moulded line of the bottom shell plating at centreline)	MARPOL / IBC: B/15 or 6 metres, whichever is less (measured from the moulded line of the bottom shell plating at centreline) IGC: B/15 or 2 metres, whichever is less (measured from the moulded line of the bottom shell plating at centreline)
3 Bottom raking damage		MARPOL	
3.1	Longitudinal extent	In tankers of 75,000 tonnes deadweight and above: 0,6 L (metres) measured from the forward perpendicular of the ship In tankers of less than 75,000 tonnes deadweight: 0,4 L (metres) measured from the forward perpendicular of the ship	
3.2	Transverse extent	B/3 anywhere in the bottom	
3.3	Vertical extent	Breach of the outer hull	
Notes:			
(1) See below.			
(2) Bottom damage is not required in the ICLL			
(3) Bottom raking damage is required only for oil tankers of 20,000 tonnes deadweight and above			

Note 1:

DESCRIPTION OF THE LONGITUDINAL EXTENT OF DAMAGE ACCORDING TO ICLL PROTOCOL 1988, REGULATION 27(12)(d)

The longitudinal extent of one compartment may vary depending if transversal wing tank bulkheads exceed B/5 (or 11.5m, whichever is less) or not. Please see the damages of sketch below.

1. Normal B/5 or 11.5m damage;
2. and 3. Transverse bulkhead exceeding B/5 or 11.5 m undamaged (two single one compartment damage cases); and
4. Transverse bulkhead not exceeding B/5 or 11.5m damaged (one single one compartment damage case).

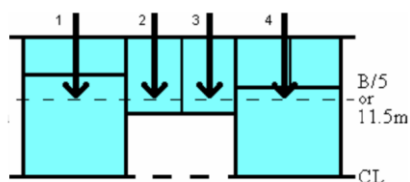


FIGURE F.E1.203.1 - IBC CODE AND MARPOL – CHEMICAL AND OIL TANKERS

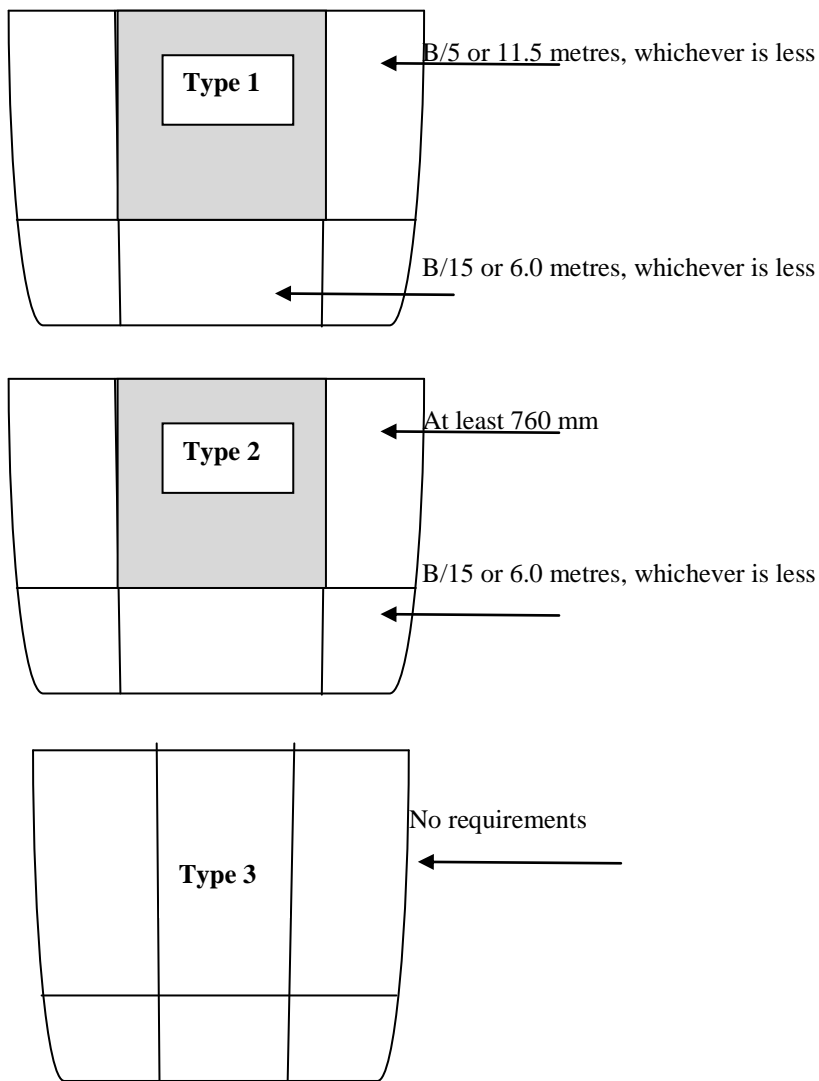
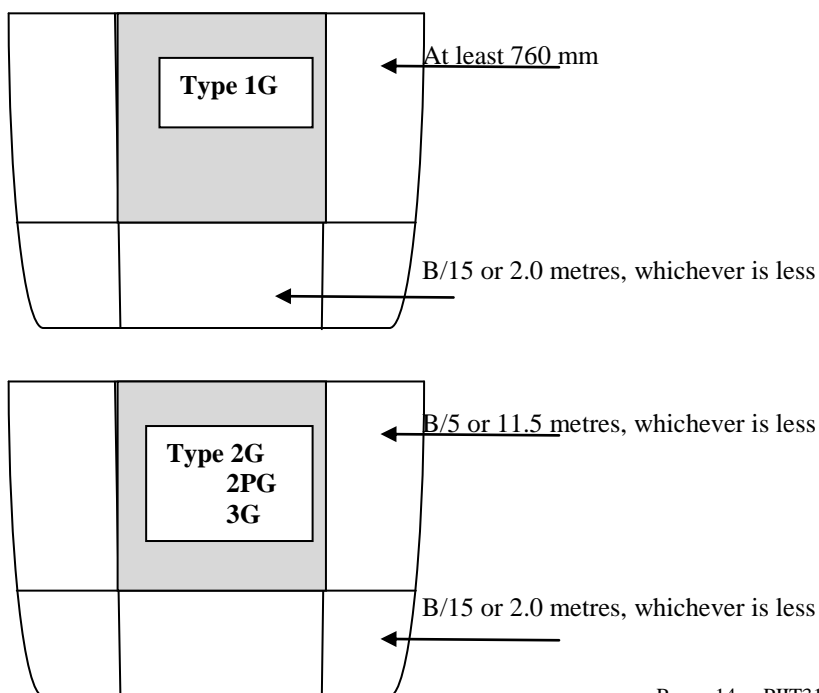


FIGURE F.E1.203.2 - IGC CODE – LIQUEFIED GAS CARRIERS



Rgmm14en-PIIT31S1-abde-00