
GUIDANCE NOTES
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INTERNATIONAL SHIP CLASSIFICATION

# GUIDELINES FOR INSPECTION OF FITNESS FOR CARRIAGE OF SOLID BULK CARGOES BY SHIPS

2012

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# Chapter 1 General

## 1.1 Purpose

1.1.1 The Guidelines of Inspection of Fitness for Carriage of Solid Bulk Cargoes by Ships (hereinafter referred to as the Guidelines) provides the relevant requirements for issuance of the International Certificate of Fitness for the Carriage of Maritime Solid Bulk Cargoes (hereinafter called the IMSBC Certificate of Fitness for Carriage) and the reference for the designer, builder, inspection organization, cargo handling operator, etc. to implement the International Maritime Solid Bulk Cargoes Code (IMSBC Code).

1.1.2 The Guidelines is based on the provisions of SOLAS Reg. II-2/19, SOLAS Chapters VI and VII, as amended by resolution MSC.269(85), and further defines the specific requirements for issuance of IMSBC Certificate of Fitness for Carriage for cargo ships.

## 1.2 Application

1.2.1 The Guidelines applies to all of the ships applying for issuance of IMSBC Certificate of Fitness for Carriage.

1.2.2 The carriage of solid bulk cargoes and issuance of related certificates are also to comply with the relevant provisions of the flag State and the competent authority concerned.

1.2.3 The carriage of solid bulk cargoes not listed in Appendix I of the IMSBC Code is to comply with the relevant provisions of 1.3 in the IMSBC Code and the requirements of the competent authority associated with the cargoes intended to transport.

## 1.3 Definitions

1.3.1 *Solid bulk cargo* means any cargo, other than liquid or gas, consisting of a combination of particles, granules or any larger pieces of material, generally uniform in composition and is loaded directly into the cargo spaces of a ship without any intermediate form of containment.

1.3.2 *Dangerous goods in solid form in bulk* means any material, other than liquid or gas, consisting of a combination of particles, granules or any larger pieces of material, generally uniform in composition, which is covered by the IMDG Code and is loaded directly into the cargo spaces of a ship without any intermediate form of containment, and includes such materials carried by barge.

1.3.3 *IMSBC Code* means the International Maritime Solid Bulk Cargoes (IMSBC) Code adopted by the Maritime Safety Committee of the Organization by resolution MSC. 268(85), as may be amended by the Organization, and the amendments are adopted, brought into force and take effect in accordance with the provisions of article VIII of the SOLAS Convention concerning the amendment procedures.

1.3.4 *IMDG Code* means the International Maritime Dangerous Goods (IMDG) Code adopted by the Maritime Safety Committee of the Organization by resolution MSC.122(75), as amended by the Organization①.

① The valid version of International Maritime Dangerous Goods (IMDG) Code is 34-08 currently. The 35-10 version has been adopted by IMO and will be taken into effect on 1 January 2012 formally.

1.3.5 *Classification of dangerous goods* means according to the IMDG Code, the material and goods complying with the Code are to be categorized into Class 1 ~ Class 9 based on their existed hazards or main hazard profiles.

1.3.6 *Cargo space* means any space in a ship designated for carriage of cargoes.

1.3.7 *Cargoes which may liquefy* means cargoes which contain a certain proportion of fine particles and a certain amount of moisture. They may liquefy if shipped with a moisture content in excess of their transportable moisture limit.

1.3.8 *Flow moisture point* means the percentage moisture content (wet mass base) at which a flow state develops under the method of test prescribed by Appendix of the IMSBC Code in a representative sample of the material.

1.3.9 The grouping of cargoes in the IMSBC Code:

(1) *Group A* consists of cargoes which may liquefy if shipped at a moisture content in excess of their transportable moisture limit.

(2) *Group B* consists of cargoes which possess a chemical hazard, that means the cargoes have chemical properties such as flammability, explosive and toxicity which could give rise to a dangerous situation to the ship and personnel onboard.

(3) *Group C* consists of cargoes which neither liable to liquefy (Group A) nor to possess chemical hazards (Group B).

1.3.10 *Materials hazardous only in bulk (MHB)* means materials which may possess chemical hazardous when carried in bulk other than materials classified as dangerous goods in the IMDG Code.

1.3.11 *Moisture content* means that portion of a representative sample consisting of water, ice or other liquid expressed as a percentage of the total wet mass of that sample.

1.3.12 *Transportable moisture limit (TML) of a cargo which may liquefy* means the maximum moisture content of the cargo which is considered safe for carriage in ships not complying with the special provisions of 7.3.2 in the IMSBC Code. It is determined by the test procedures, approved by a competent authority, such as those specified in paragraph 1 of Appendix 2 of the IMSBC Code.

1.3.13 *Trimming* means any leveling of a cargo within a cargo space, either partial or total.

1.3.14 *Ventilation* means exchange of air from outside to inside a cargo space.

(1) *Continuous ventilation* means ventilation that is operating at all times.

(2) *Mechanical ventilation* means power-generated ventilation.

(3) *Natural ventilation* means ventilation that is not power-generated.

(4) *Surface ventilation* means ventilation of the space above the cargo.

1.3.15 *Bulk cargo shipping* name (BSCN) identifies a bulk cargo during transport by sea. The bulk cargo shipping name of the cargo is identified by capital letters in the individual schedules or in the index of the IMSBC Code. When the cargo is a dangerous good, as defined in the IMDG Code, as defined in Reg. VII/1.1 of the SOLAS Convention, the proper shipping name of that cargo is the bulk cargo shipping name.

1.3.16 *Adjacent to hot areas* means the boundary areas of the cargo hold in contact with the cargo, having a temperature consistently greater than 55? during carriage of the cargo, such as can sometimes be experienced when heated fuel oil service tanks and fuel oil setting tanks have a common boundary with the cargo hold.

Note that the heated fuel oil tanks adjacent to cargo space carrying these cargoes are not normally be considered as "hot areas" when the fuel oil temperature is controlled at less than 55?; this temperature is not exceeded for periods greater than 12 hours in any 24-hour period, and the maximum temperature of the fuel oil reached does not exceed 65?.

**1.4 Classes of dangerous goods in solid form which may be carried in bulk**

1.4.1 For the purpose of the Guidelines, dangerous goods in solid form in bulk is to be classified as follows:

(1) Class 4.1: Flammable solids
The materials in this class are readily combustible solids and solids which may cause fire through friction.

(2) Class 4.2: Substances liable to spontaneous combustion
The materials in this class are materials, other than pyrophoric materials, which, in contract with air without energy supply, are liable to self-heating.

(3) Class 4.3: Substances which, in contract with water, emit flammable gases
The materials in this class are solids which, by interaction with water, are liable to become spontaneously flammable or to give off flammable gases in dangerous quantities.

(4) Class 5.1: Oxidizing substances
The materials in this class are materials while in themselves not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material.

(5) Class 6.1: Toxic substances
The materials in this class are materials liable either to cause death or serious injury or to harm human health if swallowed or inhaled, or by skin contact.

(6) Class 7: Radioactive material
The materials in this class are any materials containing radionuclides where both the activity concentration and the total activity in the consignment exceed the values specified in 2.7.7.2.1 to 2.7.7.2.6 of the IMDG Code.

(7) Class 8: Corrosive substances
The materials in this class are materials which, by chemical action, will cause severe damage when in contact with living tissue or will materially damage, or even destroy, other goods or the means of transport.

(8) Class 9: Miscellaneous dangerous substances and articles
The materials in this class are materials and article which, during transport, present a danger not covered by other classes.

(9) Materials hazardous only in bulk (MHB)
These are materials which may possess chemical hazards when transported in bulk other than materials classified as dangerous goods in the IMDG Code.

**1.5 Relevant requirements and standards**

1.5.1 The Guidelines is mainly based on the following:

(1) Chapter VI Carriage of Cargoes and Chapter VII Carriage of Dangerous Goods in SOLAS, as amended by resolution MSC.269(85);

(2) SOLAS Reg. II-2/19 Carriage of Dangerous Goods;

(3) IMSBC Code;

(4) ISC Rules for Classification of Sea-going Steel Ships;

(5) IMDG Code;

(6) IMO MSC.1/Circ.1395: Lists of Solid Bulk Cargoes for Which a Fixed Gas Fire-extinguishing System may be Exempted or for Which a Fixed Gas Fire-extinguishing System is Ineffective;

(7) IMO MSC.1/Circ.1351: Interpretation Related to Hot Areas in the IMSBC Code;

(8) IACS UI SC79: Certified Safe Type Electrical Equipment for Ships Carrying Dangerous Goods;

(9) IACS UI SC89: Ventilation of Cargo Spaces (Interpretation to SOLAS Reg. II-2/19.3.4);

(10) IACS UI SC168: Hydrants for Dangerous Goods (Interpretation to SOLAS Reg. II-2/19.3.1.2);

(11) IACS UI SC197: Non-combustible Cargoes (Interpretation to SOLAS Reg. II-2/10.7.1.4);

(12) ISC Circ. No.37, Total No.37: Notice on Enhance Implementation of Chapter VI and VII of SOLAS Convention and IMSBC Code;

(13) ISC Notice BJCD (10) 1354LYZ: Interpretation to Change of Survey and Certification Requirements of IMSBC Code;

(14) ISC Notice BJCD (2010) 1476LB: Supplement to Issuance of Certificate of IMSBC Fitness for Carriage for General Dry Cargo Ships;

(15) ISC Notice BJCD (11) 0184LB: Notice on Definition of CBC (IMSBC) Certificate Annual Survey Operation;

(16) ISC Notice to Shipowners No.164: Enhanced Safety Measures for Carrying Cargoes Which May Liquefy.

# Chapter 2 Requirements for Carriage of Solid Bulk Cargoes

## 2.1 General requirements

2.1.1 For all ships engaged in the carriage of solid bulk cargoes, the operational provisions of stowage and segregation, loading and unloading, ventilation during carriage, clean-up of cargo holds, etc., are to be complied with, and necessary personnel protective equipment and related measuring equipment and instruments are to be provided with. The related operational requirements are to be effectively implemented through the ship's safety management system.

2.1.2 In order to ensure the ship's stability, regardless of the classes of the solid bulk cargoes intended to be carried, the stability information is to be available onboard the ship which is intended to carry such cargoes according to the requirements of SOLAS Reg.II-1/5-1. The stability information is to be approved by the flag State Administration and to include the check for loaded cargo conditions to ensure that its stability complies with the relevant requirements. The information of proper cargo distribution is to be provided in the loading manual or obtained by loading computers.

2.1.3 Adequate measures are to be taken to prevent liquids entering into the cargo space in which these solid bulk cargoes are stowed when the cargo is carried onboard the ship.

2.1.4 For fire-extinguishment in cargo spaces, individual fire-extinguishing system is to be provided according to the different natures of cargo intended to be carried. For solid bulk cargos for which a fixed fire-extinguishing system may be exempted, a fixed gas fire-extinguishing system in cargo hold may be applied for exemption in accordance with the requirement of SOLAS Reg. II-2/10.7.1.4.

2.1.5 For ventilation in cargo space, individual ventilation method is to be provided according to the relevant requirements of the cargo intended to be carried, such as mechanical ventilation, natural ventilation, continuous ventilation, etc. The height and opening position of ventilator of cargo space requiring continuous ventilation are to comply with the requirements of regulation 19, Annex I of the International Convention on Load Lines, 1966. Where a space adjacent to cargo spaces is not segregated from them by gastight bulkhead or deck, the requirement for ventilation is to be the same of the cargo spaces.

2.1.6 For segregation of cargo spaces, the cargo spaces are to be effectively segregated from the bulkheads of engine-room or sources of heat for the cargoes with the nature of flammable, liable to spontaneous combustion, susceptible to oxidation or possible to cause hazard reaction by heating according to the relevant requirements.

2.1.7 For selection of electrical equipment, all of the electrical equipment and cables used in the spaces where possibly contain dangerous gases onboard a ship which carries cargoes easily generate flammable and explosive gases or dusts are to comply with the requirements for those electrical equipment and cables used in hazardous zones.

2.1.8 For detection of dangerous gases, when transporting a bulk cargo which is liable to emit a toxic or flammable gas, or cause oxygen depletion in the cargo space, an appropriate instrument for measuring the concentration of gas or oxygen in the air is to be provided.

2.1.9 In order to ensure the safety for the personnel onboard the ships, protective clothing, self-contained breathing apparatus, eyewashes, etc. are to be provided and corresponding medical first aid guide is to be developed according to the hazards possibly caused by the carried cargoes.

2.1.10 The requirements for arrangement of particular cargoes and provision of equipment and system onboard the ships carrying solid bulk cargoes are referred to the Table in Chapter 4 of the Guidelines.

**2.2 Plans and documents**

2.2.1 The following plans and documents are to be supplemented for ships applying for the carriage of solid bulk cargoes:

(1) list of products;

(2) typical loading and discharging sequence booklet①.

2.2.2 The corresponding plans and documents are to be submitted for approval by ships applying for carriage of solid bulk cargoes based on the list of products intended to be carried according to the contents of plans and documents in Table 2.2.2.

① Ships other than bulk carriers or bulk carriers of less than 150 m in length are to be examined only at the request of shipowners.

**Comparison of products and plans & documents required for submission Table 2.2.2**

| No. | Plans and documents to be submitted | Product name | | Remarks |
|---|---|---|---|---|
| 1 | Fire Division, Arrangement of Insulation, Deck covering | UN 1395 | ALUMINIUM FERROSILICON POWDER | The bulkhead division between the cargo space and engine room is of Class A-60 standard, (where the horizontal distance from the above- mentioned bulkhead is at least 3 m for the cargo loading, interpretation is to be given in the plan approval comments) |
| | | UN 1398 | ALUMINIUM SILICON POWDER, UNCOATED | |
| | | UN 3170 | ALUMINIUM SMELTING BY-PRODUCTS OR ALUMINIUM REMELTING BY-PRODUCT | |
| | | UN 1942 | AMMONIUM NITRATE | |
| | | UN 2067 | AMMONIUM NITRATE BASED FERTILIZER | |
| | | UN 2071 | AMMONIUM NITRATE BASED FERTILIZER | |
| | | UN 1363 | COPRA (dry) | |
| | | UN 1408 | FERROSILICON with 30% or more but less than 90% silicon (including briquettes) | |
| | | UN 2793 | FERROUS METAL BORINGS, SHAVINGS, TURNINGS or CUTTINGS | |
| | | UN 1376 | IRON OXIDE, SPENT or IRON SPONGE, SPENT | |
| | | UN 2217 | SEED CAKE | |
| | | UN 1386 | SEED CAKE, containing vegetable oil (a) | |
| | | UN 1386 | SEED CAKE, containing vegetable oil (b) | |
| | | UN 1350 | SULPHUR(crushed lump and coarse grained) | |
| | | UN 1435 | ZINC ASHES | |

| No. | Plans and documents to be submitted | Product name | | Remarks |
|---|---|---|---|---|
| 2 | Division of hazardous zones, Arrangement of electrical equipment in hazardous zones | UN 1395 | ALUMINIUM FERROSILICON POWDER* | Safety type of electrical equipment and cables is to meet the requirements of those used in hazardous zones, where alternative method is used to disconnect with the all electrical equipment and cables completely during the carriage, an explanation is to be given in the plan approval comments. Noting that for products requiring mechanical ventilation or continuous ventilation, it is not allowed to switch-off the electrical power in cargo spaces to ensure the safety of cargoes onboard the ship. Moreover for ships required for providing an alarm for water ingress into hold, the alarm is to be capable of normal working.<br>* Required for mechanical ventilation or continuous ventilation. For cargoes requiring continuous ventilation, see Table 2.8.3 of the Guidelines |
| | | UN 1398 | ALUMINIUM SILICON POWDER, UNCOATED* | |
| | | UN 3170 | ALUMINIUM SMELTING BY-PRODUCTS OR ALUMINIUM REMELTING BY-PRODUCT* | |
| | | UN 1942 | AMMONIUM NITRATE | |
| | | UN 2067 | AMMONIUM NITRATE BASED FERTILIZER | |
| | | UN 2071 | AMMONIUM NITRATE BASED FERTILIZER | |
| | | - | AMMONIUM NITRATE BASED FERTILIZER (nonhazardous) | |
| | | MHB | BROWN COAL BRIQUETTES | |
| | | MHB | COAL | |
| | | MHB | DIRECT REDUCED IRON (A) Briquettes, hot-moulded | |
| | | MHB | DIRECT REDUCED IRON (B) Lumps, pellets. Cold-moulded briquettes | |
| | | MHB | DIRECT REDUCED IRON (C) (By product fines) | |
| | | MHB | FERROPHOSPHORUS (including briquettes) * | |
| | | MHB | FERROSILICON 25% to 30% silicon, or 90% or more with silicon (including briquettes) * | |
| | | UN 1408 | FERROSILICON with 30% or more but less than 90% silicon (including briquettes) * | |
| | | UN 1376 | IRON OXIDE, SPENT or IRON SPONGE, SPENT | |
| | | UN 2217 | SEED CAKE* | |
| | | UN 1386 | SEED CAKE, containing vegetable oil (b) * | |
| | | MHB | SILICOMANGANESE (low carbon)(with known hazard profile or known to evolve gases) (with silicon content of 25% or more) * | |
| | | UN 1350 | SULPHUR(lump and coarse grained) | |
| | | UN 1435 | ZINC ASHES* | |

| No. | Plans and documents to be submitted | Product name | | Remarks |
|---|---|---|---|---|
| 3 | Arrangement of bilge piping | MHB | FERROSILICON 25% to 30% silicon, or 90% or more with silicon (including briquettes) | The bilge system has been designed to segregate from machinery space completely; (where the suction valve of bilge system of cargo hold located in machinery space which is connected with bilge piping in machinery space is locked shut during the carriage of cargo, and a warning notice is placed near the valve, interpretation is to be given in the plan approval comments) |
| | | UN 1408 | FERROSILICON with 30% or more but less than 90% silicon (including briquettes) | |
| 4 | Arrangement of ventilation and calculation of ventilation | UN 1395 | ALUMINIUM FERROSILICON POWDER | Mechanical ventilation is compulsorily carried out to meet the requirement of six air changes per hour |
| | | UN 1398 | ALUMINIUM SILICON POWDER, UNCOATED | |
| | | UN 3170 | ALUMINIUM SMELTING BY-PRODUCTS OR ALUMINIUM REMELTING BY-PRODUCT | |
| | | MHB | FERROSILICON 25% to 30% silicon, or 90% or more with silicon (including briquettes) | |
| | | UN 1408 | FERROSILICON with 30% or more but less than 90% silicon (including briquettes) | |
| | | UN 1386 | SEED CAKE, containing vegetable oil (b) | |
| | | UN 2217 | SEED CAKE | |
| | | UN 1435 | ZINC ASHES | |
| 5 | Arrangement of ventilation | MHB | FERROSILICON 25% to 30% silicon, or 90% or more with silicon (including briquettes) | Ventilation of cargo spaces is required to separate from that of other holds, accommodation spaces or working zones |
| | | UN 1408 | FERROSILICON with 30% or more but less than 90% silicon (including briquettes) | |

| No. | Plans and documents to be submitted | Product name | | Remarks |
|---|---|---|---|---|
| 6 | Fire water system, Pressure water-spraying system | UN 1438 | ALUMINIUM NITRATE | The pressure of fire mains is maintained by starting a fire pump remotely or by permanent pressurization. For cargoes for which a fixed $CO_2$ fire-extinguishing system is ineffective, the equivalent arrangement satisfying SOLAS Reg. II-2/19.3.1.2 may be adopted |
| | | UN 1942 | AMMONIUM NITRATE | |
| | | UN 2067 | AMMONIUM NITRATE BASED FERTILIZER | |
| | | UN 2071 | AMMONIUM NITRATE BASED FERTILIZER | |
| | | UN 1446 | BARIUM NITRATE | |
| | | UN 1454 | CALCIUM NITRATE | |
| | | UN 2969 | CASTOR BEANS or CASTOR MEAL or CASTOR POMACE or CASTOR FLAKE | |
| | | UN 1363 | COPRA (dry) | |
| | | UN 2793 | FERROUS METAL BORINGS, SHAVINGS, TURNINGS or CUTTINGS | |
| | | UN 2216 | FISHMEAL (FISHSCRAP), STABILIZED | |
| | | UN 1376 | IRON OXIDE, SPENT or IRON SPONGE, SPENT | |
| | | UN 1469 | LEAD NITRATE | |
| | | UN 1474 | MAGNESIUM NITRATE | |
| | | UN 1486 | POTASSIUM NITRATE | |
| | | UN 2217 | SEED CAKE | |
| | | UN 1386 | SEED CAKE, containing vegetable oil (a) | |
| | | UN 1386 | SEED CAKE, containing vegetable oil (b) | |
| | | UN 1498 | SODIUM NITRATE | |
| | | UN 1499 | SODIUM NITRATE AND POTASSIUM NITRATE MIXTURE | |
| | | UN 1350 | SULPHUR (crushed lump and coarse grained) | |

Note: When the table and the subsequent tables involve the name of products, their English name is to prevail.

2.2.3 The bulk cargo shipping name of the goods is to be used in the list of products in 2.2.1(1), trade names alone are not to be used.

2.2.4 The typical loading and discharging sequence booklet in 2.2.1(2) is to be written in a language with which the ship's officers responsible for cargo operations are familiar. If this language is not English, the ship is to be provided with a booklet written also in the English language.

The booklet is to, as a minimum, include:

(1) stability data, required by SOLAS Reg. II-1/5-1;

(2) ballasting and deballsting rates and capacities;

(3) maximum allowable load per unit surface area of the tank top plating;

(4) maximum allowable load per hold;

(5) general cargo handling instructions with regard to the strength of the ship's structure including any limitations on the most adverse operating conditions during loading, unloading, ballasting operations and the voyage;

(6) any special restrictions such as limitations on the most adverse operating conditions imposed by the Administration or organization recognized by it, if applicable; and

(7) where strength calculations are required, maximum permissible forces and moments on the ship's hull during loading, unloading and the voyage.

**2.3 Carriage of cargoes which may liquefy (Group A)**

2.3.1 Hazard and list of cargoes which may liquefy

The cargoes which may liquefy refer to Group A cargoes in the IMSBC Code, which there are 11 cargoes. Where the moisture content of such cargoes during carriage exceeds the TML, it is possible to liquefy. Such cargoes may appear to be in relatively dry granular state when loaded, and the contained moisture may ooze to become fluid under the stimulus of compaction and the vibration and rolling which occurs during a voyage. The flow of cargo during voyage will endanger to the ship's stability, consequently the ship may progressively reach a dangerous heel and capsize quite suddenly (for the mechanism of hazard generation, refer to 7.2 of Section 7 in the IMSBC Code).

The list of cargoes which may liquefy (Group A) in the IMSBC Code is referred to Table 2.3.1.

**List of cargoes which may liquefy (Group A) in the IMSBC Code Table 2.3.1**

| Group | Name of Cargo in the IMSBC Code |
|---|---|
| Group A: cargoes which may liquefy | COAL B (and A) |
| | COAL SLURRY |
| | COKE BREEZE |
| | FISH |
| | FLUORSPAR（A and B） |
| | ILMENITE CLAY |
| | ILMENITE SAND（A and C） |
| | METAL SULPHIDE CONCENTRATES（A and B）① |
| | Mineral Concentrates② |
| | PEAT MOSS（A and B） |
| | PYRITES, CALCINED (Calcined Pyrites) (A and B) |

Notes: ① The most common metal sulphide concentrates are: zinc concentrate, lead concentrate, copper concentrate, etc.

② The most common mineral concentrates are: copper concentrate, lead silver concentrate, silver lead concentrate, iron concentrate, manganese concentrate, nickel concentrate, zinc concentrate, lead concentrate, etc. however, these schedules in IMSBC Code are not exhaustive.

2.3.2 The moisture content of cargoes which may liquefy intended to be carried is not to exceed TML. For the recommendation for carriage of cargoes which may liquefy, refer to Appendix 1 of the Guidelines.

2.3.3 The special requirements for carriage of the products in Group A are referred to in the Table of Chapter 4 of the Guidelines.

## 2.4 Carriage of materials possessing chemical hazards (Group B)

2.4.1 Hazard and list of cargoes which possess chemical hazards

Group B cargoes have chemical properties such as flammability, explosive and toxicity, which could give rise to a potential risk to the ship and personnel onboard.

The dangerous goods in solid form in bulk in the Guidelines are categorized according to the class principles and standards in the IMSBC Code. For the list of cargoes possessing chemical hazards in IMSBC Code, refer to Table 2.4.1.

**List of cargoes possessing chemical hazards in the IMSBC Code Table 2.4.1**

| Class | Name of Cargo in the IMSBC Code | |
|---|---|---|
| Class 4.1: Flammable solids | UN 1350 | SULPHUR (lump and coarse grained) |
| Class 4.2: Substances liable to spontaneous combustion | UN 1363 | COPRA (dry) |
| | UN 2793 | FERROUS METAL BORINGS, SHAVINGS, TURNINGS or CUTTINGS |
| | UN 1376 | IRON OXIDE, SPENT or IRON SPONGE, SPENT |
| | UN 1386 | SEED CAKE, containing vegetable oil (a) |
| | UN 1386 | SEED CAKE, containing vegetable oil (b) |
| | UN 2217 | SEED CAKE |
| Class 4.3: Substances which, in contact with water, emit flammable gases | UN 1395 | ALUMINIUM FERROSILICON POWDER |
| | UN 1398 | ALUMINIUM SILICON POWDER, UNCOATED |
| | UN 3170 | ALUMINIUM SMELTING BY-PRODUCTS OR ALUMINIUM REMELTING BY-PRODUCT |
| | UN 1408 | FERROSILICON with 30% or more but less than 90% silicon (including briquettes) |
| | UN 1435 | ZINC ASHES |
| Class 5.1: Oxidizing substances | UN 1438 | ALUMINIUM NITRATE |
| | UN 1942 | AMMONIUM NITRATE |
| | UN 2067 | AMMONIUM NITRATE BASED FERTILIZER |
| | UN 1446 | BARIUM NITRATE |
| | UN 1454 | CALCIUM NITRATE |
| | UN 1469 | LEAD NITRATE |
| | UN 1474 | MAGNESIUM NITRATE |
| | UN 1486 | POTASSIUM NITRATE |
| | UN 1498 | SODIUM NITRATE |
| | UN 1499 | SODIUM NITRATE AND POTASSIUM NITRATE MIXTURE |
| Class 6.1: Toxic substances and infectious materials | – | – |
| Class 7: Radioactive material | UN 2912 | RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-1), non-fissile or fissile-excepted |
| | UN 2913 | RADIOACTIVE MATERIAL SURFACE CONTAMINATED OBJECTS (SCO-1), non-fissile or fissile-excepted |
| Class 8: Corrosive substances | – | – |
| Class 9: Miscellaneous dangerous substances and articles | UN 2071 | AMMONIUM NITRATE BASED FERTILIZER |
| | UN 2969 | CASTOR BEANS or CASTOR MEAL or CASTOR POMACE or CASTOR FLAKE |
| | UN 2216 | FISHMEAL (FISHSCRAP), STABILIZED |

2.4.2 Ships carrying the dangerous goods in solid form in bulk are to comply with the relevant requirements of SOLAS Reg.II-2/19.

2.4.3 Ships intended to carry different classes of dangerous goods in solid form in bulk are to comply with the applicable requirements of SOLAS Reg.II-2/19, as given in Table 2.4.3.

**Application of the requirements to different classes of dangerous goods for ships and cargo spaces carrying solid dangerous goods in bulk Table 2.4.3**

| Class | 4.1 | 4.2 | 4.3[1] | 5.1 | 6.1 | 8 | 9 |
|---|---|---|---|---|---|---|---|
| SOLAS Reg. II-2/19 | | | | | | | |
| 3.1.1 | × | × | – | × | – | – | × |
| 3.1.2 | × | × | – | × | – | – | × |
| 3.2 | × | ×[2] | × | ×[3] | – | – | ×[3] |
| 3.4.1 | – | ×[2] | × | – | – | – | – |
| 3.4.2 | ×[4] | ×[2] | × | ×[2,4] | – | – | ×[2,4] |
| 3.4.3 | × | × | × | × | × | × | × |
| 3.6 | × | × | × | × | × | × | × |
| 3.8 | × | × | × | ×[2] | – | – | ×[5] |

Notes:
×: Applicable
–: Not applicable
1 The hazards of substances in this class which may be carried in bulk are such that special consideration is to be given by the Administration to the construction and equipment of the ship involved in addition to meeting the requirements enumerated in this Table.
2 Only applicable to seed cake containing solvent extractions, to ammonium nitrate and to ammonium nitrate fertilizers.
3 Only applicable to ammonium nitrate and to ammonium nitrate fertilizers. However, a degree of protection in accordance with standards contained in the International Electrotechnical Commission publication 60079, Electrical Apparatus for Explosive Gas Atmospheres, is sufficient.
4 Only suitable wire mesh guards are required.
5 The requirements of the IMSBC Code, are sufficient.

2.4.4 The requirements related to SOLAS Reg. II-2/19 in Table 2.4.3 are shown in Table 2.4.4.

**Requirements related to SOLAS II-2/19 Table 2.4.4**

| **SOLAS Chapter II-2** | **Relevant requirements** |
|---|---|
| **Reg. 19** | **Carriage of dangerous goods** |
| 3.1 | Water supplies |
| 3.1.1 | Arrangements are to be made to ensure immediate availability of a supply of water from the fire main at the required pressure either by permanent pressurization or by suitably placed remote arrangements for the fire pumps. |
| 3.1.2 | The quantity of water delivered is to be capable of supplying four nozzles of a size and at pressures as specified in Reg. II-2/10.2, capable of being trained on any part of the cargo space when empty. This amount of water may be applied by equivalent means to the satisfaction of the Administration. * |
| 3.2 | Sources of ignition<br>Electrical equipment and wiring are not to be fitted in enclosed cargo spaces or vehicle spaces unless it is essential for operational purposes in the opinion of the Administration. However, if electrical equipment is fitted in such spaces, it is to be of a certified safe type ** for use in the dangerous environments to which it may be exposed unless it is possible to completely isolate the electrical system (e.g. by removal of links in the system, other than fuses). Cable penetrations of the decks and bulkheads are to be sealed against the passage of gas or vapour. Through runs of cables and cables within the cargo spaces are to be protected against damage from impact. Any other equipment which may constitute a source of ignition of flammable vapour are not to be permitted. |

| SOLAS Chapter II-2 | Relevant requirements |
|---|---|
| 3.4 | Ventilation |
| 3.4.1 | Adequate power ventilation is to be provided in enclosed cargo spaces. The arrangement is to be such as to provide for at least six air changes per hour in the cargo space, based on an empty cargo space, and for removal of vapours from the upper or lower parts of the cargo space, as appropriate. |
| 3.4.2 | The fans are to be such as to avoid the possibility of ignition of flammable gas/air mixtures. Suitable wire mesh guards are to be fitted over inlet and outlet ventilation openings. |
| 3.4.3 | Natural ventilation is to be provided in enclosed cargo spaces intended for the carriage of solid dangerous in bulk, where there is no provision for mechanical ventilation. |
| 3.6 | Personnel protection |
| 3.6.1 | Four sets of full protective clothing, resistant to chemical attack, are to be provided in addition to the fire-fighter's outfits required by Reg.II-2/10.10, and to be selected according to the cargo classes and physical states, taking into account of the hazards of the chemicals intended to be carried and the standards developed by IMO***. The protective clothing is to cover all skin, so that no part of the body is unprotected. |
| 3.6.2 | At least two self-contained breathing apparatus additional to those required by Reg.II-2/10 are to be provided. Two spare charges suitable for use with the breathing apparatus are to be provided for each required apparatus. Passenger ships carrying not more than 36 passengers and cargo ships that are equipped with suitably located means for fully recharging the air cylinders free from contamination need carry only one spare charge for each required apparatus. |
| 3.8 | Insulation of machinery space boundaries<br>Bulkheads forming boundaries between cargo spaces and machinery spaces of category A are to be insulated to "A-60" class standard, unless the dangerous goods are stowed at least 3 m horizontally away from such bulkheads. Other boundaries between such spaces are to be insulated to "A-60" class standard. |
| Notes:<br>* The number and position of hydrants are to be such that at least two of the required four jets of waters, when supplied by single lengths of hose, may reach any part of the cargo space when empty (UI SC168, *MSC/Circ.1120*).<br>** Refer to the recommendations of the International Electrotechnical Commission, in particular publication IEC 600092, Electrical Installations in Ships.<br>*** For the solid bulk cargoes, the protective clothing is to meet the provisions of equipment in schedules for individual cargoes in the IMSBC Code. For goods in packaged form, the protective clothing is to meet the provisions of equipment in EmS for various substances in supplement to the IMDG Code. | |

2.4.5 The ships carrying dangerous goods in solid form in bulk, division of hazardous zones and the installation of electrical equipment are to comply with the requirements of Section 18, Chapter 2, PART FOUR of ISC Rules for Classification of Sea-going Steel Ships and IACS UI SC79.

2.4.6 Interpretation to classes of solid dangerous goods

(1) Class 6: Toxic substances or infectious materials

The toxic cargoes are those liable either to cause death or serious injury or to harm human health if swallowed or inhaled, or by skin contact. The infectious material cargoes are those having infectious pathogenic organism.

Currently, there is no Class 6 cargoes allowed to be carried in bulk in the IMSBC Code.

(2) Class 7: Radioactive material

The radioactive material cargoes are those containing radiomuclides where both the activity concentration and the total activity in the consignment exceed the values specified in 2.7.7.2.1 to 2.7.7.2.6 of the IMDG Code.

Although there are two cargoes are allowed to be carried in bulk in Class 7 of IMSBC Code, the carriage of such cargoes is to be specially approved by the Administration (including the Safety Administration, the local authorities in loading port and discharging port).

(3) Class 8: Corrosive substances
Corrosive cargoes are those which, by chemical action, will cause severe damage when in contact with living tissue or will materially damage, or even destroy, other goods or the means of transport. Currently, there is no Class 8 cargoes allowed to be carried in bulk in the IMSBC Code.

2.4.7 Special requirements for carriage of different cargoes
For the special requirements for different cargoes in this group, refer to the Table in Chapter 4 of the Guidelines.

## 2.5 Carriage of materials hazardous only in bulk (MHB)

2.5.1 The MHB cargoes are those which may possess chemical hazards when transported in bulk other than materials classified as dangerous goods in the IMDG Code. There are 24 MHB cargoes allowed to be carried in bulk in the IMSBC Code, refer to Table 2.5.1 for details.

**MHB cargoes allowed to be carried in bulk in the IMSBC Code Table 2.5.1**

| Group | Name of Cargo |
|---|---|
| Group B (MHB cargoes） | BROWN COAL BRIQUETTES |
| | CHARCOAL |
| | COAL |
| | DIRECT REDUCED IRON (A) |
| | DIRECT REDUCED IRON (B) |
| | DIRECT REDUCED IRON (C) |
| | FERROPHOSPHORUS (including briquettes) |
| | FERROSILICON 25% to 30% silicon, or 90% or more with silicon (including briquettes) |
| | FLUORSPAR |
| | LIME (UNSLAKED) |
| | LINTED COTTON SEED |
| | MAGNESIA (UNSLAKED) |
| | METAL SULPHIDE CONCENTRATES |
| | PEAT MOSS |
| | PETROLEUM COKE (calcined or uncalcined) |
| | PITCH PRILL |
| | PYRITES, CALCINED (Calcined Pyrites) |
| | SAWDUST |
| | SILICOMANGANESE (low carbon) (with known hazard profile or known to evolve gases) (with silicon content of 25% or more) |
| | TANKAGE |
| | VANADIUM ORE |
| | WOOD PELLETS |
| | WOOD PULP PELLETS |
| | WOODCHIPS |

2.5.2 Due to the difference between MHB cargo hazards and health hazards, there is no safety requirements of the integrity for such cargoes, the special requirements of different cargoes in Class MHB are referred to the Table in Chapter 4 of the Guidelines.

## 2.6 Carriage of cargos of Group C

2.6.1 Group C cargoes are neither liable to liquefy (Group A) nor to posses chemical hazards (Group B). The list of Group C cargoes with the special survey requirements in the IMSBC Code refer to Table 2.6.1.

**List of Group C cargoes with special requirements in the IMSBC Code Table 2.6.1**

| Group | Name of Cargo in the IMSBC Code |
|---|---|
| Group C: cargoes other than Group A and Group B | AMMONIUM NITRATE BASED FERTILIZER (non-hazardous) |
| | CHOPPED RUBBER AND PLASTIC INSULATION |
| | COARSE CHOPPED TYRES |
| | GRANULATE TYRE RUBBER |
| | SAND |
| | PEANUTS (IN SHELL) |

2.6.2 The special requirements for carriage of different Group C cargoes are shown in the Table in Chapter 4 of the Guidelines.

## 2.7 Personnel protective equipment

2.7.1 Poisoning, corrosive and asphyxiation hazards

Some solid bulk cargoes are susceptible to oxidation, which may result in oxygen depletion, emission of toxic gases or fumes and self-heating. Some cargoes are not liable to oxidize but may emit toxic fumes, particularly when wet. There are also cargoes which, when wetted, are corrosive to skin, eyes and mucous membranes or to the ship's structure. When these cargoes are carried, appropriate protective means are to be taken or personnel protective equipment is to be provided.

2.7.2 Oxygen depletion

Many solid bulk cargoes, such as forest products, ferrous metals, metal sulphide concentrates and coal cargoes are liable to cause oxygen depletion in a cargo space. When carrying a solid bulk cargo that is liable to emit a toxic or flammable gas, and/or cause oxygen depletion in the cargo space, the appropriate instrument for measuring the concentration of gas and oxygen in the cargo space. The concentration of gas or oxygen is to be measured for several times before the personnel enter into such cargo spaces to ensure the safety of personnel.

2.7.3 Health hazards due to dust

To minimize the chronic and acute risks associated with exposure to the dust of some solid bulk cargoes, a high standard personnel protective equipment, including breathing apparatus, protective clothing, protective skin creams, adequate personal washing and laundering of outer clothing, is to be provided for those exposed to the dust.

## 2.8 Special requirements for cargoes

2.8.1 Cargoes for which a fixed gas fire-extinguishing system may be exempted

(1) As required by SOLAS Reg. II-2/10.7.1.4, cargo ships carrying ore, coal, grain, unseasoned timber, non-combustible cargo or possessing a low fire-risk considered may be exempted the fixed gas-extinguishing system by the Administration.

In addition to the exemption provisions of some cargoes specified in the IMSBC Code, there are particular list of the cargoes and applicable requirements of the cargoes for which a fixed $CO_2$ fire-extinguishing system may be exempted in Table 1 of Annex of IMO MSC.Circ.1395, for details, refer to Appendix 2 of the Guidelines. The provision requirements of fixed gas fire-extinguishing system for cargoes are listed in column "w" of the Table in Chapter 4 of the Guidelines.

(2) For ships carrying such cargoes, the exemption of fixed gas fire-extinguishing system is to comply with the requirements of SOLAS Reg. II-2/10.7.1.4.

2.8.2 Cargoes for which a fixed $CO_2$ fire-extinguishing system are ineffective

(1) Due to some cargoes listed in the IMSBC Code, for which a $CO_2$ fire-extinguishing system is ineffective, $CO_2$ fire-extinguishing system are not applicable. The cargo spaces intended to carry such cargoes are to be provided with the fixed fire-extinguishing system giving equivalent protection to the $CO_2$ fire-extinguishing system.

(2) The fire-extinguishing system complying with the requirements of SOLAS Reg. II-2/19.3.1.2 may be regarded as an equivalent fixed fire-extinguishing system to the requirement in (1).

(3) There is a particular list of cargoes for which a fixed $CO_2$ fire-extinguishing system is ineffective in Table 2 of Annex of IMO MSC.Circ.1395, for details, refer to Appendix 2 of the Guidelines. In addition to, the provision requirements of fixed gas fire-extinguishing system for cargoes are listed in column "w" of the Table in Chapter 4 of the Guidelines.

2.8.3 Cargoes requiring continuous ventilation in cargo spaces

Where the cargoes require continuous ventilation during the transportation, the minimum height of vent openings are to comply with the requirements of regulation 19.3 of LL Convention for openings not being fitted with closing arrangements (Position 1 is for 4.5 m, Position 2 is for 2.3 m). However, it does not exempt the requirements of SOLAS Reg. II-2/5.2.1.1 for inlets and outlets of ventilation system fitted with means of closure.

The cargoes requiring continuous ventilation in the IMSBC Code are referred to Table 2.8.3.

**Cargoes requiring continuous ventilation in the IMSBC Code Table 2.8.3**

| No. | Name of cargo in the IMSBC Code | |
|---|---|---|
| 1 | UN 1395 | ALUMINIUM FERROSILICON POWDER |
| 2 | UN 1398 | ALUMINIUM SILICON POWDER, UNCOATED |
| 3 | UN 3170 | ALUMINIUM SMELTING BY-PRODUCTS or ALUMINIUM REMELTING BYPRODUCTS |
| 4 | MHB | FERROPHOSPHORUS (including BRIQUETTES)① |
| 5 | MHB | FERROSILICON (25% ≤ Silicon＜30% or ≥ 90% Silicon) |
| 6 | UN 1408 | FERROSILICON UN 1408 (30% ≤ Silicon ＜ 90%) |
| 7 | UN 1435 | ZINC ASHES |

Note: ① Currently, it is required by the IMSBC Code that "the fans are to be normally run continuously whenever the cargo is onboard." Continuous ventilation requirements will be implemented after 1 January 2012.

2.8.4 Cargoes requiring to fit two fans as a minimum in each cargo space

For the requirement of mechanical ventilation by at least two fans in each cargo space, two fans connected to a common ventilation system may be accepted.

The cargoes requiring mechanical ventilation by at least two fans in each cargo space in the IMSBC Code are referred to Table 2.8.4.

**Cargoes requiring to fit two fans as a minimum in each cargo space Table 2.8.4**

| No. | Name of cargo in the IMSBC Code | |
|---|---|---|
| 1 | UN 1398 | ALUMINIUM SILICON POWDER, UNCOATED |
| 2 | UN 1408 | FERROSILICON with 30% or more but less than 90% silicon (including briquettes) |
| 3 | MHB | FERROSILICON 25% to 30% silicon, or 90% or more with silicon (including briquettes) |

2.8.5 Gas measuring for ships carrying brown coal briquette or coal

(1) An instrument which is capable of measuring methane, oxygen and carbon monoxide concentration is to be provided onboard a ship carrying brown coal briquette or coal. The instrument is to be fitted with an aspirator, flexible connection and a length of spark-proof metal tubing to enable a representative sample to be obtained from within the square of the hatch.

(2) When recommended by the manufacturer, a suitable filter is to be used to protect the instrument against the ingress of moisture. The presence of even a small amount of water will compromise the accuracy of the measurement.

(3) In order to obtain meaningful information about the behaviour of this cargo in a cargo space, gas measurement is to be made via one sample point per cargo space. To ensure flexibility of measurement in adverse weather, however, two sample points are to be provided per cargo space, one on the port side and one on the starboard side of the hatch cover or hatch coaming. Measurement from either of these locations is satisfactory. The diagram of gas sampling point is referred to Fig. 2.8.5.

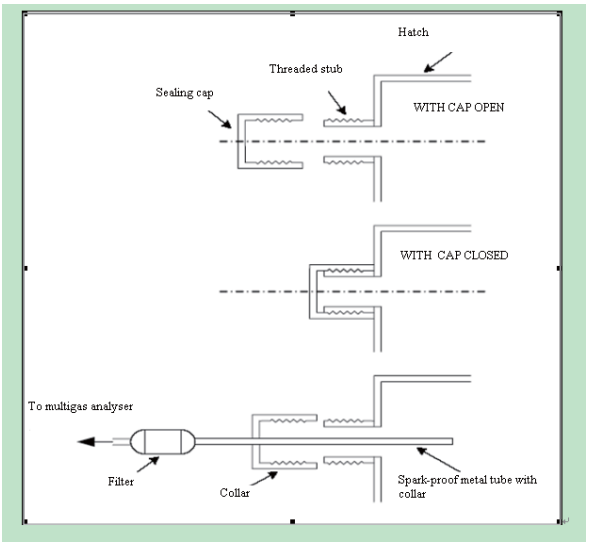


**Figure 2.8.5 Diagram of gas sampling point**

(4) Each sample point is to comprise a hole of diameter approximately 12 mm positioned as close to the top of the hatch coaming as possible. It is to be sealed with a sealing cap to prevent ingress of water and air. It is essential this cap be securely replaced after each measurement to maintain a tight seal.

**2.9 Requirements for carriage of solid bulk cargoes by general dry cargo ships**

2.9.1 If the side structure inside the cargo holds of a single-hull general dry cargo ship is of the longitudinal framed structure, generally, such ship is not under the condition to be issued the IMSBC Certificate of Fitness for Carriage as the strength of horizontal girders bearing the bulk cargoes in holds cannot be checked. Where the loading conditions of bulk cargoes have been included in the approved loading manual and stability information for ships with such structure type, an application is to be made to ISC Headquarters by the on-site survey unit.

2.9.2 To issue the IMSBC Certificate of Fitness for Carriage for a general dry cargo ship, the bulk cargoes intended to be carried onboard are first to meet the ship's strength and stability requirements. Where the harmonious loading conditions are not included in the approved loading manual and stability information, then the ship is not under the condition to be issued the IMSBC Certificate of Fitness for Carriage.

2.9.3 For those not satisfying the requirements of 2.9.2 above, if the shipowner supplements the working conditions for bulk cargoes, the appropriate loading manual and stability data are to be submitted to the Plan Approval Centre for approval. For ships in-service, the other plans related to loading conditions involved the special requirements of IMSBC Code may be checked on site.

2.9.4 Note that the requirement of "Loading, Unloading and Stowage of Bulk Cargoes" in SOLAS Reg.VI/7 is also applicable to general dry cargo ships intended to carry solid bulk cargoes. For general dry cargo ships, it is to be confirmed that a typical loading and discharging sequence booklet has been provided with as required by SOLAS Reg.VI/7.2 before the IMSBC Certificate of Fitness for Carriage is issued. Where the ship is fitted with tween' deck and its hatch covers, any restrictions on the load of harmonious loading or the loading requirements on the tween' deck and its hatch covers are to be specified in the loading manual or typical loading and discharging sequence booklet, otherwise, the solid bulk cargoes are only permitted to be loaded in the bottom holds, and the restrictions are to be indicated in the IMSBC Certificate of Fitness for Carriage.

# Chapter 3 Survey and Certificate

## 3.1 General requirements

3.1.1 The survey for issuance of IMSBC Certificate of Fitness for Carriage is to inspect whether the ship is applicable to carry solid bulk cargoes, which is not related to the date of ship's construction.

3.1.2 The survey items and plans intended to be examined are to be determined according to the particular cargoes.

## 3.2 Types and periods of surveys

3.2.1 Surveys are to be carried out for ships carrying solid bulk cargoes as the following types:

(1) Initial survey: means the survey carried out before the IMSBC Certificate of Fitness for Carriage is issued for the first time, which is to include a complete inspection of ship's documentation, arrangements, equipment, etc. The survey is to be such as to ensure that the relevant requirements of IMSBC Code and its latest amendments are complied with.

(2) Annual survey: the interval of annual survey is to be in accord with that of Cargo Ship Safety Construction Certificate. The annual survey of IMSBC Certificate of Fitness for Carriage is generally to be carried out in conjunction with that of Cargo Ship Safety Construction Certificate. The annual survey is to include the inspection of documentation, installations, equipment, etc. for solid bulk cargoes to confirm that no changes have been made in the ship's arrangements or conditions to affect the validity of certificates, and to ensure that the relevant requirements of IMSBC Code including its latest amendments are complied with and fit for the cargoes for which the ship is intended to carry.

(3) Renewal survey: the interval of renewal survey is to be in accord with that of Cargo Ship Safety Construction Certificate, i.e. not exceeding five years. The renewal survey is generally to be carried out in conjunction with that of Cargo Ship Safety Construction Certificate. The renewal survey is to include the inspection of documentation, installations, equipment, etc. for solid bulk cargoes to confirm that no changes have been made in the ship's arrangements or conditions to affect the validity of certificates, and to ensure that the relevant requirements of IMSBC Code including its latest amendments are complied with and fit for the cargoes for which the ship is intended to carry.

3.2.2 Additional survey is to be applied for in one of the following cases:

(1) to increase/decrease or amend the products intended to be carried upon the application by shipowner;

(2) to renew the IMSBC Certificate of Fitness for Carriage accordingly due to the change of shipowner, ship's name or flag;

(3) the fitness for carriage has altered due to ship's damage, accident or failure of equipment;

(4) to avoid the effect on the validity of certificate due to increase or upgrade of products (e.g. from MHB to dangerous goods) caused by the effectiveness of amendments.

### 3.3 Issuance of certificates

3.3.1 IMSBC Certificate of Fitness for Carriage will be issued or renewed by ISC to the ship which has been carried out the initial survey or renewal survey and is in compliance with the applicable requirements of the Guidelines. The term of validity of the certificate is not to exceed five years, and the renewal survey is to be completed before the expiry date of certificate.

### 3.4 Invalidation of certificates

3.4.1 The IMSBC Certificate of Fitness for Carriage will be invalid automatically in one of the following cases:

(1) solid bulk cargoes are not carried under the restrictions of the certificate;

(2) survey is not carried out according to the specified period within the validity of certificate;

(3) survey is not applied for after occurrence of accident affecting the ship's safety;

(4) ship's structure, machinery equipment, including electrical installations and safety devices which have been changed or altered are not inspected and approved.

### 3.5 Initial survey

3.5.1 Check of structural plans and equipment data for some products

(1) Where the boundaries in cargo spaces are required to meet the requirements of structural or fire integrity, the approved structural plans and Fire Division are to be checked to confirm that their design is in compliance with the relevant requirements, and where necessary, supporting documents such as certificates of products, survey reports are also to be checked.

(2) Where the electrical equipment are required to meet the requirements of certified safe type, the approved Classification of Hazardous Zones and Arrangement of Electrical Equipment in Hazardous Zones are to be checked, and the certificates of products for the relevant equipment and cables are also to be checked. For ships in-service applying for survey of the certificate for the first time (consideration for the carriage of dangerous goods not included at the design stage), certificates of products for the equipment and cables are to be checked, including the inspection for the relevant structural fire-protection, and evidences are to be shown clearly that the equipment are in compliance with the requirements of fitness for carriage of dangerous goods.

(3) Where the ventilation in cargo spaces is required to meet the requirements of mechanical ventilation, certificates of products for fans are to be checked:

① for products intended to be carried are required to meet the requirements of certified safe type electrical equipment, it is to be confirmed that the fans meet the corresponding requirements of explosive grades, otherwise, the fans are to be switched-off outside the hazardous zones, means are to be taken to prevent the unauthorized re-switching, including isolating links or lockable switches;

② for cargo spaces requiring mechanical ventilation or continuous ventilation, the use of alternative method in ① is not allowed, the fans are to meet the corresponding requirements of explosive grades.

(4) Where the ventilation is required to meet the requirement of six air changes per hour, the ventilation of fans is to be compared with the effective capacity of holds to confirm that it meets the relevant requirement.

(5) Where products intended to be carried are required for continuous ventilation, the approved Arrangement of Ventilation is to be checked to confirm the height of ventilators.

(6) Where the bilge system is required to be isolated from the machinery spaces, confirm that the arrangement of isolation for bilge system of cargo holds and additional discharging system (if any) is to be satisfied according to the approved Arrangement of Bilge Piping System.

(7) Where products intended to be carried are required to meet the requirement of maintaining fire main pressure, confirm that the arrangement of fixed pressure water tanks is to be satisfied according to the approved Arrangement of Fire Piping System.

3.5.2 Examination of documentation

(1) Class certificate and/or statutory certificate

Ships are to hold the valid class certificate and/or statutory certificate, and the class conditions and/or outstanding recommendations overdue have been removed.

(2) Certificate of fitness for the carriage of dangerous goods

① Ships constructed on 1 January 2002 or after and carrying dangerous goods in solid form in bulk (other than Class 6.2 and Class 7) defined in 1.3.2 of the Guidelines (SOLAS Reg. VII/7) are to hold the certificates of fitness for the carriage of dangerous goods in solid form in bulk.

② Both of the cargo ships of 500 gross tonnage and above constructed on 1 September 1984 or after and the ships less than 500 gross tonnage constructed on 1 February 1992 or after which carry dangerous goods in solid form in bulk (other than Class 6.2 and Class 7) defined in 1.3.2 of the Guidelines (SOLAS Reg.VII/7) are to hold the certificates of fitness for the carriage of dangerous goods in solid form in bulk.

(3) Ship's loading manual and stability data

① Examining whether the ship's loading manual includes the cargoes applying for carriage, its maximum bending moment and stress are within the permissible range. The loading manual is to be approved by ISC or the flag State Administration. In addition, the trimming requirement for the cargoes carried is to be considered.

② Examining whether the ship's stability data includes the check for cargo loading condition to ensure that its stability complies with the applicable requirements of codes and conventions. The stability data is to be approved by ISC or the flag State Administration. Verifying whether the effect of cargo loading is to be considered.

③ For ships fitted with loading computers, the loading computers are to be surveyed and certified according to the relevant provisions of ISC, for those loading computers which have been approved, tests are to be carried out and it is to check the approved documents.

(4) Latest valid IMDG Code and IMSBC Code

IMDG Code and IMSBC Code and their latest amendments (if any) are to be available onboard the ship.

(5) Ship/ashore safety inspection item

Several copies of ship/ashore safety inspection item are to be available onboard the ship during the cargo handling, the inspection item is to be fully in compliance with the provisions of IMO resolution A.862(20).

(6) The corresponding instructions for emergency reaction to the accident of dangerous goods and medical first aid guide

One copy is to be available onboard the ship.

(7) Recommendation on the safety use of pesticides for the purpose of fumigation

One copy is to be available onboard the ship.

(8) Other documentary evidences required by schedules for individual cargoes.

(9) Supporting documentation

① Survey report of hull structure:

Examining the survey reports of structure in history kept onboard the ship. For ESP ships, it is to include the examination of ESP document to know the general condition of hull structure and the possible repairing history.

② Cargo carriage history record:

The availability of cargo information obtained by the ship (whether the loading is beyond the permissible range, etc.) may be found by means of examining the voyage loading plan and cargo information from the chief officer. For cargoes which have been planned to load or have been loaded, cargo information, the loading plan, stability and strength calculations (if any) are required to be provided for the intended precautions.

3.5.3 On-site inspection items

(1) Personnel protective equipment

① Confirming that the approved four sets of full protective clothing, resistant to chemical attack have been provided and two self-contained breathing apparatus have been added, it is to select according to the classes of cargoes and physical conditions and take the hazards of carriage for chemicals and the standards made by IMO into account. The protective clothing is to include gloves, boots, coverall and headgear.

② Two applicable spare charges suitable for use with the breathing apparatus are to be provided for each required apparatus. Cargo ships that are equipped with suitable located means for fully recharging the air cylinders free from contamination need carry only one spare charge for each required apparatus.

③ Checking the number and working condition of four dual-purpose type spray/jet nozzles.

④ Checking the provision of eyewashes and sun screen creams.

(2) Boundaries

① Visual inspection is carried out for the bulkheads of cargo spaces to confirm there are no openings, cracks and excessive corrosion. Special attention is to be paid to the bulkheads within the ventilation trunk, where necessary, covers may be required to be opened for internal inspection;

② Inspecting that the A-60 class insulation of the boundaries between cargo spaces and machinery spaces of category A is so installed that it meets the relevant requirement, unless the dangerous goods are stowed at least 3 m horizontally away from the bulkhead;

③ For ships intended to carry cargoes required for gastightness of boundary, inspecting whether the boundary between cargo hold and machinery room is integrity, without any cracks and excessive corrosion, special attention is to be paid to whether watertight door (if any) and the penetration of cable, piping are gastight, where necessary, a hose test may be required.

(3) Integrity of cargo space

① General inspection is to be carried out for all cargo holds to confirm that the internal structure, bilge well, piping system are kept in normal order.

② All openings of cargo holds, such as companionways and ventilator openings, are to be inspected to ensure the weathertightness. Meanwhile, combining with the inspection of cargo holds, attention is to be given to the conditions of air pipes, sounding pipes and filling pipes and to maintain them in good order.

③ All piping systems passing through the cargo holds are to be kept in good order, without excessive corrosion and leakage. If an opening for sampling is fitted in cargo hold, inspection is to be carried out for its tightness.

④ The sealing for beads and glands in way of penetration of all cables or ducts on decks and bulkheads of cargo holds are in good condition.

⑤ Confirming the structure, bilge well and piping system of cargo holds are in normal condition.

® If an oil fuel tank is fitted in the lower part of cargo hold, a pressure test is to be carried out for the tank to inspect whether the manhole and piping system of the tank leak or not.

⑦ If the cargo hold is required to be sealed, the surveyor is to strictly carry out the inspection for hatch covers and their sealing strips and/or hatch battens, covering canvases, wedges, cleats, etc. Where necessary, a hose test is to be carried out.

(4) Electrical equipment

① The type, explosion group and temperature class and shell integrity of certified safe type electrical equipment in hazardous zones are to be inspected. The portable lamps are to be inspected whether to meet the requirements of 2.18.9.1 of Chapter 2, PART FOUR of ISC Rules for Classification of Sea-going Steel Ships. In addition to, if the electrical power of cargo space is switched-off to ensure the safety of cargoes during they are loaded onboard the ship, note whether the cargo requires mechanical ventilation or continuous ventilation and indicated in the certificate. For ships provided with alarms for water ingress into hold, it is to be ensured that the alarms are to be capable of working normally.

② The cables passing through decks and bulkheads are to be sealed to prevent gas or vapour. The cables inside the cargo holds are to be protected to prevent from being damaged.

(5) No smoking and open lights

The notice of "No smoking and open lights" is to be provided according to the Table in Chapter 4 of the Guidelines.

(6) Measuring equipment

Different measuring equipment are possibly required by various cargoes, and are provided according to the Table in Chapter 4 of the Guidelines.

(7) Ventilation

① All of the ventilators in cargo holds are to be inspected whether there is excessive corrosion or rust and confirm the effectiveness of fire damper and means of closure, where necessary, a hose test may be carried out.

② When the mechanical ventilation is required, checking the safe-type certificate of fan and inspecting the insulation of equipment and cable, a function test is to be carried out for the fan.

③ When the continuous ventilation is required, noting that the distance between ventilators and deck measured on site is to comply with the height requirements of 1969 LL Convention for not being fitted with closing arrangements for ventilators in position 1 or position 2.

④ Verifying the effectiveness of means for measuring the gas concentration accurately in way of ventilator outlet but prevent the hazards to the operator, an opening for sampling may be fitted in the outlet and its tightness is to be inspected.

⑤ Verifying the arrangement for isolating the ventilation between the cargo hold and other hold, accommodation space or working zones on site.

® Verifying the arrangement of ventilators in cargo holds to prevent any exhausted gases entering into the accommodation spaces on the deck or below the deck.

⑦ Inspecting the condition of flame screen for ventilator, and repairing the damaged part.

(8) Isolation of bilge piping system

① When the bilge system of cargo holds is led to the machinery space or its discharge pipeline is one part of that in the machinery space, valves provided in the machinery space are to be inspected to prevent the flammable or toxicity liquid from discharging to the machinery space, where necessary, the valves are to be overhauled. The valves are to be locked shut and a notice is to be placed adjacent to the valve warning against opening without the master's permission.

② If it is designed that the bilge system of cargo holds is so arranged to isolate from the machinery space via gravity drainage to overboard directly or to a closed drain tank located outside the machinery space, the bilge system is to be inspected and a function test is to be carried out to ensure the effectiveness of such isolation.

(9) Readily availability of fire water

① An effectiveness test is to be carried out for the arrangement to ensure immediate availability of a supply of water from the fire main either by permanent pressurization or by suitably placed remote arrangements for the fire pumps during the cargo handling, including remote controlled/automatic activation of fire pump.

② Inspecting whether the hose and nozzle are placed in position and kept readily available.

(10) Arrangement when the fixed $CO_2$ fire-extinguishing system is ineffective

① For products that a fixed $CO_2$ fire-extinguishing system is ineffective, the equivalent fixed fire-extinguishing system in the cargo holds, if provided, is to be inspected.

② For ships for which a fixed fire-extinguishing system may be exempted in cargo holds, a list of products is to be determined according to the other availability of IMSBC Code.

(11) Inspection of inerting arrangement for cargo holds

① For cargoes requiring to introduce the inert gas to maintain the oxygen concentration less than 5% throughout the cargo space, means are to be taken to ensure that such oxygen concentration is kept during the voyage.

② The fixed $CO_2$ fire-extinguishing system cannot be used for such purpose.

(12) When the dangerous goods in solid form in bulk other than MHB in Group B of Appendix 1 of IMSBC Code are to be carried, it is also to be in compliance with the following requirements.

① Inspection of water supply: inspecting the position of hydrants, testing the quantity of water delivered, it is to be capable of supplying four nozzles of a size and at pressures as specified in SOLAS Reg. II-2/10.2, capable of being trained on any part of the cargo space when empty. The pressure of each hydrant is not to be less than 0.27 $N/mm^2$ (however, the minimum pressure for cargo ships less than 6,000 gross tonnage is not to be less than 0.25 $mm^2$).

② Inspection of ventilation arrangement

According to the different ventilation requirements of various cargoes, confirming:

a. whether the mechanical ventilation is capable of ensuring at least six air changes per hour in cargo space (based on the empty cargo space), or

b. whether the fan is required to be of non-sparking type and flame screen is to be fitted in ventilator, or

c. natural ventilation is to be arranged for the enclosed cargo space onboard the ship carrying dangerous goods in solid form in bulk, if mechanical ventilation is not provided.

**3.6 Requirements for annual and renewal surveys**

3.6.1 Examination of documentation

The requirements are the same as those in 3.5.2.

3.6.2 Inspection items on site

Inspection items are the same as those in 3.5.3, except 3.5.3(3)®.

3.6.3 Miscellaneous

(1) Confirm that no changes have been made in the ship's arrangements or conditions to affect the validity of the certificate.

(2) When the requirements of new effective amendments to IMSBC Code affect the availability of products in IMSBC Certificate of Fitness for Carriage, additional measures or correction of the list of products may be taken to meet the requirements of the new amendments.

## Chapter 4 Table of Minimum Requirements of Carriage for Dangerous Goods in Solid Form in Bulk

The table of minimum requirements of carriage for dangerous goods in solid form in bulk mainly addresses the requirements of fitness for carriage of Group B cargoes possessing chemical hazards and the special carriage requirements of Group A and Group C cargoes in the IMSBC Code (if any), it also includes the requirements of dangerous goods in solid form in bulk in SOLAS Reg. II-2/19. The interpretation of column is as follows:

| | | |
|---|---|---|
| Column “a” | Name of cargo | Bulk cargo shipping name (BCSN) |
| Column “b” | UN. No. | Four numbers assigned to the special dangerous goods in the United Nations Recommendation on the Transport of Dangerous Goods |
| Column “c” | Class of dangerous goods | The Group B cargoes in the IMSBC Code may be classed as follows according to their hazards:<br>Class 4.1 : Flammable solids<br>Class 4.2 : Substances liable to spontaneous combustion<br>Class 4.3 : Substances which, in contract with water, emit flammable gases<br>Class 5.1 : Oxidizing substances<br>Class 7 : Radioactive material<br>Class 9 : Miscellaneous dangerous substances and articles<br>MHB : Materials hazardous only bulk |
| Column “d” | Group | A: Cargoes which may liquefy;<br>B: Cargoes which possess a chemical hazard during the transportation;<br>C: Cargoes which are neither liable to Group A nor Group B |
| Column “e” | Isolation between cargo space and engine room | A-60: Bulkheads between cargo space and engine room are to be of A-60 class standard or the bulkheads are kept far away from the products (as a minimum of 3 m);<br>F: Bulkheads of cargo holds in which products are carried are to be of fire-protection and water-proof;<br>G: Bulkheads between cargo space and engine room are to be of gastight |
| Column “f” | No smoking and open lights | Yes: Smoking and open lights are forbidden in cargo holds or the adjacent spaces, the notice of “No Smoking and Open Lights” are to be displayed in a conspicuous place |
| Column “g” | Ventilation | N: Natural ventilation is to be provided;<br>Nm: Natural or mechanical ventilation is to be provided;<br>M: Mechanical ventilation is to be provided;<br>ML: Two sets of mechanical ventilation capable of being at least six air changes per hour, as a minimum are to be provided;<br>Sa: Fans are to be used safely under the combustible gas conditions;<br>Sp: Flame screen is to be fitted on the ventilator;<br>C: When the continuous ventilation is required, ventilation openings are to meet the requirements of LL Convention, as amended, for openings not being fitted with closing arrangements;<br>Ot: Means for measuring the gas concentration accurately in way of ventilator outlet but prevent the hazards to the operator;<br>Tr: Ventilation of a cargo hold is to be so arranged as not to be connected with other holds, accommodation space or working zone;<br>*: Ventilation is to be so arranged that any exhaust gases could not enter into the accommodation space on the deck or below the deck |
| Column “h” | Self-contained breathing apparatus | Yes: Two self-contained breathing apparatus are to be provided and two spare charges are to be equipped for each apparatus |

| | | |
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| Column “i” | Two sets of additional breathing apparatus | Yes: Two additional self-contained breathing apparatus other than the one required in SOLAS Reg. II-2/10.10 are to be provided;<br>*: Recommended alterative measures to read the temperature in such a way as not to require entry into the cargo hold |
| Column “j” | Protective clothing | Yes: Four sets of protective clothing meeting the requirement of SOLAS Reg. II-2/19.3.6.1 are to be provided, including gloves, gloves, boots, coverall and headgear |
| Column “k” | Bilge piping system | Yes: Where the bilge suction valve of the cargo space is located in the machinery space, it is to inspect whether the valve has been blanked or locked shut and a notice is to be place adjacent to the valve warning against opening without the master’s permission. If the bilge system has been designed to isolated from the machinery space completely, such requirement does not applied to. |
| Column “l” | Certified safe type requirement of electrical equipment in cargo space | Degree of protection for shell:<br>IP55: satisfied with IP55 as a minimum.<br>Group of certified safe type for electrical equipment:<br>IIA: satisfied with IIA as a minimum.<br>IIC: satisfied with IIC as a minimum.<br>Temperature class of certified safe type for electrical equipment:<br>T1: satisfied with T2 as a minimum.<br>T2: satisfied with T2 as a minimum.<br>T3: satisfied with T3 as a minimum.<br>T4: satisfied with T4 as a minimum.<br>IS: intrinsically safe electrical equipment |
| Column “m” | Dual-purposes type spray/jet nozzle | Yes: Dual-purposes type spray/jet nozzle is to be provided |
| Column “n” | Readily availability of a supply of fire water | Yes: Arrangements are to be made to ensure immediate availability of a supply of water from the fire main either by starting a fire pump remotely or by permanent pressurization. The hose and nozzle are placed in position and kept readily available |
| Column “o” | Measuring equipment | a: means for measuring the concentration of methane is to be provided;<br>b: means for measuring the concentration of oxygen is to be provided;<br>c: means for measuring the concentration of carbon monoxide is to be provided;<br>d: means for measuring PH value of cargo hold bilge samples is to be provided;<br>e: means for measuring the temperature of cargo is to be provided;<br>f: suitable means for quantitative measuring the concentration of hydrogen is to be provided, which may be used in the explosive gas;<br>g: two sampling locations are to be provided for each cargo hold;<br>h: suitable means for quantitative measuring the concentration of phosphine and arsine is to be provided;<br>i: suitable means for quantitative measuring the toxic gases emitted by metal sulophide is to be provided;<br>j: suitable means for quantitative measuring the concentration of silane is to be provided;<br>k: suitable means for quantitative measuring the concentration of ammonia and acetylene is to be provided;<br>l: suitable means for quantitative measuring the concentration of hydrogen cyanide is to be provided;<br>m: means for measuring the surface temperature of cargo is to be provided and is so arranged not to enter into the cargo hold;<br>*: such means includes aspirator, flexible connection and a length of spark-proof metal tubing to enable sampling in cargo hold;<br>**: as recommended |

| | | |
|---|---|---|
| Column “p” | Special requirements | Particular requirements for different cargoes:<br>1. Castor meal, castor pomace and castor flakes are not to be carried in bulk.<br>2. If the period from the commencement of loading to the completion of discharge does not exceed five days, a fixed gas fire-extinguishing system in the cargo hold may be exempted.<br>3. It is capable of providing the ship with the means to top up the cargo spaces with inert gas during the voyage, on completion of loading and filling with nitrogen, the cargo hold is to be kept in sealing condition. The ship’s fixed $CO_2$ fire-fighting system is not to be used for this purpose.<br>4. Industrial sand coated with resin is not to be adjacent to any sources of heat.<br>5. It only applies to solvent extracted seed cake.<br>6. Fine grained sulphur (flowers of sulphur) is not to be transported in bulk.<br>7. Where products containing 15% moisture and more are carried, the fixed fire-extinguishing system in cargo hold may be exempted.<br>8. Such product is to be stowed out of direct contact with a metal engine-room boundary.<br>9. Such product is to be stowed neither adjacent to any sources of heat or ignition, nor immediately adjacent to any tank or double bottom containing fuel oil heated to more than 50?.<br>10. Such product is not to be stowed adjacent to hot areas.<br>11. Charcoal in Class 4.2 is not to be carried in bulk, and the moisture contained does not exceed 10%.<br>12. Such product is not to be loaded adjacent to the heated hold or resource of heat.<br>13. Pressure testing is to be carried out for oil fuel tank below the cargo hold to ensure that the manhole and piping extending to the tank do not leak.<br>14. The integrity and weathertightness of weather deck closures and hatch covers are in good order.<br>15. All penetrating pipelines are in good order and the sampling openings in cargo holds are sealed effectively.<br>16. Cable and conduit penetrations of the decks and bulkheads are to be sealed against the passage of gas and vapour.<br>17. Eyewashes are to be provided.<br>18. All electrical cables and components situated in adjacent enclosed spaces of cargo holds are safe to be used in a flammable and/or dusty atmosphere or positively isolated. This provision need not apply to engine-rooms where the engine-room is separated from the cargo space by a gastight bulkhead with no direct access.<br>19. If the temperature of the cargo reaches 55? and continuous to increase, ventilation to the cargo space is to be stopped. If self-heating continues, then carbon dioxide or inert gas is to be introduced to the cargo space |
| Column “q” to “v” | Requirements of SOLAS Reg. II-2/54.2 or Reg. II-2/19.3 | X: applicable;<br>For ventilation requirements (column “t”):<br>M: mechanical ventilation is provided, and is capable of at least six air changes per hour;<br>Nm: natural ventilation or mechanical ventilation is to be provided;<br>Sa: fans are to be used safely under the flammable gas environment;<br>Sp: flame screen is to be fitted on the ventilator |
| Column “w” | Fixed gas fire-extinguishing system (SOLAS Reg. II-2/10.7.1.3） | Yes: according to the requirement of SOLAS Reg. II-2/10.7.1.3 for fitting a fixed $CO_2$ fire-extinguishing system;<br>(Yes): a fixed gas fire-extinguishing system is ineffective, an equivalent fire-extinguishing system is to be provided. According to IMO unified interpretation, the water fire-extinguishing system complying with the requirement of SOLAS Reg. II-2/19.3.1.2 may be used to subsitute the fixed gas fire-extinguishing system in cargo spaces |

Note: The blank column means “Not Applicable”.

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| | | | | | | | | | | | | | | | | | Requirements of SOLAS Reg. II-2/19 | | | | | | | | |
| | Name of Cargo | UN. No | Class of dangerous good | Group | Isolation between cargo space and engine room | No Smoking and open lights | Ventilation | Self-contained breathing apparatus | Two sets of additional breathing apparatus | Protective clothing | Bilge piping system | Requirement of certified safe type electrical equipment in cargo space | Dual-purposes type spray/jet nozzle | Readily availability of a supply of fire water | Measuring equipment | Special requirement | Readily use of fire water | 4 sets of nozzles | Certified safe type electrical equipment in cargo hold | Ventilation requirement | 4 sets of protective clothing & 2 additional breathing apparatus | Isolation between cargo space and engine room | Fixed gas fire-extinguishing system |
| 1 | ALUMINIUM FERROSILICON POWDER | **UN 1395** | 4.3 | B | G | Yes | M, C, Sa | Yes | Yes | | | IIC, T2 | | | f, h, j | | | | X | M, Sa, Sp | X | X | |
| 2 | ALUMINIUM NITRATE | **UN 1438** | 5.1 | B | | | | Yes | | Yes | | | Yes | | | | X | X | | Nm | X | | (Yes) |
| 3 | ALUMINIUM SILICON POWDER, UNCOATED | **UN 1398** | 4.3 | B | G | Yes | ML, C, Sa* | Yes | Yes | | | IIC, T2 | | | f, h, j | | | | X | M, Sa, Sp | X | X | |
| 4 | ALUMINIUM SMELTING BY-PRODUCTS OR ALUMINIUM REMELTING BY-PRODUCT | **UN 3170** | 4.3 | B | G | Yes | M, C, Sa* | Yes | Yes | | | IIC, T2 | | | f, k | | | | X | M, Sa, Sp | X | X | |
| 5 | AMMONIUM NITRATE | **UN 1942** | 5.1 | B | A-60 | Yes | | Yes | | Yes | | IS | | Yes | | 13, 14 | X | X | X | Nm, Sp | X | X | (Yes) |
| 6 | AMMONIUM NITRATE BASED FERTILIZER | **UN 2067** | 5.1 | B | A-60 | Yes | | Yes | | Yes | | IS | | Yes | e | 9, 13, 14 | X | X | X | Nm, Sp | X | X | (Yes) |
| 7 | AMMONIUM NITRATE BASED FERTILIZER | **UN 2071** | 9 | B | A-60 | Yes | | Yes | | Yes | | IS | | Yes | e | 9, 14 | X | X | X | Nm, Sp | X | X | (Yes) |
| 8 | AMMONIUM NITRATE BASED FERTILIZER (non-hazardous) | | | C | | Yes | | Yes | | Yes | | IS | | | e | 8, 9, 14 | | | | | | | |
| 9 | BARIUM NITRATE | **UN 1446** | 5.1 | B | | | Nm | Yes | | Yes | | | Yes | | | | X | X | | Nm | X | | (Yes) |
| 10 | BROWN COAL BRIQUETTES | | MHB | B | F | Yes | | Yes | | | | IP55, IIA, T4 | | | a*,b*, c*, d, e**,g | 10, 14 15, 18 | | | | | | | |
| 11 | CALCIUM NITRATE | **UN 1454** | 5.1 | B | | | | Yes | | Yes | | | Yes | | | | X | X | | Nm | X | | (Yes) |
| 12 | CASTOR BEANS or CASTOR MEAL or CASTOR POMACE or CASTOR FLAKE | **UN 2969** | 9 | B | | | Nm | Yes | | Yes | | | Yes | | | 1 | X | X | | Nm | X | | Yes |

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| | | | | | | | | | | | | | | | | | Requirements of SOLAS Reg. II-2/19 | | | | | | | | | |
| | Name of Cargo | UN. No | Class of dangerous good | Group | Isolation between cargo space and engine room | No Smoking and open lights | Ventilation | Self-contained breathing apparatus | Two sets of additional breathing apparatus | Protective clothing | Bilge piping system | Requirement of certified safe type electrical equipment in cargo space | Dual-purposes type spray/jet nozzle | Readily availability of a supply of fire water | Measuring equipment | Special requirement | Readily use of fire water | 4 sets of nozzles | Certified safe type electrical equipment in cargo hold | Ventilation requirement | 4 sets of protective clothing & 2 additional breathing apparatus | Isolation between cargo space and engine room | Fixed gas fire-extinguishing system |
| 13 | CHARCOAL | | MHB | B | | | | | | | | | | | | 11 | | | | | | | | | | Yes |
| 14 | CHOPPED RUBBER AND PLASTIC INSULATION | | | C | | Yes | | | | | | | | | | 2 | | | | | | | | | | Yes |
| 15 | COAL | | MHB | B (& A) | F | Yes | Nm | Yes | | | | IP55, IIA, T4 | | | a*,b*, c*, d, e**,g | 10, 15, 18 | | | | | | | | | | |
| 16 | COAL SLURRY | | | A | | | N | | | | | | | | a | | | | | | | | | | | |
| 17 | COARSE CHOPPED TYRES | | | C | | Yes | | | | | | | | | | 2 | | | | | | | | | | Yes |
| 18 | COPRA (dry) | UN 1363 | 4.2 | B | | Yes | Nm | | | | | | | | e | 12 | X | X | | Nm | | X | | X | | Yes |
| 19 | DIRECT REDUCED IRON (A) Briquettes, hot-moulded | | MHB | B | F | Yes | Nm, Sp* | | | | | IIC, T2 | | | f, e | 14 | | | | | | | | | | |
| 20 | DIRECT REDUCED IRON (B) Lumps, pellets. Coldmoulded Briquettes | | MHB | B | F | Yes | | | | | | IIC, T2 | | | b, f, e | 3 14 | | | | | | | | | | Yes |
| 21 | DIRECT REDUCED IRON (C) (By product fines) | | MHB | B | F | Yes | | Yes | | | | IIC, T2 | | | b, f, e | 3, 14 | | | | | | | | | | Yes |
| 22 | FERROPHOSPHORUS (including briquettes) | | MHB | B | | | M, Sa | Yes | | | | IIC, T1 | | | | | | | | | | | | | | |
| 23 | FERROSILICON with 30% or more but less than 90% silicon (including briquettes) | UN 1408 | 4.3 | B | G | Yes | ML, Sa, C, Ot, Tr | Yes | Yes | Yes | Yes | IIC, T1 | | | b, f, h, j | 15 | | | X | M, Sa, Sp | | X | | X | | |

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| | | | | | | | | | | | | | | | | | Requirements of SOLAS Reg. II-2/19 | | | | | | | | | |
| | Name of Cargo | UN. No | Class of dangerous good | Group | Isolation between cargo space and engine room | No Smoking and open lights | Ventilation | Self-contained breathing apparatus | Two sets of additional breathing apparatus | Protective clothing | Bilge piping system | Requirement of certified safe type electrical equipment in cargo space | Dual-purposes type spray/jet nozzle | Readily availability of a supply of fire water | Measuring equipment | Special requirement | Readily use of fire water | 4 sets of nozzles | Certified safe type electrical equipment in cargo hold | Ventilation requirement | 4 sets of protective clothing & 2 additional breathing apparatus | Isolation between cargo space and engine room | Fixed gas fire-extinguishing system |
| 24 | FERROSILICON 25% to 30% silicon, or 90% or more with silicon (including briquettes) | | MHB | B | G | Yes | ML, Sa, C, Ot, Tr | Yes | Yes | | Yes | IIC, T1 | | | b, f, h, j | 15 | | | | | | | |
| 25 | FERROUS METAL BORINGS, SHAVINGS, TURNINGS or CUTTINGS | **UN 2793** | 4.2 | B | | | | Yes | Yes* | | | | | | m | | X | X | | Nm | X | X | Yes |
| 26 | FISHMEAL (FISHSCRAP), STABILIZED | **UN 2216** | 9 | B | | | Nm | Yes | | | | | | | b, e | 19 | X | X | | Nm | X | | Yes |
| 27 | FLUORSPAR | | MHB | A & B | | | | | | | | | | | | | | | | | | | |
| 28 | GRANULATE TYRE RUBBER | | | C | | Yes | | | | | | | | | | 2 | | | | | | | Yes |
| 29 | IRON OXIDE, SPENT or IRON SPONGE, SPENT | **UN 1376** | 4.2 | B | | | Nm | Yes | | Yes | | IP55, IIA, T2 | Yes | | b, l | | X | X | | Nm | X | X | Yes |
| 30 | LEAD NITRATE | **UN 1469** | 5.1 | B | | | N | Yes | | Yes | | | Yes | | | | X | X | | Nm | X | | (Yes) |
| 31 | LIME (UNSLAKED) | | MHB | B | | | | | | | | | | | | | | | | | | | |
| 32 | LINTED COTTON SEED with not more than 9% moisture and not more than 20.5% oil | | MHB | B | | | | Yes | | | | | | | | | | | | | | | Yes |
| 33 | MAGNESIA (UNSLAKED) | | MHB | B | | | | | | | | | | | | | | | | | | | |
| 34 | MAGNESIUM NITRATE | **UN 1474** | 5.1 | B | | | | Yes | | Yes | | | Yes | | | | X | X | | Nm | X | | (Yes) |
| 35 | METAL SULPHIDE CONCENTRATES | | MHB | A & | | | | Yes | | | | | | | b,i | | | | | | | | Yes |

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| | | | | | | | | | | | | | | | | | Requirements of SOLAS Reg. II-2/19 | | | | | | | | | | | |
| | Name of Cargo | UN. No | Class of dangerous good | Group | Isolation between cargo space and engine room | No Smoking and open lights | Ventilation | Self-contained breathing apparatus | Two sets of additional breathing apparatus | Protective clothing | Bilge piping system | Requirement of certified safe type electrical equipment in cargo space | Dual-purposes type spray/jet nozzle | Readily availability of a supply of fire water | Measuring equipment | Special requirement | Readily use of fire water | 4 sets of nozzles | Certified safe type electrical equipment in cargo hold | Ventilation requirement | 4 sets of protective clothing & 2 additional breathing apparatus | Isolation between cargo space and engine room | Fixed gas fire-extinguishing system |
| | | | | B | | | | | | | | | | | | | | | | | | | | | | | | |
| 36 | PEANUTS (In shell) | | | C | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | PEAT MOSS | | MHB | A & B | | | Nm | | | | | | | | | | | | | | | | | | | | | |
| 38 | PETROLEUM COKE (calcined or uncalcined) | | MHB | B | | | | Yes | | Yes | | | Yes | | | | | | | | | | | | | | | |
| 39 | PITCH PRILL | | MHB | B | | | Nm | Yes | | Yes | | | Yes | | | 12, 14, 17 | | | | | | | | | | | | |
| 40 | POTASSIUM NITRATE | **UN 1486** | 5.1 | B | | | | Yes | | Yes | | | Yes | | | | X | X | | | X | | (Yes) | | | | | |
| 41 | PYRITES, CALCINED (Calcined Pyrites) | | MHB | A & B | | | | | | | | | | | | | | | | | | | | | | | | |
| 42 | RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-1), non-fissile or fissile-excepted | **UN 2912** | 7 | B | | | | Yes | | Yes | | | | | | | | | | | | | | | | | | |
| 43 | RADIOACTIVE MATERIAL SURFACE CONTAMINATED OBJECTS (SCO-1), non-fissile or fissile excepted | **UN 2913** | 7 | B | | | | Yes | | Yes | | | | | | | | | | | | | | | | | | |
| 44 | SAND | | | C | | | | | | | | | | | | 4 | | | | | | | | | | | | |
| 45 | SAWDUST | | MHB | B | | | Nm | | | | | | | | | | | | | | | | Yes | | | | | |
| 46 | SEED CAKE, containing vegetable oil (a) mechanically expelled seeds, containing more than 10% of oil or more than 20% of oil and moisture combined | **UN 1386** | 4.2 | B | | | | Yes | | | | | | | e | 14, 19 | X | X | | Nm | X | X | Yes | | | | | |

| | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | p | q | | | | | | r | s | t | u | v | w |
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| | | | | | | | | | | | | | | | | | Requirements of SOLAS Reg. II-2/19 | | | | | | | | | | | |
| | Name of Cargo | UN. No | Class of dangerous good | Group | Isolation between cargo space and engine room | No Smoking and open lights | Ventilation | Self-contained breathing apparatus | Two sets of additional breathing apparatus | Protective clothing | Bilge piping system | Requirement of certified safe type electrical equipment in cargo space | Dual-purposes type spray/jet nozzle | Readily availability of a supply of fire water | Measuring equipment | Special requirement | Readily use of fire water | 4 sets of nozzles | Certified safe type electrical equipment in cargo hold | Ventilation requirement | 4 sets of protective clothing & 2 additional breathing apparatus | Isolation between cargo space and engine room | Fixed gas fire-extinguishing system |
| 47 | SEED CAKE, containing vegetable oil (b) solvent extractions 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 | **UN 1386** | 4.2 | B | A-60 | Yes | Nm, Sp, Sa | Yes | | | | IIA, T3 | | | e | 5, 14, 19 | X | X | X | M, Sp, Sa | X | X | Yes |
| 48 | SEED CAKE, with not more than 1.5% oil and not more than 11% moisture | **UN 2217** | 4.2 | B | A-60 | Yes | Nm, Sp, Sa | Yes | | | | IIA, T3 | | | e | 5, 14, 19 | X | X | X | M, Sp, Sa | X | X | Yes |
| 49 | SILICOMANGANESE (low carbon) (with known hazard profile or known to evolve gases) (with silicon content of 25% or more) | | MHB | B | | Yes | M, Sa | Yes | | | | IIC, T1 | | | b, f, h | 16 | | | | | | | |
| 50 | SODIUM NITRATE | **UN 1498** | 5.1 | B | | | | Yes | | Yes | | | Yes | | | | X | X | | Nm | X | | (Yes) |
| 51 | SODIUM NITRATE AND POTASSIUM NITRATE MIXTURE | **UN 1499** | 5.1 | B | | | | Yes | | Yes | | | Yes | | | | X | X | | Nm | X | | (Yes) |
| 52 | SULPHUR (lump and coarse grained) | **UN 1350** | 4.1 | B | | Yes | Nm, Sp | Yes | | | | IP55, T4 | | | | 6 | X | X | X | Nm, Sp | X | X | |
| 53 | TANKAGE | | MHB | B | | | | Yes | | | | | | | e | | | | | | | | Yes |
| 54 | VANADIUM ORE | | MHB | B | | | | Yes | | | | | | | | | | | | | | | |
| 55 | WOODCHIPS | | MHB | B | | | | Yes | | | | | | | b | 7 | | | | | | | Yes |
| 56 | WOOD PELLETS | | MHB | B | | | | Yes | | | | | | | b, c | 14 | | | | | | | Yes |

| | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | p | q | | | | | | r | s | t | u | v | w |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | Requirements of SOLAS Reg. II-2/19 | | | | | | | | | | | |
| | Name of Cargo | UN. No | Class of dangerous good | Group | Isolation between cargo space and engine room | No Smoking and open lights | Ventilation | Self-contained breathing apparatus | Two sets of additional breathing apparatus | Protective clothing | Bilge piping system | Requirement of certified safe type electrical equipment in cargo space | Dual-purposes type spray/jet nozzle | Readily availability of a supply of fire water | Measuring equipment | Special requirement | Readily use of fire water | 4 sets of nozzles | Certified safe type electrical equipment in cargo hold | Ventilation requirement | 4 sets of protective clothing & 2 additional breathing apparatus | Isolation between cargo space and engine room | Fixed gas fire-extinguishing system |
| 57 | WOOD PULP PELLETS[1] | | MHB | B | | | | | | | | | | | | 7 | | | | | | | Yes |
| 58 | ZINC ASHES | **UN 1435** | 4.3 | B | | Yes | M, Sa, C | Yes | | Yes | | IIC, T2 | | | f | | | | X | M, Sa, Sp | X | | X | |
| 59 | Wood products – General[2] (Bulk Cargo Shipping Names)LOGS ,PULP WOOD, TIMBER, ROUNDWOOD, SAW LOGS | | MHB | B | | | | Yes | | | | | | | b | | | | | | | | | |

1 Due to no such material in the practical transportation, IMO has decided to delete it, which will be implemented from 1 January 2013.
2 IMO new added product, which will be implemented from 1 January 2013.

## Appendix 1 Enhanced safety measures for carrying cargoes which may liquefy

Group A cargoes, which is the cargoes may liquefy, as defined in IMSBC Code, contain a certain proportion of small particles and a certain amount of moisture. Owning to the vessel's motion and vibration during a voyage, the volume of the spaces between the particles reduces as the cargo is compacted, causing an increase in water pressure in the space. The increase in water pressure reduces the friction between cargo particles resulting in a reduction in the shear strength of the cargo, leading to cargo liquefaction. A cargo shift caused by liquefaction may occur when the moisture content exceeds the Transportable Moisture Limit (TML). Some cargoes are susceptible to moisture migration and may develop a dangerous wet base even if the average moisture content is less than the TML. Although the cargo surface may appear dry, undetected liquefaction may take place resulting in shifting of the cargo. Cargoes with high moisture content are prone to sliding, particularly when the cargo is shallow and subject to large heel angles. In the resulting viscous fluid state cargo may flow to one side of the ship with a roll but not completely return with a roll the other way. Consequently the ship may progressively reach a dangerous heel and capsize quite suddenly.

**Figure 1 Cargoes liquefied and moisture migration**

To ensure the safety of vessels and human life, ISC would like to bring to the attention of the Owners and Management Company, the risks associated with liquefaction and the necessary precautions to minimize the risk and to prevent accidents.

The following are some of the suggested measures may be considered by the company:

### I. A cargo with moisture content shown to be more than the TML is not to be accepted onboard

SOLAS Reg.VI/2 requires that the shipper is to provide the master or his representative with appropriate information on the cargo sufficiently in advance of loading to enable the precautions which may be necessary for proper stowage and safe carriage of the cargo to be put into effect. Such information shall be confirmed in writing and by appropriate shipping documents prior to loading the cargo on the ship. In the case of concentrates or other cargoes which may liquefy, the cargo information is to include additional information in the form of a certificate on the moisture content of the cargo and its transportable moisture limit (TML) as required in Section 4 of IMSBC Code.

The master is to conform first the appropriate documentation certifying the moisture content and TML of the cargo or Cargo Declaration before accepting the cargo for loading. The interval between sampling/testing and loading is not to be more than seven days. If there has been significant rain or snow between the time of testing and loading, check tests are to be conducted to ensure that the moisture content of the cargo is still less than its TML.

The master may, according to 8.4 “Complementary test procedure for determining the possibility of liquefaction” of IMSBC Code, to carry out a check test for approximately determining the possibility of flow onboard ship or at the dockside by a “Can Test” for verifying whether the moisture content documents reflect the cargo’s actual moisture content. The procedure of the test as follows:

Half fill a cylindrical can or similar container (0.5 to 1 litre capacity) with a sample of the material. Take the can in one hand and bring it down sharply to strike a hard surface such as a solid table from a height of about 0.2 m. Repeat the procedure 25 times at one- or two-second intervals. Examine the surface for free moisture or fluid conditions. If free moisture or a fluid condition appears, arrangements are to be made to have additional laboratory tests conducted on the material before it is accepted for loading.

**Cylindrical can test**

**Before test**

**After test(cargo liquefied)**

**Figure 2 Complementary test for approximately determining the possibility of liquefaction**

Note that the poor condition of storage piles, transportation before loading (barged from stockyard to the ship) and bad weather condition such as raining, etc. may cause the actual moisture content far beyond the figure, even the TML, contained within the shipper's declaration. The master is to pay serious attention to the signs of excess moisture content of the cargo and may conduct Can Test to the cargoes of each stock pile or each barge to judge the possibility of cargo liquefaction before loading and during the whole loading process. Attention is to be paid to the position of sampling to reflect the real condition of the cargoes during the Can Test. If any doubts about the moisture content of the cargoes, the master may refuse or stop loading to take further arrangement such as informing the company and related parties, seeking expert advice and requesting independent cargo inspector, etc.

Cargoes are not to be loaded in raining and cargoes exposed to rain are to be re-tested. Cargoes obviously containing rain water are not to be loaded onboard. In addition, to avoid carrying those cargoes which may liquefy in raining season would significantly reduce the risk of accidents associated with liquefaction.

**II. Cargo monitoring during voyages**

After the cargo meeting the provisions is loaded onboard, the master is to arrange regular sounding and draining of bilges in cargo holds according to the relevant procedures of SMS and the requirements listed in cargo's certificate.

It is recommended that the master is to take pictures of cargoes at each stage of loading and stowage onboard, particularly upon completion of cargo, where necessary, marks of storage piles are to be made to make reference. If practicable, regular visual examination to the cargoes in holds, taking photos and comparing with the status after discharge under the allowable conditions at specific intervals during the voyage would help reveal whether there is any change or liquefaction of the cargoes.

**III. Emergency response whilst liquefying**

Section 8 "Emergency Preparedness" of International Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM Code) requires that:

"8.1 The Company is to identify potential emergency shipboard situations, and establish procedures to respond to them.

8.2 The Company is to establish programmes for drills and exercises to prepare for emergency actions."

Therefore, the safety management system of the ships intended to carry the cargoes which may liquefy is to include the emergency procedures to stipulate the key points for cargo carriage and define the measures taken for cargo liquefaction and heel of ship, such as calculation of stability, avoiding turning with large rudder angle and seeking shore-based support whist cargo liquefying at sea.

**IV. Proper routine maintenance to ensure of weather tightness and sound structural condition of cargo holds**

Weather tightness and structural condition of cargo holds is related not only to seaworthiness but also cargo worthiness. A proper maintenance is the key element for assuring weathertightness of cargo holds. The following guidelines to which routine maintenance may be referred to:

1) Guidance to Ship's Crews and Terminal Personnel for Bulk Carrier Inspections (resolution A.866(20));

2) Standards for Owners' Inspection and Maintenance of Bulk Carrier Hatch Covers (resolution MSC.169(79));

3) Guidelines for Bulk Carrier Hatch Cover Surveys and Owner's Inspections and Maintenance (MSC/Circ.1071));

4) Care and Survey of Hatch Covers of Dry Cargo Ships – Guidance to Owners (IACS Recommendation No.15);

5) Guidelines for Survey, Assessment and Repair of Hull Structure – Bulk Carriers (IACS Recommendation No.76).

1. Hatch coaming and hatch covers

1) Hatch coaming and hatch covers are to be examined regularly. During the inspection, hammer may be used to ascertain the real condition of the structural members to avoid the influence on judgement due to thick coating and rust scales. A testing of the satisfactory operation of mechanically operated hatch covers together with inspection to the cover panels at their mostly opened and closed condition would be a good practice to reveal the condition of the hatch covers. The figure below shows the defects most commonly found upon hatch coaming and hatch covers.

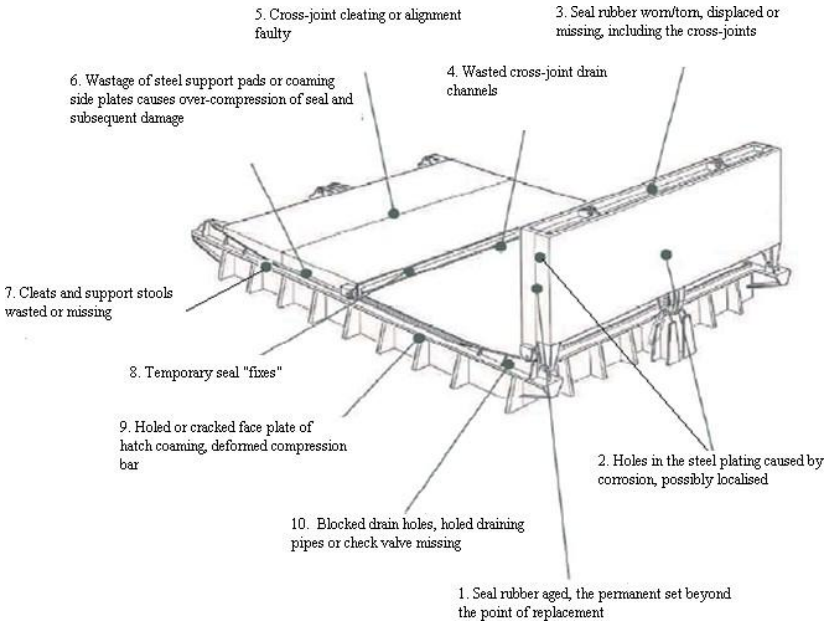


**Figure 3 Hatch coaming and hatch covers related deficiencies**

**4-1 Holed hatch covers, attention to be paid to the lower part of the cover panels and the ventilators or cement holes in panel (if any)**

**4-2 Seriously corroded rubber channel and draining channel**

**4-3 Seriously corroded skirt plate**

**4-4 Holed face plate of hatching coaming**

**4-5 Holed face plate around cleat and over-compressed rubber**

**Figure 4 Typical defects of hatch covers and coaming**

2) If any doubts about the weathertightness of hatch coaming and hatch cover or after repair, the effectiveness of sealing arrangements may be proved by hose or ultrasonic test.


**Figure 5 Tightness test to hatch covers (ultrasonic test and hose test)**

2. Other structural members related to the weathertightness of cargo holds

1) Holed cargo hold ventilators, air pipes and sounding pipes penetrating cargo holds would lead to damage of weathertightness of cargo holds, such structures are to be examined through not only visual inspection but also hammer test.

**Figure 6 Holed ventilator and air pipe**

2) Attention is to be paid to the condition of access hatch coaming, covers, seal rubber and cleats. Additional chalk test or hose test is to be carried out where necessary to verify its weathertightness.

3) Bilge well is to be examined to found out the condition of its coaming, bottom, especially the area right underneath the sounding pipe. Bilge well is to be kept clean with no waste or rubbish stuck. A function test to the bilge system and high level alarm system, if fitted, may be carried out as far as possible.

# Appendix 2

## Lists of Solid Bulk Cargoes for Which a Fixed Gas Fire-extinguishing System May Be Exempted or for Which a Fixed Gas Fire-extinguishing System is Ineffective

MSC.1/Circ.1395
15 June 2011

1. The Maritime Safety Committee, at its sixty-fourth session, agreed that there was a need to provide Administration with guidelines regarding the provisions of SOLAS regulation II-2/10 concerning exemptions from the requirements for fire-extinguishing systems.

2. Consequently, the Committee approved MSC/Circ.671 whereby it agreed to:

.1 a list of solid bulk cargoes, for which a fixed gas fire-extinguishing system may be exempted (table 1) and recommended Member Governments to take into account the information contained in table 1 when granting exemptions under the provisions of SOLAS Reg. II-2/10.7.1.4; and

.2 a list of solid bulk cargoes for which a fixed gas fire-extinguishing system is ineffective (table 2), and recommended that cargo spaces in a ship engaged in the carriage of cargoes listed in table 2 be provided with a fire-extinguishing system which provides equivalent protection. The Committee also agreed that Administrations are to take account of the provisions of SOLAS regulation II-2/19.3.1 when determining suitable requirements for an equivalent fire-extinguishing system.

3. The Maritime Safety Committee, at its seventy-ninth session, reviewed the above-mentioned tables and approved MSC/Circ.1146. The Committee decided that the annexed tables are to be periodically reviewed and invited Member Governments to provide the Organization, when granting exemptions to ships for the carriage of cargoes not included in table 1, with data on the non-combustibility of fire risk properties of such cargoes. Member Governments were also requested to provide the Organization, when equivalent fire-extinguishing systems are required for the agreed carriage of cargoes not included in table 2, with data on the inefficiency of fixed gas fire-extinguishing systems for such cargoes.

4. The Maritime Safety Committee, at its eighty-ninth session, noting the mandatory status of the IMSBC Code, reviewed the aforementioned lists of solid bulk cargoes to align certain names in the lists with those in the recent version of the IMDG Code, and approved them, as set out in tables 1 and 2 of the annex.

5. The purpose of this circular is to provide guidance to Administrations. It should not, however, be considered as precluding Administrations from their right to grant exemptions for cargoes not included in table 1 or to impose any conditions when granting such exemptions under the provisions of SOLAS regulation II-2/10.7.1.4.

6. The circular supersedes MSC/Circ.1146.

# Annex

## Table 1

**List of solid bulk cargoes for which a fixed gas fire-extinguishing system may be exempted**

1. Cargoes including, but not limited to, those listed in regulation II-2/10:
   Ore
   Coal (COAL and BROWN COAL BRIQUETTES)
   Grain
   Unseasoned timber

2. Cargoes listed in the International Maritime Solid Bulk Cargoes (IMSBC) Code, which are not combustible or constitute a low fire risk, as follows:

.1 all cargoes not categorized into Group B in the IMSBC Code; and

.2 the following cargoes categorized into Group B in the IMSBC Code:

ALUMINIUM SMELTING BY-PRODUCTS, UN 3170

(Both the names ALUMINIUM SMELTING BY-PRODUCTS or ALUMINIUM REMELTING BY-PRODUCTS are in use as proper shipping name)

ALUMINIUM FERROSILICON POWDER, UN 1395

ALUMINIUM SILICON POWDER, UNCOATED, UN 1398

CALCINED PYRITES (Pyritic ash)

DIRECT REDUCED IRON Briquettes, hot moulded

FERROPHOSPHORUS (including briquettes)

FERROSILICON, with more than 30% but less than 90% silicon (including briquettes), UN 1408

FERROSILICON with 25% to 30% silicon, or 90% or more silicon (including briquettes)

FLUORSPAR (calcium fluoride)

LIME (UNSLAKED)

LOGS

MAGNESIA (UNSLAKED)

PEAT MOSS

PETROLEUM COKE①

PITCH PRILL

PULP WOOD

RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY MATERIAL (LSA-1), UN 2912 (non fissile - excepted)

RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECT(S) (SCO-1), UN 2913 (non fissile or fissile – excepted)

ROUNDWOOD

SAW LOGS

SILICOMANGANESE

SULPHUR (lump and coarse-grained powder), UN 1350

TIMBER

VANADIUM ORE

WOODCHIPS, with moisture content of 15% or more

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.① When loaded and transported under the provisions of the IMSBC Code.

ZINC ASHES, UN 1435

3. Solid bulk cargoes which are not listed in the IMSBC Code, provided that:

.1 they are assessed in accordance with section 1.3 of the Code;

.2 they do not present hazards of Group B as defined in the Code; and

.3 a certificate has been provided by the competent authority of the port of loading to the master in accordance with 1.3.2 of the IMSBC Code.

## Table 2

## List of solid bulk cargoes for which a fixed gas fire-extinguishing system is ineffective and for which a fire-extinguishing system giving equivalent protection shall be available

The following cargoes categorized into Group B of the IMSBC Code:

ALUMINIUM NITRATE, UN 1438

AMMONIUM NITRATE, UN 1942 (with not more than 0.2% total combustible material, including any organic substance, calculated as carbon to the exclusion of any other added substance)

AMMONIUM NITRATE BASED FERTILIZERS, UN 2067

AMMONIUM NITRATE BASED FERTILIZERS, UN 2071

BARIUM NITRATE, UN 1446

CALCIUM NITRATE, UN 1454

LEAD NITRATE, UN 1469

MAGNESIUM NITRATE, UN 1474

POTASSIUM NITRATE, UN 1486

SODIUM NITRATE, UN 1498

SODIUM NITRATE AND POTASSIUM NITRATE, MIXTURE, UN 1499