

MARITIME SAFETY COMMITTEE  
95th session  
Agenda item 3

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**CONSIDERATION AND ADOPTION OF AMENDMENTS  
TO MANDATORY INSTRUMENTS**

**Amendments to the International Maritime Solid Bulk Cargoes (IMSBC) Code**

**Note by the Secretariat**

**SUMMARY**

<i>Executive summary:</i>	The Committee is invited to consider, with a view to adoption, proposed amendments to the International Maritime Solid Bulk Cargoes (IMSBC) Code (resolution MSC.268(85))
<i>Strategic direction:</i>	5.2
<i>High-level action:</i>	5.2.3
<i>Planned output:</i>	5.2.3.3
<i>Action to be taken:</i>	Paragraph 4
<i>Related documents:</i>	CCC 1/13 (paragraphs 5.40 and 5.41) and Circular Letters No.3488 and No.3489

**General**

1 In accordance with the procedure established by MSC 86 (MSC 86/26, paragraph 7.2), the Sub-Committee on Carriage of Cargoes and Containers (CCC), at its first session, agreed to draft amendments (03-15) to the International Maritime Solid Bulk Cargoes (IMSBC) Code (resolution MSC.268(85)) and authorized E&T 22 to prepare the final text of draft amendments to the IMSBC Code (excluding draft amendments related to substances harmful to the marine environment (HME)), for submission to MSC 95 with a view to adoption, the text of which is set out in annex 1.

2 CCC 1 also prepared a separate set of draft amendments to the IMSBC Code related to HME substances only, for submission to MEPC 68 for advice and submission to MSC 95 with a view to adoption, if appropriate, taking into account the outcome of MEPC 68, the text of which is set out in annex 2.

3 The proposed amendments, as set out in annexes 1 and 2, have been circulated to all IMO Member States and Contracting Governments to the International Convention for the Safety of Life at Sea, 1974 under the cover of Circular Letters No.3488 and No.3489 of 17 November 2014, respectively.

**Action requested of the Committee**

4 The Committee is invited to consider the proposed amendments to the IMSBC Code, as set out in annexes 1 and 2, with a view to adoption in accordance with article VIII(b)(iv) of the 1974 SOLAS Convention.

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**ANNEX 1**

**DRAFT RESOLUTION MSC.[...](95)  
(adopted on [...])**

**AMENDMENTS TO THE INTERNATIONAL MARITIME  
SOLID BULK CARGOES (IMSBC) CODE**

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

NOTING resolution MSC.268(85) by which it adopted the International Maritime Solid Bulk Cargoes Code (hereinafter referred to as "the IMSBC Code"), which has become mandatory under chapter VI of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended (hereinafter referred to as "the Convention"),

NOTING ALSO article VIII(b) and regulation VII/1.1 of the Convention concerning amendment procedure for amending the IMSBC Code,

HAVING CONSIDERED, at its [ninety-fifth] session, amendments to the IMSBC Code, proposed and circulated in accordance with article VIII(b)(i) of the Convention,

1 ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the IMSBC Code, the text of which is set out in the annex to the present resolution;

2 DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the said amendments shall be deemed to have been accepted on [1 July 2016], unless prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have notified their objections to the amendments;

3 INVITES Contracting Governments to the Convention to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on [1 January 2017] upon their acceptance in accordance with paragraph 2 above;

4 AGREES that Contracting Governments to the Convention may apply the aforementioned amendments in whole or in part on a voluntary basis as from [1 January 2016];

5 REQUESTS the Secretary-General, for the purpose of article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Contracting Governments to the Convention;

6 FURTHER REQUESTS the Secretary-General to transmit copies of this resolution and its annex to Members of the Organization, which are not Contracting Governments to the Convention.

\*\*\*

## ANNEX

### DRAFT AMENDMENTS TO THE INTERNATIONAL MARITIME SOLID BULK CARGOES (IMSBC) CODE

**Note:** The shadow text in this annex highlights amendments which are applicable to the published version of the IMSBC Code only, these are not to be included in the final resolution including amendment 03-15.

#### Contents

- 1 At the end, a new entry "appendix 5" is added with the following:  
  
"Appendix 5 Bulk Cargo Shipping Names in three languages (English, Spanish and French)"

#### Section 1 General provisions

##### [1.3 Cargoes not listed in this Code

##### 1.3.3 Format for the properties of cargoes not listed in this Code and conditions of the carriage\*

- 2 In the end of the footnote assigned to the title, replace the words "according to subsection 1.3.3 of the IMSBC Code" by "(see supplement of this publication)".]

##### 1.4 Application and implementation of this Code

- 3 In the existing paragraph 1.4.2, the line for "Appendices other than appendix 1, Individual schedules of solid bulk cargoes; and" is amended to read as follows:

"Appendices other than appendix 1, Individual schedules of solid bulk cargoes and appendix 5 Bulk Cargo Shipping Names in three languages (English, Spanish and French); and"

##### 1.6 Conventions

- 4 In the body of paragraph 1.6, at the end of the first sentence, the words "are reproduced in full" are replaced by the words "the relevant parts are reproduced below", and the second sentence is deleted.

## **Chapter VI Carriage of cargoes**

### **Part A General provisions**

5 The title of chapter VI is replaced by the following:

### **"Carriage of cargoes and oil fuels"**

#### **Regulation 1 Application**

6 At the beginning of paragraph 1, the words "Unless expressly provided otherwise," are added and the existing word "This" is replaced by the word "this".

#### **Regulation 4 The use of pesticides in ships**

7 In the footnote, in subparagraph .2, the reference for "(MSC.1/Circ.1264)" is replaced by "(MSC.1/Circ.1264, as amended by MSC.1/Circ.1396)".

#### **Regulation 5-1 Material safety data sheets**

8 Regulation 5-1 is deleted.

## **Chapter VII Carriage of dangerous goods**

### **Part A-1 *Carriage of dangerous goods in solid form in bulk***

#### **Regulations 7-4 Reporting of incidents involving dangerous goods**

9 In the footnote assigned at the end of paragraph 1, the reference "(MSC/Circ.857)" is amended to read "(MSC/Circ.857, as contained in the supplement to the IMDG Code)".

#### **1.7 Definitions**

10 In the definition for "Manual of Tests and Criteria", replace the words "(ST/SG/AC.10/11/Rev.5/Amendment 1)" by the words "(ST/SG/AC.10/11/Rev.5/Amendment 2)".

### **Section 3** **Safety of personnel and ship**

#### **3.1 General requirements**

11 After the existing paragraph 3.1.1, insert a new paragraph 3.1.2 with the following:

"3.1.2 Regular fire safety risk assessments shall be carried out for cargo handling areas on self-unloading bulk carriers featuring internally installed conveyor systems within the ship's structure. Due consideration shall be given to fire prevention and the effective operation of fire detection systems, containment and suppression under all anticipated operating conditions and cargoes."

and the existing paragraph 3.1.2 is renumbered as 3.1.3.

#### **3.2 Poisoning, corrosive and asphyxiation hazards**

[12 In paragraph 3.2.4, the corresponding footnote is amended to read as follows:

"Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27) (see the supplement of this publication)."]

#### **3.6 Cargo under in-transit fumigation**

[13 In paragraph 3.6.2, the existing footnotes are amended to read as follows:

"\* Refer to the Recommendations on the safe use of pesticides in ships applicable to the fumigation of cargo holds (MSC.1/Circ.1264), as amended by MSC.1/Circ.1396. (see the supplement of this publication)."

"† Refer to subsection 3.3.2.4 of MSC.1/Circ.1264, as amended by MSC.1/Circ.1396."]

[and a new footnote "‡" is added at the end of the paragraph with the following:

"‡ Refer to subsection 3.3.2.10 of MSC.1/Circ.1264, as amended by MSC.1/Circ.1396".]

### **Section 7** **Cargoes that may liquefy**

#### **7.3 Provisions for cargoes that may liquefy**

##### **7.3.1 General**

14 The existing paragraphs 7.3.1.1 to 7.3.1.4 are replaced by the following:

"7.3.1.1 Concentrates or other cargoes which may liquefy shall only be accepted for loading when the actual moisture content of the cargo is less than its TML. Notwithstanding this provision, cargoes having moisture content in excess of the TML may be carried on a specially constructed or fitted cargo ship for confining cargo shift specified in paragraph 7.3.2."

7.3.1.2 Notwithstanding the provisions in section 1.4 of this Code, the requirements in sections 4.2.2.9, 4.2.2.10, 4.3.2 to 4.3.5, 4.5, 4.6 and 8 of this Code need not apply to a cargo which may liquefy provided that the cargo is carried on a specially constructed or fitted cargo ship for confining cargo shift specified in paragraph 7.3.2 or on a specially constructed ship for dry powdery cargoes specified in paragraph 7.3.3.

7.3.1.3 Cargoes which contain liquids other than packaged canned goods or the like shall not be stowed in the same cargo space above or adjacent to these solid bulk cargoes.

7.3.1.4 Adequate measures shall be taken to prevent liquids entering the cargo space in which these solid bulk cargoes are stowed during the voyage.

7.3.1.5 Masters shall be cautioned about the possible danger of using water to cool these cargoes while the ship is at sea. Introducing water may bring the moisture content of these cargoes to a flow state. When necessary, due regard shall be paid to apply water in the form of spray."

### **7.3.2 Specially constructed or fitted cargo ships**

15 The existing subsection 7.3.2 is replaced by the following:

#### **"7.3.2 Specially constructed or fitted cargo ships for confining cargo shift**

7.3.2.1 Specially constructed cargo ships for confining cargo shift shall have permanent structural boundaries, so arranged as to confine any shift of cargo to an acceptable limit. The ship concerned shall carry evidence of approval by the Administration.

7.3.2.2 Specially fitted cargo ships for confining cargo shift shall be fitted with specially designed portable divisions to confine any shift of cargo to an acceptable limit. Specially fitted cargo ships shall be in compliance with the following requirements:

- .1 The design and positioning of such special arrangements shall adequately provide not only the restraint of the immense forces generated by the flow movement of high-density bulk cargoes, but also for the need to reduce to an acceptable safe level the potential heeling movements arising out of a transverse cargo flow across the cargo space. Divisions provided to meet these requirements shall not be constructed of wood.
- .2 The elements of the ship's structure bounding such cargo shall be strengthened, as necessary.
- .3 The plan of special arrangements and details of the stability conditions on which the design has been based shall have been approved by the Administration. The ship concerned shall carry evidence of approval by the Administration.

7.3.2.3 A submission made to an Administration for approval of such a ship shall include:

- .1 relevant structural drawings, including scaled longitudinal and transverse sections;

- .2 stability calculations, taking into account loading arrangements and possible cargo shift, showing the distribution of cargo and liquids in tanks, and of cargo which may become fluid; and
- .3 any other information which may assist the Administration in the assessment of the submission."

16 Add the following new subsection 7.3.3:

"7.3.3 Specially constructed cargo ships for dry powdery cargoes

7.3.3.1 Specially constructed cargo ships for dry powdery cargoes shall be designed and constructed to:

- .1 carry solely dry powdery cargoes; and
- .2 handle cargoes by means of closed type systems using pneumatic equipment which prevent the cargo from the exposure to weather.

7.3.3.2 The ship concerned shall carry evidence of approval by the Administration."

## Section 8

### Test procedures for cargoes that may liquefy

8.1 General

17 In the end of paragraph "8.1", the words "unless the cargo is carried in a specially constructed or fitted ship" are deleted.

## Section 9

### Materials possessing chemical hazards

9.2.3. Materials hazardous only in bulk

9.2.3.1 General

18 After the existing paragraphs 9.2.3.1.3, two new subparagraphs 9.2.3.1.4 and 9.2.3.1.5 are added with the following:

"9.2.3.1.4 Although the chemical hazards are intended to be closely defined in order to establish a uniform approach to MHB classification, where human experience or other factors indicate the need to consider other chemical hazards, these shall always be taken into account. Where deviations from the chemical hazards described in 9.2.3.2 to 9.2.3.7, have been recognized (Other hazards (OH)), they shall be properly recorded with justifications. Other hazards are to be included in the section for "Hazard" in the individual schedule.



9.2.3.1.5 A notational reference shall accompany the MHB designation in the "Class" cell of the Characteristics table for each individual schedule for cargoes classified as MHB. When a material possesses one or more of the chemical hazards as defined below, the notational reference for each hazard shall be included in the "Class" cell. A summary of the notational references is presented in the table below:

<b>Chemical Hazard</b>	<b>Notational Reference</b>
Combustible solids	CB
Self-heating solids	SH
Solids that evolve flammable gas when wet	WF
Solids that evolve toxic gas when wet	WT
Toxic solids	TX
Corrosive solids	CR
Other hazards	OH

and amend the following subsection headings under 9.2.3 as follows:

**9.2.3.2 Combustible solids: MHB (CB)**

**9.2.3.3 Self-heating solids: MHB (SH)**

**9.2.3.4 Solids that evolve flammable gas when wet: MHB (WF)**

**9.2.3.5 Solids that evolve toxic gas when wet: MHB (WT)**

**9.2.3.6 Toxic solids: MHB (TX)**

**9.2.3.7 Corrosive solids: MHB (CR)"**

**9.2.3.7** *Corrosive solids*

19 In paragraph 9.2.3.7.3, replace the reference "ISO 3574:199" by the reference "ISO 3574:1999".

**9.3 Stowage and segregation requirements**

**9.3.3 Segregation between bulk materials possessing chemical hazards and dangerous goods in packaged form**

20 The second paragraph of the existing paragraph 9.3.3.1, before the table, is numbered as "9.3.3.2".

## Section 13 References to related information and recommendations

### 13.1 General

21 In paragraph 13.1, after the words "IMO Instruments", insert the words "and other international standards (such as ISO, IEC)".

### 13.2 Reference list

22 In paragraph 13.2, after the words "IMO Instruments", in the first sentence, insert the words "or standard"; and, in the third sentence of the paragraph, after the words "IMO Instruments", insert the words "or reference standard".

23 In the heading of the table, in column "Reference to the relevant IMO instruments (2)", add the words "or standard" after the words "IMO instruments".

#### 13.2.3 *Fire-extinguishing arrangements*

24 Under section 13.2.3 of the table, insert a new second row with the following:

"

General Group B	FSS Code chapter 5	Fixed Gas Fire-Extinguishing Systems
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"

and under section 13.2.3 of the table, in the column "Reference to the relevant IMO instruments (2)", for entry "Groups A, B and C", delete the words "MSC/Circ.1146 as amended by"; after "1395", insert the words "/Rev.1"; and, in the column "Subject (3)", after the words "may be exempted", add the words "or for which a fixed gas fire-extinguishing system is ineffective".

#### 13.2.4 *Ventilation*

25 Under section 13.2.4 of the table, at the end of the section, insert three new rows with the following:

"

General Group B	MSC.1/Circ.1434	Unified Interpretation of SOLAS II-2/19.3.4
General Group B	MSC.1/Circ.1120	Unified Interpretation of SOLAS including II-2 /19.3.2, 19.3.4 and 19.3.4.2
General Group B	IEC 60092-506	Electrical standards for equipment safe for use in an explosive atmosphere

"

#### 13.2.6 *Gas detection*

26 Under section 13.2.6 of the table, in the column "Reference to the relevant IMO instruments (2)", the words "section 3" are replaced by "as amended by MSC.1/Circ.1396",

and, at the end of the section, insert a new row with the following:

"

General	IEC 60092-506	Electrical standards for equipment safe for use in an explosive atmosphere
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"

### 13.2.10 Segregation

27 Under section 13.2.10 of the table, at the end of the section, insert a new row with the following:

Group B	IEC 60092-352	Standards for electrical cable penetrations in boundaries
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### 13.2.12 Entering enclosed spaces

28 Under section 13.2.12 of the table, in the column "Reference to the relevant IMO instruments (2)", amend the text to read "resolution A.1050(27), 30 November 2011"; and in the column "Subject (3)", amend the title to read "Revised recommendations for entering enclosed spaces aboard ships".

### 13.2.13 Avoidance of excessive stresses

29 Under section 13.2.13 of the table, at the end of the section, insert two new rows with the following:

2.1.2	Resolution A.862(20), as amended	Code of Practice for the Safe Loading and Unloading of Bulk Carriers (BLU Code)
2.1.2	MSC.1/Circ.1357	Additional Considerations for the Safe Loading of Bulk Carriers

## APPENDIX 1

### *Individual schedules of solid bulk cargoes*

#### Amendments to existing individual schedules

##### **ALFALFA**

30 In the individual schedule for "ALFALFA", under the section for "Loading", in the first sentence, replace the words "of the Code" by the words "of this Code".

##### **ALUMINA HYDRATE**

31 In the individual schedule for "ALUMINA HYDRATE", under the section for "Weather precautions", in the first paragraph, the words "specially constructed or fitted cargo" are deleted.

##### **CLINKER ASH, WET**

32 In the bulk cargo shipping name, the word "WET", is deleted. Under the section for "Description", the third sentence "Insoluble in water." is replaced by the following:

"This cargo can be classified into wet type, which is taken out using water, and dry type, which is taken out under dry condition."

and under the section for "Weather precautions", in the first paragraph, the words "specially constructed or fitted cargo" are deleted. After the reference "7.3.2", insert the words "or a ship complying with the requirements in subsection 7.3.3".

### **COAL**

33 In the individual schedule for "COAL", under the section for "Weather precautions", in the first paragraph, the words "specially constructed or fitted cargo" are deleted. In the appendix for the individual schedule for "COAL", in the section for "Procedures for gas monitoring of coal cargoes", [the corresponding footnote in paragraph "2.7.1.4" is amended to read as follows:

"Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27) (see the supplement of this publication)."]

### **COAL SLURRY**

34 In the section for "Weather precautions", in the first paragraph, the words "specially constructed or fitted cargo" are deleted.

### **COKE BREEZE**

35 In the section for "Weather precautions", in the first paragraph, the words "specially constructed or fitted cargo" are deleted.

### **FLUORSPAR**

36 In the section for "Weather precautions", in the first paragraph, the words "specially constructed or fitted cargo" are deleted.

### **FLY ASH, WET**

37 In the section for "Weather precautions", in the first paragraph, the words "specially constructed or fitted cargo" are deleted.

### **ILMENITE CLAY**

38 In the section for "Weather precautions", in the first paragraph, the words "specially constructed or fitted cargo" are deleted.

### **ILMENITE (UPGRADED)**

39 In the section for "Weather precautions", in the first paragraph, the words "specially constructed or fitted cargo" are deleted.

### **IRON ORE**

40 Replace the existing individual schedule for "IRON ORE" by the following:

## "IRON ORE

The provisions of this schedule shall apply to iron ore cargoes:

- .1 containing either:
  - .1 less than 10% of fine particles less than 1 mm ( $D_{10} > 1$  mm); or
  - .2 less than 50% of particles less than 10 mm ( $D_{50} > 10$  mm); or
  - .3 both; or
- .2 iron ore fines where the total goethite content is 35% or more by mass, provided the master receives from the shipper a declaration of the goethite content of the cargo which has been determined according to internationally or nationally accepted standard procedures.

### Description

Iron ore varies in colour from dark grey to rusty red. It varies in iron content from haematite, (high grade ore) to ironstone of the lower commercial ranges. Mineral Concentrates are different cargoes (see IRON CONCENTRATE).

### Characteristics

Angle of repose	Bulk density (kg/m <sup>3</sup> )	Stowage factor (m <sup>3</sup> /t)
Not applicable	1,250 to 3,500	0.29 to 0.80
Size	Class	Group
Up to 250 mm	Not applicable	C

### Hazard

No special hazards.

This cargo is non-combustible or has a low fire-risk.

Iron ore cargoes may affect magnetic compasses.

### Stowage & segregation

No special requirements.

### Hold cleanliness

No special requirements.

### Weather precautions

No special requirement.

### Loading

Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code. When the stowage factor of this cargo is equal or less than 0.56 m<sup>3</sup>/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo forming.

### Precautions

Loading rates of this cargo are normally very high. Due consideration shall be given to the ballasting operation to develop the loading plan required by SOLAS regulation VI/7.3. Bilge wells shall be clean, dry and protected as appropriate to prevent ingress of the cargo.

### **Ventilation**

No special requirements.

### **Carriage**

No special requirements.

### **Discharge**

No special requirements.

### **Clean-up**

No special requirements."

## **IRON ORE PELLETS**

41 In the individual schedule for "IRON ORE PELLETS", under "Precautions", delete the words "No special requirements".

## **METAL SULPHIDE CONCENTRATES**

42 In the section for "Weather precautions", in the first paragraph, the words "specially constructed or fitted cargo" are deleted.

## **MINERAL CONCENTRATES**

43 In the section for "Weather precautions", in the first paragraph, the words "specially constructed or fitted cargo" are deleted."

## **NICKEL ORE**

44 In the section for "Weather precautions", in the first paragraph, the words "specially constructed or fitted cargo" are deleted.

## **PEAT MOSS**

45 In the section for "Loading", the words "specially fitted or constructed ships (see subsection 7.3.2)" are replaced by the words "a ship complying with the requirements in subsection 7.3.2 of this Code".

## **SAND, HEAVY MINERAL**

46 In the section for "Weather precautions", in the first paragraph, the words "specially constructed or fitted cargo" are deleted.

## **SULPHUR (formed, solid)**

[47 In the individual schedule for "SULPHUR (formed, solid)", the corresponding footnote under "Clean-up" is amended to read as follows:

"Refer to the *Revised recommendations for entering enclosed spaces aboard ships*, adopted by the Organization by resolution A.1050(27) (see the supplement of this publication)."]

## **WOOD PELLETS**

48 The existing individual schedule for "WOOD PELLETS" is deleted.

## New individual schedules

49 Insert the following new individual schedules accordingly in alphabetical order:

### "ALUMINIUM FLUORIDE

#### Description

The aluminium fluoride is a fine, white powder, odourless which presents itself dry. The cargo is not cohesive. The moisture content is less than 1%.

#### Characteristics

Angle of repose	Bulk density (kg/m <sup>3</sup> )	Stowage factor (m <sup>3</sup> /t)
32° to 35°	1,527	0.65
Size	Class	Group
Fine powder	Not applicable	A

#### Hazard

This cargo may liquefy if shipped at a moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of this Code.

The cargo may be slightly irritating to eyes and mucous membranes. In contact with acids, it develops toxic vapours of hydrogen fluoride. If involved in a fire, it may develop toxic fumes of hydrogen fluoride. This cargo is non-combustible or has a low fire-risk.

#### Stowage & segregation

No special requirements.

#### Hold cleanliness

No special requirements.

#### Weather precautions

When a cargo is carried in a ship other than a ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

- .1 the moisture content of the cargo shall be kept less than its TML during voyage;
- .2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;
- .3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;
- .4 the cargo may be handled during precipitation under the conditions stated in the procedures required in paragraph 4.3.3 of this Code; and
- .5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

#### Loading

Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

### Precautions

Persons who may be exposed to the dust of the cargo shall wear protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

### Ventilation

No special requirements.

### Carriage

The appearance of the surface of this cargo shall be checked regularly during voyage. If free water above the cargo or fluid state of the cargo is observed during voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge.

### Discharge

Maintain accommodation and equipment protected from dust.

### Clean-up

Make sure that decks and holds are well shovelled and swept before using the water."

## "AMORPHOUS SODIUM SILICATE LUMPS

This schedule shall apply only to amorphous sodium silicate lumps with molar ratio of silicon dioxide to sodium oxide ( $\text{SiO}_2/\text{Na}_2\text{O}$ ) greater than 3.2.

### Description

Lumps. Colorless to green glassy solid.

### Characteristics

Angle of repose	Bulk density (kg/m <sup>3</sup> )	Stowage factor (m <sup>3</sup> /t)
Not applicable	1,100 to 1,500	0.67 to 0.91
Size	Class	Group
Up to 100 mm	MHB (CR)	B

### Hazard

Dust may cause skin and eye irritation.

This cargo is non-combustible or has a low fire-risk. This cargo is hygroscopic and will cake if wet.

### Stowage & segregation

No special requirements.

### Hold cleanliness

Clean and dry as relevant to the hazards of the cargo.

### Weather precautions

This cargo shall be kept as dry as practicable. This cargo shall not be handled during precipitation. During handling of this cargo all non-working hatches of the cargo spaces into which this cargo is to be loaded shall be closed.

### Loading

During loading, due consideration shall be given to minimize dust generation. Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.



### Precautions

Bilge wells shall be clean and dry and covered as appropriate to prevent ingress of the cargo.

Persons who may be exposed to the cargo shall wear protective clothing, goggles or other equivalent dust eye-protection and dust filter masks. Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo.

### Ventilation

The cargo spaces carrying this cargo shall not be ventilated during voyage.

### Carriage

No special requirements.

### Discharge

During discharge, due consideration shall be given to minimize dust generation. This cargo is hygroscopic and may cake in overhangs, impairing safety during discharge. If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

### Clean-up

No special requirements.

### Emergency procedures

<p><b>Special emergency equipment to be carried</b></p> <p>Nil</p>
<p><b>Emergency procedures</b></p> <p>Nil</p> <p><b>Emergency action in the event of fire</b></p> <p>Nil</p> <p><b>Medical First Aid</b></p> <p>Refer to the Medical First Aid Guide (MFAG), as amended</p>

### "BORIC ACID

#### Description

A white free-flowing crystalline powder. Odourless and dry with not more than 1.0% moisture. Water soluble.

#### Characteristics

Angle of repose	Bulk density (kg/m <sup>3</sup> )	Stowage factor (m <sup>3</sup> /t)
Not applicable	544 to 862	1.16 to 1.84
Size	Class	Group
Fine crystalline powder, dry	MHB (TX)	B

### **Hazard**

Mild irritation effects to nose and throat may occur from inhalation. May cause irritation to skin. May cause long-term health effects. This cargo is non-combustible.  
This cargo is hygroscopic and will cake if wet.

### **Stowage & segregation**

"Separated from" metal hydrides and alkali metals.

### **Hold cleanliness**

Clean and dry as relevant to the hazards of the cargo.

### **Weather precautions**

This cargo shall be kept as dry as practicable. This cargo shall not be handled during precipitation. During handling of this cargo, all non-working hatches of the cargo spaces into which this cargo is loaded or to be loaded shall be closed.

### **Loading**

Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

### **Precautions**

Persons who may be exposed to the dust of the cargo shall wear protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

### **Ventilation**

No special requirements.

### **Carriage**

No special requirements.

### **Discharge**

No discharge operations during precipitation.

Boric acid is hygroscopic and may cake in overhangs, impairing safety during discharge. If this cargo has hardened, it shall be trimmed to avoid the formation of overhangs, as necessary.

### **Clean-up**

Thorough dry cleaning to be carried out prior to washing all cargo spaces.

### **Emergency procedures**

<b>Special emergency equipment to be carried</b> Nil.
<b>Emergency procedures</b> Nil.
<b>Emergency action in the event of fire</b> Nil.
<b>Medical First Aid</b> Refer to the <i>Medical First Aid Guide (MFAG)</i> , as amended.

## "CHEMICAL GYPSUM

### Description

Calcium sulphate hydrate generated as a product or by-product in the process of smelter and refinery, and polyaluminum chloride. White or brown powder without smell and insoluble. In use for Gypsum-Board and Cement.

### Characteristics

Angle of repose	Bulk density (kg/m <sup>3</sup> )	Stowage factor (m <sup>3</sup> /t)
Not applicable	570 to 1,170	0.85 to 1.74
Size	Class	Group
40 µm to 1 mm	Not applicable	A

### Hazard

This cargo may liquefy if shipped at a moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of this Code. This cargo is non-combustible or has a low fire-risk.

### Stowage & segregation

No special requirements.

### Hold cleanliness

No special requirements.

### Weather precautions

When a cargo is carried in a ship other than a ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

- .1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;
- .2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;
- .3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;
- .4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and
- .5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

### Loading

Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

### Precautions

No special requirements.

### Ventilation

No special requirements.

### **Carriage**

The appearance of the surface of this cargo shall be checked regularly during voyage. If free water above the cargo or fluid state of the cargo is observed during voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge.

### **Discharge**

No special requirements.

### **Clean-up**

Prior to washing out the residues of this cargo, the decks and the cargo spaces shall be shovelled and swept clean, because washing out of this cargo is difficult."

## **"COPPER SLAG**

### **Description**

Residue generated from copper smelting process. This cargo is highly permeable and pore water of this cargo drains quickly. It is black or red-brown in colour and either granular or lump.

### **Characteristics**

<b>Angle of repose</b>	<b>Bulk density (kg/m<sup>3</sup>)</b>	<b>Stowage factor (m<sup>3</sup>/t)</b>
Not applicable	1,500 to 2,500	0.40 to 0.67
<b>Size</b>	<b>Class</b>	<b>Group</b>
Up to 10 mm	Not applicable	A

### **Hazard**

This cargo may liquefy if shipped at moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of this Code. This cargo is abrasive. This cargo is non-combustible and has a low fire-risk.

### **Stowage & segregation**

No special requirements.

### **Hold cleanliness**

No special requirements.

### **Weather precautions**

When a cargo is carried in a ship other than a ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

- .1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;
- .2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;
- .3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;
- .4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and

- .5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

### Loading

This cargo shall be trimmed to ensure that the height difference between peaks and troughs does not exceed 5% of the ship's breadth and that the cargo slopes uniformly from the hatch boundaries to the bulkheads and no shearing faces remain to collapse during voyage.

When the stowage factor of this cargo is equal or less than 0.56 m<sup>3</sup>/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo forming.

### Precautions

Appropriate action shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress of the cargo. Due consideration shall be given to protect equipment from the dust of the cargo.

Persons who may be exposed to the dust of the cargo shall wear protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

### Ventilation

No special requirements.

### Carriage

Bilge water shall be removed regularly during the voyage.

### Discharge

No special requirements.

### Clean-up

No special requirements."

## "GLASS CULLET

### Description

Green, brown or uncoloured glass. May have a slight sweet smell. Used to make new glass, glass wool and foam glass.

### Characteristics

Angle of repose	Bulk density (kg/m <sup>3</sup> )	Stowage factor (m <sup>3</sup> /t)
Not applicable	1,060 to 1,330	0.75 to 0.94
Size	Class	Group
Up to 50 mm	Not applicable	C

### Hazard

This cargo is non-combustible or has a low fire-risk.

Potential inhalation hazard and skin and eye irritation from cullet dust during handling, placement and transportation.

Potential risk for cuts or punctures during handling and placement.

**Stowage & segregation**

No special requirements.

**Hold cleanliness**

No special requirements.

**Weather precautions**

No special requirements.

**Loading**

Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

**Precautions**

To protect against possible cuts or penetration injuries as well as against exposure of glass dust to skin, ears and eyes, personnel working with glass cullet shall wear long sleeves, pants, gloves, work boots, hard hats, ear protection and eye protection. Shirt sleeves and pant legs can be taped for additional protection.

Personnel can also wear disposable nuisance dust masks to protect against dust inhalation.

**Ventilation**

No special requirements.

**Carriage**

No special requirements.

**Discharge**

No special requirements.

**Clean-up**

Avoid handling which creates dust.

Wet suppression is an effective measure of dust control."

**"IRON AND STEEL SLAG AND ITS MIXTURE**

This cargo may contain substances hazardous to human health such as cadmium, lead, hexavalent chromium, boron and fluorine. This individual schedule shall not apply to cargoes that meet the criteria specified in 9.2.2.5 and 9.2.3.6.

**Description**

The main component of the cargo is a slag arising from iron and steel manufacture, and a slag mixed with one of the following additives or a combination thereof: cement, granulated blast furnace slag and concrete debris.

The cargo is mostly stabilized before transportation by ageing and slaking for the volume and/or chemical stability in practical usages, and physical properties such as the grain size, etc. are controlled for the performance requirement if necessary: the cargo is transported at room temperature.

This cargo does not include both slag residue and hot iron and steel slag discharged from iron and steelmaking processes.

The iron and steel slag is a vitrified or crystallized solid formed out of high temperature processes, and it is a mixture of several mineralogical phases.

This cargo may include shaped blocks made of iron and steel slag with a combination of cement and ground granulated blast furnace slag. The colour is in the range from greyish-white to dark grey, and the appearance is in the range from granulated, pebble to blocks. Examples of the application of this cargo are: road construction materials, concrete aggregate, soil improvement, civil engineering materials, raw materials of cement industry and raw materials for fertilizer.

### Characteristics

Angle of repose	Bulk density (kg/m <sup>3</sup> )	Stowage factor (m <sup>3</sup> /t)
Not applicable	1,200 to 3,000	0.33 to 0.83
Size	Class	Group
Up to 100 mm	Not applicable	A

### Hazard

This cargo may liquefy if shipped at a moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of this Code. This cargo is non-combustible and has a low fire-risk.

### Stowage & segregation

No special requirements.

### Hold cleanliness

No special requirements.

### Weather precautions

When a cargo is carried in a ship other than a ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

- .1 the moisture content of the cargo shall be kept at less than its TML during loading operations and the voyage;
- .2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;
- .3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;
- .4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and
- .5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

### Loading

Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

When the stowage factor of this cargo is equal or less than 0.56 m<sup>3</sup>/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo forming.

### Precautions

Persons who may be exposed to the dust of the cargo shall wear protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

### Ventilation

No special requirements.

### Carriage

The appearance of the surface of this cargo shall be checked regularly during voyage. If free water above the cargo or fluid state of the cargo is observed during voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsizing of the ship, and give consideration to seeking emergency entry into a place of refuge.

### Discharge

No special requirements.

### Clean-up

No special requirements."

### "IRON ORE FINES

The provisions of this schedule shall apply to iron ore cargoes containing both:

- .1 10% or more of fine particles less than 1 mm ( $D_{10} \leq 1$  mm); and
- .2 50% or more of particles less than 10 mm ( $D_{50} \leq 10$  mm).

Notwithstanding the above provision, iron ore fines where the total goethite content is 35% or more by mass may be carried in accordance with the individual schedule for "IRON ORE", provided the master receives from the shipper a declaration of the goethite content of the cargo which has been determined according to internationally or nationally accepted standard procedures.

### Description

Iron ore fines vary in colour from dark grey, rusty red to yellow and contain hematite, goethite and magnetite with varying iron content.

IRON CONCENTRATE is a different cargo (see individual schedule for "Mineral Concentrates")

### Characteristics

Angle of repose	Bulk density (kg/m <sup>3</sup> )	Stowage factor (m <sup>3</sup> /t)
Not applicable	1,500 to 3,500	0.29 to 0.67
Size	Class	Group
10% or more of fine particles less than 1 mm and 50% or more of particles less than 10 mm	Not applicable	A

### Hazard

This cargo may liquefy if shipped at moisture content in excess of its transportable moisture limit (TML). See sections 7 and 8 of this Code.

This cargo may affect magnetic compasses.

This cargo is non-combustible or has a low fire-risk.



### **Stowage & segregation**

No special requirements

### **Hold cleanliness**

No special requirements

### **Weather precautions**

When a cargo is carried in a ship other than a ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

- .1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;
- .2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;
- .3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;
- .4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and
- .5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

### **Loading**

Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

When the stowage factor of this cargo is equal or less than 0.56 m<sup>3</sup>/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo forming.

### **Precautions**

Loading rates of this cargo are normally very high. Due consideration shall be given to the ballasting operation in developing the loading plan required by SOLAS regulation VI/7.3. Bilge wells shall be clean, dry and protected as appropriate to prevent ingress of the cargo.

### **Ventilation**

No special requirements

### **Carriage**

Cargo hold bilges shall be sounded at regular intervals and pumped out, as necessary. The appearance of the surface of this cargo shall be checked regularly during voyage, as far as practicable. If free water above the cargo or fluid state of the cargo is observed during voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge.

### **Discharge**

No special requirements.

### **Clean-up**

No special requirements."

## **"IRON OXIDE TECHNICAL**

### **Description**

Iron oxide technical is generated as a product or by-product in the manufacture of di-iron trioxide (iron (III) oxide) for the industrial and commercial use. The material is odourless and red in colour.

### **Characteristics**

<b>Angle of repose</b>	<b>Bulk density (kg/m<sup>3</sup>)</b>	<b>Stowage factor (m<sup>3</sup>/t)</b>
Not applicable	1,000	1.0
<b>Size</b>	<b>Class</b>	<b>Group</b>
Fine particles	Not applicable	A

### **Hazard**

Dust may cause skin and eye irritation. Iron cargoes may affect magnetic compasses.

This cargo may liquefy if shipped at moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of this Code. This cargo is non-combustible or has a low fire-risk.

### **Stowage & segregation**

No special requirements

### **Hold cleanliness**

No special requirements

### **Weather precautions**

When a cargo is carried in a ship other than a ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

- .1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;
- .2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;
- .3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;
- .4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and
- .5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

### Loading

Trim in accordance with the relevant provisions in compliance with sections 4 and 5 of this Code.

### Precautions

Persons who may be exposed to the dust of the cargo shall wear protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.  
Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo.

### Ventilation

No special requirements

### Carriage

The appearance of the surface of this cargo shall be checked regularly during voyage. If free water above the cargo or fluid state of the cargo is observed during voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge.

### Discharge

No special requirements

### Clean-up

After discharge of this cargo, the bilge wells and the scuppers of the cargo spaces shall be checked and any blockage in the bilge wells and the scuppers shall be removed."

## "IRON SINTER

### Description

The thermally agglomerated substance formed by heating a variable mixture of finely divided coke, iron ore, blast furnace dust, steelmaking dust, mill scale, other miscellaneous iron-bearing materials, limestone, and dolomite at 1315°C to 1482°C.

### Characteristics

Angle of repose	Bulk density (kg/m <sup>3</sup> )	Stowage factor (m <sup>3</sup> /t)
Not applicable	1,800 to 2,100	0.47 to 0.56
Size	Class	Group
Up to 200 mm	Not applicable	C

### Hazard

Dust of this cargo is fine and may be irritating to eye and respiratory tract. This cargo is non-combustible or has a low fire-risk.

### Stowage & segregation

No special requirements.

### Hold cleanliness

No special requirements.

### Weather precautions

No special requirements.

### **Loading**

Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

As the density of the cargo is extremely high, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during voyage and during loading by a pile of the cargo.

### **Precautions**

Bilge wells of the cargo space shall be protected from ingress of the cargo. Persons who may be exposed to the dust of the cargo shall wear protective clothing, goggles or other equivalent dust eye protection and dust filter masks, as necessary.

### **Ventilation**

No special requirements.

### **Carriage**

Bilge shall be sounded and pumped out as necessary during the voyage.

### **Discharge**

No special requirements.

### **Clean-up**

No special requirements."

## **"MANGANESE COMPONENT FERROALLOY SLAG**

### **Description**

By-product generated in process of manufacturing manganese component ferroalloy. Particles or lumps of green, brownish-red or grayish-black. Moisture: 1.2% to 5.6%.

### **Characteristics**

<b>Angle of repose</b>	<b>Bulk density (kg/m<sup>3</sup>)</b>	<b>Stowage factor (m<sup>3</sup>/t)</b>
Not applicable	1,480 to 1,935	0.52 to 0.68
<b>Size</b>	<b>Class</b>	<b>Group</b>
Up to 200 mm	Not applicable	C

### **Hazard**

No special hazards.

This cargo is non-combustible or has a low fire-risk.

### **Stowage & segregation**

No special requirements.

### **Hold cleanliness**

No special requirements.

### **Weather precautions**

No special requirements.

### Loading

Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

When the stowage factor of this cargo is equal or less than 0.56 m<sup>3</sup>/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that tank top is not overstressed during voyage and during loading by a pile of the cargo forming.

### Precautions

Persons who may be exposed to the dust of the cargo shall wear protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

### Ventilation

No special requirements.

### Carriage

No special requirements.

### Discharge

No special requirements.

### Clean-up

No special requirements."

## "MANGANESE ORE FINES

The provisions of this schedule shall apply to manganese ore cargoes containing both:

- .1 10% or more of fine particles less than 1 mm ( $D_{10} \leq 1$  mm); and
- .2 50% or more of particles less than 10 mm ( $D_{50} \leq 10$  mm).

Notwithstanding the above provisions, manganese ore cargoes which do not exhibit a flow moisture point (FMP) are not liable to liquefy and shall be shipped as a Group C cargo under the provisions of the MANGANESE ORE individual schedule.

This schedule applies to manganese ore cargoes which may liquefy. For manganese ore cargoes not liable to liquefy see the MANGANESE ORE schedule.

### Description

Manganese ore fines is multicoloured, and usually brown to black. Its colour and texture may vary due to variations of the manganese and gangue minerals present. It is a very heavy cargo with typical moisture content up to 15% by weight.

### Characteristics

Angle of repose	Bulk density (kg/m <sup>3</sup> )	Stowage factor (m <sup>3</sup> /t)
Not applicable	1,450 to 3,200	0.31 to 0.69
Size	Class	Group
Typically up to 15 mm with more than 10% finer than 1 mm and more than 50% finer than 10 mm	Not applicable	A

### **Hazard**

This cargo may liquefy if shipped at moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of this Code.

The dust of this cargo is irritating to the eyes and mucous membranes.

This cargo is non-combustible or has a low fire-risk. It is stable and non-reactive under normal conditions of use, storage and transport. However, this cargo may ignite in contact with incompatible materials such as acids, alkalis, oxidizing and reducing agents. It may decompose to form toxic manganese oxide particles when heated to decomposition.

### **Stowage & segregation**

Separated from acids, alkalis, oxidizing and reducing agents.

### **Hold cleanliness**

Clean and dry as relevant to the hazards of the cargo.

### **Weather precautions**

When a cargo is carried in a ship other than a ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

- .1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;
- .2
- .3 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;
- .4 unless expressly provided otherwise in this schedule, during handling of the cargo all non-working hatches of the cargo spaces into which the cargo is loaded, or to be loaded, shall be closed;
- .5 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and
- .6 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

### **Loading**

Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

When the stowage factor of this cargo is equal to or less than 0.56 m<sup>3</sup>/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be paid to ensure that the tank top is not overstressed during voyage and during loading by a pile of the cargo.

### **Precautions**

Persons who may be exposed to the dust of the cargo shall wear protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo. Bilge system of a cargo space to which this cargo is to be loaded shall be tested to ensure it is working. Appropriate precautions shall be taken to protect machinery and accommodation spaces from the dust of the cargo.

### **Ventilation**

No special requirements.

### Carriage

The appearance of the surface of the cargo shall be checked regularly during voyage. If free water above the cargo or fluid state of the cargo is observed during the voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge.

### Discharge

No special requirements.

### Clean-up

No special requirements."

## "SCALE GENERATED FROM THE IRON AND STEEL MAKING PROCESS

### Description

This cargo consists mainly of ferric oxide which is collected from various places of iron and steel making process. Mill scale, which is scale collected from water used in hot rolling process and from drainage pits with a small amount of oil which is used for rolling, is a main component of this cargo. This cargo is reused as a raw material for iron.

Shape varies from powder to lumps. Colour is gray, ash brown, ash black green, brown, burnt umber or black. Specific gravity of solids is 3 to 6.

This cargo consists mainly of moisture, oil (less than 1.2%), Wustite (FeO), Magnetite (Fe<sub>3</sub>O<sub>4</sub>), Hematite (Fe<sub>2</sub>O<sub>3</sub>), metallic iron and Fayalite (Fe<sub>2</sub>SiO<sub>4</sub>). It consists of main chemical elements in this cargo except for moisture and oil are in the range of the followings: Fe > 70%, Ca < 0.8%, Si < 0.7%, Al < 0.3%, Cr < 1.5%, Ni < 0.5%, Mn < 1.0%.

### Characteristics

Angle of repose	Bulk density (kg/m <sup>3</sup> )	Stowage factor (m <sup>3</sup> /t)
Not applicable	1,300 to 3,300	0.30 to 0.77
Size	Class	Group
Up to 150 mm	Not applicable	A

### Hazard

This cargo may liquefy if shipped at moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of this Code. This cargo is non-combustible or has a low fire-risk.

### Stowage & segregation

No special requirements.

### Hold cleanliness

No special requirements.

### Weather precautions

When a cargo is carried in a ship other than a ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

- .1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;
- .2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;

- .3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;
- .4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and
- .5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

### **Loading**

Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

When the stowage factor of this cargo is equal or less than 0.56 m<sup>3</sup>/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during voyage and during loading by a pile of the cargo forming.

### **Precautions**

Persons who may be exposed to the dust of the cargo shall wear protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

As this cargo may contain oil less than 1.2%, due consideration shall be given not to discharge bilge directly from the cargo holds.

### **Ventilation**

No special requirements.

### **Carriage**

The appearance of the surface of this cargo shall be checked regularly during voyage. If free water above the cargo or fluid state of the cargo is observed during voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge.

### **Discharge**

No special requirements.

### **Clean-up**

No special requirements."

## **"SPODUMENE (UPGRADED)**

### **Description**

Spodumene (upgraded) is an odourless and tasteless off-white to beige sand containing a mixture of naturally occurring silicates and quartz. It is produced by processing naturally occurring spodumene.

### **Characteristics**

<b>Angle of repose</b>	<b>Bulk density (kg/m<sup>3</sup>)</b>	<b>Stowage factor (m<sup>3</sup>/t)</b>
30° to 40°	1,600 to 2,000	0.50 to 0.63
<b>Size</b>	<b>Class</b>	<b>Group</b>
Up to 8 mm	Not applicable	A



### **Hazard**

This cargo may liquefy if shipped at moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of this Code. This cargo is non-combustible or has a low fire-risk.

### **Stowage & segregation**

No special requirements.

### **Hold cleanliness**

Clean and dry as relevant to the hazards of the cargo.

### **Weather precautions**

When this cargo is carried in a ship other than a ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

- .1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;
- .2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;
- .3 unless expressly provided otherwise in this schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;
- .4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and
- .5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

### **Loading**

Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

When the stowage factor of this cargo is equal or less than 0.56 m<sup>3</sup>/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo forming.

### **Precautions**

Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo. Bilge system of a cargo space to which this cargo is to be loaded shall be tested to ensure it is working.

### **Ventilation**

No special requirements.

### **Carriage**

The appearance of the surface of the cargo shall be checked regularly during the voyage. If free water above the cargo or fluid state of the cargo is observed during the voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsize of the ship, and give consideration to seeking emergency entry into a place of refuge.

### **Discharge**

No special requirements.

### **Clean-up**

No special requirements."

## **"WOOD PELLETS CONTAINING ADDITIVES AND/OR BINDERS**

### **Description**

The wood pellets covered by this schedule are those containing additives and/or binders. These wood pellets are light blond to dark brown in colour; very hard and cannot be easily squashed; have a typical specific density between 1,100 to 1,700 kg/m<sup>3</sup>. Wood pellets are made of sawdust, planer shavings and other wood waste such as bark coming out of the lumber manufacturing processes. The raw material is fragmented, dried and extruded into pellet form using appropriate additives and/or binders. The raw material is compressed approximately 3.5 times and the finished wood pellets typically have a moisture content of 4% to 8%. Wood pellets are used as a fuel in district heating and electrical power generation as well as a fuel for small space heaters such as stoves and fireplaces.

Wood pellets are also used as animal bedding due to the absorption characteristics. Such wood pellets typically have a moisture content of 8% to 10%.

For wood pellets not containing any additives and/or binders see separate schedule.

### **Characteristics**

<b>Angle of repose</b>	<b>Bulk density (kg/m<sup>3</sup>)</b>	<b>Stowage factor (m<sup>3</sup>/t)</b>
Approximately 30°	600 to 750	1.33 to 1.67
<b>Size</b>	<b>Class</b>	<b>Group</b>
Cylindrical with Diameter: 3 mm to 12 mm Length: 10 to 20 mm	MHB (WF)	B

### **Hazard**

Shipments are subject to oxidation leading to depletion of oxygen and increase of carbon monoxide and carbon dioxide in cargo and communicating spaces (also see Weather precautions).

Swelling if exposed to moisture. Wood pellets may ferment over time if moisture content is over 15%, leading to generation of asphyxiating and flammable gases which may cause spontaneous combustion.

Handling of wood pellets may cause dust to develop. Risk of explosion at high dust concentration.

### **Stowage & segregation**

Segregate as for class 4.1 materials.

### **Hold cleanliness**

Clean and dry as relevant to the hazards of the cargo.

### **Weather precautions**

This cargo shall be kept as dry as practicable. This cargo shall not be handled during precipitation. During handling of this cargo, all non-working hatches of the cargo spaces into which this cargo is loaded or to be loaded shall be closed. There is a high risk of renewed oxygen depletion and carbon monoxide formation in previously ventilated adjacent spaces after closure of the hatch covers.

### **Loading**

Trim in accordance with the relevant provisions required under sections 4, 5 and 6 of this Code.

### **Precautions**

Entry of personnel into cargo and adjacent confined spaces shall not be permitted until tests have been carried out and it has been established that the oxygen content and carbon monoxide levels have been restored to the following levels: oxygen 21% and carbon monoxide <100 ppm. If these conditions are not met, additional ventilation shall be applied to the cargo hold or adjacent confined spaces and re-measuring shall be conducted after a suitable interval.

An oxygen and carbon monoxide meter shall be worn and activated by all crew when entering cargo and adjacent enclosed spaces.

### **Ventilation**

Ventilation of enclosed spaces adjacent to a cargo hold before entry may be necessary even if these spaces are apparently sealed from the cargo hold.

### **Carriage**

No special requirements.

### **Discharge**

No special requirements.

### **Clean-up**

No special requirements.

### **Emergency procedures**

<p style="text-align: center;"><b>Special emergency equipment to be carried</b> Self-contained breathing apparatus and combined or individual oxygen and carbon monoxide meters should be available.</p>
<p style="text-align: center;"><b>Emergency procedures</b> Nil</p>
<p style="text-align: center;"><b>Emergency action in the event of fire</b> Batten down; use ship's fixed fire-fighting installation, if fitted. Exclusion of air may be sufficient to control fire. Extinguish fire with carbon dioxide, foam or water.</p>
<p style="text-align: center;"><b>Medical First Aid</b> Refer to the Medical First Aid Guide (MFAG), as amended.</p>

## "WOOD PELLETS NOT CONTAINING ANY ADDITIVES AND/OR BINDERS

### Description

The wood pellets covered by this schedule are those not containing any additives and/or binders. These wood pellets are light blond to dark brown in colour; very hard and cannot be easily squashed; have a typical specific density between 1,100 to 1,700 kg/m<sup>3</sup>. The wood pellets are made of sawdust, planer shavings and other wood waste such as bark coming out of the lumber manufacturing processes. The raw material is fragmented, dried and extruded into pellet form. The raw material is compressed approximately 3.5 times and the finished wood pellets typically have a moisture content of 4% to 8%. Wood pellets are used as a fuel in district heating and electrical power generation as well as a fuel for small space heaters such as stoves and fireplaces.

Wood pellets are also used as animal bedding due to the absorption characteristics. Such wood pellets typically have a moisture content of 8% to 10%.  
For wood pellets containing additives and/or binders see separate schedule.

### Characteristics

Angle of repose	Bulk density (kg/m <sup>3</sup> )	Stowage factor (m <sup>3</sup> /t)
Approximately 30°	600 to 750	1.33 to 1.67
Size	Class	Group
Cylindrical with Diameter: 3 mm to 12 mm Length: 10 to 20 mm	MHB (OH)	B

### Hazard

Shipments are subject to oxidation leading to depletion of oxygen and increase of carbon monoxide and carbon dioxide in cargo and communicating spaces (also see "Weather precautions").

Swelling if exposed to moisture. Wood pellets may ferment over time if moisture content is over 15%, leading to generation of asphyxiating and flammable gases but gas concentrations do not reach flammable levels. This cargo has a low fire-risk.

Handling of wood pellets may cause dust to develop. Risk of explosion at high dust concentration.

### Stowage & segregation

Segregate as for class 4.1 materials.

### Hold cleanliness

Clean and dry as relevant to the hazards of the cargo.

### Weather precautions

This cargo shall be kept as dry as practicable. This cargo shall not be handled during precipitation. During handling of this cargo, all non-working hatches of the cargo spaces into which this cargo is loaded or to be loaded shall be closed. There is a high risk of renewed oxygen depletion and carbon monoxide formation in previously ventilated adjacent spaces after such closure.

### **Loading**

Trim in accordance with the relevant provisions required under sections 4, 5 and 6 of this Code.

### **Precautions**

Entry of personnel into cargo and adjacent confined spaces shall not be permitted until tests have been carried out and it has been established that the oxygen content and carbon monoxide levels have been restored to the following levels: oxygen 21% and carbon monoxide <100 ppm. If these conditions are not met, additional ventilation shall be applied to the cargo hold or adjacent confined spaces and remeasuring shall be conducted after a suitable interval.

An oxygen and carbon monoxide meter shall be worn and activated by all crew when entering cargo and adjacent enclosed spaces.

### **Ventilation**

Ventilation of enclosed spaces adjacent to a cargo hold before entry may be necessary even if these spaces are apparently sealed from the cargo hold.

### **Carriage**

No special requirements.

### **Discharge**

No special requirements.

### **Clean-up**

No special requirements.

### **Emergency procedures**

<p style="text-align: center;"><b>Special emergency equipment to be carried</b> Self-contained breathing apparatus and combined or individual oxygen and carbon monoxide meters should be available.</p>
<p style="text-align: center;"><b>Emergency procedures</b> Nil</p>
<p style="text-align: center;"><b>Emergency action in the event of fire</b> Batten down; use ship's fixed fire-fighting installation, if fitted. Exclusion of air may be sufficient to control fire. Extinguish fire with carbon dioxide, foam or water.</p>
<p style="text-align: center;"><b>Medical First Aid</b> Refer to the Medical First Aid Guide (MFAG), as amended.</p>

## **"ZINC SLAG**

### **Description**

Residue generated from zinc smelting process. This cargo is highly permeable and pore water of this cargo drains quickly. It is black or red-brown in colour and either granular or lump.

### Characteristics

Angle of repose	Bulk density (kg/m <sup>3</sup> )	Stowage factor (m <sup>3</sup> /t)
Not applicable	1,500 to 2,500	0.40 to 0.67
Size	Class	Group
Up to 10 mm	Not applicable	A

### Hazard

This cargo may liquefy if shipped at moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of this Code. This cargo is abrasive. This cargo is non-combustible or has a low fire-risk.

### Stowage & segregation

No special requirements.

### Hold cleanliness

No special requirements.

### Weather precautions

When a cargo is carried in a ship other than a ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

- .1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;
- .2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;
- .3 unless expressly provided otherwise in this individual schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;
- .4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and
- .5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

### Loading

This cargo shall be trimmed to ensure that the height difference between peaks and troughs does not exceed 5% of the ship's breadth and that the cargo slopes uniformly from the hatch boundaries to the bulkheads and no shearing faces remain to collapse during voyage.

When the stowage factor of this cargo is equal or less than 0.56 m<sup>3</sup>/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo forming.

### Precautions

Appropriate action shall be taken to protect machinery and accommodation spaces from the dust of the cargo. Bilge wells of the cargo spaces shall be protected from ingress of the cargo. Due consideration shall be given to protect equipment from the dust of the cargo. Persons who may be exposed to the dust of the cargo shall wear protective clothing, goggles or other equivalent dust eye-protection and dust filter masks, as necessary.

### Ventilation

No special requirements.

### Carriage

Bilge water shall be removed regularly during the voyage.

### Discharge

No special requirements.

### Clean-up

No special requirements."

## "ZIRCON KYANITE CONCENTRATE

### Description

Zircon kyanite concentrate is an odourless and tasteless off-white to brown mixture of the heavy mineral sand processing waste stream (concentrate) and zircon sand. It is used for upgrading mineral sand products such as zircon and kyanite. It is a very heavy cargo.

### Characteristics

Angle of repose	Bulk density (kg/m <sup>3</sup> )	Stowage factor (m <sup>3</sup> /t)
Not applicable	2,400 to 3,000	0.33 to 0.42
Size	Class	Group
Fine particles	Not applicable	A

### Hazard

This cargo may liquefy if shipped at moisture content in excess of its Transportable Moisture Limit (TML). See sections 7 and 8 of this Code. This cargo is non-combustible or has a low fire-risk.

### Stowage & segregation

No special requirements.

### Hold cleanliness

Clean and dry as relevant to the hazards of the cargo.

### Weather precautions

When this cargo is carried in a ship other than a specially constructed or fitted cargo ship complying with the requirements in subsection 7.3.2 of this Code, the following provisions shall be complied with:

- .1 the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage;
- .2 unless expressly provided otherwise in this individual schedule, the cargo shall not be handled during precipitation;
- .3 unless expressly provided otherwise in this schedule, during handling of the cargo, all non-working hatches of the cargo spaces into which the cargo is loaded or to be loaded shall be closed;
- .4 the cargo may be handled during precipitation under the conditions stated in the procedures required in subsection 4.3.3 of this Code; and

- .5 the cargo in a cargo space may be discharged during precipitation provided that the total amount of the cargo in the cargo space is to be discharged in the port.

### **Loading**

Trim in accordance with the relevant provisions required under sections 4 and 5 of this Code.

When the stowage factor of this cargo is equal or less than 0.56 m<sup>3</sup>/t, the tank top may be overstressed unless the cargo is evenly spread across the tank top to equalize the weight distribution. Due consideration shall be given to ensure that the tank top is not overstressed during the voyage and during loading by a pile of the cargo forming.

### **Precautions**

Bilge wells shall be clean, dry and covered as appropriate, to prevent ingress of the cargo. Bilge system of a cargo space to which this cargo is to be loaded shall be tested to ensure it is working.

### **Ventilation**

No special requirements.

### **Carriage**

The appearance of the surface of the cargo shall be checked regularly during the voyage. If free water above the cargo or fluid state of the cargo is observed during the voyage, the master shall take appropriate actions to prevent cargo shifting and potential capsizing of the ship, and give consideration to seeking emergency entry into a place of refuge.

### **Discharge**

No special requirements.

### **Clean-up**

No special requirements."

## **APPENDIX 2**

### ***Laboratory test procedures, associated apparatus and standards***

#### **1 Test procedures for materials which may liquefy and associated apparatus**

50 Add the following new "subsection 1.4":

#### **"1.4 Modified Proctor/Fagerberg test procedure for Iron Ore Fines**

##### **1.4.1 Scope**

- .1 The test procedure specified in this section (this test) should only be used for determining transportable moisture limit (TML) of Iron Ore Fines. See individual schedule for Iron Ore Fines.
- .2 Iron Ore Fines is iron ore containing both:
- .1 10% or more of fine particles less than 1 mm, and



- .2 50% or more of particles less than 10 mm.
- .3 The TML of Iron Ore Fines is taken as equal to the critical moisture content at 80% degree of saturation according to the modified Proctor/Fagerberg method test.
- .4 The test procedure is applicable when the degree of saturation corresponding to Optimum Moisture Content (OMC) is 90% or higher.

#### **1.4.2 Modified Proctor/Fagerberg test equipment**

- .1 The Proctor apparatus (see figure 1.4.1) consists of a cylindrical iron mould with a removable extension piece (the compaction cylinder) and a compaction tool guided by a pipe open at its lower end (the compaction hammer).
- .2 Scales and weights (see 3.2) and suitable sample containers.
- .3 A drying oven with a controlled temperature interval from 100°C to maximum 105°C.
- .4 A container for hand mixing. Care should be taken to ensure that the mixing process does not reduce the particle size by breakage or increase the particle size by agglomeration or consistency of the test material.
- .5 A gas or water pycnometry equipment to determine the density of the solid material as per a recognized standard (e.g. ASTM D5550, AS1289, etc.)

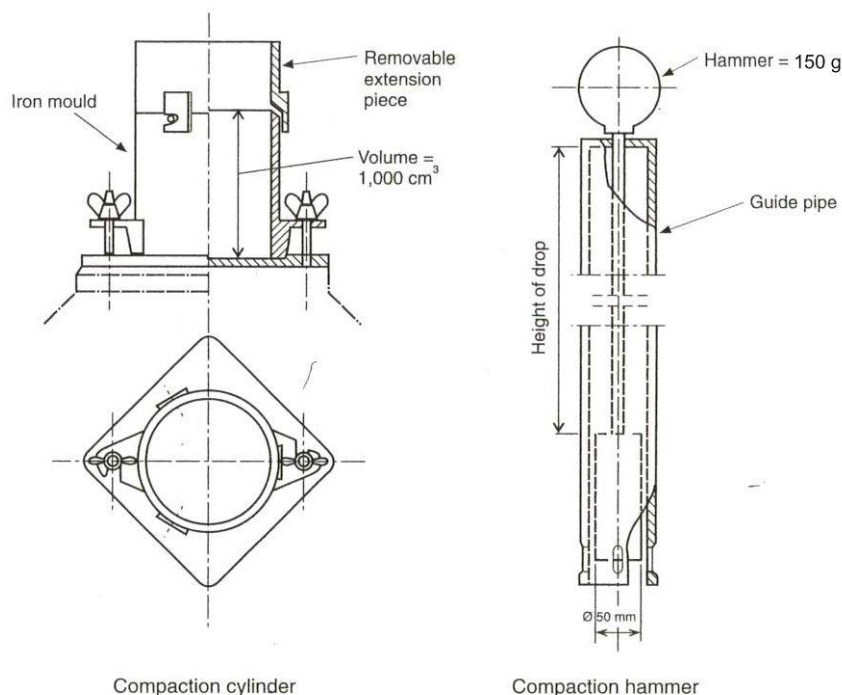
#### **1.4.3 Temperature and humidity** (see 1.1.3)

#### **1.4.4 Procedure**

##### **.1 Establishment of a complete compaction curve**

A representative sample according to a relevant standard (see section 4.7 of the IMSBC Code) of the test material is partially dried at a temperature of approximately 60°C or less to reduce the samples moisture to suitable starting moisture, if needed. The representative sample for this test should not be fully dried, except in case of moisture content measurement.

The total quantity of the test material should be at least three times as big as required for the complete test sequence. Compaction tests are executed for five to ten different moisture contents (five to ten separate tests). The samples are adjusted in order that partially dry to almost saturated samples are obtained. The required quantity per compaction test is about 2,000 cm<sup>3</sup>.



**Figure 1.4.1**

At each compaction test a suitable amount of water is added to the sample of the test material. The sample material is gently mixed before being allowed to rest and equilibrate. Approximately one fifth of the mixed sample is filled into the mould and levelled and then the increment is tamped uniformly over the surface of the increment. Tamping is executed by dropping a 150 g hammer 25 times through the guide pipe, 0.15 m each time. The performance is repeated for all five layers. When the last layer has been tamped, the extension piece is removed and the sample is levelled off along the brim of the mould with care, ensuring to remove any large particles that may hinder levelling of the sample, replacing them with material contained in the extension piece and re-levelling.

When the weight of the cylinder with the tamped sample has been determined, the cylinder is emptied, the sample is dried at 105°C and the weight is determined. Reference is made to ISO 3087:2011 "Iron ores – Determination of the moisture content of a lot". The test then is repeated for the other samples with different moisture contents.

Density of solid material should be measured using a gas or water pycnometry equipment according to internationally or nationally accepted standard, e.g. ASTM D5550 and AS 1289 (see subsection 1.4.2.5).

**.2 Definitions and data for calculations (see figure 1.4.2)**

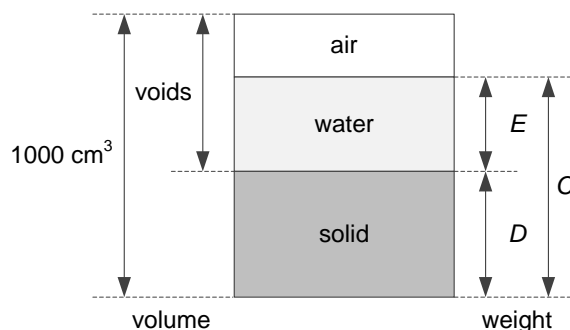
- empty cylinder, mass in grams:  $A$
- cylinder with tamped sample, mass in grams:  $B$
- wet sample, mass in grams:  $C$

$$C = B - A$$

- dry sample, mass in grams:  $D$
- water, mass in grams (equivalent to volume in  $\text{cm}^3$ ):  $E$

$$E = C - D$$

Volume of cylinder:  $1000 \text{ cm}^3$



**Figure 1.4.2**

**.3 Calculation of main characteristics**

- density of solid material,  $\text{g/cm}^3$  ( $\text{t/m}^3$ ):  $d$
- dry bulk density,  $\text{g/cm}^3$  ( $\text{t/m}^3$ ):  $\gamma$

$$\gamma = \frac{D}{1000}$$

- net water content, volume %:  $e_v$

$$e_v = \frac{E}{D} \times 100 \times d$$

- void ratio:  $e$  (volume of voids divided by volume of solids)

$$e = \frac{d}{\gamma} - 1$$

- degree of saturation, percentage by volume:  $S$

$$S = \frac{e_v}{e}$$

- gross water content, percentage by mass:  $W^1$

$$W^1 = \frac{E}{C} \times 100$$

- net water content, percentage by mass:  $W$

$$W = \frac{E}{D} \times 100$$

#### .4 Presentation of the compaction tests

For each compaction test the calculated void ratio ( $e$ ) value is plotted as the ordinate in a diagram with net water content ( $e_v$ ) and degree of saturation ( $S$ ) as the respective abscissa parameters.

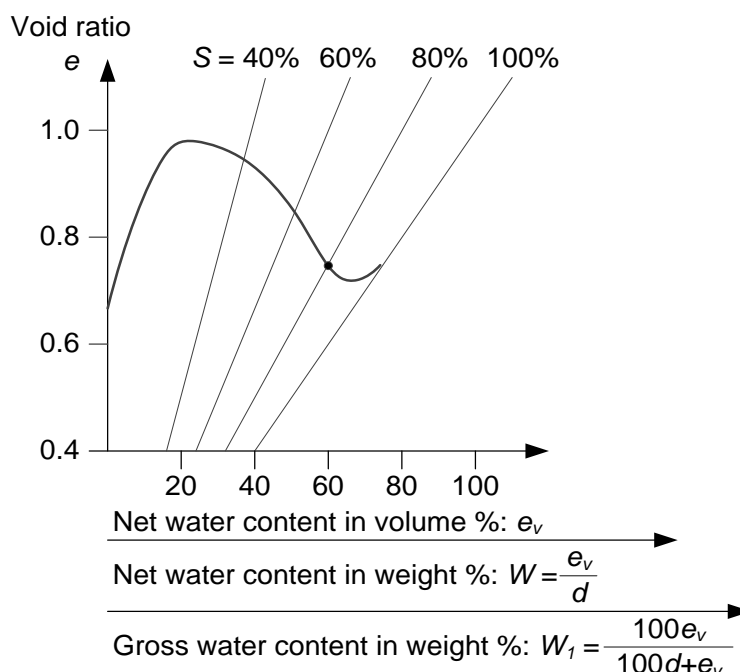


Figure 1.4.3

#### .5 Compaction curve

The test sequence results in a specific compaction curve (see figure 1.4.3).

The critical moisture content is indicated by the intersection of the compaction curve and the line  $S = 80\%$  degree of saturation. The transportable moisture limit (TML) is the critical moisture content.

Optimum Moisture Content (OMC) is the moisture content corresponding to the maximum compaction (maximum dry density) under the specified compaction condition. To check the applicability of this test, the relationship between moisture content and dry density should be evaluated, during this test. Then the OMC and the corresponding degree of saturation should be determined. This test procedure was developed based on the

finding that the degree of saturation corresponding to OMC of iron ore fines was 90 to 95%, while such degree of saturation of mineral concentrates was 70% to 75%. In the case that the degree of saturation corresponding to OMC is less than 90%, the shipper should consult with an appropriate authority, for the reason that this test may not be applicable for the material and the TML determined by this test may be too high."

### APPENDIX 3

#### *Properties of solid bulk cargoes*

#### 1 Non-cohesive cargoes

#### 1.1 The following cargoes are non-cohesive when dry:

51 In the list, add the following new entries in alphabetical order:

"ALUMINIUM FLUORIDE"  
"SPODUMENE (UPGRADED)"  
"WOOD PELLETS CONTAINING ADDITIVES AND/OR BINDERS"  
"WOOD PELLETS NOT CONTAINING ANY ADDITIVES AND/OR BINDERS"

and the entry for "WOOD PELLETS" is deleted.

### APPENDIX 4

#### *INDEX*

52 Insert the following new entries in alphabetical order:

Material	Group	References
ALUMINIUM FLUORIDE	A	
AMORPHOUS SODIUM SILICATE LUMPS	B	
BORIC ACID	B	
CHEMICAL GYPSUM	A	
COPPER SLAG	A	
GLASS CULLET	C	
IRON AND STEEL SLAG AND ITS MIXTURE	A	
IRON ORE FINES	A	
IRON OXIDE TECHNICAL	A	
IRON SINTER	C	
MANGANESE COMPONENT FERROALLOY SLAG	C	
MANGANESE ORE FINES	A	
SCALE GENERATED FROM THE IRON AND STEEL MAKING PROCESS	A	
SPODUMENE (UPGRADED)	A	
WOOD PELLETS CONTAINING ADDITIVES AND/OR BINDERS	B	
WOOD PELLETS NOT CONTAINING ANY ADDITIVES AND/OR BINDERS	B	
ZINC SLAG	A	
ZIRCON KYANITE CONCENTRATE	A	

- 53 The entry for "WOOD PELLETS" is deleted.
- 54 In the entry for "CLINKER ASH, WET" the word "WET" is deleted.

## APPENDIX 5

### *Bulk Cargo Shipping Names in three languages (English, Spanish and French)*

- 55 A new appendix 5 is inserted with following:

### **"Bulk Cargo Shipping Names in three languages (English, Spanish and French)**

ENGLISH	SPANISH	FRENCH
ALFALFA	ALFALFA	LUZERNE
ALUMINA	ALÚMINA	ALUMINE
ALUMINA, CALCINED	ALÚMINA CALCINADA	ALUMINE CALCINÉE
ALUMINA HYDRATE	HIDRATO DE ALÚMINA	HYDRATE D'ALUMINE
ALUMINIUM FLUORIDE	FLUORURO DE ALUMINIO	FLUORURE D'ALUMINIUM
Aluminium hydroxide	Hidróxido de aluminio	Hydroxyde d'aluminium
ALUMINA SILICA	ALÚMINA SÍLICE	ALUMINE SILICEUSE
ALUMINA SILICA, pellets	ALÚMINA SÍLICE, pellets de	ALUMINE SILICEUSE en granules
ALUMINIUM DROSS	RESIDUOS DE ALUMINIO	LAITIER D'ALUMINIUM
REMELTING BY-PRODUCTS UN 3170	PRODUCTOS DERIVADOS DE LA REFUNDICIÓN DEL ALUMINIO, No ONU 3170	SOUS-PRODUITS DE LA REFUSION UN 3170
ALUMINIUM FERROSILICON POWDER UN 1395	ALUMINIO-FERROSILICIO EN POLVO, No ONU 1395	ALUMINO-FERRO-SILICIUM EN POUDRE UN 1395
ALUMINIUM NITRATE UN 1438	NITRATO DE ALUMINIO, No ONU 1438	NITRATE D'ALUMINIUM UN 1438
ALUMINIUM REMELTING BY-PRODUCTS UN 3170	PRODUCTOS DERIVADOS DE LA REFUNDICIÓN DEL ALUMINIO, No ONU 3170	SOUS-PRODUITS DE LA REFUSION DE L'ALUMINIUM UN 3170
ALUMINIUM SALT SLAGS	ESCORIA DE SALES DE ALUMINIO	SCORIES SALINES D'ALUMINIUM
ALUMINIUM SMELTING / REMELTING BY-PRODUCTS, PROCESSED	PRODUCTOS DERIVADOS DE LA FUNDICIÓN DEL ALUMINIO o PRODUCTOS DERIVADOS DE LA REFUNDICIÓN DEL ALUMINIO, TRATADOS	SOUS-PRODUITS DE LA FABRICATION/REFUSION DE L'ALUMINIUM, TRAITÉS
REMELTING BY-PRODUCTS UN 3170	PRODUCTOS DERIVADOS DE LA REFUNDICIÓN DEL ALUMINIO, No ONU 3170	SOUS-PRODUITS DE LA REFUSION UN 3170
ALUMINIUM SILICON POWDER, UNCOATED UN 1398	ALUMINIO-SILICIO EN POLVO, NO RECUBIERTO, No ONU 1398	SILICO-ALUMINIUM EN POUDRE NON ENROBÉ UN 1398
ALUMINIUM SKIMMINGS	ESPUMA DE ALUMINIO	CRASSE D'ALUMINIUM
REMELTING BY-PRODUCTS UN 3170	PRODUCTOS DERIVADOS DE LA REFUNDICIÓN DEL ALUMINIO, No ONU 3170	SOUS-PRODUITS DE LA REFUSION UN 3170

ENGLISH	SPANISH	FRENCH
ALUMINIUM SMELTING BY-PRODUCTS UN 3170	PRODUCTOS DERIVADOS DE LA FUNDICIÓN DEL ALUMINIO, No ONU 3170	SOUS-PRODUITS DE LA FABRICATION DE L'ALUMINIUM UN 3170
AMMONIUM NITRATE UN 1942	NITRATO AMÓNICO, No ONU 1942	NITRATE D'AMMONIUM UN 1942
AMMONIUM NITRATE BASED FERTILIZER UN 2067	ABONOS A BASE DE NITRATO AMÓNICO, No ONU 2067	ENGRAIS AU NITRATE D'AMMONIUM UN 2067
AMMONIUM NITRATE BASED FERTILIZER UN 2071	ABONOS A BASE DE NITRATO AMÓNICO, No ONU 2071	ENGRAIS AU NITRATE D'AMMONIUM UN 2071
AMMONIUM NITRATE, BASED FERTILIZER (non-hazardous)	ABONOS A BASE DE NITRATO AMÓNICO (no entrañan riesgos)	ENGRAIS AU NITRATE D'AMMONIUM (non dangereux)
AMMONIUM SULPHATE	SULFATO AMÓNICO	SULFATE D'AMMONIUM
ANTIMONY ORE AND RESIDUE	ANTIMONIO, MINERAL Y RESIDUOS DE	MINERAI D'ANTIMOINE ET RÉSIDU DE MINERAI D'ANTIMOINE
Bakery materials	Materias de panadería	Produits de boulangerie
BARIUM NITRATE UN 1446	NITRATO DE BARIO, No ONU 1446	NITRATE DE BARYUM UN 1446
Barley malt pellets	Malta de cebada, pellets de	Malte d'orge en boulettes
BARYTES	BARITAS	BARYTINE
BAUXITE	BAUXITA	BAUXITE
Beet, expelled	Remolacha, prensada	Betterave, triturée
Beet, extracted	Remolacha, en extracto	Betterave, sous-produits de l'extraction
BIOSLUDGE	FANGOS BIOLÓGICOS	BOUE ACTIVÉE
Blende (zinc sulphide)	Blenda (sulfuro de cinc)	Blende (sulfure de zinc)
BORAX (PENTAHYDRATE CRUDE)	BÓRAX (CRUDO PENTAHIDRATADO)	BORAX (BRUT PENTAHYDRATÉ)
BORAX, ANHYDROUS, crude	BÓRAX ANHIDRO, crudo	BORAX ANHYDRE brut
BORAX, ANHYDROUS, refined C	BÓRAX ANHIDRO, refinado	BORAX ANHYDRE raffiné C
<b>BORIC ACID</b>	<b>ÁCIDO BÓRICO</b>	<b>ACIDE BORIQUE</b>
Bran pellets	Salvado, pellets de	Son en boulettes
Brewer's grain pellets	Orujo de cerveza, pellets de	Drêches de brasserie en boulettes
BROWN COAL BRIQUETTES	BRIQUETAS DE LIGNITO	CHARBON BRUN EN BRIQUETTES
Calcined clay	Arcilla calcinada	Argile calcinée
Calcined pyrites	Piritas calcinadas	Pyrites calcinées
Calcium fluoride	Fluoruro de calcio	Fluorure de calcium
CALCIUM NITRATE	NITRATO CÁLCICO, No ONU 1454	NITRATE DE CALCIUM
CALCIUM NITRATE FERTILIZER	ABONOS A BASE DE NITRATO CÁLCICO	ENGRAIS AU NITRATE DE CALCIUM
Calcium oxide	Óxido de calcio	Oxyde de calcium
Canola pellets	Píldoras de canola	Canola en boulettes
CARBORUNDUM	CARBORUNDO	CARBORUNDUM
CASTOR BEANS UN 2969	SÉMILLAS DE RICINO, No ONU 2969	GRAINES DE RICIN UN 2969
CASTOR FLAKE UN 2969	ESCAMAS DE RICINO, No ONU 2969	GRAINES DE RICIN EN FLOCONS UN 2969
CASTOR MEAL UN 2969	HARINA DE RICINO, No ONU 2969	FARINES DE RICIN UN 2969

ENGLISH	SPANISH	FRENCH
CASTOR POMACE UN 2969	PULPA DE RICINO, No ONU 2969	TOURTEAUX DE RICIN UN 2969
CEMENT	CEMENTO	CIMENT
CEMENT CLINKERS	CEMENTO, CLINKERS DE	CIMENT, CLINKERS DE
CEMENT COPPER	COBRE DE CEMENTACIÓN	CUIVRE CÉMENT
Chalcopyrite	Calcopirita	Chalcopyrite
CHAMOTTE	CHAMOTA	CHAMOTTE
CHARCOAL	CARBÓN VEGETAL	CHARBON
CHEMICAL GYPSUM	YESO QUÍMICO	GYPSE DE SYNTHÈSE
CHOPPED RUBBER AND PLASTIC INSULATION	FRAGMENTOS DE REVESTIMIENTOS AISLANTES DE GOMA Y PLÁSTICO	FRAGMENTS D'ISOLANT EN PLASTIQUE ET EN CAOUTCHOUC
Chile saltpetre	Salitre de Chile	Salpêtre du Chili
Chilean natural nitrate	Nitrato natural de Chile	Nitrate naturel du Chili
Chilean natural potassic nitrate	Nitrato potásico natural de Chile	Nitrate de potassium naturel du Chili
Chrome ore	Cromo, mineral de	Minerai de chrome
CHROME PELLETS	CROMO, PELLETS DE	CHROME EN PELLETS
CHROMITE ORE	CROMITA, MINERAL DE	MINERAI DE CHROMITE
Chromium ore	Cromio, mineral de	Minerai de chromium
Citrus pulp pellets	Cítricos, pellets de pulpa de	Pulpe d'agrumes en boulettes
CLAY	ARCILLA	ARGILE
CLINKER ASH	CENIZAS DE CLÍNKER	CENDRES DE MÂCHEFER
COAL	CARBÓN	CHARBON
COAL SLURRY	FANGOS DE CARBÓN	BOUES DE CHARBON
COAL TAR PITCH	BREA DE ALQUITRÁN DE HULLA	BRAI DE GOUDRON DE HOUILLE
COARSE CHOPPED TYRES	FRAGMENTOS DE NEUMÁTICOS TRITURADOS	FRAGMENTS DE PNEUS DE GRANDES DIMENSIONS
COARSE IRON AND STEEL SLAG AND ITS MIXTURE	ESCORIA GRUESA DE HIERRO Y ACERO Y SU MEZCLA	SCORIES DE FER ET D'ACIER À GROS GRAINS ET LEUR MÉLANGE
Coconut	Coco	Noix de coco
COKE	COQUE	COKE
COKE BREEZE	CISCO DE COQUE	POUSSIER DE COKE
COLEMANITE	COLEMANITA	COLÉMANITE
COPPER CONCENTRATE	COBRE, CONCENTRADO DE	CONCENTRÉ DE CUIVRE
COPPER GRANULES	COBRE, GRÁNULOS DE	CUIVRE EN GRANULES
COPPER MATTE	COBRE, MATA DE	MATTE DE CUIVRE
Copper nickel	Cuproníquel	Nickel-cuivre
COPPER SLAG	COBRE, ESCORIA DE	SCORIES DE CUIVRE
Copper ore concentrate	Cobre, concentrado mineral de	Concentré de minerai de cuivre
COPPER CONCENTRATE	COBRE, CONCENTRADO DE	CONCENTRÉ DE CUIVRE
Copper precipitate	Cobre, precipitado de	Précipités de cuivre
CEMENT COPPER	COBRE DE CEMENTACIÓN	CUIVRE CÉMENT
COPRA (dry) UN 1363 B	COPRA (seca), No ONU 1363 B	COPRAH (sec) UN 1363



ENGLISH	SPANISH	FRENCH
Copra, expelled	Copra, prensada	Coprah, trituré
Copra, extracted	Copra, en extracto	Coprah, sous-produit d'extraction
Corn gluten	Maíz, gluten de	Gluten de maïs
Cotton seed	Semillas de algodón	Graines de cotonnier
CRUSHED CARBON ANODES	ÁNODOS DE CARBÓN TRITURADOS	ANODES EN CARBONE CONCASSÉES
CRYOLITE	CRIOLITA	CRYOLITHE
Deadburned magnesite	Magnesita calcinada a muerte	Magnésite calcinée
DIAMMONIUM PHOSPHATE	FOSFATO DIAMÓNICO	HYDROGÉNOPHOSPHATE DE DIAMMONIUM
DIRECT REDUCED IRON (A) Briquettes, hot-moulded	HIERRO OBTENIDO POR REDUCCIÓN DIRECTA (A) En forma de briquetas moldeadas en caliente	FER OBTENU PAR RÉDUCTION DIRECTE (A) Briquettes moulées à chaud
DIRECT REDUCED IRON (B) Lumps, pellets, cold-moulded briquettes	HIERRO OBTENIDO POR REDUCCIÓN DIRECTA (B) Terrones, pellets y briquetas moldeadas en frío	FER OBTENU PAR RÉDUCTION DIRECTE (B) Morceaux, pellets, briquettes moulées à froid et tournures de fer indiennes
DIRECT REDUCED IRON (C) By-product fines	HIERRO OBTENIDO POR REDUCCIÓN DIRECTA (C) (Finos obtenidos como productos derivados)	FER OBTENU PAR RÉDUCTION DIRECTE (C) (Fines en tant que sous-produit)
DISTILLERS DRIED GRAINS WITH SOLUBLES	GRANOS SECOS DE DESTILERÍA CON SOLUBLES	DISTILLATS SÉCHÉS DE GRAINS AVEC RÉSIDUS SOLUBLES
DOLOMITE	DOLOMITA	DOLOMITE
Dolomitic quicklime	Cal dolomítica	chaux vive dolomitique
D.R.I.	HRD	[not applicable in French]
Expellers	Tortas de presión	Expellers
FELSPAR LUMP	FELDESPATO EN TERRONES	FELDSPATH EN MORCEAUX
FERROCHROME	FERROCROMO	FERROCHROME
FERROCHROME, exothermic	FERROCROMO exotérmico	FERROCHROME, exothermique
FERROMANGANESE	FERROMANGANESO	FERROMANGANÈSE
Ferromanganese, exothermic	Ferromanganese exotérmico	Ferromanganèse exothermique
FERRONICKEL	FERRONÍQUEL	FERRONICKEL
FERROPHOSPHORUS	FERROFÓSFORO	FERROPHOSPHORE
Ferrophosphorus briquettes	Ferrofósforo, briquetas de	Ferrophosphore en briquettes
FERROSILICON UN 1408	FERROSILICIO, No ONU 1408	FERROSILICIUM UN 1408
FERROSILICON	FERROSILICIO	FERROSILICIUM
FERROUS METAL BORINGS UN 2793	VIRUTAS DE TALADRADO DE METALES FERROSOS, No ONU 2793	ROGNURES DE MÉTAUX FERREUX UN 2793
FERROUS METAL CUTTINGS UN 2793	RECORTES DE METALES FERROSOS, No ONU 2793	ÉBARBURES DE MÉTAUX FERREUX UN 2793
FERROUS METAL SHAVINGS UN 2793	RASPADURAS DE METALES FERROSOS, No ONU 2793	COPEAUX DE MÉTAUX FERREUX UN 2793
FERROUS METAL TURNINGS UN 2793	VIRUTAS DE TORNEADO DE METALES FERROSOS, No ONU 2793	TOURNURES DE MÉTAUX FERREUX UN 2793
FERROUS SULPHATE HEPTAHYDRATE	SULFATO FERROSO HEPTAHIDRATADO	SULFATE FERREUX HEPTAHYDRATÉ
FERTILIZERS WITHOUT NITRATES	ABONOS SIN NITRATOS (no entrañan riesgos)	ENGRAIS SANS NITRATES

ENGLISH	SPANISH	FRENCH
FISH (IN BULK)	PESCADO (A GRANEL)	POISSON (EN VRAC)
FISHMEAL, STABILIZED UN 2216	HARINA DE PESCADO ESTABILIZADA, No ONU 2216	FARINE DE POISSON STABILISÉE UN 2216
FISHSCRAP, STABILIZED UN 2216	DESECHOS DE PESCADO ESTABILIZADOS, No ONU 2216	DÉCHETS DE POISSON STABILISÉS UN 2216
FLUORSPAR	ESPATOFLÚOR	SPATH FLUOR
FLY ASH, DRY	CENIZAS VOLANTES SECAS	CENDRES VOLANTES SÈCHES
FLY ASH, WET	CENIZAS VOLANTES HÚMEDAS	CENDRES VOLANTES HUMIDES
Galena (lead sulphide)	Galena (sulfuro de plomo)	Galène (sulfure de plomb)
Garbage tankage	Detritos orgánicos	Détritus organiques
<b>GLASS CULLET</b>	<b>DESPERDICIOS DE VIDRIO</b>	<b>CALCIN DE VERRE</b>
Gluten pellets	Gluten, pellets de	Gluten en boulettes
GRAIN SCREENING PELLETS	PELLETS DE GRANZA DE GRANO	CRIBLURES DE GRAIN EN PELLETS
GRANULAR FERROUS SULPHATE	SULFATO FERROSO GRANULAR	SULFATE FERREUX EN GRANULES
GRANULATED NICKEL MATTE (LESS THAN 2 per cent MOISTURE CONTENT)	MATA DE NÍQUEL GRANULADA (CONTENIDO DE HUMEDAD INFERIOR A 2 %)	MATTE DE NICKEL EN GRANULES (TENEUR EN HUMIDITÉ INFÉRIEURE À 2 %)
GRANULATED SLAG	ESCORIA GRANULADA	SCORIES EN GRAINS
GRANULATED TYRE RUBBER	NEUMÁTICO GRANULADO	CAOUTCHOUC DE PNEUS EN GRANULES
Ground nuts, meal	Maní (cacahuetes), harina de	Farine d'arachide
GYPSUM	YESO	GYPSE
Hominy chop	Machacado	Hominy chop
GYPSUM GRANULATED	YESO GRANULADO	GYPSE EN GRAINS
ILMENITE CLAY	ILMENITA, ARCILLA DE	ARGILE D'ILMÉNITE
ILMENITE (ROCK)	ILMENITA (ROCA)	ILMÉNITE (ROCHE)
ILMENITE SAND	ILMENITA, ARENA DE	SABLE D'ILMÉNITE
ILMENITE (UPGRADED)	ILMENITA (ENRIQUECIDA)	ILMÉNITE VALORISÉE
<b>IRON AND STEEL SLAG AND ITS MIXTURE</b>	<b>ESCORIA DE HIERRO Y ACERO Y SU MEZCLA</b>	<b>SCORIES DE FER ET D'ACIER ET LEUR MÉLANGE</b>
IRON CONCENTRATE	HIERRO, CONCENTRADO DE	CONCENTRÉ DE FER
IRON CONCENTRATE (pellet feed)	HIERRO, CONCENTRADO DE (para pellets)	CONCENTRÉ DE FER (pour pellets)
IRON CONCENTRATE (sinter feed)	HIERRO, CONCENTRADO DE (para aglomerados)	CONCENTRÉ DE FER (pour agglomérés)
Iron disulphide	Disulfuro de hierro	Disulfure de fer
IRON ORE	HIERRO, MINERAL DE	MINÉRAI DE FER
Iron ore (concentrate, pellet feed, sinter feed)	Hierro, mineral de (concentrado, aglomerados o pellets)	Minérai de fer (concentré, pour pellets, pour agglomérés)
<b>IRON ORE FINES</b>	<b>FINOS DE MINERAL DE HIERRO</b>	<b>FINES DE MINÉRAI DE FER</b>
IRON ORE PELLETS	HIERRO, PELLETS DE MINERAL DE	MINÉRAI DE FER EN PELLETS
IRON OXIDE, SPENT UN 1376	ÓXIDO DE HIERRO AGOTADO, No ONU 1376	OXYDE DE FER RÉSIDUAIRE UN 1376
<b>IRON OXIDE TECHNICAL</b>	<b>ÓXIDO DE HIERRO-GRADO TÉCNICO</b>	<b>OXYDE DE FER DE QUALITÉ TECHNIQUE</b>
<b>IRON SINTER</b>	<b>HIERRO SINTERIZADO</b>	<b>AGGLOMÉRÉS DE FER</b>

ENGLISH	SPANISH	FRENCH
Iron swarf	Hierro, virutas de	copeaux de fer
IRON SPONGE, SPENT UN 1376	ESPONJA DE HIERRO AGOTADA, No ONU 1376	TOURNURE DE FER RÉSIDUAIRE UN 1376
IRONSTONE	ROCA FERRUGINOSA	ROCHE FERRUGINEUSE
LABRADORITE	LABRADORITA	LABRADOR
LEAD AND ZINC CALCINES (mixed)	PLOMO Y CINCO, CALCINADOS DE (en mezclas)	PLOMB ET ZINC CALCINÉS (en mélange)
LEAD AND ZINC MIDDINGS	PLOMO Y CINCO, MIXTOS DE	MIXTES DE PLOMB ET DE ZINC
LEAD CONCENTRATE	PLOMO, CONCENTRADO DE	CONCENTRÉ DE PLOMB
LEAD NITRATE UN 1469	NITRATO DE PLOMO, No ONU 1469	NITRATE DE PLOMB UN 1469
LEAD ORE	PLOMO, MINERAL DE	MINÉRAI DE PLOMB
Lead ore concentrate	Plomo, concentrado de mineral de	Concentré de minerais de plomb
LEAD ORE RESIDUE	PLOMO, RESIDUOS DE MINERAL DE	RÉSIDU DE MINÉRAI DE PLOMB
LEAD SILVER CONCENTRATE	PLOMO Y PLATA, CONCENTRADO DE	CONCENTRÉ DE PLOMB ARGENTIFÈRE
Lead silver ore	Plomo y plata, mineral de	Minerais de plomb argentifère
Lead sulphide	Sulfuro de plomo	Sulfure de plomb
Lead sulphide (galena)	Sulfuro de plomo (galena)	Sulfure de plomb (galène)
Lignite	Lignita	Lignite
LIME (UNSLAKED)	CAL (VIVA)	CHAUX (VIVE)
LIMESTONE	PIEDRA CALIZA	CALCAIRE
LINTED COTTON SEED	SEMILLAS DE ALGODÓN DESPEPITADO	GRAINES DE COTONNIER AVEC LINTER
Linseed, expelled	Linaza, prensada	Graines de lin, triturées
Linseed, extracted	Linaza, en extracto	Graines de lin, sous-produits de l'extraction
LOGS	TRONCOS	GRUMES
MAGNESIA (DEADBURNED)	MAGNESIA (CALCINADA A MUERTE)	MAGNÉSIE (CALCINÉE)
MAGNESIA (UNSLAKED)	MAGNESIA (VIVA)	MAGNÉSIE (VIVE)
Magnesia, clinker	Magnesia, clinker de	Magnésie en clinkers
Magnesia, electro-fused	Magnesia electrofundida	Magnésie électrofondue
Magnesia, lightburned	Magnesia quemada ligeramente	Magnésie calcinée légère
Magnesia, calcined	Magnesia calcinada	Magnésie calcinée
Magnesia, caustic calcined	Magnesia cáustica calcinada	Magnésie calcinée caustique
Magnesite, clinker	Magnesita, clinker de	Magnésite, clinkers de
MAGNESITE, natural	MAGNESITA natural	MAGNÉSITE, naturelle
Magnesium carbonate	Carbonato de magnesio	Carbonate de magnésium
MAGNESIUM NITRATE UN 1474	NITRATO DE MAGNESIO, No ONU 1474	NITRATE DE MAGNÉSIUM UN 1474
MAGNESIUM SULPHATE FERTILIZERS	ABONOS DE SULFATO DE MAGNESIO	ENGRAIS AU SULFATE DE MAGNÉSIUM
Maize, expelled	Maíz, prensado	Maïs, trituré
Maize, extracted	Maíz, en extracto	Maïs, sous-produit de l'extraction
MANGANESE COMPONENT FERROALLOY SLAG	ESCORIA DE ALEACIÓN DE HIERRO CON MANGANESO	SCORIES DE FERRO-ALLIAGES DE MANGANÈSE

ENGLISH	SPANISH	FRENCH
MANGANESE CONCENTRATE	MANGANESO, CONCENTRADO DE	CONCENTRÉ DE MANGANÈSE
MANGANESE ORE	MANGANESO, MINERAL DE	MINÉRAI DE MANGANÈSE
MANGANESE ORE FINES	FINOS DE MINERAL DE MANGANESO	FINES DE MINÉRAI DE MANGANÈSE
M.A.P.	FMA	[not applicable in French]
MARBLE CHIPS	MÁRMOL, ASTILLAS DE	ÉCLATS DE MARBRE
Meal, oily	Harina oleosa	Farines oléagineuses
METAL SULPHIDE CONCENTRATES	SULFUROS METÁLICOS, CONCENTRADOS DE	CONCENTRÉS DE SULFURES MÉTALLIQUES
Mill feed pellets	Piensos, pellets de	Sous-produits de meunerie en boulettes
Milorganite	Milorganita	Milorganite
Mineral Concentrates	Concentrados de minerales	Concentrés de minerais
MONOAMMONIUM PHOSPHATE	FOSFATO MONOAMÓNICO	MONOPHOSPHATE D'AMMONIUM
Muriate of potash	Muriato de potasa	Muriate de potasse
NEFELINE SYENITE (mineral)	SIENITA NEFELÍNICA (mineral)	SYÉNITE NÉPHÉLINIQUE (minérai)
NICKEL ORE	MINERAL DE NÍQUEL	MINÉRAI DE NICKEL
NICKEL CONCENTRATE	NÍQUEL, CONCENTRADO DE	CONCENTRÉ DE NICKEL
Nickel ore concentrate	Níquel, concentrado de mineral de	Concentré de minérai de nickel
Niger seed, expelled	Níger, semillas de, prensadas	Graines de niger, triturées
Niger seed, extracted	Níger, semillas de, en extracto	Graines de niger, sous-produits de l'extraction
Oil cake	Torta oleaginoso	Tourteaux oléagineux
Palm kernel, expelled	Nuez de palma, prensada	Amande de palmiste, triturée
Palm kernel, extracted	Nuez de palma, en extracto	Amande de palmiste, sous-produit de l'extraction
Peanuts, expelled	Cacahuètes (maní), prensados	Cacahuètes, triturées
Peanuts, extracted	Cacahuètes (maní), en extracto	Cacahuètes, sous-produits de l'extraction
PEANUTS (in shell)	CACAHUETES (con vaina)	CACAHUÈTES (en coques)
PEAT MOSS	TURBA FIBROSA	TOURBE HORTICOLE
PEBBLES (sea)	CANTOS RODADOS (de mar)	GALETS (de mer)
PELLETS (concentrates)	PELLETS (concentrados)	PELLETS (concentrés)
Pellets (cereal)	Cereales, pellets de	Céréales en boulettes
Pencil pitch	Brea en lápices	Brai en crayons
PENTAHYDRATE CRUDE	PENTAHIDRATO EN BRUTO	PENTAHYDRATE BRUT
PERLITE ROCK	PERLITA, ROCA DE	ROCHE PERLITE
PETROLEUM COKE (calcined)	COQUE DE PETRÓLEO (calcinado)	COKE DE PÉTROLE (calciné)
PETROLEUM COKE (uncalcined)	COQUE DE PETRÓLEO (no calcinado)	COKE DE PÉTROLE (non calciné)
PHOSPHATE ROCK (calcined)	FOSFATO EN ROCA (calcinado)	ROCHE PHOSPHATÉE (calcinée)
PHOSPHATE ROCK (uncalcined)	FOSFATO EN ROCA (no calcinado)	ROCHE PHOSPHATÉE (non calcinée)
PHOSPHATE (defluorinated)	FOSFATO (desfluorado)	PHOSPHATE (défluoré)
PIG IRON	HIERRO EN LINGOTES	FRONTE EN GUEUSES

ENGLISH	SPANISH	FRENCH
PITCH PRILL	BREA EN BOLITAS	BRAI EN GRAINS
Pollard pellets	Trasmochos, pellets de	Recoupette en boulettes
POTASH	POTASA	POTASSE
Potash muriate	Muriato de potasa	Muriate de potasse
POTASSIUM CHLORIDE	CLORURO POTÁSICO	CHLORURE DE POTASSIUM
POTASSIUM NITRATE UN 1486	NITRATO POTÁSICO, No ONU 1486	NITRATE DE POTASSIUM UN 1486
Potassium nitrate/sodium nitrate (mixture)	Nitrato potásico y nitrato sódico, mezclas de	Nitrate de potassium/nitrate de sodium (en mélange)
POTASSIUM NITRATE MIXTURE	Nitrato potásico en mezcla	NITRATE DE POTASSIUM EN MÉLANGE
POTASSIUM SULPHATE	SULFATO DE POTASIO	SULFATE DE POTASSIUM
Prilled coal tar	Alquitrán de hulla en bolitas	Goudron de houille en grains
PULP WOOD	MADERA PARA PASTA PAPELERA	BOIS À PÂTE
PUMICE	PIEDRA PÓMEZ	PONCE
PYRITE (containing copper and iron)	PIRITA (contiene cobre y hierro)	PYRITE (contenant du cuivre et du fer)
PYRITES, CALCINED	PIRITAS CALCINADAS	PYRITES CALCINÉES
PYRITES	PIRITAS	PYRITES
Pyrites (cupreous, fine, flotation, or sulphur)	Piritas (cuprosas, disgregadas, flotación o azufre)	Pyrites (cuivreuses, fines, flottation, soufre)
Pyritic ash	Cenizas piríticas	Cendres pyriteuses
PYRITIC ASHES (iron)	CENIZAS PIRITOSAS (hierro)	CENDRES PYRITEUSES (fer)
PYRITIC CINDERS	ESCORIAS PIRITOSAS	CENDRES PYRITEUSES
PYROPHYLLITE	PIROFILITA	PYROPHYLLITE
QUARTZ	CUARZO BLANCO	QUARTZ
QUARTZITE	CUARCITA	QUARTZITE
Quicklime	Cal viva	chaux vive
RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I) UN 2912	MATERIALES RADIATIVOS, DE BAJA ACTIVIDAD ESPECÍFICA (BAE-I), No ONU 2912	MATIÈRES RADIOACTIVES DE FAIBLE ACTIVITÉ SPÉCIFIQUE (LSA-I) UN 2912
RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I) UN 2913	MATERIALES RADIATIVOS, OBJETOS CONTAMINADOS EN LA SUPERFICIE (OCS-I), No ONU 2913	MATIÈRES RADIOACTIVES, OBJETS CONTAMINÉS SUPERFICIELLEMENT (SCO-I) UN 2913
Rape seed, expelled	Semillas de colza, prensadas	Graines de colza, triturées
Rape seed, extracted	Semillas de colza, en extracto	Graines de colza, sous-produits de l'extraction
RASORITE (ANHYDROUS)	RASORITA (ANHIDRA)	RASORITE (ANHYDRE)
Rice bran	Arroz, salvado de	Son de riz
Rice broken	Arroz partido	Brisures de riz
Rough ammonia tankage	Amonio en bruto, desechos orgánicos de	Déchets organiques ammoniacaux
ROUNDWOOD	ROLLIZOS	RONDINS
RUTILE SAND	RUTILO, ARENA DE	SABLE DE RUTILE

ENGLISH	SPANISH	FRENCH
Safflower seed, expelled	Cártamo, semillas de, prensadas	Graines de carthame, triturées
Safflower seed, extracted	Cártamo, semillas de, en extracto	Graines de carthame, sous-produits de l'extraction
SALT	SAL	SEL
SALT CAKE	SAL, TORTAS DE	PAIN DE SEL
SALT ROCK	SAL GEMA	ROCHE SALINE
Saltpetre	Salitre	Salpêtre
SAND	ARENA	SABLE
Sand, ilmenite	Arena de ilmenita	Sable, ilménite
Sand, zircon	Arena de circonio	Sable, zircon
Spodumene	Espodumeno	Spodumène
SAND, HEAVY MINERAL	ARENAS DE MINERALES PESADOS	SABLE, MINÉRAUX LOURDS
SAWDUST	SERRÍN	SCIURE DE BOIS
SAW LOGS	TRONCOS PARA ASERRAR	BOIS DÉBITÉ
SCALE GENERATED FROM THE IRON AND STEEL MAKING PROCESS	CASCARILLA GENERADA EN LOS PROCESOS SIDERÚRGICOS	DÉPÔTS PROVENANT DE LA FABRICATION DU FER ET DE L'ACIER
SCRAP METAL	CHATARRA	FERRAILLE
SEED CAKE, containing vegetable oil UN 1386 (a) mechanically expelled seeds, containing more than 10% of oil or more than 20% of oil and moisture content	TORTA DE SEMILLAS, con una proporción de aceite vegetal, No ONU 1386 a) residuos de semillas prensadas por medios mecánicos, con un contenido de más del 10 % de aceite o más del 20 % de aceite y humedad combinados	TOURTEAUX contenant de l'huile végétale UN 1386 a) Graines triturées par procédé mécanique contenant plus de 10 % d'huile ou plus de 20 % d'huile et d'humidité combinées
SEED CAKE, containing vegetable oil UN 1386 (b) solvent extraction and expelled seeds, containing not more than 10% of oil and when the amount of moisture is higher than 10%, not more than 20% of oil and moisture combined	TORTA DE SEMILLAS, con una proporción de aceite vegetal, No ONU 1386 b) residuos de la extracción del aceite de las semillas con disolventes o por prensado, con un contenido de no más del 10 % de aceite o, si el contenido de humedad es superior al 10 %, no más del 20 % de aceite y humedad combinados	TOURTEAUX contenant de l'huile végétale UN 1386 b) Sous-produits de l'extraction au solvant ou graines triturées contenant au maximum 10 % d'huile et, si la teneur en humidité est supérieure à 10 %, pas plus de 20 % d'huile et d'humidité combinées
SEED CAKE UN 2217	TORTA DE SEMILLAS, No ONU 2217	TOURTEAUX UN 2217
SEED CAKE (non-hazardous)	TORTA DE SEMILLAS (no entraña riesgos)	TOURTEAUX (non dangereux)
Seed expellers, oily	Semillas oleosas, torta de presión de	Expellers oléagineux
SILICOMANGANESE	SILICOMANGANESO	SILICOMANGANÈSE
SILICON SLAG	ESCORIA DE SILICIO	SCORIES DE SILICIUM
SILVER LEAD CONCENTRATE	PLATA Y PLOMO, CONCENTRADO DE	CONCENTRÉ DE PLOMB ARGENTIFÈRE
Silver lead ore concentrate	Plata y plomo, concentrado de mineral de	Concentré de minerai de plomb argentifère
Sinter	Sinterizado	Agglomérés

ENGLISH	SPANISH	FRENCH
Slag, granulated	Escoria granulada	Scories, en grains
SLIG, iron ore	SLIG (mineral de hierro)	SLIG (minerai de fer)
SODA ASH	SOSA, CENIZA DE	SOUDE DU COMMERCE
SODIUM NITRATE UN 1498	NITRATO SÓDICO, No ONU 1498	NITRATE DE SODIUM UN 1498
SODIUM NITRATE AND POTASSIUM NITRATE MIXTURE UN 1499	NITRATO SÓDICO Y NITRATO POTÁSICO, EN MEZCLA, No ONU 1499	NITRATE DE SODIUM ET NITRATE DE POTASSIUM EN MÉLANGE UN 1499
Soyabean, expelled	Soja, prensada	Graines de soja, triturées
Soyabean, extracted	Soja, en extracto	Graines de soja, sous-produits de l'extraction
SOLIDIFIED FUELS RECYCLED FROM PAPER AND PLASTICS	COMBUSTIBLES SOLIDIFICADOS RECICLADOS DE PAPELES Y PLÁSTICOS	COMBUSTIBLES SOLIDIFIÉS RECYCLÉ À PARTIR DE PAPIER ET DE PLASTIQUE
SPENT CATHODES	CÁTODOS AGOTADOS	CATHODES USÉES
SPENT POTLINER	CUBAS ELECTROLÍTICAS AGOTADAS	REVÊTEMENT USÉ DES CUVES
<b>SPODUMENE (UPGRADED)</b>	<b>ESPODÚMENO (ENRIQUECIDO)</b>	<b>SPODUMÈNE (ENRICHI)</b>
STAINLESS STEEL GRINDING DUST	ACERO INOXIDABLE, POLVO DEL RECTIFICADO DE	ACIER INOXYDABLE, POUSSIÈRE DE MEULAGE
Steel swarf	Acero, virutas de	Rognures d'acier
Stibnite	Estibina	Stibnite
STONE CHIPPINGS	GRAVILLA	PIERRES CONCASSÉES
Strussa pellets	Strussa, pellets de	Strussa en boulettes
SUGAR	AZÚCAR	SUCRE
SULPHATE OF POTASH AND MAGNESIUM	SULFATO DE POTASA Y MAGNESIO	SULFATE DE POTASSIUM ET DE MAGNÉSIO
Sulphide concentrates	Sulfuros, concentrados de	Concentrés sulfurés
SULPHUR UN 1350 (crushed lump and coarse grained)	AZUFRE, No ONU 1350 (en terrones triturados o en polvo de grano grueso)	SOUFRE UN 1350 (concassé en morceaux et en poudre à gros grains)
SULPHUR (formed, solid)	AZUFRE (sólido con forma)	SOUFRE (solide, moulé)
Sunflower seed, expelled	Girasol, semillas de, prensadas	Graines de tournesol, triturées
Sunflower seed, extracted	Girasol, semillas de, en extracto	Graines de tournesol, sous-produits de l'extraction
SUPERPHOSPHATE	SUPERFOSFATO	SUPERPHOSPHATE
SUPERPHOSPHATE (triple, granular)	SUPERFOSFATO (triple granular)	SUPERPHOSPHATE (triple, granuleux)
Swarf	Virutas	Rognures
TACONITE PELLETS	TACONITA, PELLETS DE	TACONITE EN PELLETS
TALC	TALCO	TALC
TANKAGE	DESECHOS ORGÁNICOS	DÉCHETS ORGANIQUES
Tankage fertilizer	Fertilizante orgánico	Engrais à base de déchets organiques
TAPIOCA	TAPIOCA	TAPIOCA
TIMBER	MADERAJE	BILLES DE BOIS
Toasted meals	Harinas tostadas	Farines grillées
Triple superphosphate	Superfosfato triple	Superphosphate triple
UREA	UREA	URÉE

ENGLISH	SPANISH	FRENCH
VANADIUM ORE	VANADIO, MINERAL DE	MINÉRAI DE VANADIUM
VERMICULITE	VERMICULITA	VERMICULITE
WHITE QUARTZ	CUARZO BLANCO	QUARTZ BLANC
WOODCHIPS	MADERA, ASTILLAS DE	COPEAUX DE BOIS
WOOD PELLETS	MADERA, PELLETS DE	GRANULÉS (PELLETS) DE BOIS
WOOD PELLETS CONTAINING ADDITIVES AND/OR BINDERS	PELLETS DE MADERA QUE CONTIENEN ADITIVOS Y/O AGLUTINANTES	GRANULÉS (PELLETS) DE BOIS CONTENANT DES ADDITIFS OU LIANTS
WOOD PELLETS NOT CONTAINING ANY ADDITIVES AND/OR BINDERS	PELLETS DE MADERA QUE NO CONTIENEN ADITIVOS NI AGLUTINANTES	GRANULÉS (PELLETS) DE BOIS NE CONTENANT AUCUN ADDITIF OU LIANT
Wood Products – General	Productos generales de madera	Produits du bois – Généralités
WOOD TORREFIED	MADERA TORRADA	BOIS TORRÉFIÉ
ZINC AND LEAD CALCINES (mixed)	CINC Y PLOMO, CALCINADOS DE (en mezclas)	ZINC ET PLOMB CALCINÉS (en mélange)
ZINC AND LEAD MIDDINGS	CINC Y PLOMO, MIXTOS DE	MIXTES DE ZINC ET DE PLOMB
ZINC ASHES UN 1435	CINC, CENIZAS DE, No ONU 1435	CENDRES DE ZINC UN 1435
ZINC CONCENTRATE	CINC, CONCENTRADO DE	CONCENTRÉ DE ZINC
Zinc, dross, residue or skimmings	Cinc (escoria de, residuos de o espuma de)	Zinc, crasses, résidus, laitier
Zinc ore, burnt	Cinc, mineral quemado de	Minérai de zinc, brûlé
Zinc ore, calamine	Cinc, mineral de, calamina	Minérai de zinc, calamine
Zinc ore, concentrates	Cinc, mineral de, concentrados	Minérai de zinc, concentrés
Zinc ore, crude	Cinc, mineral de, bruto	Minérai de zinc, brut
ZINC SINTER	CINC SINTERIZADO	AGGLOMÉRÉS DE ZINC
ZINC SLAG	CINC, ESCORIA DE	SCORIES DE ZINC
ZINC SLUDGE	CINC, FANGOS DE	BOUES DE ZINC
Zinc sulphide	Sulfuro de cinc	Sulfure de zinc
Zinc sulphide (blende)	Sulfuro de cinc (blenda)	Sulfure de zinc (blende)
ZIRCON KYANITE CONCENTRATE	CONCENTRADO DE CIANITA DE CIRCONIO	CONCENTRÉ DE KYANITE ET DE ZIRCON
ZIRCONSAND	CIRCONIO, ARENA DE	SABLE DE ZIRCON

\*\*\*



## ANNEX 2

### DRAFT AMENDMENTS TO THE INTERNATIONAL MARITIME SOLID BULK CARGOES (IMSBC) CODE (RELATED TO SUBSTANCES HARMFUL TO THE MARINE ENVIRONMENT (HME))

#### Section 1 General Provisions

##### 1.4 Application and implementation of this Code

1 In paragraph 1.4.2, the following entries are inserted in the corresponding order:

"Paragraph 4.2.2.2;"

"[Section 14 Prevention of pollution by cargo residues from ships];".

#### Section 4 Assessment of acceptability of consignments for safe shipment

##### 4.2 Provision of information

2 The existing paragraph 4.2.2 is renumbered as "4.2.2.1" and the following new paragraph "4.2.2.2" is added:

"4.2.2.2 The cargo information should include whether or not the cargo is harmful to the marine environment\*.

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\* Refer to paragraphs 3.2 and 3.4 of *2012 Guidelines for the implementation of MARPOL Annex V (MEPC.219(63))* (See paragraph 14.2 in this Code)."

3 In paragraph 4.2.3, in the "Form for cargo information for Solid Bulk Cargoes", after the row for that describes Group of the cargo, the following rows are inserted:

"

Classification relating to MARPOL Annex V

harmful to the marine environment

not harmful to the marine environment

"

4 A new "Section 14" is added with the following texts:

**["Section 14  
Prevention of pollution by cargo residues from ships**

**Introductory note**

The provisions of this section address the implementation of the revised MARPOL Annex V<sup>\*</sup> in relation to the management of residues of solid bulk cargoes, taking into account the current *Guidelines for the implementation of MARPOL Annex V*<sup>\*\*</sup> (the Guidelines). In accordance with MARPOL Annex V, the management of the residues of solid bulk cargoes depends primarily on the classification of a solid bulk cargo as to whether it is harmful to the marine environment (HME) or non-HME. The responsibility for classifying and declaring, whether a solid bulk cargo is HME or non-HME, lies with the shipper as per section 3.4 of the Guidelines. Relevant texts of MARPOL Annex V and the Guidelines relating to the management of residues of solid bulk cargoes are reproduced below. The information in this section is provided in order to assist users of the Code to comply with MARPOL Annex V.

Footnotes

- \* Regulations for the prevention of pollution by garbage from ships, i.e. Annex V of "the International Convention for the Prevention of Pollution from Ships, (MARPOL)" as amended.
- \*\* *2012 Guidelines for the implementation of MARPOL Annex V* as adopted by Resolution MEPC.219(63)

14.1 Regulations for the prevention of pollution by garbage from ships, i.e. MARPOL Annex V, as amended, deal with the management of residues of solid bulk cargoes. The texts in MARPOL Annex V relevant to residues of solid bulk cargoes are reproduced below: [MARPOL Annex V may be amended after the adoption of this version of the IMSBC Code, and, therefore, MARPOL Annex V, as amended and pertaining at the time of reading should always be referred to.](#)

**"REVISED MARPOL ANNEX V  
Regulations for the prevention of pollution by garbage from ships**

**Regulation 1**

*Definitions*

For the purposes of this Annex:

1 (Not reproduced.)

2 *Cargo residues* means the remnants of any cargo which are not covered by other Annexes to the present Convention and which remain on the deck or in holds following loading or unloading, including loading and unloading excess or spillage, whether in wet or dry condition or entrained in wash water but does not include cargo dust remaining on the deck after sweeping or dust on the external surfaces of the ship.

3 (Not reproduced.)

4 (Not reproduced.)

5 *En route* means that the ship is underway at sea on a course or courses, including deviation from the shortest direct route, which as far as practicable for navigational purposes, will cause any discharge to be spread over as great an area of the sea as is reasonable and practicable.

6 (Not reproduced.)

7 (Not reproduced.)

8 (Not reproduced.)

9 *Garbage* means all kinds of food wastes, domestic wastes and operational wastes, all plastics, cargo residues, incinerator ashes, cooking oil, fishing gear, and animal carcasses generated during the normal operation of the ship and liable to be disposed of continuously or periodically except those substances which are defined or listed in other Annexes to the present Convention. Garbage does not include fresh fish and parts thereof generated as a result of fishing activities undertaken during the voyage, or as a result of aquaculture activities which involve the transport of fish including shellfish for placement in the aquaculture facility and the transport of harvested fish including shellfish from such facilities to shore for processing.

10 (Not reproduced.)

11 *Nearest land.* The term "from the nearest land" means from the baseline from which the territorial sea of the territory in question is established in accordance with international law, except that, for the purposes of the present Annex, "from the nearest land" off the north-eastern coast of Australia shall mean from a line drawn from a point on the coast of Australia in:

latitude 11°00'S, longitude 142°08'E  
to a point in latitude 10°35'S, longitude 141°55'E,  
thence to a point latitude 10°00'S, longitude 142°00'E,  
thence to a point latitude 09°10'S, longitude 143°52'E,  
thence to a point latitude 09°00'S, longitude 144°30'E,  
thence to a point latitude 10°41'S, longitude 145°00'E,  
thence to a point latitude 13°00'S, longitude 145°00'E,  
thence to a point latitude 15°00'S, longitude 146°00'E,  
thence to a point latitude 17°30'S, longitude 147°00'E,  
thence to a point latitude 21°00'S, longitude 152°55'E,  
thence to a point latitude 24°30'S, longitude 154°00'E,  
thence to a point on the coast of Australia in  
latitude 24°42'S, longitude 153°15'E.

12 *Operational wastes* means all solid wastes (including slurries) not covered by other Annexes that are collected on board during normal maintenance or operations of a ship, or used for cargo stowage and handling. Operational wastes also includes cleaning agents and additives contained in cargo hold and external wash water. Operational wastes does not include grey water, bilge water, or other similar discharges essential to the operation of a ship, taking into account the guidelines developed by the Organization.

13 *Plastic* means a solid material which contains as an essential ingredient one or more high molecular mass polymers and which is formed (shaped) during either manufacture of the polymer or the fabrication into a finished product by heat and/or pressure. Plastics have material properties ranging from hard and brittle to soft and elastic. For the purposes of this

Annex, "all plastics" means all garbage that consists of or includes plastic in any form, including synthetic ropes, synthetic fishing nets, plastic garbage bags and incinerator ashes from plastic products.

14 *Special area* means a sea area where for recognized technical reasons in relation to its oceanographic and ecological condition and to the particular character of its traffic the adoption of special mandatory methods for the prevention of sea pollution by garbage is required.

For the purposes of this Annex the special areas are the Mediterranean Sea area, the Baltic Sea area, the Black Sea area, the Red Sea area, the Gulfs area, the North Sea area, the Antarctic area and the Wider Caribbean Region, which are defined as follows:

- .1 The Mediterranean Sea area means the Mediterranean Sea proper including the gulfs and seas therein with the boundary between the Mediterranean and the Black Sea constituted by the 41°N parallel and bounded to the west by the Straits of Gibraltar at the meridian 5°36'W.
- .2 The Baltic Sea area means the Baltic Sea proper with the Gulf of Bothnia and the Gulf of Finland and the entrance to the Baltic Sea bounded by the parallel of the Skaw in the Skagerrak at 57°44.8'N.
- .3 The Black Sea area means the Black Sea proper with the boundary between the Mediterranean and the Black Sea constituted by the parallel 41°N.
- .4 The Red Sea area means the Red Sea proper including the Gulfs of Suez and Aqaba bounded at the south by the rhumb line between Ras si Ane (12°28.5'N, 43°19.6'E) and Husn Murad (12°40.4'N, 43°30.2'E).
- .5 The Gulfs area means the sea area located north-west of the rhumb line between Ras al Hadd (22°30'N, 59°48'E) and Ras al Fasteh (25°04'N, 61°25'E).
- .6 The North Sea area means the North Sea proper including seas therein with the boundary between:
  - .1 the North Sea southwards of latitude 62°N and eastwards of longitude 4°W;
  - .2 the Skagerrak, the southern limit of which is determined east of the Skaw by latitude 57°44.8'N; and
  - .3 the English Channel and its approaches eastwards of longitude 5°W and northwards of latitude 48°30'N.
- .7 The Antarctic area means the sea area south of latitude 60°S.
- .8 The Wider Caribbean Region means the Gulf of Mexico and Caribbean Sea proper including the bays and seas therein and that portion of the Atlantic Ocean within the boundary constituted by the 30°N parallel from Florida eastward to 77°30'W meridian, thence a rhumb line to the intersection of 20°N parallel and 59°W meridian, thence a rhumb line to the intersection of 7°20'N parallel and 50°W meridian, thence a rhumb line drawn southwesterly to the eastern boundary of French Guiana.

## **Regulation 2**

### *Application*

Unless expressly provided otherwise, the provisions of this Annex shall apply to all ships.

## **Regulation 3**

### *General prohibition on discharge of garbage into the sea*

1 Discharge of all garbage into the sea is prohibited, except as provided otherwise in regulations 4, 5, 6 and 7 of this Annex.

2 Except as provided in regulation 7 of this Annex, discharge into the sea of all plastics, including but not limited to synthetic ropes, synthetic fishing nets, plastic garbage bags and incinerator ashes from plastic products is prohibited.

3 Except as provided in regulation 7 of this Annex, the discharge into the sea of cooking oil is prohibited.

## **Regulation 4**

### *Discharge of garbage outside special areas*

1 Discharge of the following garbage into the sea outside special areas shall only be permitted while the ship is en route and as far as practicable from the nearest land, but in any case not less than:

- .1 3 nautical miles from the nearest land for food wastes which have been passed through a comminuter or grinder. Such comminuted or ground food wastes shall be capable of passing through a screen with openings no greater than 25 mm.
- .2 12 nautical miles from the nearest land for food wastes that have not been treated in accordance with subparagraph .1 above.
- .3 12 nautical miles from the nearest land for cargo residues that cannot be recovered using commonly available methods for unloading. These cargo residues shall not contain any substances classified as harmful to the marine environment, taking into account guidelines developed by the Organization.
- .4 For animal carcasses, discharge shall occur as far from the nearest land as possible, taking into account the guidelines developed by the Organization.

2 Cleaning agents or additives contained in cargo hold, deck and external surfaces wash water may be discharged into the sea, but these substances must not be harmful to the marine environment, taking into account guidelines developed by the Organization.

3 When garbage is mixed with or contaminated by other substances prohibited from discharge or having different discharge requirements, the more stringent requirements shall apply.

### **Regulation 5**

*Special requirements for discharge of garbage from fixed or floating platforms*  
(Not reproduced.)

### **Regulation 6**

*Discharge of garbage within special areas*

1 Discharge of the following garbage into the sea within special areas shall only be permitted while the ship is en route and as follows:

- .1 (Not reproduced.)
- .2 Discharge of cargo residues that cannot be recovered using commonly available methods for unloading, where all the following conditions are satisfied:
  - .1 Cargo residues, cleaning agents or additives, contained in hold washing water do not include any substances classified as harmful to the marine environment, taking into account guidelines developed by the Organization;
  - .2 Both the port of departure and the next port of destination are within the special area and the ship will not transit outside the special area between those ports;
  - .3 No adequate reception facilities are available at those ports taking into account guidelines developed by the Organization; and
  - .4 Where the conditions of subparagraphs 2.1, 2.2 and 2.3 of this paragraph have been fulfilled, discharge of cargo hold washing water containing residues shall be made as far as practicable from the nearest land or the nearest ice shelf and not less than 12 nautical miles from the nearest land or the nearest ice shelf.

2 Cleaning agents or additives contained in deck and external surfaces wash water may be discharged into the sea, but only if these substances are not harmful to the marine environment, taking into account guidelines developed by the Organization.

3 The following rules (in addition to the rules in paragraph 1 of this regulation) apply with respect to the Antarctic area:

- .1 Each Party at whose ports ships depart en route to or arrive from the Antarctic area undertakes to ensure that as soon as practicable adequate facilities are provided for the reception of all garbage from all ships, without causing undue delay, and according to the needs of the ships using them.
- .2 Each Party shall ensure that all ships entitled to fly its flag, before entering the Antarctic area, have sufficient capacity on board for the retention of all garbage, while operating in the area and have concluded arrangements to discharge such garbage at a reception facility after leaving the area.

4 When garbage is mixed with or contaminated by other substances prohibited from discharge or having different discharge requirements, the more stringent requirements shall apply.

## **Regulation 7**

### *Exceptions*

- 1 Regulations 3, 4, 5 and 6 of this Annex shall not apply to:
  - .1 The discharge of garbage from a ship necessary for the purpose of securing the safety of a ship and those on board or saving life at sea; or
  - .2 The accidental loss of garbage resulting from damage to a ship or its equipment, provided that all reasonable precautions have been taken before and after the occurrence of the damage, to prevent or minimize the accidental loss; or
  - .3 (Not reproduced.)
  - .4 (Not reproduced.)
- 2 Exception of en route:
  - .1 The en route requirements of regulations 4 and 6 shall not apply to the discharge of food wastes where it is clear the retention on board of these food wastes presents an imminent health risk to the people on board.

## **Regulation 8**

### *Reception facilities*

- 1 Each Party undertakes to ensure the provision of adequate facilities at ports and terminals for the reception of garbage without causing undue delay to ships, and according to the needs of the ships using them.
- 2 Each Party shall notify the Organization for transmission to the Contracting Parties concerned of all cases where the facilities provided under this regulation are alleged to be inadequate.
- 3 (Not reproduced.)

## **Regulation 9**

### *Port State control on operational requirements*

(Not reproduced.)

## **Regulation 10**

### *Placards, garbage management plans and garbage record-keeping*

- 1 .1 Every ship of 12 m or more in length overall and fixed or floating platforms shall display placards which notify the crew and passengers of the discharge requirements of regulations 3, 4, 5 and 6 of this Annex, as applicable.
- .2 The placards shall be written in the working language of the ship's crew and, for ships engaged in voyages to ports or offshore terminals under the jurisdiction of other Parties to the Convention, shall also be in English, French or Spanish.

2 Every ship of 100 gross tonnage and above, and every ship which is certified to carry 15 or more persons, and fixed or floating platforms shall carry a garbage management plan which the crew shall follow. This plan shall provide written procedures for minimizing, collecting, storing, processing and disposing of garbage, including the use of the equipment on board. It shall also designate the person or persons in charge of carrying out the plan. Such a plan shall be based on the guidelines developed by the Organization and written in the working language of the crew.

3 Every ship of 400 gross tonnage and above and every ship which is certified to carry 15 or more persons engaged in voyages to ports or offshore terminals under the jurisdiction of another Party to the Convention and every fixed or floating platform shall be provided with a Garbage Record Book. The Garbage Record Book, whether as a part of the ship's official log-book or otherwise, shall be in the form specified in the appendix to this Annex:

- .1 Each discharge into the sea or to a reception facility, or a completed incineration, shall be promptly recorded in the Garbage Record Book and signed for on the date of the discharge or incineration by the officer in charge. Each completed page of the Garbage Record Book shall be signed by the master of the ship. The entries in the Garbage Record Book shall be at least in English, French or Spanish. Where the entries are also made in an official language of the State whose flag the ship is entitled to fly, the entries in that language shall prevail in case of a dispute or discrepancy;
- .2 The entry for each discharge or incineration shall include date and time, position of the ship, category of the garbage and the estimated amount discharged or incinerated;
- .3 The Garbage Record Book shall be kept on board the ship or the fixed or floating platform, and in such a place as to be readily available for inspection at all reasonable times. This document shall be preserved for a period of at least two years from the date of the last entry made in it;
- .4 In the event of any discharge or accidental loss referred to in regulation 7 of this Annex an entry shall be made in the Garbage Record Book, or in the case of any ship of less than 400 gross tonnage, an entry shall be made in the ship's official log-book, of the location, circumstances of, and the reasons for the discharge or loss, details of the items discharged or lost, and the reasonable precautions taken to prevent or minimize such discharge or accidental loss.

4 (Not reproduced.)

5 (Not reproduced.)

6 (Not reproduced.)



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## APPENDIX

### FORM OF GARBAGE RECORD BOOK

Name of ship: \_\_\_\_\_

Distinctive number or letters: \_\_\_\_\_

IMO No.: \_\_\_\_\_

Period: \_\_\_\_\_ From: \_\_\_\_\_ To: \_\_\_\_\_

#### 1 Introduction

In accordance with regulation 10 of Annex V of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL), a record is to be kept of each discharge operation or completed incineration. This includes discharges into the sea, to reception facilities, or to other ships, as well as the accidental loss of garbage.

#### 2 Garbage and garbage management

*Garbage* means all kinds of food wastes, domestic wastes and operational wastes, all plastics, cargo residues, incinerator ashes, cooking oil, fishing gear, and animal carcasses generated during the normal operation of the ship and liable to be disposed of continuously or periodically except those substances which are defined or listed in other Annexes to the present Convention. Garbage does not include fresh fish and parts thereof generated as a result of fishing activities undertaken during the voyage, or as a result of aquaculture activities which involve the transport of fish including shellfish for placement in the aquaculture facility and the transport of harvested fish including shellfish from such facilities to shore for processing.

The *Guidelines for the implementation of Annex V of MARPOL*<sup>1</sup> should also be referred to for relevant information.

#### 3 Description of the garbage

Garbage is to be grouped into categories for the purposes of the Garbage Record Book (or ship's official log-book) as follows:

- A Plastics
- B Food wastes
- C Domestic Wastes
- D Cooking Oil
- E Incinerator ashes

---

<sup>1</sup> Refer to the *Guidelines for the implementation of Annex V of MARPOL*, as amended by resolutions.

- F Operational wastes
- G Cargo residues
- H Animal Carcass(es)
- I Fishing Gear<sup>2</sup>

#### **4 Entries in the Garbage Record Book**

4.1 Entries in the Garbage Record Book shall be made on each of the following occasions:

4.1.1 When garbage is discharged to a reception facility<sup>3</sup> ashore or to other ships:

- .1 Date and time of discharge
- .2 Port or facility, or name of ship
- .3 Categories of garbage discharged
- .4 Estimated amount discharged for each category in cubic metres
- .5 Signature of officer in charge of the operation.

4.1.2 When garbage is incinerated:

- .1 Date and time of start and stop of incineration
- .2 Position of the ship (latitude and longitude) at the start and stop of incineration
- .3 Categories of garbage incinerated
- .4 Estimated amount incinerated in cubic metres
- .5 Signature of the officer in charge of the operation.

4.1.3 When garbage is discharged into the sea in accordance with regulations 4, 5 or 6 of Annex V of MARPOL:

- .1 Date and time of discharge
- .2 Position of the ship (latitude and longitude). Note: for cargo residue discharges, include discharge start and stop positions.
- .3 Category of garbage discharged
- .4 Estimated amount discharged for each category in cubic metres
- .5 Signature of the officer in charge of the operation.

---

<sup>2</sup> Refer to Guidelines to be developed by the Organization.

<sup>3</sup> Ship's masters should obtain from the operator of the reception facilities, which includes barges and trucks, a receipt or certificate specifying the estimated amount of garbage transferred. The receipts or certificates must be kept together with the Garbage Record Book.

4.1.4 Accidental or other exceptional discharges or loss of garbage into the sea, including in accordance with regulation 7 of Annex V of MARPOL:

- .1 Date and time of occurrence
- .2 Port or position of the ship at time of occurrence (latitude, longitude and water depth if known)
- .3 Categories of garbage discharged or lost
- .4 Estimated amount for each category in cubic metres
- .5 The reason for the discharge or loss and general remarks.

#### **4.2 Amount of garbage**

The amount of garbage on board should be estimated in cubic metres, if possible separately according to category. The Garbage Record Book contains many references to estimated amount of garbage. It is recognized that the accuracy of estimating amounts of garbage is left to interpretation. Volume estimates will differ before and after processing. Some processing procedures may not allow for a usable estimate of volume, e.g. the continuous processing of food waste. Such factors should be taken into consideration when making and interpreting entries made in a record.

### RECORD OF GARBAGE DISCHARGES

Ship's name: \_\_\_\_\_

Distinctive No., or letters: \_\_\_\_\_

IMO No.: \_\_\_\_\_

Garbage categories:

- A.     Plastics
- B.     Food wastes
- C.     Domestic wastes (e.g. paper products, rags, glass, metal, bottles, crockery, etc.)
- D.     Cooking oil
- E.     Incinerator Ashes
- F.     Operational wastes
- G.     Cargo residues
- H.     Animal Carcass(es)
- I.     Fishing gear

**NEW TABLE LAYOUT AS BELOW:**

Date/ Time	Position of the Ship/Remarks (e.g. accidental loss)	Category	Estimated Amount Discharged or Incinerated	To Sea	To Reception Facility	Incineration	Certification/ Signature

Master's signature: \_\_\_\_\_ Date: \_\_\_\_\_ "

14.2 *2012 Guidelines for the implementation of MARPOL Annex V* as adopted by Resolution MEPC.219(63) assist with the implementation of the above mentioned requirements in MARPOL Annex V. The texts relevant to residues of solid bulk cargoes are reproduced below. The Guidelines may be amended after the adoption of this version of the IMSBC Code, and the latest version of the Guidelines should always be referred to.

## **"2012 GUIDELINES FOR THE IMPLEMENTATION OF MARPOL ANNEX V**

### **PREFACE**

(Not reproduced.)

## **1 INTRODUCTION**

1.1 The revised MARPOL Annex V with an entry into force date of 1 January 2013, prohibits the discharge of all types of garbage into the sea unless explicitly permitted under the Annex. These guidelines have been developed taking into account the regulations set forth in Annex V, as amended, of the International Convention for the Prevention of Pollution from Ships, (MARPOL) (hereinafter referred to as the "Convention"). The purpose of these guidelines is to provide guidance to governments, shipowners, ship operators, ships' crews, cargo owners, port reception facility operators and equipment manufacturers. The guidelines are divided into the following six sections that provide a general framework upon which governments can formulate programmes:

- Introduction;
- Garbage management;
- Management of cargo residues of solid bulk cargoes;
- Training, education and information;
- Port reception facilities for garbage; and
- Enhancement of compliance with MARPOL Annex V.

1.2 Under the revised MARPOL Annex V, discharge of all garbage is now prohibited, except as specifically permitted in regulations 3, 4, 5 and 6 of MARPOL Annex V. MARPOL Annex V reverses the historical presumption that garbage may be discharged into the sea based on the nature of the garbage and defined distances from shore. Regulation 7 provides limited exceptions to these regulations in emergency and non-routine situations. Generally, discharge is restricted to food wastes, identified cargo residues, animal carcasses, and identified cleaning agents and additives and cargo residues entrained in wash water which are not harmful to the marine environment. It is recommended that ships use port reception facilities as the primary means of discharge for all garbage.

1.3 Recognizing that the MARPOL Annex V regulations continue to restrict the discharge of garbage into the sea, require garbage management for ships, and that garbage management technology continues to evolve, it is recommended that governments and the Organization continue to gather information and review these guidelines periodically.

1.4 (Not reproduced.)

1.5 (Not reproduced.)

## **1.6 Definitions**

(Not reproduced.)

## **1.7 Application**

1.7.1 This section provides clarification as to what should and should not be considered garbage under MARPOL Annex V.

1.7.2 (Not reproduced.)

1.7.3 (Not reproduced.)

1.7.4 While cleaning agents and additives contained in hold washwater, and deck and external surface washwater are considered "operational wastes" and thus "garbage" under Annex V, these cleaning agents and additives may be discharged into the sea so long as they are not harmful to the marine environment.

1.7.5 A cleaning agent or additive is considered not harmful to the marine environment if it:

- .1 is not a "harmful substance" in accordance with the criteria in MARPOL Annex III; and
- .2 does not contain any components which are known to be carcinogenic, mutagenic or reprotoxic (CMR).

1.7.6 The ship's record should contain evidence provided by the producer of the cleaning agent or additive that the product meets the criteria for not being harmful to the marine environment. To provide an assurance of compliance, a dated and signed statement to this effect from the product supplier would be adequate for the purposes of a ship's record. This might form part of a Safety Data Sheet or be a stand-alone document but this should be left to the discretion of the producer concerned.

1.7.7 (Not reproduced.)

1.7.8 (Not reproduced.)

## **2 GARBAGE MANAGEMENT**

### **2.1 Waste Minimization**

2.1.1 All shipowners and operators should minimize taking onboard material that could become garbage. Ship-specific garbage minimization procedures should be included in the Garbage Management Plan. It is recommended that manufacturers, cargo owners, ports and terminals, shipowners and operators and governments consider the management of garbage associated with ships' supplies, provisions, and cargoes as needed to minimize the generation of garbage in all forms.

2.1.2 (Not reproduced.)

2.1.3 (Not reproduced.)

2.1.4 (Not reproduced.)

**2.2 Fishing gear**  
(Not reproduced.)

**2.3 Shipboard garbage handling (collection, processing, storage, discharge)**

2.3.1 Regulation 3 of MARPOL Annex V provides that the discharge of garbage into the sea is prohibited, with limited exceptions, as summarized in table 1. Under certain conditions discharge into the sea of food wastes, animal carcasses, cleaning agents and additives contained in hold washwater, deck and external surface washwater and cargo residues which are not considered to be harmful to the marine environment is permitted.

**TABLE 1 – SUMMARY OF RESTRICTIONS TO THE DISCHARGE OF GARBAGE INTO THE SEA UNDER REGULATIONS 4, 5 AND 6 OF MARPOL ANNEX V (Not fully reproduced)**

(Note: Table 1 is intended as a summary reference. The provisions in MARPOL Annex V, not table 1, prevail.)

Garbage type <sup>1</sup>	All ships except platforms <sup>4</sup>		Offshore platforms located more than 12 nm from nearest land and ships when alongside or within 500 metres of such platforms <sup>4</sup> Regulation 5
	Outside special areas Regulation 4 (Distances are from the nearest land)	Within special areas Regulation 6 (Distances are from nearest land or nearest ice-shelf)	
Cargo residues <sup>5, 6</sup> not contained in washwater	≥ 12 nm, en route and as far as practicable	Discharge prohibited	Discharge prohibited
Cargo residues <sup>5, 6</sup> contained in washwater		≥ 12 nm, en route and as far as practicable (subject to conditions in regulation 6.1.2)	
Cleaning agents and additives <sup>6</sup> contained in cargo hold washwater	Discharge permitted	≥ 12 nm, en route and as far as practicable (subject to conditions in regulation 6.1.2)	Discharge prohibited
Cleaning agents and additives <sup>6</sup> in deck and external surfaces washwater		Discharge permitted	

<sup>1</sup> When garbage is mixed with or contaminated by other harmful substances prohibited from discharge or having different discharge requirements, the more stringent requirements shall apply.

<sup>4</sup> (not reproduced).

<sup>5</sup> Cargo residues means only those cargo residues that cannot be recovered using commonly available methods for unloading.

<sup>6</sup> These substances must not be harmful to the marine environment.

2.3.2 (Not reproduced.)

2.3.3 (Not reproduced.)

2.3.4 (Not reproduced.)

**2.4 Collection**

(Not reproduced.)

**2.5 Processing**

(Not reproduced.)

**2.6 Storage**

(Not reproduced.)

**2.7 Discharge**

(Not reproduced.)

**2.8 Shipboard equipment for processing garbage**

(Not reproduced.)

**2.9 Grinding or comminution**

(Not reproduced.)

**2.10 Compaction**

(Not reproduced.)

**2.11 Incineration**

(Not reproduced.)

**2.12 Treatment of animal carcasses**

(Not reproduced.)

**2.13 Discharge of fish carried as a cargo**

(Not reproduced.)

**3 MANAGEMENT OF CARGO RESIDUES OF SOLID BULK CARGOES**

3.1 Cargo residues are included in the definition of garbage within the meaning of MARPOL Annex V, regulation 1.9 and may be discharged in accordance with regulations 4.1.3 and 6.1.2. However, cargo material contained in the cargo hold bilge water should not be treated as cargo residues if the cargo material is not harmful to the marine environment and the bilge water is discharged from a loaded hold through the ship's fixed piping bilge drainage system.

3.2 Cargo residues are considered harmful to the marine environment and subject to regulations 4.1.3 and 6.1.2.1 of the MARPOL Annex V if they are residues of solid bulk substances which are classified according to the criteria of the United Nations Globally Harmonized System for Classification and Labelling of Chemicals (UN GHS) meeting the following parameters<sup>1</sup>:

- .1 Acute Aquatic Toxicity Category 1; and/or
- .2 Chronic Aquatic Toxicity Category 1 or 2; and/or
- .3 Carcinogenicity<sup>2</sup> Category 1A or 1B combined with not being rapidly degradable and having high bioaccumulation; and/or
- .4 Mutagenicity<sup>2</sup> Category 1A or 1B combined with not being rapidly degradable and having high bioaccumulation; and/or



- .5 Reproductive Toxicity<sup>2</sup> Category 1A or 1B combined with not being rapidly degradable and having high bioaccumulation; and/or
- .6 Specific Target Organ Toxicity Repeated Exposure<sup>2</sup> Category 1 combined with not being rapidly degradable and having high bioaccumulation; and/or
- .7 Solid bulk cargoes containing or consisting of synthetic polymers, rubber, plastics, or plastic feedstock pellets (this includes materials that are shredded, milled, chopped or macerated or similar materials).

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Notes:

- 1) The criteria are based on UN GHS, fourth revised edition (2011). For specific products (e.g. metals and inorganic metal compounds) guidance available in UN GHS, annexes 9 and 10 are essential for proper interpretation of the criteria and classification and should be followed.
- 2) Products that are classified for Carcinogenicity, Mutagenicity, Reproductive toxicity or Specific Target Organ Toxicity Repeated Exposure for oral and dermal hazards or without specification of the exposure route in the hazard statement.

3.3 Cargo residues that are harmful to the marine environment may require special handling not normally provided by reception facilities. Ports and terminals receiving such cargoes should have adequate reception facilities for all relevant residues, including when contained in washwater.

3.4 Solid bulk cargoes should be classified and declared by the shipper as to whether or not they are harmful to the marine environment. Such declaration should be included in the information required in section 4.2 of the IMSBC Code.

3.5 Ports, terminals and ship operators should consider cargo loading, unloading and onboard handling practices<sup>4</sup> in order to minimize production of cargo residues. Cargo residues are created through inefficiencies in loading, unloading, onboard handling. Options that should be considered to decrease the amount of such garbage include the following:

- .1 ensuring ships are suitable to carry the intended cargo and also suitable for unloading the same cargo using conventional unloading methods;
- .2 unloading cargo as efficiently as possible, utilizing all appropriate safety precautions to prevent injury or ship and equipment damage and to avoid or minimize cargo residues; and
- .3 minimizing spillage of the cargo during transfer operations by carefully controlling cargo transfer operations, both on board and from dockside. This should include effective measures to enable immediate communications between relevant ship and shore-based personnel during the transfer operations and when feasible, enclosure of conveyance devices such as conveyor belts. Since this spillage typically occurs in port, it should be completely cleaned up immediately following the loading and unloading event and handled as cargo; delivering it into the intended cargo space or into the appropriate unloading holding area.

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<sup>4</sup> Refer to the International Maritime Solid Bulk Cargoes (IMSBC) Code and supplement.

3.6 When the master, based on the information received from the relevant port authorities, determines that there are no adequate reception facilities<sup>5</sup> at either the port of departure or the port of destination in the case where both ports are situated within the same special area, the condition under regulation 6.1.2.3 should be considered satisfied.

3.7 MARPOL Annex V, regulation 6.1.2 also applies when the "port of departure" and the "next port of destination" is the same port. To discharge cargo hold washwater in this situation, the ship must be en route and the discharge must take place not less than 12 miles from the nearest land.

#### **4 TRAINING, EDUCATION AND INFORMATION**

(Not reproduced.)

#### **5 PORT RECEPTION FACILITIES FOR GARBAGE**

(Not reproduced.)

#### **6 ENHANCEMENT OF COMPLIANCE WITH MARPOL ANNEX V**

(Not reproduced.)"]

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<sup>5</sup> IMO Circular MEPC.1/Circ.469/Rev.1, Revised Consolidated Format for Reporting Alleged Inadequacy of Port Reception Facilities.