Transportstyrelsens författningssamling

TRANSPORT STYRELSEN

TSFS 2017:15

SJÖFART

# Transportstyrelsens föreskrifter om transport till sjöss av skadliga flytande kemikalier i bulk (BCH-koden)

## Innehåll

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TSFS 2017:15

Utkom från trycket
den 24 mars 2017

# Transportstyrelsens föreskrifter om transport till sjöss av skadliga flytande kemikalier i bulk (BCH-koden);

beslutade den 10 mars 2017.

**SJÖFART**

Transportstyrelsen föreskriver följande med stöd av 2 kap. 1 och 4 §§ och 3 kap. 2 och 4 §§ fartygssäkerhetsförordningen (2003:438).

## Tillämpningsområde

**1 §** Som Transportstyrelsens föreskrifter ska gälla den internationella koden för konstruktion och utrustning för fartyg som till sjöss transporterar skadliga flytande kemikalier i bulk (BCH-koden) som antogs av den internationella sjöfartsorganisationen (IMO) den 12 oktober 1971 genom resolution A.212(VII)[1], senast ändrad genom resolution MSC.376(93)[2].

BCH-kodens engelska text i dess gällande lydelse efter ändringar antagna genom resolutionen MSC.376(93) finns i bilagor till dessa föreskrifter.

**2 §** Kemikalietankfartyg får, i stället för dessa föreskrifter, uppfylla kraven i Transportstyrelsens föreskrifter och allmänna råd (TSFS 2014:136) om transport till sjöss av skadliga flytande kemikalier i bulk (IBC-koden).

För kemikalietankfartyg anses kraven i Transportstyrelsens föreskrifter och allmänna råd om transport till sjöss av skadliga flytande kemikalier i bulk (IBC-koden) motsvara kraven i dessa föreskrifter.

**3 §** Kemikalietankfartyg som undergår reparation, ändringar eller modifieringar och utrustas i samband därmed ska fortsätta att uppfylla åtminstone de krav som tidigare var tillämpliga för fartyget. Ett sådant fartyg ska som regel uppfylla kraven för fartyg med byggnadsdatum den 1 juli 1986 eller senare i åtminstone samma utsträckning som innan fartyget undergick reparation, ändringar, modifieringar eller utrustades. Om ett fartyg genomgår väsentlig förändring ska det uppfylla kraven i Transportstyrelsens föreskrifter och allmänna råd (TSFS 2014:136) om transport till sjöss av

[1] A.212(VII), Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk.
[2] MSC.376(93), Amendments to the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH Code).

skadliga flytande kemikalier i bulk (IBC-koden) i den utsträckning som Transportstyrelsen anser vara rimlig och praktiskt möjligt.

Fartyg som konverteras till kemikalietankfartyg ska uppfylla de krav som gäller för ett kemikalietankfartyg med byggnadsdatum det datum då konverteringen påbörjades.

## Ömsesidighetsklausul

**4 §** Tekniska krav i dessa föreskrifter gäller inte för ett fartyg eller dess utrustning om fartyget eller utrustningen

1. lagligen har tillverkats eller har satts på marknaden i en annan medlemsstat inom EU eller i Turkiet, eller
2. lagligen har tillverkats i ett EFTA-land som har undertecknat EES-avtalet.

Om fartyg eller utrustning enligt första stycket inte uppnår en säkerhetsnivå som är likvärdig med den som garanteras genom dessa föreskrifter, ska de tekniska kraven i dessa föreskrifter gälla.

## Definitioner

**5 §** I dessa föreskrifter används följande begrepp med nedan angiven betydelse.

| | |
|---|---|
| *BCH-koden* | the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk, antagen av IMO genom resolution A.212(VII) |
| *fartyg byggda* | fartyg som är kölsträckt eller befinner sig på motsvarande byggnadsstadium |
| *IBC-koden* | the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk, antagen av IMO genom resolution MSC.4(48) och MEPC.19(22) |
| *kemikalietankfartyg* | lastfartyg som är byggt eller anpassat och används för att frakta sådan flytande produkt som finns listad i kapitel 17 i IBC-koden |
| *motsvarande byggnadsstadium* | byggnation som kan identifieras till ett visst fartyg har påbörjats och sammanfogning av fartyget har nått en omfattning av minst 50 ton eller 1 % av den uppskattade totalvikten av allt material som ingår i fartygets struktur, varvid den lägsta angivelsen ska gälla |
| *väsentlig förändring* | ändrade huvuddimensioner eller utökad kapacitet |

## Undantag

**6 §** Transportstyrelsen kan, om det finns särskilda skäl, medge undantag från dessa föreskrifter om det inte strider mot internationella överenskommelser eller gemenskapsrättslig lagstiftning.

## Ikraftträdande- och övergångsbestämmelser

1. Denna författning träder i kraft den 15 april 2017.

2. Sjöfartsverkets och Transportstyrelsens beslut som gäller då denna författning träder i kraft gäller även efter ikraftträdandet av denna författning. Sådana beslut ska anses ha meddelats av Transportstyrelsen och gäller till dess att Transportstyrelsen meddelar ett nytt beslut eller giltighetstiden för beslutet går ut.

På Transportstyrelsens vägnar

JONAS BJELFVENSTAM

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(Sjö- och luftfartsavdelningen)

Utgivare: Kristina Nilsson, Transportstyrelsen, Norrköping ISSN 2000-1975

## Bilaga

**Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH CODE)**

- Chapter IV
  - 4.12
  - 4.15
- Chapter V
  - 5.2.5–5.2.7
- Chapter VA
- Chapter VI
- Chapter VIII
  - 8.3.2.2
- Appendix

RESOLUTION A.212(VII)

## CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK

The Assembly,

*Noting* Article 16(i) of the Convention on the Inter-Governmental Maritime Consultative Organization concerning the functions of the Assembly,

*Recognizing* that the rapid increase in sea transport of hazardous or noxious chemicals in bulk gives rise to the need for international measures to ensure their safe carriage, with a view to minimizing the risk to ships' crews and the environment,

*Having considered* the Recommendation by the Maritime Safety Committee at its twenty-third session,

*Adopts* the Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk, the text of which is set out at Annex to this Resolution,

*Invites* all governments concerned to take appropriate steps to give effect to the Code as soon as possible,

*Recognizing* the need for further elaboration of the Code and in addition for extension of the Code or development of separate codes to cover the carriage of hazardous gases (compressed or liquefied) in bulk and non-propelled vessels engaged in international seagoing and inland water navigation,

*Requests* the Maritime Safety Committee to continue its study on this subject,

*Authorizes* the Maritime Safety Committee to amend the Code and draw up additional codes as necessary in the light of further studies.

ANNEX

# CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK

## PREAMBLE

1. This Code has been developed to provide an agreed international standard for the safe carriage by sea of dangerous chemicals in bulk by prescribing the constructional features of ships involved in such carriage and the equipment they should carry with regard to the nature of the products involved.

The basic philosophy is one of ship types related to the hazards of the various chemicals covered by the Code.

2. The United States publication "Evaluation of the Hazards of Bulk Water Transportation of Industrial Chemicals" was used as the basic guide in evaluating the hazards of the products considered in the Code and supplemented by other hazard rating systems.

3. It is intended that either the Code will be extended or further codes will be drawn up to cover hazardous gases in bulk (compressed or liquefied) and the carriage of dangerous chemicals in non-propelled vessels.

4. It is recognized that the subject of cargo size limitation warrants consideration in the context of the Code. However, in this respect, it is considered that a further study in depth is necessary before any comprehensive provisions can be incorporated. The figures for cargo size limitation which are currently detailed in Chapter V of the Code have therefore been agreed as "holding figures" and it is intended that a deeper study in connexion with this requirement will be undertaken.

5. In order to ensure uniform interpretation and application of the subdivision and damage stability requirements by Administrations the relevant section has to be reviewed.

6. It is recognized that the section on fire protection is at present incomplete and it is intended to await the results of relevant studies currently being undertaken before expanding these provisions. In the meantime, advice should be sought from Administrations with regard to detailed fire protection arrangements.

7. It is intended to re-examine that part of the Code dealing with electrical requirements when work on this subject has been completed by the International Electrotechnical Commission and considered by Administrations.

8. The transitional period for full compliance with the Code by existing ships is not intended to replace any controls over existing ships which may already be in operation in certain countries. During the transitional period, existing ships should comply with the Interim Recommendation for Existing Ships.

9. A list of products which are not considered to come within the scope of the Code is reproduced in Chapter VII. This list may be used as a guide when consideration is being given to the bulk carriage of products whose hazards have not yet been evaluated.

10. The Code will be kept under constant review taking into account both experience and future developments with regard to the bulk carriage of dangerous chemicals.

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## CHAPTER I - GENERAL

### 1.1 *Purpose*

The purpose of the Code is to recommend suitable design criteria, construction standards and other safety measures for ships transporting dangerous chemical substances in bulk so as to minimize the risk to the ship, its crew and the neighbourhood.

### 1.2 *Scope*

1.2.1 *Products* - The Code applies to bulk cargoes of dangerous chemical substances, other than petroleum or similar flammable products as follows:

(a) Products having significant fire hazards in excess of those of petroleum products and similar flammable products.

(b) Products having significant hazards in addition to or other than flammability.

The Code is at present limited to the liquids shown in Chapter VI, Summary of Minimum Requirements. Products that have been reviewed and determined not to come within the scope of the Code are found in Chapter VII.

1.2.2 *Ships* - The Code is at present limited to tankships.

### 1.3 *Hazards*

Hazards of chemicals and other substances considered in this Code are:

(a) *Fire hazard* defined by flashpoint, boiling point, explosion limit range and auto-ignition temperature of the chemical.

(b) *Health hazard* defined by:

(i) irritant or toxic effect on the skin or to the mucuous membranes of the eyes, nose, throat and lungs in the gas or vapour state combined with vapour pressure; or

(ii) irritational effects on the skin in the liquid state; or

(iii) toxic effect via skin absorption, taking into account values of LC 50, LD 50 oral, and LD 50 skin.

(c) *Water pollution hazard* defined by human toxicity, water solubility, volatility, odour or taste, and specific gravity.

(d) *Air pollution hazard* defined by:

(i) Emergency Exposure Limit (E.E.L.) or LC 50;

(ii) Vapour pressure;

(iii) Solubility in water;

(iv) Specific gravity of liquid;

(v) Relative density of vapour.

(e) *Reactivity hazard* defined by reactivity with

(i) other chemicals, or

(ii) water, or

(iii) the chemical itself (including polymerization).

1.4 *Definitions*

1.4.1 *Liquids covered by this Code* are those having a vapour pressure not exceeding 2.8 kp/cm$^2$ (40 psia) at a temperature of 37.8°C (100°F).

1.4.2 *Vapour pressure* is equilibrium pressure of the saturated vapour above the liquid expressed in kp/cm$^2$ (psia) or mm Hg absolute at a specified temperature.

1.4.3 *Flashpoint* is the temperature in °C (°F) at which a liquid will give off enough inflammable vapour to be ignited. Values given in this Code are both "open cup" and "closed cup" which indicate two different types of test equipment.

1.4.4 *Boiling point* is the temperature at which a liquid exhibits a vapour pressure equal to the atmospheric barometric pressure.

1.4.5 *Explosive range* is the range of gas or vapour concentrations (per cent by volume in air) which will burn or explode if an ignition source is present.

1.4.6 *Specific gravity* is the ratio of the weight of a certain volume of a substance to the weight of an equal volume of water. For liquids of limited solubility, the specific gravity will predict whether the product will sink or float on water.

1.4.7 *Vapour density* is the relative density or the ratio of the weight of a vapour or gas (with no air present) to the weight of an equal volume of air at the same pressure and temperature. Values less than 1 indicate that the vapour or gas is lighter than air, while values greater than 1 show that the gas is heavier than air.

1.4.8 *Viscosity* is the shearing resistance of a liquid film which separates two horizontal plates, one of which is being moved across the other. The absolute viscosity of a substance is the force in dynes which will move one square centimetre of a plane surface with a speed of one centimetre per second relative to another parallel plane surface from which it is separated by a layer of the substance one centimetre thick. The kinematic viscosity of a substance is the ratio of the absolute viscosity to the density of the substance at the temperature of measurement.

1.4.9 *Corrosive aggression* is the property of a substance having a destructive effect on the environment by entering into an electrochemical reaction with it.

1.4.10 *Cargo tank area* is that part of the ship that contains cargo tanks and cargo pump rooms and includes cofferdams, void spaces and deck spaces adjacent to and above all such spaces.

1.4.11 *Toxicity limits*

(i) LD 50 Oral: a dose which is lethal to 50 per cent of the test subjects when administered orally;

(ii) LD 50 Skin: a dose which is lethal to 50 per cent of the test subjects when administered to the skin;

(iii) LC 50: the concentration which is lethal by inhalation to 50 per cent of the test subjects.

1.5 *Equivalents*

1.5.1 Where the Code requires that a particular fitting, material, appliance or apparatus, or type thereof, should be fitted or carried in a ship, or that any particular provision should be made, the Administration may allow any other fitting, material, appliance or apparatus, or type thereof, to be fitted or carried, or any other provision to be made in that ship, if it is satisfied by trial thereof or otherwise that such fitting, material, appliance or apparatus, or type thereof, or provision, is at least as effective as that required by the Code.

1.5.2 When an Administration so allows any fitting, material, appliance, apparatus, item of equipment, or type thereof, or provision, procedure, or arrangement, or novel design or application to be substituted hereafter, it should communicate to the Inter-Governmental Maritime Consultative Organization (IMCO), referred to hereafter as the Organization, the particulars thereof together with a report on the evidence submitted that the Organization may circulate the same to other participating governments for the information of their officers.

1.6 *Certification*

1.6.1 The Administration, after having satisfactorily inspected a ship should issue an appropriate certificate. The certificate should contain the following information:

(a) name of ship;

(b) port of registration;

(c) ship type;

(d) cargoes which the ship is permitted to carry;

(e) the conditions of carriage;

(f) any authorized exemptions permitted by the Code.

The ship should be surveyed in respect of the safety equipment provisions of the Code at intervals not exceeding 2 years and the constructional provisions at intervals not exceeding 5 years and the certificate should be suitably endorsed if the ship continues to comply with the appropriate provisions of the Code.

1.6.2 Certificates issued by Administrations in accordance with 1.6.1 should be accepted by other Administrations for all purposes covered by the Code and should be regarded by other Administrations as having the same force as certificates issued by them.

1.7 *Effective date*

1.7.1 The effective date of the Code is 6 months after the Code has been adopted by the IMCO Assembly.

1.7.2 The Code is applicable to vessels whose keel is laid or which are at a similar stage of construction or to vessels whose conversion is begun on or after the effective date.

1.7.3 The Code should also be applicable to existing ships carrying cargoes covered by the Code. Taking into account availability of equipment and services, existing ships should comply with the following provisions of the Code for the cargoes to be carried within the time periods after the effective date as follows:

(a) immediately: all operational requirements of Chapter V including those stated in paragraph 5.6;

(b) within one year: 3.11 and 3.16;

(c) within two years: 2.13, 2.14, 3.8, 3.9, 3.10, 3.13, 3.14, 3.15;

(d) as soon as possible but in any case within 6 years: all other requirements not listed in sub-paragraphs (a) to (c) above such as for requiring alterations or fitting of bulkheads, double bottoms, piping, etc. However, full compliance with 2.2.4(a)(ii), (b)(ii) and (c), and 2.7.1 would not be expected, but with the intent of 2.2.4(a)(iii) and (b)(iii) where relaxations from required distances may be allowed for existing structures provided that cargo tanks in Type II ships are located at least 760 mm (30 inches) from the bottom shell.

1.8 *New products*

Where it is proposed to carry in bulk dangerous liquid chemicals which may be considered to come within the scope of the Code but are not at present designated in Chapter VI, Summary Table of Minimum Requirements, the Administrations involved in such carriage should establish suitable conditions of carriage based on the principles of the Code and notify such conditions to the Organization. During the periodical review of the Code these submissions will be considered for inclusion.

## CHAPTER II - CARGO CONTAINMENT

### A. PHYSICAL PROTECTION (SITING OF CARGO TANKS; FLOATABILITY AND DAMAGE STABILITY)

2.1 *General*

The probability of damage resulting from collision, stranding or other circumstance, to a ship carrying a dangerous chemical in bulk leading, sooner or later, to uncontrolled release of the cargo cannot be discounted. Therefore, the siting of the cargo tanks in relation to the ship's side and bottom (which would afford a degree of protection from external damage to the

cargo containment), and the extent to which the ship should be capable of remaining afloat subsequent to such damage should be related to the extent to which escape of that cargo, taking into account the nature and severity of its hazard to the environment, could be tolerated.

2.1.1 Three degrees of physical protection are employed. The highest standard of such protection - Type I - is required for the substances considered to have the greatest environmental hazard, with reduced standards - Types II and III - for substances of progressively lesser hazard.

2.1.2 The required degrees of physical protection for the transport of individual substances are shown in column b of the Summary of Minimum Requirements, Chapter VI.

2.1.3 Where it is intended to transport more than one substance, the requirements for ship survival of damage should correspond to the most dangerous substance, but the cargo containment requirement need only conform to the specified minimum requirements for the chemicals taken individually.

2.2 *Ship Types*

2.2.1 *General* - Ships subject to this Code may be assigned the minimum freeboard permitted by the International Convention on Load Lines, 1966. The additional requirements in 2.2.4, taking into account any empty or partially filled tank as well as the specific gravities of cargoes to be carried, however, should govern the allowed operating draught for any actual condition of loading. To this end all ships engaged in the transport of chemicals in bulk should be supplied with loading and stability manuals for the information and guidance of the master. These manuals should contain details concerning the loaded conditions of full and empty or partially empty tanks, the position of these tanks in the ship, the specific gravities of the various parcels of cargoes carried, and any ballast arrangements, in critical conditions of loading. Provisions for evaluating other conditions of loading should be contained in the manuals.

2.2.2 *Damage assumption* - In establishing criteria in regard to siting of cargo tanks and ships stability, it is necessary to define the assumed damages and to state the conditions of survival and of cargo containment. The following main assumed damage conditions will apply. In those cases where the machinery space is to be treated as a floodable compartment, a permeability of 0.85 is to be assumed therein. The permeability of other spaces subject to flooding should be so determined as to reflect the limitations of cargo, fuel or ballast loaded. Such limitations should be included in the information to be supplied to the master.

(a) *Collision damage*

| | | |
|---|---|---|
| (i) | Longitudinal extent: | $\frac{1}{3}L^{\frac{2}{3}}$ or 14.5 m ($0.495L^{\frac{2}{3}}$ or 47.6 feet), whichever is less |
| (ii) | Transverse extent: (inboard from the ship's side at right angles to the centre-line at the level of the load line) | $\frac{B}{5}$ or 11.5 m (37.7 feet), whichever is less |
| (iii) | Vertical extent: | from the base line upwards without limit |

(b) *Stranding*

| | | For 0.3L from the forward perpendicular of ship | Any other part of ship |
|---|---|---|---|
| (i) | Longitudinal extent: | $\frac{L}{10}$ | $\frac{L}{10}$ or 5 m (16.4 feet) whichever is less |
| (ii) | Transverse extent: | $\frac{B}{6}$ or 10.0 m (32.8 feet) whichever is less | 5 m (16.4 feet) |
| (iii) | Vertical extent from the base line: | $\frac{B}{15}$ or 6 m (19.7 feet) whichever is less | |

where: L, B in metres (feet) for any part of the ship and perpendicular are as defined in Regulation 3 of the International Convention on Load Lines, 1966

(c) *Minor side damage*

Damage from tugs, piers, etc., should be taken as:

| | |
|---|---|
| Transverse extent: (inboard from the ship's side at right angles to the centre-line at the level of the deepest load line) | 760 mm (30 inches) |

2.2.3 *Survival assumption* - The ship is considered to survive the conditions of damage specified for each Ship Type (see 2.2.4) if she remains afloat in a condition of stable equilibrium and satisfying the following stability criteria:

(a) The stability in the final condition of flooding may be regarded as sufficient if the righting lever curve has a minimum range of 20° beyond the position of equilibrium in association with a residual righting lever of at least 100 mm (4 inches). The unflooded volume of the poop superstructure around the machinery space casing, provided the machinery casing is watertight at this level, may be taken into consideration in which case the damage waterline should not be above the after end of the top of the poop superstructure deck at the centreline.

(b) The angle of heel in the final condition of flooding should not exceed 15°, except that if no part of the deck is immersed, an angle of heel up to 17° may be accepted. For ships less than 150 m (492 feet) in length, the Administration may accept an angle of heel not exceeding 25° provided it is positively shown that a lesser limit is not reasonably obtainable, and that all other provisions stated in sub-paragraph (a) of this paragraph are complied with.

2.2.4 *Ship Type requirements*

(a) *Type I ship*

(i) *General*

A Type I ship is designed to transport products which require maximum preventive measures to preclude escape of such cargo.

(ii) *Ship capability*

The ship should be capable of sustaining anywhere in her length collision damage (2.2.2(a)) or stranding damage (2.2.2(b)) and surviving as specified in 2.2.3.

(iii) *Cargo tank location*

Tanks intended for carriage of cargoes which are required to be transported in a Type I ship should be located outside the extent of the damage specified in 2.2.2(a) and 2.2.2(b), and should nowhere be closer to the ship's shell than 760 mm (30 inches).

(b) *Type II ship*

(i) *General*

A Type II ship is designed to transport products which require significant preventive measures to preclude the escape of such cargo.

(ii) *Ship capability*

(1) A ship of 150 m (492 feet) in length or less should be capable of sustaining collision damage (2.2.2(a)) or stranding damage (2.2.2(b)) anywhere in her length except involving either of the bulkheads bounding a machinery space located aft, and surviving as specified in 2.2.3.

(2) A ship of more than 150 m (492 feet) in length should be capable of sustaining collision damage (2.2.2(a)) or stranding damage (2.2.2(b)) anywhere in her length and surviving as specified in 2.2.3.

(iii) *Cargo tank location*

Tanks containing cargoes which are required to be transported in a Type II ship should be located outside the extent of damage specified in 2.2.2(b) and 2.2.2(c).

(c) *Type III ship*

(i) *General*

A Type III ship is designed to carry products of sufficient hazard to require a moderate degree of containment to increase survival capability in a damaged condition.

(ii) *Ship capability*

(1) A Type III ship of 125 m in length and over should be capable of sustaining collision damage (2.2.2(a)) or stranding damage (2.2.2(b)) anywhere in her length except involving either of the bulkheads bounding a machinery space located aft and surviving as specified in 2.2.3.

(2) A Type III ship below 125 m in length should be capable of sustaining collision damage (2.2.2(a)) or stranding damage (2.2.2(b)) anywhere in her length and surviving as specified in 2.2.3 with the exception of damage to the machinery space. In addition to the foregoing the ability to survive flooding of the machinery space should be determined by the Administration.

(iii) *Cargo tank location*

No special requirements.

2.2.5 *Special considerations for small ships* - In the case of small ships intended for the carriage of cargoes requiring Type I or Type II containment which do not comply in all respects with the requirements in 2.2.4(a)(ii) and 2.2.4(b)(ii) above special dispensations may only be considered by the Administration where alternative measures can be taken which maintain the same degree of safety. In the approval of the design of a ship for which a dispensation has been granted, the nature of the alternative measures prescribed should be clearly stated and be available to the Administration in the countries the ship will visit and any such dispensation should be duly noted on the Certificate (1.6).

B. TANK TYPES

2.3 *Installation*

2.3.1 *Integral tank* - A cargo containment envelope which forms part of the ship's hull and may be stressed in the same manner and by the same loads which stress the continuous hull structure. An integral tank is essential to the structural completeness of its ship's hull.

2.3.2 *Independent tank* - A cargo containment envelope which is not a contiguous part of the hull structure. An independent tank is built and installed so as to eliminate whenever possible (or in any event, to minimize) its stressing as a result of stressing or motion of the adjacent hull structure. An independent tank is not essential to the completeness of its ship's hull.

2.4 *Design and construction*

*Gravity tank* - Tanks having a design pressure not greater than 0.7 kp/cm$^2$ (10 psig) at the top of the tank. Gravity tanks may be independent or integral. Gravity tanks should be constructed and tested according to the standards of the Administration.

2.5 *Requirements for individual substances*

Tank type requirements (covering both installation and design) for individual substances are shown in column c of the Summary of Minimum Requirements, Chapter VI.

C. SHIP ARRANGEMENTS

2.6 *Cargo segregation*

2.6.1 A cargo subject to the provisions of the Code should be segregated from machinery and boiler spaces, accommodation and service spaces and drinking water and stores for human consumption by means of a cofferdam, void space, pump room, empty tank, fuel tank or other similar space, except where otherwise excluded by the Code.

2.6.2 Cargoes which react in a hazardous manner with other cargoes should:

(a) be separated from such other cargoes by means of a cofferdam, void space, pump room, empty tank, or a mutually compatible cargo;

(b) have separate pumping and piping systems which should not pass through other cargo tanks containing such cargoes, unless encased in a tunnel; and

(c) have separate tank vent systems.

2.6.3 Cargo piping should not pass through any accommodation or machinery space, other than pump rooms.

2.6.4 A cargo subject to the provisions of the Code should not be stowed either in the fore or after peak tanks.

2.7 *Accommodation spaces*

2.7.1 No accommodation spaces should be located over cargo tanks or pump rooms and no cargo tanks should be aft of the forward end of accommodation.

2.7.2 In order to guard against the danger of hazardous vapours, due consideration should be given to the location of air intakes and openings into accommodation and machinery spaces in relation to cargo piping and tank vent systems.

2.7.3 Doors and air ports in the accommodation should be on the house sides at least L/25 and not less than 3.05 m (10 feet) aft of the forward end of the house and the cargo tank area. Port lights located on the forward bulkhead or along the house sides within L/25 but not less than 3.05 m (10 feet) aft of the forward bulkhead should be of the fixed type. Wheelhouse windows may be non-fixed and wheelhouse doors may be located within the above limits. However, they are to be so designed that a rapid and efficient gas- and vapour-tightening of the wheelhouse can be ensured.

2.8 *Cargo pump rooms*

2.8.1 Pump rooms should be so arranged as to ensure unrestricted passage at all times from any ladder platform and from the floor.

2.8.2 Permanent arrangements should be fitted for hoisting an unconscious person with a rescue line whilst avoiding any projecting obstacles.

2.8.3 Pump rooms should be so arranged as to ensure unrestricted access to all valves necessary for cargo handling for a person wearing the required personnel protective equipment.

2.8.4 Guard railings should be installed on all ladders and platforms.

2.8.5 Normal access ladders should not be fitted vertical, and should incorporate platforms at suitable intervals.

2.8.6 Arrangements should be installed to deal with drainage and any possible leakage from cargo pumps and valves in pump rooms. The bilge system serving the pump room should be operable from outside the pump room. One or more slop tanks for storage of contaminated bilge water or tank washings should be provided. A shore connection with a standard coupling or other facilities should be provided for transferring contaminated water to on-shore slop tanks.

2.8.7 Pump discharge pressure gauges should be provided outside the pump room.

2.8.8 For cargo pump requirements for certain products see column j of the Summary of Minimum Requirements, Chapter VI.

2.9 *Access to void spaces, cargo tanks and other spaces in the cargo tank area*

Arrangements for void spaces, cargo tanks and other spaces in the cargo tank area should be such as to ensure adequate access for complete inspection of any such space while the required personnel protective equipment is being worn and, in the event of injury, to allow unconscious personnel to be removed from the space. Access to cargo tanks should be direct from the open deck.

D. CARGO TRANSFER

2.10 *Piping arrangements*

Cargo piping systems should be designed, arranged and fabricated in accordance with the standards of the Administration taking into account the following provisions.

2.10.1 All piping system components should have a pressure rating not less than the maximum pressure to which the system may be subjected. Piping which is not protected against over pressure by a pressure relief valve, or which can be isolated from its relief valve should be designed to withstand the greatest pressure the piping would experience in service, taking into consideration:

(a) cargo vapour pressure at the appropriate reference temperature;

(b) pressure rating of the cargo tank;

(c) maximum discharge pressure of the associated pump and its relief valve setting; and

(d) maximum hydrostatic pressure that could be generated in the piping during normal operations.

2.10.2 Piping connections to tanks should be protected against mechanical damage and tampering. Other than for approved connections to shut-off valves and expansion joints cargo piping should be joined by welding.

2.10.3 Cargo piping should not be installed under deck between the outboard side of the cargo containment spaces and the skin of the ship unless clearances required for damage protection (see 2.1 and 2.2) are maintained; but such distances may be reduced where damage to the pipe would not cause release of cargo provided that the clearance required for inspection purposes is maintained.

2.10.4 Runs of cargo piping, located below the main deck, may run from the tank they serve and penetrate tank bulkheads or boundaries common to adjacent (longitudinally or transversally) cargo tanks, ballast tanks, empty tanks, or pump rooms, provided that inside the tank they serve they are fitted with a stop valve operable from the weather deck and provided cargo compatibility is assured in the event of piping failure.

2.10.5 In any pump room where a pump serves more than one tank, a stop valve should be fitted in the line to each tank.

2.10.6 Runs of cargo piping installed in pipe tunnels should also comply with the requirements of 2.10.4 and 2.10.5 and should satisfy all tank requirements for construction, location and ventilation and electrical hazard requirements. Cargo compatibility should be assured in the event of a piping failure. The tunnel should not have any other openings except to the weather deck and the pump room.

2.11 *Cargo transfer control systems*

2.11.1 For the purpose of adequately controlling the cargo, cargo transfer systems should be provided with the following:

(a) One stop valve capable of being manually operated on each tank filling and discharge line, located near the tank penetration; if individual deepwell pumps are used to discharge the contents of each cargo tank a stop valve at the tank is not required on the discharge line.

(b) One stop valve at each cargo hose connection.

(c) Remote shutdown devices for all cargo pumps and similar equipment.

2.11.2 For certain products additional cargo transfer control requirements are shown in column j of the Summary of Minimum Requirements, Chapter VI.

2.12 *Cargo hoses carried aboard the ship*

Transfer hoses for liquid and vapour cargoes should be constructed of suitable material resistant to the action of the cargoes. Design, construction and testing of hoses should be to the standards of the Administration but in no case should the burst pressure of the hose be less than five times its service pressure.

E. TANK VENT SYSTEMS

2.13 *General*

2.13.1 All cargo tanks should be provided with a venting system appropriate to the cargo being carried. Tank vent systems should be designed so as to minimize the possibility of cargo vapour accumulating about the decks, entering accommodation and machinery

spaces, and, in the case of flammable vapours, other spaces containing sources of ignition. They should also be designed to minimize possible spraying onto the decks of those cargoes offering a significant skin contact health hazard. Vent outlets should be arranged to prevent entrance of water into the cargo tanks and, at the same time, should direct the vapour discharge upwards in the form of unimpeded jets. Provision should be made to ensure that the liquid head in any tank does not exceed the test head of that tank.

2.13.2 Vent pipes should be of sufficient size allowing for flame screens if fitted, to permit loading at the design rate without over pressuring the cargo tanks.

2.13.3 Any flame screens fitted to the discharge openings of vent systems should be easily accessible and removable for cleaning.

2.13.4 Suitable provision should be made for drainage of vent lines.

2.13.5 Tank vent piping connected to cargo tanks of corrosion-resistant material, or which are lined or coated to handle special cargoes as required by the Code should be similarly lined or coated, or constructed of corrosion-resistant material.

2.14 *Types of tank vent systems*

2.14.1 *Open venting* - An open venting system is one which offers no restriction, except for friction losses and flame screens if fitted, to the free flow of cargo vapours to and from the cargo tanks during normal operations and should only be used for those cargoes with a flashpoint above 60°C (140°F) and not offering a significant inhalation health hazard. An open venting system may consist of individual vents from each tank, or such individual vents may be combined into a common header or headers, with due regard for cargo segregation. However, in no case should shut-off valves be fitted either to the individual vents or to the header.

2.14.2 *Controlled venting* - A controlled venting system is one in which pressure-vacuum relief valves are fitted to each tank to limit the pressure or vacuum in the tank and should be used for cargoes other than those for which open venting is permitted. A controlled venting system may consist of individual vents from each tank, or such individual vents, on the pressure side only, as may be combined into a common header or headers with due regard for cargo segregation. In no case should shut-off valves be fitted either above or below pressure-vacuum relief valves but provision may be made for bypassing the pressure-vacuum relief valves under certain operating conditions. The heights of vent exits should not be less than 4 m (13.1 feet) above the weather deck or above the fore and aft gangway if fitted within 4 m of the gangway. Lesser vents heights may be employed where comparable cargo vapour dispersion is obtained with high velocity vent valves. The vent exits should also be arranged at a distance of at least 10 m (32.8 feet) from the nearest air intake or openings to accommodation and service spaces and ignition sources. Flammable vapour outlets should be provided with readily renewable and effective flame screens or safety heads of an approved type.

F. CARGO TEMPERATURE CONTROL

2.15 *General*

2.15.1 When provided, cargo heating or cooling systems should be constructed, fitted and tested to the satisfaction of the Administration. Materials used in the construction of temperature control systems should be suitable for use with the cargo to be carried.

2.15.2 Heating or cooling media should be approved for use with the specific cargo. Where cargo is highly water reactive, water or steam should not be used as the media. Consideration should be given to the surface temperature of heating coils or ducts to avoid dangerous reactions from localized overheating of cargo.

2.15.3 For any heating or cooling system means should be provided to isolate the system for each tank and to regulate the flow.

2.15.4 In any heating or cooling system means should be provided to ensure that, when in any other but the empty condition, a higher pressure is maintained within the system than the maximum pressure head that could be exerted by the cargo tank contents on the system.

2.15.5 Means should be provided for measuring the cargo temperature. When overheating or overcooling could result in a dangerous condition an alarm system which monitors the cargo temperature should be provided.

2.15.6 Where products with a significant toxic hazard are being heated or cooled, the heating or cooling media should operate:

(a) in a circuit independent of other ship's services; or

(b) in a system external to the tank; or

(c) in a circuit where the liquid is sampled to check for the presence of cargo before it is recirculated in the heater or cooler. The sampling device should be located within the cargo area.

2.16 *Additional requirements*

For certain products additional requirements are shown in column j of the Summary of Minimum Requirements, Chapter VI.

G. MATERIALS OF CONSTRUCTION

2.17 *General*

Structural materials used for tank construction, together with associated piping, pumps, valves, vents and their adjoining materials, should be suitable at the carriage temperature and pressure, for the cargo to be carried to the satisfaction of the Administration. Steel is assumed to be the normal material of construction. Where applicable the following should be taken into account in selecting the material of construction:

(a) notch ductility at the operating temperature;

(b) corrosive effect of the cargo;

(c) possibility of hazardous reactions between the cargo and the material of construction; and

(d) suitability of linings and coatings.

2.18 *Additional requirements*

For certain products additional requirements are shown in column j of the Summary of Minimum Requirements, Chapter VI.

H. *Environmental Control of Vapour Space in Cargo Tanks and Void Spaces Surrounding such Tanks*

2.19 *General*

2.19.1 Vapour spaces within cargo tanks and in some cases spaces surrounding cargo tanks, may require to have specially controlled atmospheres.

2.19.2 Three different types of control are:

(a) *Inerting* - by filling and maintaining the cargo tank and associated piping systems (and, where necessary, the spaces surrounding the tanks) with a gas or vapour which will not support combustion and which will not react with the cargo.

(b) *Padding* - by filling and maintaining the cargo tank and associated piping system (and, where necessary, the spaces surrounding the tanks) with a liquid, gas or vapour which separates the cargo from the air.

(c) *Ventilation* - forced or natural.

2.19.3 Arrangements required in connexion with (a) and (b) above are:

(a) An adequate supply of inert gas for use in filling and discharging should be carried or should be manufactured on board unless a shore supply is available.

(b) In addition, sufficient inert gas should be available on the ship to compensate for normal losses and arrangements should be made so that a small positive pressure is maintained in the space concerned.

(c) Where padding is used similar arrangements for supply of the padding medium should be made as required for inert gas in (a) and (b) of this paragraph.

(d) Means should be provided for monitoring ullage spaces containing a gas blanket to ensure that the correct atmosphere is being maintained; and

(e) Inerting and/or padding arrangements where used with flammable cargoes should be such as to minimize the creation of static electricity during the admission of the inerting media.

2.20 *Environmental control requirements for individual substances*

The necessity for environmental control for certin products is shown in column e of the Summary of Minimum Requirements, Chapter VI.

2.21 *Ballast and slop tank arrangements*

2.21.1 *Permanent ballast tanks* - Pumps, ballast lines, vent lines, and other similar equipment serving permanent ballast tanks should be isolated from similar equipment serving cargo tanks and from cargo tanks themselves. Permanent ballast tanks should not be used if adjacent cargo tanks contain dangerously water-reactive cargo. Discharge arrangements for permanent ballast tanks sited immediately adjacent to cargo tanks should be outside engine room and accommodation spaces. Filling arrangements may be in the engine room provided that such arrangements ensure filling from tank deck level and non-return valves are fitted.

2.21.2 *Slop tanks and cargo tanks used for ballast or slops* - Cargoes which are dangerously water-reactive should not be placed in tanks adjacent to slop tanks and cargo tanks containing ballast or slops. Pumps, pipes or vent lines serving such tanks should be isolated from similar equipment serving tanks containing cargo dangerously reactive with water. Slop tank lines or ballast lines should not pass through tanks containing cargoes which are dangerously reactive with water unless encased in a tunnel.

2.22 *Bilge pumping arrangements from spaces within the cargo tank area*

Bilge pumping arrangements for pump rooms, void spaces, slop tanks, double bottom tanks and similar spaces should be situated entirely within the cargo tank area except where such spaces are separated from cargo tanks by a double bulkhead.

2.23 *Pump and pipeline identification*

Provisions should be made for the distinctive marking of pumps, valves and pipelines to identify the service and tanks which they serve.

## CHAPTER III - SAFETY EQUIPMENT AND RELATED CONSIDERATIONS

### A. VENTILATION IN CARGO HANDLING SPACES

3.1 *Spaces normally entered during cargo handling operations*

3.1.1 *General* - Pump rooms and other closed spaces which contain cargo handling equipment and similar spaces in which work is performed on the cargo should be fitted with mechanical ventilation systems which should be capable of being controlled from outside such spaces. Provisions should be made to ventilate such spaces prior to entering the compartment and operating the equipment.

3.1.2 *Mechanical ventilation systems*

(a) Mechanical ventilation inlets and outlets should be arranged to ensure sufficient air movement through the space to avoid the accumulation of toxic and/or flammable vapours (taking into account their vapour densities) and to ensure sufficient oxygen to provide a safe working environment but in no case should the ventilation system have a capacity of less than 30 changes of air per hour based upon the total volume of the space. For certain products increased ventilation rates for pump rooms are prescribed in 4.13.

(b) Ventilation systems should be permanent and should normally be of the extraction type. Extraction from above and below the floor plates should be possible. In rooms housing motors driving cargo pumps, the ventilation should be of the positive pressure type.

(c) Ventilation exhaust ducts should discharge upwards in locations well away from ventilation intakes, accommodation, working or other similar spaces.

(d) Ventilation intakes should be so arranged as to minimize the possibility of re-cycling hazardous vapours from any ventilation discharge opening.

(e) Ventilation ducts should not be led through engine rooms, accommodation, working or other similar spaces.

(f) Ventilation fans should be approved by the Administration for operation in explosive atmospheres when flammable cargoes are carried aboard the ship.

(g) Sufficient spare parts should be carried for each type of fan on board.

(h) Flame screens should be installed in ventilation ducts when flammable cargoes are carried aboard the ship.

3.2 *Spaces not normally entered*

Cofferdams, duct keels, pipe tunnels, spaces containing cargo tanks and other spaces where cargo may accumulate should be capable of being ventilated to ensure sufficient air to avoid the accumulation of toxic and/or flammable vapours and to ensure sufficient oxygen to provide a safe environment. Where a permanent ventilation system is not provided for such spaces, approved portable means of mechanical ventilation should be provided.

B. ELECTRICAL REQUIREMENTS IN RESPECT OF FLAMMABLE CARGOES

3.3 *General*

Electrical installations should be such as to minimize the risk of fire and explosion from flammable cargoes. Care should be taken to exclude sources of ignition from areas where flammable vapours may be present.

3.4 *Installations in pump rooms and spaces containing cargo tanks or pipes*

3.4.1 Generally no electrical installations should be permitted in spaces containing cargo tanks or pipes.

3.4.2 Only gauging and monitoring equipment of intrinsically safe design should be used in cargo tanks or in spaces containing cargo tanks or pipes. Consideration for the use of submerged motors and pumps may be given by the Administration.

3.4.3 Only lighting equipment of explosion proof design should be used in pump room.

3.5 *Installation in enclosed spaces immediately aft of - forward of - or above the cargo tank area*

3.5.1 Any electrical gauging or monitoring equipment should be of intrinsically safe design.

3.5.2 Electrical equipment of explosion proof design may be used in spaces where forced ventilation is fitted.

3.5.3 Electrical equipment of enclosed ventilated design may be used provided the spaces may be regarded as non-hazardous, and to which entrances and ventilation openings are situated at a safe distance from gas vents, exhaust outlets, etc.

3.6 *Installations on open decks*

3.6.1 Electrical equipment of explosion proof design only should be used on the cargo deck.

3.6.2 Electrical equipment of enclosed ventilated design may be used on decks other than the cargo deck provided the equipment is situated at a safe distance from gas vents, exhaust outlets, tank openings, pipe flanges or cargo valves and at a safe height above the deck.

3.7 *Bonding*

Independent cargo tanks should be electrically bonded to the hull.

3.8 *Electrical requirements for individual substances*

Electrical requirements for individual substances are shown in column f of the Summary of Minimum Requirements, Chapter VI.

C. GAUGING

3.9 *General*

Cargo tanks should be fitted with one of the following types of gauging devices:

(a) *Open device* which makes use of an opening in the tank and may expose the gauger to the cargo or its vapour. An example of this is the ullage opening.

(b) *Restricted device* which penetrates the tank and which, when in use, permits a small quantity of cargo vapour or liquid to be exposed to the atmosphere. When not in use, the device is completely closed. The design should ensure that no dangerous escape of tank contents (liquid or spray) can take place in opening the device.

(c) *Closed device* which penetrates the tank, but which is part of a closed system and keeps tank contents from being released. Examples are the float-type systems, electronic probe, magnetic probe and protected sight glass.

(d) *Indirect device* which does not penetrate the tank shell and is independent of the tank. An indirect measurement for determining the amount of cargo is used such as weighing of cargo, pipe flow meter, etc.

3.10 *Gauging for individual substances*

Types of gauging for individual substances are shown in column g of the Summary of Minimum Requirements, Chapter VI.

D. VAPOUR DETECTION

3.11 *General*

3.11.1 Ships carrying toxic and/or flammable cargoes should be equipped with at least two instruments designed and calibrated for testing for the specific vapours in question. If such instruments are not capable of testing for both toxic concentrations and flammable concentrations, then two separate sets of instruments should be provided.

3.11.2 Vapour detection instruments may be portable or fixed. If a fixed system is installed, at least one portable instrument should be provided.

3.12 *Requirements for individual substances*

Vapour detection requirements for individual substances are shown in column h of the Summary of Minimum Requirements, Chapter VI.

E. FIRE PROTECTION

3.13 *Fire-extinguishing arrangements*

3.13.1 All ships irrespective of size carrying cargoes which are subject to this Code should be subject to Regulation 65 of Chapter II of the International Convention for the Safety of Life at Sea, 1960.

3.13.2 All sources of ignition should be excluded from spaces where flammable vapours may be present.

3.14 *Fire-extinguishing equipment*

3.14.1 Suitable fire-extinguishing equipment for all products to be carried should be provided and kept in good operating order.

3.14.2 For products evolving flammable vapours such equipment should include a fixed fire-extinguishing system approved by the Administration for the cargoes to be carried. $CO_2$ and steam-smothering systems should be avoided unless due consideration is given to the danger of static electricity.

3.15 *Fire-extinguishing media*

Fire-extinguishing media considered to be suitable for certain products are listed for information in column i of the Summary of Minimum Requirements, Chapter VI.

F. PERSONNEL PROTECTION

3.16 *Requirements*

3.16.1 For the protection of crew members who are engaged in loading and discharging operations, the ship should have on board suitable protective equipment consisting of large aprons, special gloves with long sleeves, suitable footwear, coveralls of chemical resistant material, and tight-fitting goggles and/or face shields. The protective clothing and equipment should cover all skin so that no part of the body is unprotected.

3.16.2 Work clothes and protective equipment should be kept in easily accessible places and in special lockers. Such equipment should not be kept within accommodation spaces unless cleaned.

3.16.3 Protective equipment should be used in any operation which may entail danger to personnel.

3.16.4 Ships carrying toxic cargoes should have on board sufficient but not less than 3 complete sets of safety equipment each permitting personnel to enter a gas-filled compartment and perform work there for at least 20 minutes. Such equipment should be in addition to that required by Regulation 65 of Chapter II of the International Convention for the Safety of Life at Sea, 1960.

3.16.5 One complete set of safety equipment should consist of:

(a) one self-contained air-breathing apparatus (not using stored oxygen);

(b) protective clothing, boots, gloves and tight-fitting goggles;

(c) steel cored rescue line with belt; and explosion-proof lamp.

3.16.6 The ship should have on board an adequate supply of air supplied by either a special compressor or by sufficient spare bottles.

3.16.7 At least one set of safety equipment as required in 3.16.5 should be kept in a suitable clearly marked locker in a readily accessible place near the pump room. The other sets of safety equipment should also be kept in clearly marked easily accessible, suitable places.

3.16.8 The compressed air equipment should be inspected at least once a month by a responsible officer. At least once a year the equipment should be inspected and tested by an expert.

3.16.9 A stretcher which is suitable for hoisting an injured person up from spaces such as pump room, should be placed in a readily accessible location.

3.16.10 If the characteristics of a cargo should so require, some form of respiratory protection suitable for such cargo should be available for every person on board.

3.16.11 The ship should have on board medical first aid equipment including oxygen resuscitation equipment and antidotes for cargoes carried.

3.16.12 Suitably marked decontamination showers and an eye wash should be available on deck in convenient locations.

G. TANK FILLING

3.17 *General*

Tanks carrying liquids at ambient temperatures should be so loaded as to avoid the tank becoming liquid full during the voyage having due regard to the highest temperature which the cargo may reach.

## CHAPTER IV - SPECIAL REQUIREMENTS

The provisions of this Chapter are applicable where specific reference is made in column j of the Summary of Minimum Requirements, Chapter VI.

### A. SPECIAL REQUIREMENTS FOR CERTAIN CARGOES

4.1 *Carbon bisulphide*

4.1.1 Provisions should be made to maintain a water pad in the cargo tank during loading, unloading and during transit. In addition, an inert gas pad should be maintained in the ullage space during transit.

4.1.2 All openings should be in the top of the tank above the deck.

4.1.3 Loading lines should terminate near the bottom of the tank.

4.1.4 A standard ullage opening should be provided for emergency sounding.

4.1.5 Cargo piping and vent lines should be independent of piping and vent lines used for other cargo.

4.1.6 Pumps may be used for discharging cargo provided that they are of a type designed to avoid liquid pressure against the shaft gland or are of a submerged type and are suitable for use with cargo.

4.1.7 If a cargo discharge pump is used, it should be inserted through a cylindrical well extending from the tank top to a point near the tank bottom. A blanket of water should be formed in this well before attempting pump removal unless the tank has been certified as gas free.

4.1.8 Water or inert gas displacement may be used for discharging cargo provided the cargo system is designed for the expected pressure and temperature.

4.1.9 Safety relief valves should be of stainless steel construction.

4.1.10 Because of its low ignition temperature and close clearances required to arrest its flame propagation, carbon bisulphide requires safeguards beyond those provided by normal explosion-proof electrical equipment.

4.2 *Ethyl ether*

4.2.1 Unless inerted, natural ventilation should be provided for the voids around the cargo tanks while the vessel is under way. If a mechanical ventilation system is installed, all blowers should be of non-sparking construction. Mechanical ventilation equipment should not be located in the void spaces surrounding the cargo tanks.

4.2.2 Pressure relief valve settings should not be less than 0.2 kp/$cm^2$ (3 psig) for gravity tanks.

4.2.3 Inert gas displacement may be used for discharging cargo from pressure vessel tanks provided the cargo system is designed for the expected pressure.

4.2.4 No electrical equipment except for approved lighting fixtures should be installed in enclosed spaces adjacent to cargo tanks. Lighting fixtures should be approved for use in ethyl ether vapours. The installation of electrical equipment on the weatherdeck should comply with the requirements of this Code.

4.2.5 In view of the fire hazard provisions should be made to avoid any ignition source and/or heat generation in the cargo area.

4.2.6 Pumps may be used for discharging cargo provided that they are of a type designed to avoid liquid pressure against the shaft gland or are of a submerged type and are suitable for use with the cargo.

4.2.7 Provisions should be made to maintain the inert gas pad in the cargo tank during loading, unloading and during transit.

4.3 *Liquid sulphur*

4.3.1 *Cargo tank ventilation*

(a) Cargo tank ventilation should be provided to maintain the concentration of $H_2S$ below one-half of its lower explosive limit throughout the cargo tank vapour space for all conditions of carriage i.e., below 1.85 per cent by volume.

(b) Where mechanical ventilation systems are used for maintaining low gas concentrations in cargo tanks, an alarm system should be provided to give warning if the system fails.

(c) Ventilation systems should be designed and arranged to preclude depositing of sulphur within the system.

4.3.2 *Void spaces*

(a) Openings to void spaces adjacent to cargo tanks should be designed and fitted to prevent the entry of water, sulphur or cargo vapour.

(b) Connections should be provided to enable sampling and analyzing vapour in void spaces.

(c) Temperature controls should be provided.

4.4 *Acetone cyanohydrin*

Acetone cyanohydrin must be stabilized with an inorganic acid to a pH of not more than 2.5.

4.5 *Elemental phosphorus*

4.5.1 Phosphorus should, at all times, be loaded, carried and discharged under a water blanket of 760 mm (30 inches) minimum depth. During discharge operations it should be arranged that water occupy the volume of phosphorus discharged. Any water discharged from a phosphorus tank should be returned only to a shore installation.

4.5.2 Tanks should be designed and tested to a minimum equivalent water head of 2.4 m (8 feet) above the top of the tank, under designed loading conditions, taking into account the depth, specific gravity and method of loading and discharge of the phosphorus.

4.5.3 Tanks should be designed so as to minimize the interfacial area between the liquid phosphorus and its water blanket.

4.5.4 A minimum ullage space of one per cent should be maintained above the water blanket and should be filled with inert gas if phosphorus is carried in the liquid form.

4.5.5 All openings should be at the top of cargo tanks and fittings and joints attached thereto should be of materials resistant to phosphorus pentoxide.

4.5.6 Phosphorus should be loaded at a temperature not exceeding 60°C (140°F).

4.5.7 Tank heating arrangements should be external to tanks and have a suitable method of temperature control to ensure that the temperature of the phosphorus does not exceed 60°C (140°F). A high temperature alarm should be fitted.

4.5.8 A water drench system acceptable to the Administration should be installed in all void spaces surrounding the tanks. The system should operate automatically in the event of an escape of phosphorus.

4.5.9 Void spaces referred to in 4.5.8 above should be provided with effective means of mechanical ventilation which should be capable of being sealed off quickly in any emergency.

4.5.10 Loading and discharge of phosphorus should be governed by a central system on the ship which, in addition to incorporating high level alarms, should ensure that no overflow of tanks is possible and that such operations can be stopped quickly in an emergency from either ship or shore.

4.5.11 During cargo transfer, a water hose on deck should be connected to a water supply and kept flowing throughout the operation so that any spillage of phosphorus may be washed down with water immediately.

4.5.12 Ship to shore loading and discharge connections should be approved by the Administration.

4.6 *Motor fuel anti-knock compounds containing TEL*

4.6.1 Tanks used for these cargoes should not be used for the transportation of any other cargo except those commodities to be used in the manufacture of motor fuel anti-knock compounds containing lead alkyls.

4.6.2 If a pump room is located on deck level according to 4.13.3, the ventilation arrangements should be in compliance with 4.13.2.

4.6.3 Entry into cargo tanks used for the transportation of these cargoes is not permitted unless approved by the Administration.

4.6.4 Air analysis should be made for lead content to determine if the atmosphere is satisfactory prior to allowing personnel to enter the pump room or void spaces surrounding the cargo tank.

4.7 *Propylene oxide*

4.7.1 Propylene oxide transported under provisions of this section should be acetylene free.

4.7.2 No other product should be transported in tanks certified for propylene oxide except that the Administration may approve subsequent transportation of other products and return to propylene oxide service if tanks, piping and auxiliary equipment are satisfactorily cleaned.

4.7.3 All valves, flanges, fittings and accessory equipment should be of a type suitable for use with propylene oxides and should be constructed of steel or stainless steel, or other materials acceptable to the Administration. Impurities of copper, magnesium and other acetylides-forming metals should be kept to a minimum. The chemical composition of all material used should be submitted to the Administration for approval prior to fabrication. Discs or disc faces, seats and other wearing parts of valves should be made of stainless

steel containing not less than 11 per cent chromium. Mercury, silver, aluminium, magnesium, copper and their alloys should not be used for any valves, gauges, thermometers, etc. All packing and gaskets should be constructed of materials which do not react spontaneously with or lower the auto-ignition temperature of the propylene oxides.

4.7.4 Pressure rating of valves, fittings and accessories should not be less than the maximum pressure for which the cargo tank is designed or the shut-off head of the cargo pump, whichever is greater. Threaded joints in the cargo liquid and vapour lines are prohibited.

4.7.5 Filling and discharge piping should extend to within 100 mm (4 inches) of the tank bottom or any sump pit.

4.7.6 Suitable means should be provided to return vapours to the shore during cargo transfer. For this purpose, a valved connection should be provided to a vapour return line to shore.

4.7.7 Tanks carrying propylene oxide should be vented independently of tanks carrying other products.

4.7.8 Manifolds for mounting multiple safety relief valves may be fitted with acceptable interlocking shut-off valves so arranged that at all times the required relief valve capacity will be available to relieve internal pressure. The valving arrangements should be such that no vapour will escape even if the "out-of-service" relief valve is removed.

4.7.9 Enclosed spaces in which cargo tanks are located should be:

(a) inerted by injection of a suitable inert gas or well ventilated and monitored, or

(b) if an inerting system is not installed, be fitted with forced ventilation of such capacity to provide a complete change of air every three minutes and arranged in such a manner that any vapours lost into the space will be removed. The ventilation system should be in operation at all times during cargo transfer.

4.7.10 All ventilation machinery should be of non-sparking constructior

4.7.11 In no case should air be allowed to enter the cargo pump or piping system. During cargo transfer, vapour should not be discharged to the atmosphere.

4.7.12 Prior to disconnecting shore lines, the pressure in liquid and vapour lines should be relieved through suitable valves installed at the loading header. Liquid and vapour from these lines should not be discharged to the atmosphere.

4.7.13 Propylene oxide may be carried in gravity type tanks when carried at pressures less than 0.7 kp/cm$^2$ (10 psig). Tanks should be designed for the maximum pressure expected to be encountered during loading, storing and discharging cargo.

4.7.14 Cargo tanks with a design pressure less than 0.6 kp/cm$^2$ (9 psig) require a cooling system to maintain the propylene oxide below the boiling temperature at the pressure at which it is carried. The cooling system may not be required if it can be demonstrated that the propylene oxide can always be maintained below its boiling temperature at the pressure at which it is carried.

4.7.15

(a) Any cooling system should maintain the liquid temperature below 40°C (104°F) or below the boiling temperature, whichever is less. At least two complete cooling plants, automatically regulated by temperature variations within the tanks should be provided, each to be complete with the necessary auxiliaries for proper operation. The control system should also be capable of being manually operated. An alarm should be provided to indicate malfunctioning of the temperature controls. The capacity of each cooling system should be sufficient to maintain the temperature of the liquid cargo at or below the design temperature of the system.

(b) An alternate arrangement may consist of three cooling plants, any two of which should be sufficient to maintain the liquid temperature at or below the design temperature.

(c) Cooling systems requiring compression of propylene oxide are prohibited.

4.7.16 Pressure relief valve settings should not be less than 0.21 kp/cm$^2$ (3 psig) for gravity tanks.

4.7.17 When propylene oxide is carried, piping systems in propylene oxide service should not be used for any other product and should be completely separate from all other systems. The piping system should be designed so that no cross connection may be made either through accident or design.

4.7.18 Filling density should not exceed 80 per cent for non-refrigerate pressure vessels.

4.7.19 The cargo should be shipped under a suitable protective padding, such as nitrogen gas. Original charging of the gas pad at the loading facility is not adequate. Additional gas should be provided to maintain pad gas concentration. Any padding gas selected should be at least 98.0 per cent pure and free of reactive materials.

4.7.20 Prior to, during, and after loading, if necessary, the cargo tank vapour space should be tested to ensure that oxygen content is 2 per cent or less.

4.7.21 A water spray extinguishing system should be provided in the area where loading and unloading operations are conducted. The capacity and arrangement should be such as to blanket effectively the area in way of the loading manifold and exposed deck piping for propylene oxide. The rate of discharge and the arrangement of piping and nozzles should be such as to give a uniform distribution over the entire area protected. Additionally, means should be provided for local and remote manual operation. The arrangement should ensure that any spilled cargo is washed away. A water hose with pressure to the nozzle, when atmospheric temperatures permit, should be connected ready for immediate use during filling and discharge operations and any spillage of propylene oxide should immediately be washed away. The water spray extinguishing system should provide a uniform spray over the area of application of 0.175 $\ell/m^2.sec$ $\left(0.5 \frac{gallons}{ft^2\ sec}\right)$.

4.7.22 A remote operational, quick closing shut-off valve should be provided at each cargo hose connection used in cargo transfer. Such valves should be of the fail-closed (closed on loss of power) type and be capable of local manual operation. The operating time for such valves should be such as to avoid excessive pressures in the piping on both ship and shore.

4.8 *Acids*

4.8.1 The ship's shell plating should not form any boundaries of tanks containing mineral acids.

4.8.2 Materials of construction of the tanks should be in accordance with 2.17, 2.18 and 4.12. Proposals for lining mild steel tanks and related piping systems with corrosion-resistant materials may be considered by the Administration. The elasticity of the lining should not be less than that of the supporting boundary plating.

4.8.3 Unless constructed wholly of corrosion-resistant materials or fitted with an approved lining, the plating thickness should take into account the corrosivity of the cargo.

4.8.4 Flanges of the loading and discharge manifold connections should be provided with shields which may be portable to guard against the danger of the cargo being sprayed; and, in addition, drip trays should also be provided to guard against leakage on to the deck.

4.8.5 Because of the danger of evolution of hydrogen when these substances are being carried, no electrical equipment or other sources of ignition should be permitted in enclosed spaces adjacent to cargo tanks.

4.8.6 Substances subjected to the requirements of this section should be segregated from oil fuel bunkers in addition to the segregation requirements in 2.6 to 2.9.

4.8.7 Provision should be made for suitable apparatus to detect leakage of cargo into adjacent spaces.

4.8.8 Bilge pumping arrangements from the pump room and spaces immediately adjacent to tanks containing acids and drainage arrangements in pump rooms should be generally of corrosive resistant materials.

4.9 *Toxic products*

4.9.1 Exhaust openings of tank vent systems should be located:

(a) at a height of B/3 or 6 m (20 feet) whichever is greater above the cargo tank;

(b) not less than 6 m (20 feet) above the fore and aft gangway, if fitted within 6 m (20 feet) of the gangway; and

(c) 15 m (49 feet) from any opening or air intake to any accommodation and service spaces.

4.9.2 Tank venting systems should be provided with a connection for a vapour return line to the shore installation.

4.9.3 Products should:

(a) not be stowed adjacent to bunker tanks;

(b) have separate piping systems; and

(c) have separate tank vent systems.

4.10 *Cargoes inhibited against self-reaction*

4.10.1 Certain cargoes as listed in column j of the Summary of Minimum Requirements, Chapter VI, by the nature of their chemical make-up tend to polymerize under certain conditions of temperature, exposure to air or contact with a catalyst. Mitigation of this tendency is carried out by introducing small amounts of chemical inhibitors into the liquid cargo or controlling the cargo tank environment.

4.10.2 Ships carrying these cargoes should be designed to eliminate from the cargo tanks and cargo handling system any material of construction or contaminants which could act as a catalyst or destroy the inhibitor.

4.10.3 Care should be taken to ensure that these cargoes are sufficiently inhibited to prevent polymerization at all times during the voyage. Ships carrying such cargoes should be provided with:

(a) Cargo sampling equipment and test facilities to check at periodic intervals, the inhibitor concentration should it be of a type that deteriorates with age.

(b) A supply of inhibitor and means of introducing and circulating the inhibitor into the cargo while en route, should it be required.

4.10.4 Ships using the exclusion of air as the method of preventing self-reaction of the cargo should comply with 2.19.3.

4.10.5 Venting systems should be of a design that eliminates blockage from polymer buildup. Venting equipment should be of a type that can be checked periodically for adequacy of operation.

4.11 *Cargoes which have a vapour pressure greater than 1.033 kp/cm$^2$ at 37.8°C (14.7 psia at 100°F)*

4.11.1 Unless the tank is specially designed to withstand the vapour pressure of the cargo, provision should be made to maintain the temperature of the cargo below its boiling point at atmospheric pressure.

4.11.2 Connections for returning the expelled gases ashore during loading should be provided.

4.11.3 Each tank should be provided with a pressure gauge indicating the pressure in the vapour space above the cargo.

4.11.4 Where the cargo is being cooled each tank should be provided with thermometers at the top and bottom of the tank.

B. SPECIAL REQUIREMENTS FOR CONSTRUCTION AND EQUIPMENT

4.12 *Materials of construction*

4.12.1 Copper, copper alloys, zinc, aluminium and mercury should not be used as materials of construction for tanks, pipelines, valves, fittings and other items of equipment that may come in contact with cargo liquid or vapour.

4.12.2 Copper, copper alloys, zinc or galvanized steel should not be used as materials of construction for tanks, pipelines, valves, fittings and other items of equipment that may come in contact with cargo liquid or vapour.

4.12.3 Aluminium, magnesium, zinc and lithium should not be used as materials of construction for tanks, pipelines, valves, fittings and other items of equipment that may come in contact with cargo liquid or vapour.

4.12.4 Copper and copper bearing alloys should not be used as materials of construction for tanks, pipelines, valves, fittings and other items of equipment that may come in contact with cargo liquid or vapour.

4.12.5 Aluminium or copper or alloys of either should not be used as materials of construction for tanks, pipelines, valves, fittings and other items of equipment that may come in contact with cargo vapour or liquid.

4.12.6 Aluminium, stainless steel or steel covered with a suitable protective lining or coating should be used as materials of construction for tanks, pipelines, valves, fittings and other items of equipment that may come in contact with cargo liquid or vapour.

4.12.7 Alkaline or acidic materials, such as caustic soda or sulphuric acid, should not be allowed to contaminate this cargo.

4.12.8 The following materials of construction should be used:

(a) for concentrations of 98 per cent or greater, aluminium or stainless steel;

(b) for concentrations of less than 98 per cent, special acid-resistant stainless steel.

4.12.9 Copper, silver, mercury and magnesium or other acetylides-forming metals and their alloys should not be used as materials of construction for tanks, pipelines, valves, fittings and other items of equipment that may come in contact with cargo liquid or vapour.

4.12.10 Copper and copper bearing alloys with greater than one per cent copper should not be used as materials of construction for tanks, pipelines, valves, fittings and other items of equipment that may come in contact with cargo liquid or vapour.

4.13 *Pump rooms*

4.13.1 Pump rooms if fitted should be situated within or adjacent to the cargo tank area.

4.13.2 The ventilation system as described in 3.1.2 should have a minimum capacity of at least 45 changes of air per hour based upon the total volume of space. The ventilation system exhaust ducts should discharge at least 10 m (32.8 feet) away from openings into accommodation spaces, intakes to ventilation systems, work areas or other similar spaces and at least 4 m (13.1 feet) above the tank deck.

4.13.3 Pumps should be located in the cargo tank or the pump room should be located on the deck level. Special consideration by the Administration should be required for below deck pump room.

4.14 *Overflow control*

The provisions of this section are applicable in addition to the required gauging devices where specific reference is made in column j of the Summary of Minimum Requirements, Chapter VI.

4.14.1 *High level alarm* - Cargo tanks should be fitted with an alarm which will indicate when there is imminent danger of the tank being overfilled. Means should be provided to enable the alarm to be tested prior to loading.

4.14.2 *Tank overflow control* - A system acceptable to the Administration should be provided to ensure that cargo tanks while being loaded cannot overflow onto the deck or overboard.

## CHAPTER V - OPERATIONAL REQUIREMENTS

5.1 *Maximum allowable quantity of cargo per tank*

5.1.1 The quantity of a cargo, required to be carried in a Type I ship, should not exceed 1,250 $m^3$ (44143.3 cu.ft.) in any one tank.

5.1.2 The quantity of a cargo, required to be carried in a Type II ship, should not exceed 3,000 $m^3$ (105944 cu.ft.) in any one tank.

5.2 *Cargo information*

5.2.1 Information should be on board and available to all concerned, giving the necessary data for the safe carriage of the cargo. Such information should include for each dangerous chemical carried:

(i) A full description of the physical and chemical properties, including reactivity, necessary for the safe containment of the cargo;

(ii) action to be taken in the event of spills or leaks;

(iii) counter measures against accidental personal contact;

(iv) fire-fighting procedures and fire-fighting media; and

(v) procedures for cargo transfer, tank cleaning, gas freeing and ballasting.

5.2.2 If sufficient information necessary for the safe transportation of the cargo is not available, the cargo should be refused.

5.2.3 Cargoes which evolve highly toxic imperceptible vapours should not be transported unless perceptible additives are introduced into the cargo.

5.3 *Personnel training*

5.3.1 All personnel should be adequately trained in the use of protective equipment and have basic training in the procedures, appropriate to their duties, necessary under emergency conditions.

5.3.2 Personnel involved in cargo operations should be adequately trained in handling procedures.

5.3.3 Officers should be trained in emergency procedures to deal with conditions of leakage, spillage or fire involving the cargo and a sufficient number of them should be instructed and trained in essential first aid for cargoes carried.

5.4 *Tank entry*

5.4.1 Personnel should not enter cargo tanks, void spaces around such tanks, cargo handling spaces, or other enclosed spaces unless:

(i) the compartment is free of toxic vapours and not deficient in oxygen; or

(ii) personnel wear breathing apparatus and other necessary protective equipment and the entire operation is under the close supervision of a responsible officer.

5.4.2 Personnel should not enter such spaces when the only hazard is of a purely flammable nature except under the close supervision of a responsible officer.

5.5 *Opening in cargo tanks*

5.5.1 During handling and carriage of cargoes producing flammable and/or toxic vapours, or when ballasting after the discharge of such cargo, or when loading cargo, cargo tank lids should always be kept closed. With any hazardous cargo, cargo tank lids, ullage and sighting ports, tank washing access covers should be open only when necessary.

5.6 *Additional operational requirements*

Additional operational requirements are found in the following paragraphs of the Code:

| | | |
|---|---|---|
| 1.7.3(a) | 4.2.7 | 4.7.12 |
| 2.5 | 4.3.1 | 4.7.13 |
| 2.6.1 | 4.4 | 4.7.15 |
| 2.6.2(a) and (b) | 4.5.1 | 4.7.17 |
| 2.6.4 | 4.5.4 | 4.7.18 |
| 2.14.2 | 4.5.6 | 4.7.19 |
| 2.15.2 | 4.5.11 | 4.7.20 |
| 2.21.1 | 4.6.1 | 4.7.21 |
| 2.21.2 | 4.6.3 | 4.7.22 |
| 3.11.1 | 4.6.4 | 4.8.4 |
| 3.11.2 | 4.7.1 | 4.8.5 |
| 3.16 | 4.7.2 | 4.8.6 |
| 3.17 | 4.7.6 | 4.9.3(a) |
| 4.1.1 | 4.7.7 | 4.10.1 |
| 4.1.7 | 4.7.9 | 4.10.3 |
| 4.1.8 | 4.7.11 | |

## CHAPTER VI

## SUMMARY OF MINIMUM REQUIREMENTS

| a | b | c | d | e | f | g | h | i | j |
|---|---|---|---|---|---|---|---|---|---|
| *Product Name* | *Ship Type* | *Tank Type* | *Tank Vents* | *Tank Environmental Control* | *Electrical Instruments* | *Gauging* | *Vapour Detection* | (1) *Fire Protection* | *Special Requirements (See Chapter IV)* |
| Acetic Acid | 3 | 2G | Cont | No | SP | R | I | A | 4.8.2, 4.8.3, 4.8.4, 4.8.6, 4.8.7, 4.8.8, 4.12.6 |
| Acetic Anhydride | 2 | 2G | Cont | No | SP | R | I-T | A | 4.8.2, 4.8.3, 4.8.4, 4.8.6, 4.8.7, 4.8.8, 4.12.6 |
| Acetone Cyanohydrin | 2 | 2G | Cont | No | St | C | T | A | 4.4, 4.9, 4.12.6, 4.13.3, 4.14 |
| Acetonitrile | 2 | 2G | Cont | No | SP | R | I-T | A | 4.9, 4.13.1 |
| Acrylonitrile | 2 | 2G | Cont | No | SP | C | I-T | A | 4.9, 4.10, 4.12.3, 4.13.1, 4.13.2, 4.14 |
| Adiponitrile | 3 | 2G | Cont | No | St | R | T | A | — |
| Allyl Alcohol | 2 | 2G | Cont | No | SP | C | I-T | A | 4.9, 4.13.1, 4.13.2, 4.14 |
| Allyl Chloride | 2 | 2G | Cont | No | SP | C | I-T | A | 4.9, 4.13.1, 4.13.2, 4.14 |
| Aminoethylethanolamine | 3 | 2G | Open | No | St | O | No | A | 4.12.1 |
| Ammonia Aqua less than 28% | 3 | 2G | Cont | No | SP | R | T | C | 4.12.4, 4.12.10 |

| a | b | c | d | e | f | g | h | i | j |
|---|---|---|---|---|---|---|---|---|---|
| *Product Name* | *Ship Type* | *Tank Type* | *Tank Vents* | *Tank Environmental Control* | *Electrical Instruments* | *Gauging* | *Vapour Detection* | *Fire Protection* (1) | *Special Requirements (See Chapter IV)* |
| Aniline | 2 | 2G | Cont | No | St | C | T | A | 4.9,.4.13.1, 4.13.2, 4.14 |
| Benzene | 3 | 2G | Cont | No | SP | R | I-T | B | 4.9.1, 4.13.1, 4.13.2 |
| iso-Butyl Acrylate | 2 | 2G | Cont | No | SP | R | I-T | A | 4.10 |
| n-Butyl Acrylate | 2 | 2G | Cont | No | SP | R | I-T | A | 4.10 |
| iso-Butyraldehyde | 3 | 2G | Cont | No | SP | O | I-T | A | 4.12.7 |
| n-Butyraldehyde | 3 | 2G | Cont | No | SP | O | I-T | A | 4.12.7 |
| Camphor Oil | 3 | 2G | Cont | No | SP | O | I | B | — |
| Carbolic Oil | 2 | 2G | Cont | No | SP | C | I-T | A | 4.9, 4.14 |
| Carbon Disulfide | 2 | 1G | Cont | Inert | No Use | C | I-T | C | 4.1, 4.9, 4.14 |
| Carbon Tetrachloride | 3 | 2G | Cont | No | St | R | T | — | 4.9, 4.13.1, 4.13.2 |
| Caustic Soda | 3 | 2G | Open | No | St | O | No | — | 4.12.1 |
| Chlorobenzene | 3 | 2G | Cont | No | SP | R | I-T | B | — |

| a | b | c | d | e | f | g | h | i | j |
|---|---|---|---|---|---|---|---|---|---|
| *Product Name* | *Ship Type* | *Tank Type* | *Tank Vents* | *Tank Environmental Control* | *Electrical Instruments* | *Gauging* | *Vapour Detection* | *Fire Protection (1)* | *Special Requirements (See Chapter IV)* |
| Chloroform | 3 | 2G | Cont | No | St | R | T | – | 4.9 |
| Chlorohydrins, Crude | 2 | 2G | Cont | No | SP | C | I-T | A | 4.9, 4.14 |
| Chloro Sulfonic Acid | 1 | 2G | Cont | No | – | C | T | – | 4.8.2, 4.8.3, 4.8.4, 4.8.5, 4.8.6, 4.8.7, 4.8.8, 4.9, 4.14 |
| Cresols (Mixed isomers) | 3 | 2G | Open | No | St | O | No | B | – |
| Crotonaldehyde | 2 | 2G | Cont | No | SP | R | I-T | A | 4.9, 4.12.7, 4.13.1, 4.13.2 |
| 1,2 Dichloropropane | 2 | 2G | Cont | No | SP | R | I-T | B | 4.9 |
| 1,3 Dichloropropene | 2 | 2G | Cont | No | SP | R | I-T | B | 4.9 |
| Diethanolamine | 3 | 2G | Open | No | St | O | No | A | 4.12.2 |
| Diethylenetriamine | 3 | 2G | Open | No | St | O | No | A | 4.12.2 |
| Diisopropanolamine | 3 | 2G | Open | No | St | O | No | A | 4.12.2 |
| Dimethylamine (40% Aq) | 3 | 2G | Cont | No | SP | R | I-T | C,D | 4.9, 4.12.2 |
| Dimethylformamide | 3 | 2G | Cont | No | SP | R | I-T | B | – |

| a | b | c | d | e | f | g | h | i | j |
|---|---|---|---|---|---|---|---|---|---|
| *Product Name* | *Ship Type* | *Tank Type* | *Tank Vents* | *Tank Environmental Control* | *Electrical Instruments* | *Gauging* | *Vapour Detection* | *Fire Protection* (1) | *Special Requirements (See Chapter IV)* |
| Epichlorohydrin | 2 | 2G | Cont | No | SP | C | I-T | A | 4.9, 4.14 |
| Ethyl Acrylate | 2 | 2G | Cont | No | SP | R | I-T | A | 4.10 |
| Ethyl Ether | 2 | 1G | Cont | Inert | SP | C | I-T | A | 4.2, 4.11, 4.12.9, 4.14 |
| 2 Ethyl 3 Propyl Acrolein | 3 | 2G | Cont | No | SP | R | I-T | A | — |
| Ethylene Cyanohydrin | 3 | 2G | Open | No | St | O | No | A | — |
| Ethylene Diamine | 2 | 2G | Cont | No | SP | R | I-T | A | 4.12.2 |
| Ethylene Dibromide | 2 | 2G | Cont | No | St | R | T | — | 4.1, 4.9 |
| Ethylene Dichloride | 2 | 2G | Cont | No | SP | R | I-T | B | 4.12.4, 4.14.2 |
| Formaldehyde, 37% aqueous solution | 3 | 2G | Cont | No | SP | R | I-T | A | 4.12.7 |
| Formic Acid | 3 | 2G | Cont | No | SP | R | T | A | 4.8.2, 4.8.3, 4.8.4, 4.8.6, 4.8.7, 4.8.8, 4.10.8 |
| Furfural | 3 | 2G | Cont | No | SP | R | I-T | A | 4.12.7 |
| Hydrochloric Acid | 3 | 1G | Cont | No | St | R | T | — | 4.8 |

| a | b | c | d | e | f | g | h | i | j |
|---|---|---|---|---|---|---|---|---|---|
| *Product Name* | *Ship Type* | *Tank Type* | *Tank Vents* | *Tank Environmental Control* | *Electrical Instruments* | *Gauging* | *Vapour Detection* | *Fire Protection (1)* | *Special Requirements (See Chapter IV)* |
| Isoprene | 3 | 2G | Cont | No | SP | R | I | B | 4.10, 4.11 |
| Methyl Acrylate | 2 | 2G | Cont | No | SP | R | I-T | B | 4.10 |
| Methyl Methacrylate | 2 | 2G | Cont | No | SP | R | I-T | B | 4.10 |
| Monoethanolamine | 3 | 2G | Open | No | St | O | I-T | A | 4.12.2 |
| Monoisopropanolamine | 3 | 2G | Open | No | St | O | I-T | A | 4.12.2 |
| Morpholine | 3 | 2G | Cont | No | SP | O | I | A | 4.12.2 |
| M.F. Anti-Knock Compounds | 2 | 1G | Cont | No | SP | C | I-T | C,B | 4.6, 4.9, 4.13.3, 4.14 |
| Nitric Acid, 70% and over | 2 | 2G | Cont | No | St | C | T | — | 4.8.2, 4.8.3, 4.8.4, 4.8.6, 4.8.7, 4.8.8, 4.14 |
| Oleum | 2 | 2G | Cont | No | St | C | T | — | 4.8.2, 4.8.3, 4.8.4, 4.8.5, 4.8.6, 4.8.7, 4.8.8, 4.13.1, 4.13.2, 4.14 |
| Phenol | 2 | 2G | Cont | No | St | C | T | A | 4.9, 4.14 |
| Phosphoric Acid | 3 | 2G | Open | No | St | O | No | — | 4.8.1, 4.8.2, 4.8.3, 4.8.4, 4.8.6, 4.8.7, 4.8.8 |
| Phosphorus | 1 | 1G | Cont | Yes | St | C | No | — | 4.5, 4.14 |

| a | b | c | d | e | f | g | h | i | j |
|---|---|---|---|---|---|---|---|---|---|
| *Product Name* | *Ship Type* | *Tank Type* | *Tank Vents* | *Tank Environmental Control* | *Electrical Instruments* | *Gauging* | *Vapour Detection* | *Fire Protection* (1) | *Special Requirements (See Chapter IV)* |
| Propionic Acid | 3 | 2G | Cont | No | SP | O | I | A | 4.8.2, 4.8.3, 4.8.4, 4.8.6, 4.8.7, 4.8.8, 4.12.6 |
| Propylene Oxide | 2 | 2G | Cont | Inert | SP | C | I-T | A | 4.7 |
| Pyridine | 3 | 2G | Cont | No | SP | R | I | A | 4.12.4 |
| Styrene Monomer | 3 | 2G | Cont | No | SP | O | I | B | 4.10, 4.12.4 |
| Sulfur liquid | 3 | 1G | Open | Yes | SP | O | I-T | — | 4.3 |
| Sulfuric Acid | 3 | 2G | Open | No | St | O | No | — | 4.8 |
| Triethanolamine | 3 | 2G | Open | No | St | O | No | A | 4.12.1 |
| Triethylenetetramine | 3 | 2G | Open | No | St | O | No | A | 4.12.1 |
| Vinyl Acetate | 3 | 2G | Cont | No | SP | O | I | A | 4.10 |
| Vinylidene Chloride | 2 | 2G | Cont | Yes | SP | R | I-T | B | 4.10, 4.11, 4.12.5 |

EXPLANATORY NOTES

| | | |
|---|---|---|
| Ship Type: | 1, 2 or 3 indicates Ship Types I, II or III, respectively as discussed in II.A - Physical Protection | |
| Tank Type: | 1 - Independent tank | G - Gravity tank |
| | 2 - Integral tank | P - Pressure tank |
| Tank Vents: | Open - Open vent | |
| | Cont - Controlled venting | |
| | SR - Safety Relief Valve | |
| Electrical: | St - Standard electrical systems | |
| | SP - Special requirements | |
| Gauging: | O - Open | |
| | R - Restricted | |
| | C - Closed | |
| Vapour Detection: | I - Inflammable vapours | |
| | T - Toxic vapours | |
| Fire Protection: | A - Alc. foam deck system | |
| | B - Reg. foam deck system | |
| | C - Water spray | |
| | D - Dry chemical | |

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Footnotes: (1) Dry chemical may be used as an alternative to either alcohol or regular foam

\- Indicates nil requirement

## CHAPTER VII - LIST OF CHEMICALS TO WHICH THE CODE DOES NOT APPLY

In the following are listed certain products which are not considered to come within the scope of the Code. The list may be used as a guide in considering bulk carriage of products whose hazards have not yet been evaluated.

Acetone
Amyl acetate - iso
" " - n
" " - sec
Amyl alcohol - n
" " - p, iso
" " - sec, n
" " - sec, iso
" " - tert
Butyl acetate - iso
" " - n
" " - sec
Butyl alcohol - iso, n, sec, tert
Cyclohexane
Decyl alcohol - n
Diethylene glycol
Diethylene glycol - monoethyl ether
Dipropylene glycol
Ethyl acetate
Ethyl alcohol
Ethylene glycol
2-Ethyl hexanol
Glycerine
Heptane - n
Hexane - n
Hexylene glycol
Methyl ethyl ketone
Methyl isobutyl ketone
Nonyl Phenol
Petroleum naphtha
Perchloroethylene
Proprionaldehyde
Propyl acetate - iso, n
Propyl alcohol - iso, n
Propylene glycol
Trichloroethane - alpha, beta, 1.1.1
Triethylene glycol
Tripropylene glycol
Turpentine
Xylenes

*12 October 1971*
*Agenda item 8*

MSC 53/24

ANNEX 11

Resolution MSC.9(53)

ADOPTION OF THE REVISED CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (BCH CODE)

adopted on 17 September, 1986

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 29 of the Convention on the International Maritime Organization concerning the functions of the Committee,

RECALLING ALSO resolution A.212(VII), by which the Assembly at its seventh session adopted the Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk (BCH Code), which provides safety requirements for chemical tankers supplementary to the provisions of the International Convention for the Safety of Life at Sea, 1974 (The 1974 SOLAS Convention),

NOTING that the Marine Environment Protection Committee, at its twenty-second session, adopted by resolution MEPC.20(22) the revised BCH Code, incorporating ten sets of amendments adopted by the Maritime Safety Committee, and also amendments to cover marine pollution aspects and that this Code will become mandatory under the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78), when Annex II of that instrument becomes effective on 6 April 1987,

HAVING CONSIDERED the recommendation of the Marine Environment Protection Committee that the above-mentioned amendments to the BCH Code to cover marine pollution aspects be adopted by the Committee in order to ensure that the Code for the purposes of safety and pollution prevention remains identical,

1 ADOPTS the revised BCH Code, the text of which is given in the Annex to the present resolution, and which is identical to the Code adopted by resolution MEPC.20(22);

2 RECOMMENDS Governments concerned to implement the revised BCH Code.

ANNEX

REVISED CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (BCH CODE)

(The revised BCH Code to be annexed to the above MSC resolution will contain the text of the 1985 edition of the Code in IMO publication (Sales number 772 85:05E) incorporating amendments listed in MSC 53/9/1, annex)

***

MSC 53/9/1

ANNEX

Resolution MEPC.20(22)

ADOPTION OF THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (BCH CODE)

adopted on 5 December 1985

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38 of the Convention on the International Maritime Organization concerning the functions of the Committee,

NOTING resolution MEPC 16(22) by which it adopted amendments to the Annex of the Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, 1973, (the 1978 Protocol), to make the provisions of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code) and the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH Code) mandatory under the International Convention for the Prevention of Pollution from Ships, 1973 as modified by the 1978 Protocol (MARPOL 73/78),

NOTING ALSO that the BCH Code was adopted by the Assembly by resolution A.212(VII) and subsequently incorporated ten sets of amendments adopted by the Maritime Safety Committee,

HAVING CONSIDERED the proposed text of the BCH Code which incorporates amendments from the marine pollution point of view developed by the Committee in pursuance of resolution 15 of the International Conference on marine Pollution, 1973,

1. ADOPTS the BCH Code, the text of which is given in the Annex to the present resolution, for the purposes of Annex II of MARPOL 73/78;

2. REQUESTS the Secretary-General to transmit a copy of the present resolution together with the text of the BCH Code to all Members of the Organization and to all Parties to MARPOL 73/78 which are not Members of the Organization.

ANNEX

THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK

(The BCH Code to be annexed to the MEPC resolution will incorporate the amendments listed below)

**Preamble**

Paragraph 1

In the existing text, after the word "dangerous", the words "and noxious" are inserted.

Paragraph 7

Existing paragraph 7 is replaced by the following:

"7 In response to resolution 15 of the International Conference on Marine Pollution, 1973, the Marine Environment Protection Committee at its twenty-second session adopted with resolution MEPC ...(22) the BCH Code extended to cover the marine pollution prevention aspects for the implementation of Annex II to the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78)."

Paragraph 8

In the existing text, after the word "dangerous", the words "and noxious" are inserted.

**1.1 Purpose**

In the existing text, the words "or noxious" are inserted between the words "dangerous" and "chemical".

In the existing text the words "the neighbourhood" are replaced by the words "to the environment".

The following sentence is added to the existing text:

"For the purposes of MARPOL 73/78, the Code applies only to chemical tankers as defined in regulation 1(1) of Annex II thereof, which are engaged in the carriage of noxious liquid substances falling into Category A, B or C and identified as such by an entry of "A, B or C" in column c"."

1.2 **Scope**

1.2.1 In the existing text of the first sentence, the words "and noxious" are inserted between the words "dangerous" and "chemical" and the words "(c) products which may present a hazard to the environment, if accidentally released." are added.

1.3 **Hazards**

The existing text of 1.3 is designated as 1.3.1 and in the first line the words "relating to human life" are inserted between the words "substances" and "considered".

New paragraph 1.3.2 is added to the existing text as follows:

"1.3.2 Hazards of chemicals and other substances relating to the marine environment considered by this Code are:

.1 bioaccumulation with attendant risk to aquatic life or human health or cause tainting to seafood;
.2 damage to living resources;
.3 hazard to human health; and
.4 reduction of amenities."

1.4 **Definitions**

In the existing text of paragraph 1.4.15 after the words "propylene oxide" the words "and ethylene oxide/propylene oxide mixtures with an ethylene oxide content of not more than 30 per cent by weight" are added.

The following definitions are added to the existing text:

"1.4.16A Noxious liquid substance means any substance designated in appendix II to Annex II of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78) or provisionally assessed under the provisions of regulation 3(4) of that Annex as falling into category A, B, C or D."

"1.4.16B Standards for Procedures and Arrangements means the Standards for the Procedures and Arrangements for the Discharge of Noxious Liquid Substances, called for by Annex II of MARPOL 73/78, adopted by the Marine Environment Protection Committee at its twenty-second session by resolution MEPC 18(22) and as may be amended by the Organization."

1.5 **Equivalents**

1.5.2 In the existing text the words "other Parties to MARPOL 73/78 and" are inserted after the words "circulate the same to".

1.6 **Certification**

1.6.3.1 In the existing text the words "to a chemical tanker" the words "engaged in international voyages" are added.

1.7 **Effective date**

1.7.2 The following sentence is added to the existing text of paragraph 1.7.2

"This conversion provision does not apply to the modification of a ship referred to in regulation 1(12) of Annex II of MARPOL 73/78."

1.8 **New products**

In the first line of the existing text between the words "chemicals" and "which" the following words are added:

"and noxious liquid substances of category A, B or C, either of".

2.2 **Ship types**

The following sentence is added to the existing texts of subparagraphs 2.2.4(a)(iii) and 2.2.4(b)(iii)

"This requirement does not apply to the tanks for diluted slops arising from the tank washing."

2.6 **Cargo segregation**

2.6.2 The first line of the existing text is amended to read:
"Cargoes, residues of cargoes or mixtures containing cargoes which react in a hazardous manner with other cargoes, residues or mixtures, should:"

Chapter IV - Special requirements

The existing text of section 4.7 is replaced by the following:

"4.7 Propylene oxide and mixtures of ethylene oxide/propylene oxide with an ethylene oxide content of not more than 30 per cent by weight.

4.7.1 Products transported under the provisions of this section should be acetylene free.

4.7.2 (a) Unless cargo tanks are properly cleaned, these products should not be carried in tanks which have contained as one of the three previous cargoes any products known to catalyse polymerization, such as:

(i) mineral acids (e.g. sulphuric, hydrochloric, nitric);

(ii) carboxylic acids and anhydrides (e.g. formic, acetic);

(iii) halogenated carboxylic acids (e.g. chloracetic);

(iv) sulphonic acids (e.g. benzene sulphonic);

(v) caustic alkalis (e.g. sodium hydroxide, potassium hydroxide);

(vi) ammonia and ammonia solutions;

(vii) amines and amine solutions;

(viii) oxidizing substances.

(b) Before loading, tanks should be thoroughly and effectively cleaned, to remove all traces of previous cargoes from tanks and associated pipework, except where the immediately prior cargo has been propylene oxide or ethylene oxide/propylene oxide mixtures. Particular care should be taken in the case of ammonia in tanks made of steel other than stainless steel.

(c) In all cases, the effectiveness of cleaning procedures for tanks and associated pipework should be checked by suitable testing or inspection, to ascertain that no traces of acidic or alkaline materials remain that might create a hazardous situation in the presence of these products.

(d) Tanks should be entered and inspected prior to each initial loading of these products to ensure freedom from contamination, heavy rust deposits and visible structural defects. When cargo tanks are in continuous service for these products, such inspections should be performed at intervals of not more than two years.

(e) Tanks for the carriage of these products should be of steel or stainless steel construction.

(f) Tanks for the carriage of these products may be used for other cargoes after thorough cleaning of tanks and associated pipework systems by washing or purging.

4.7.3 (a) All valves, flanges, fittings and accessory equipment should be of a type suitable for use with the products and should be constructed of steel or stainless steel or other material acceptable to the Administration. The chemical composition of all material used should be submitted to the Administration for approval prior to fabrication. Discs or disc faces, seats and other wearing parts of valves should be made of stainless steel containing not less than 11 per cent chromium.

(b) Gaskets should be constructed of materials which do not react with, dissolve in, or lower the auto-ignition temperature of, these products, and which are fire resistant and possess adequate mechanical behaviour. The surface presented to the cargo should be polytetrafluorethylene (PTFE), or materials giving a similar degree of safety by their inertness. Spirally-wound stainless steel, with a filler of PTFE or similar fluorinated polymer, may be accepted by the Administration.

(c) Insulation and packing, if used, should be of a material which does not react with, dissolve in, or lower the auto-ignition temperature of, these products.

(d) The following materials are generally found unsatisfactory for gaskets, packing and similar uses in containment systems for these products and would require testing before being approved by the Administration:

(i) Neoprene or natural rubber, if it comes into contact with the products.

(ii) Asbestos, or binders used with asbestos.

(iii) Materials containing oxides of magnesium, such as mineral wools.

4.7.4 Threaded joints should not be permitted in the cargo liquid and vapour lines.

4.7.5 Filling and discharge piping should extend to within 100 mm of the bottom of the tank or any sump pit.

4.7.6 (a) The containment system for a tank containing these products should have a valved vapour return connection.

(b) The products should be loaded and discharged in such a manner that venting of the tanks to atmosphere does not occur. If vapour return to shore is used during tank loading, the vapour return system connected to a containment system for the product should be independent of all other containment systems.

(c) During discharging operations, the pressure in the cargo tank must be maintained above 0.07 $kp/cm^2$ gauge.

4.7.7 The cargo may be discharged only by deepwell pumps, hydraulically operated submerged pumps, or inert gas displacement. Each cargo pump should be arranged to ensure that the product does not heat significantly if the discharge line from the pump is shut off or otherwise blocked.

4.7.8 Tanks carrying these products should be vented independently of tanks carrying other products. Facilities should be provided for sampling the tank contents without opening the tank to atmosphere.

4.7.9 Cargo hoses used for transfer of these products should be marked "FOR ALKYLENE OXIDE TRANSFER ONLY".

4.7.10 Cargo tanks, void spaces and other enclosed spaces, adjacent to an integral gravity cargo tank carrying propylene oxide, should either contain a compatible cargo (those cargoes specified in 4.7.2 are examples of substances considered incompatible) or be inerted by injection of a suitable inert gas. Any hold space in which an independent cargo tank is located should be inerted. Such inerted spaces and tanks should be monitored for these products and oxygen. The oxygen content of these spaces should be maintained below 2 per cent. Portable sampling equipment is satisfactory.

4.7.11 In no case should air be allowed to enter the cargo pump or piping system while these products are contained within the system.

4.7.12 Prior to disconnecting shore-lines, the pressure in liquid and vapour lines should be relieved through suitable valves installed at the loading header. Liquid and vapour from these lines should not be discharged to atmosphere.

4.7.13 Propylene oxide may be carried in pressure tanks or in independent or integral gravity tanks. Ethylene oxide/propylene oxide mixtures should be carried in independent gravity tanks or pressure tanks. Tanks should be designed for the maximum pressure expected to be encountered during loading, conveying and discharging cargo.

4.7.14 (a) Tanks for the carriage of propylene oxide with a design pressure less than 0.6 $kp/cm^2$ gauge and tanks for the carriage of ethylene oxide/propylene oxide mixtures with a design pressure less than 1.2 $kp/cm^2$ gauge should have a cooling system to maintain the cargo below the reference temperature.*

(b) The refrigeration requirement for tanks with a design pressure less than 0.6 $kp/cm^2$ gauge may be waived by the Administration for ships operating in restricted areas or on voyages of

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* See 1.4.15.

restricted duration, and account may be taken in such cases of any insulation of the tanks. The area and times of year for which such carriage would be permitted should be included in the conditions of the Certificate of Fitness.

4.7.15 (a) Any cooling system should maintain the liquid temperature below the boiling temperature at the containment pressure. At least two complete cooling plants automatically regulated by variations within the tanks should be provided. Each cooling plant should be complete with the necessary auxiliaries for proper operation. The control system should also be capable of being manually operated. An alarm should be provided to indicate malfunctioning of the temperature controls. The capacity of each cooling system should be sufficient to maintain the temperature of the liquid cargo below the reference temperature* of the system.

(b) An alternative arrangement may consist of three cooling plants, any two of which should be sufficient to maintain the liquid temperatures below the reference temperature*.

(c) Cooling media which are separated from the products by a single wall only should be non-reactive with the products.

(d) Cooling systems requiring compression of the products should not be used.

4.7.16 Pressure relief valve settings should not be less than 0.2 $kp/cm^2$ gauge and for pressure tanks not greater than 7.0 $kp/cm^2$ gauge for the carriage of propylene oxide and not greater than 5.3 $kp/cm^2$ gauge for carriage of propylene oxide/ethylene oxide mixtures.

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* See 1.4.15.

4.7.17 (a) The piping system for tanks to be loaded with these products should be separated (as defined in 1.4.13) from piping systems for all other tanks, including empty tanks. If the piping system for the tanks to be loaded is not independent (as defined in 1.4.14), the required piping separation should be accomplished by the removal of spool pieces, valves, or other pipe sections, and the installation of blank flanges at these locations. The required separation applies to all liquid and vapour piping, liquid and vapour vent lines and any other possible connections, such as common inert gas supply lines.

(b) These products may be transported only in accordance with cargo handling plans that have been approved by the Administration. Each intended loading arrangement should be shown on a separate cargo handling plan. Cargo handling plans should show the entire cargo piping system and the locations for installation of blank flanges needed to meet the above piping separation requirements. A copy of each approved cargo handling plan should be maintained on board the ship. The Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk should be endorsed to include reference to the approved cargo handling plans.

(c) Before each initial loading of these products and before every subsequent return to such service, certification verifying that the required piping separation has been achieved should be obtained from a responsible person acceptable to the Port Administration and carried on board the ship. Each connection between a blank flange and a pipeline flange should be fitted with a wire and seal by the responsible person to ensure that inadvertent removal of the blank flange is impossible.

4.7.18 (a) No cargo tanks should be more than 98 per cent liquid full at the reference temperature.*

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* See 1.4.15.

(b) The maximum volume to which a cargo tank should be loaded is:

$$V_L = 0.98\ V\ \frac{d_R}{d_L}$$

where $V_L$ = maximum volume to which the tank may be loaded

$V$ = volume of the tank

$d_R$ = relative density of cargo at the reference temperature*

$d_L$ = relative density of cargo at the loading temperature and pressure

(c) The maximum allowable tank filling limits for each cargo tank should be indicated for each loading temperature which may be applied, and for the applicable maximum reference temperature, on a list to be approved by the Administration. A copy of the list should be permanently kept on board by the master.

4.7.19 The cargo should be carried under a suitable protective padding of nitrogen gas. An automatic nitrogen make-up system should be installed to prevent the tank pressure falling below 0.07 kp/cm$^2$ gauge in the event of product temperature fall due to ambient conditions or maloperation of refrigeration systems. Sufficient nitrogen should be available on board to satisfy the demand of the automatic pressure control. Nitrogen of commercially pure quality (99.9 per cent by volume) should be used for padding. A battery of nitrogen bottles connected to the cargo tanks through a pressure reduction valve satisfies the intention of the expression "automatic" in this context.

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* See 1.4.15.

4.7.20 The cargo tank vapour space should be tested prior to and after loading to ensure that the oxygen content is 2 per cent by volume or less.

4.7.21 A water spray system of sufficient capacity should be provided to blanket effectively the area surrounding the loading manifold, the exposed deck piping associated with product handling, and the tank domes. The arrangement of piping and nozzles should be such as to give a uniform distribution rate of 10 $l/m^2/min$. The water spray system should be capable of both local and remote manual operation, and the arrangement should ensure that any spilled cargo is washed away. Additionally, a water hose with pressure to the nozzle, when atmospheric temperatures permit, should be connected ready for immediate use during loading and unloading operations.

4.7.22 A remotely operated, controlled closing-rate, shut-off valve should be provided at each cargo hose connection used during cargo transfer."

4.20 Hydrogen peroxide solutions over 60% but not over 70%

The existing title is amended to read "Hydrogen peroxide solutions" and a subtitle without a number is inserted to read "Hydrogen peroxide solutions over 60% but not over 70%."

4.20.1 In the existing text the words "solutions over 60% but not over 70%" are inserted between the words "peroxide" and "should".

4.20.14 The following text is added after the existing paragraph 4.20.13.

"Hydrogen peroxide solutions over 8 per cent but not over 60 per cent by weight.

4.20.15 The ship's shell plating should not form any boundaries of tanks containing this product.

4.20.16 Hydrogen peroxide should be carried in tanks thoroughly and effectively cleaned of all traces of previous cargoes and their vapours or ballast. Procedures for inspection, cleaning, passivation and loading of

tanks should be in accordance with MSC/Circ.394. A certificate should be on board the vessel indicating that the procedures in the Circular have been followed. The passivation requirement may be waived by an Administration for domestic shipments of short duration. Particular care in this respect is essential to ensure the safe carriage of hydrogen peroxide.

.1 When hydrogen peroxide is carried no other cargoes should be simultaneously carried.

.2 Tanks which have contained hydrogen peroxide may be used for other cargoes after cleaning in accordance with the procedures outlined in MSC/Circ.394.

.3 Consideration in design should provide minimum internal tank structure, free draining, no entrapment and ease of visual inspection.

4.20.17 Cargo tanks and associated equipment should be either pure aluminium (99.5%) or solid stainless steel of types suitable for use with hydrogen peroxide (e.g. 304, 304L, 316, 316L, 316Ti). Aluminium should not be used for piping on deck. All non-metallic materials of construction for the containment system should neither be attacked by hydrogen peroxide nor contribute to its decomposition.

4.20.18 Cargo tanks should be separated by a cofferdam from fuel oil tanks or any other space containing materials incompatible with hydrogen peroxide.

4.20.19 Temperature sensors should be installed at the top and bottom of the tank. Remote temperature readouts and continuous monitoring should be located on the navigating bridge. If the temperature in the tank rises above 35°C, visible and audible alarms should activate on the navigating bridge.

4.20.20 Fixed oxygen monitors (or gas sampling lines) should be provided in void spaces adjacent to tanks to detect leakage of the cargo into these spaces. The enhancement of flammability by oxygen enrichment should be recognized. Remote readouts, continuous monitoring (if gas sampling lines are

used, intermittent sampling is satisfactory) and visible and audible alarms similar to those for the temperature sensors should also be located on the navigating bridge. The visible and audible alarms should activate if the oxygen concentrations in these void spaces exceed 30% by volume. Two portable oxygen monitors should also be available as back-up systems.

4.20.21 As a safeguard against uncontrolled decomposition, a cargo jettisoning system should be installed to discharge the cargo overboard. The cargo should be jettisoned if the temperature rise of the cargo exceeds a rate of 2°C per hour over a five hour period or when the temperature in the tank exceeds 40°C.

4.20.22 Cargo tank venting systems with filtration should have pressure vacuum relief valves for normal controlled venting, and a device for emergency venting, should tank pressure rise rapidly as a result of an uncontrolled decomposition rate, as stipulated in 4.20.20. These venting systems should be designed in such a manner that there is no introduction of sea water into the cargo tank even under heavy sea conditions. Emergency venting should be sized on the basis of tank design pressure and tank size.

4.20.23 A fixed water spray system should be provided for diluting and washing away any concentrated solution spilled on deck. The areas covered by the waterspray should include the manifold/hose connections and the tank tops of those tanks designated for the carriage of hydrogen peroxide solutions. The minimum application rate should satisfy the following criteria:

.1 The product should be diluted from the original concentration to 35 per cent by weight within five minutes of the spill.

.2 The rate and estimated size of the spill should be based upon maximum anticipated loading and discharge rates, the time required to stop flow of cargo in the event of tank overfill or a piping/hose failure, and the time necessary to begin application of dilution water with actuation at the cargo control location or on the navigating bridge.

4.20.24 Hydrogen peroxide should be stabilized to prevent decomposition. A certificate of stabilization should be provided by the manufacturer specifying:

.1 name and amount of stabilizer added;

.2 date stabilizer was added and duration of effectiveness;

.3 any temperature limitations qualifying the stabilizer's effective lifetime;

.4 the action to be taken should the product become unstable during the voyage.

4.20.25 Only those hydrogen peroxide solutions which have a maximum decomposition rate of 1.0 per cent per year at 25°C should be carried. Certification from the shipper that the product meets this standard should be presented to the Master and kept on board. A technical representative of the manufacturer should be on board to monitor the transfer operations and have the capability to test the stability of the hydrogen peroxide. He should certify to the Master that the cargo has been loaded in a stable condition.

4.20.26 Protective clothing that is resistant to hydrogen peroxide should be provided for each crew member involved in cargo transfer operations. Protective clothing should include coveralls that are non-flammable, suitable gloves, boots and eye protection.

4.20.27 During transfer of hydrogen peroxide the related piping system should be separate from all other systems. Cargo hoses used for transfer of hydrogen peroxide should be marked "for hydrogen peroxide transfer only"."

5.2 Cargo information

The following paragraphs 5.2.5, 5.2.6, 5.2.7 and 5.2.9 and a footnote for paragraph 5.2.7 are added to the existing text:

5.2.5 Where column "k" in the table of chapter VI refers to this paragraph, the cargo's viscosity at 20°C should be specified on a shipping document and

if the cargo's viscosity exceeds 25 mPa.s at 20°C, the temperature at which the cargo has a viscosity of 25 mPa.s should be specified in the shipping document.

5.2.6 Where column "k" in the table of chapter VI refers to this paragraph, the cargo's viscosity at 20°C should be specified on a shipping document and if the cargo's viscosity exceeds 60 mPa.s at 20°C, the temperature at which the cargo has a viscosity of 60 mPa.s should be specified in the shipping document.

5.2.7 Where column "k" in the table of chapter VI refers to this paragraph and the possibility exists that it will be unloaded within Special Areas*, the cargo's viscosity at 20°C should be specified on a shipping document and if the cargo's viscosity exceeds 25 mPa.s at 20°C, the temperature at which the cargo has a viscosity of 25 mPa.s should be specified in the shipping document.

5.2.8 Where column "k" in the table of chapter VI refers to this paragraph, the cargo's melting point should be indicated in the shipping document.

VA New Chapter VA is added to the existing text as follows:

"CHAPTER VA - ADDITIONAL MEASURES FOR THE PROTECTION OF THE MARINE ENVIRONMENT

5A.1 GENERAL

5A.1.1 The requirements of this chapter apply to ships carrying products noted as category A, B or C noxious liquid substances in chapter VI.

5A.2 CONDITION OF CARRIAGE

5A.2.1 The condition of carriage for products listed in the Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk should reflect the requirements of regulation 5A of Annex II of MARPOL 73/78.

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* Special areas are defined in regulation 1(7) of Annex II to MARPOL 73/78".

5A.2.2 A category B substance with a melting point equal to or greater than 15°C should not be carried in a cargo tank any boundary of which is formed by the ship's shell plating and should only be carried in a cargo tank fitted with a cargo heating system.

5A.3 PROCEDURES AND ARRANGEMENTS MANUAL

5A.3.1 Each ship should be provided with a Procedures and Arrangements Manual developed for the ship in accordance with the provisions of the Standards for the Procedures and Arrangements and approved by the Administration.

5A.3.2 Each ship should be fitted with equipment and arrangements identified in its Procedures and Arrangements Manual.

## CHAPTER VI - SUMMARY OF MINIMUM REQUIREMENTS

Existing text of chapter VI is replaced by the following:

### "EXPLANATORY NOTES

| | |
|---|---|
| Product name (column a)* | The product names are not always identical with the names given in previous issues of the Code, or the IBC Code for explanation see index of chemicals. |
| UN number (column b) | This is the number relating to each product shown in the recommendations proposed by the United Nations Committee of Experts on the Transport of Dangerous Goods (the "Orange Book"), New York, 1977, ST/SG/AC.10/1/Rev.1. UN numbers are given for information only. |
| Pollution category (column c) | The letter A, B, C or D means the pollution category assigned to each product under Annex II of MARPOL 73/78. "III" means the product was evaluated and found to fall outside the categories A, B, C or D.<br><br>Explanatory note on Pollution Category: Add the following to the existing note: "Pollution Category in brackets indicates that the product is provisionally categorized and that further data are necessary to complete the evaluation of their pollution hazards. Until the hazard evaluation is completed, the Pollution Category assigned is used". |
| Hazards (column d) | S means that the product is included in the Code because of its safety hazards;<br>P means that the product is included in the Code because of its pollution hazards; and<br>S/P means that the product is included in the Code because of both its safety and pollution hazards. |
| Ship type (column e) | 1, 2 or 3 indicates ship types I, II, or III respectively as discussed in chapter II, part A - Physical Protection. |
| Tank type (column f) | 1: Independent tank G: Gravity tank<br>2: Integral tank P: Pressure tank |

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* Note by the Secretariat:

References to columns a through m in other chapters of the Code will be amended according to the column designations shown here.

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| | | |
|---|---|---|
| Tank vents (column g) | Open: | open venting |
| | Cont: | controlled venting |
| | SR: | safety relief valve |
| Tank environmental control (column h) | Inert: | Inerting (see 2.19.2(a)) |
| | Pad: | Liquid or gas (2.12.2(b)) |
| | Dry: | Drying (see 2.19.2(c)) |
| | Vent: | Natural or forced (2.19.2(d)) |
| Electrical requirements (column i) | St: | Standard electrical systems (products having a flashpoint exceeding 60°C (closed cup test)). |
| | SP: | Special requirements (products having a flashpoint not exceeding 60°C (closed cup test)). |
| Gauging (column j) | O: | Open |
| | R: | Restricted |
| | C: | Closed |
| Vapour detection (column k) | F: | Flammable vapours |
| | T: | Toxic vapours |
| Fire protection (column l) | A: | Alcohol resistant foam |
| | B: | Regular foam. Encompasses all non-alcohol resistant type foams including fluoroprotein and aqueous film forming foam (AFFF) |
| | C: | Water-spray |
| | D: | Dry chemical |
| | No: | No special requirements under this Code. |
| | Fire-extinguishing media considered to be suitable for certain products are listed for information in column (i) of the summary of minimum requirements. | |

"No" indicates nil requirement.

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| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Product name | UN number | Pollution category | Hazards | Ship type | Tank type | Tank vents | Tank environmental control | Electrical requirements | Gauging | Vapour detection | Fire protection | Special requirement |
| Acetic acid | 2789 | C | S/P | 3 | 2G | Cont. | No | SP | R | F | A | 4.8.2 to 4.8.4, 4.8.6 to 4.8.8, 4.12.6, 4.17, 5.2.8 |
| Acetic anhydride | 1715 | C | S/P | 2 | 2G | Cont. | No | SP | R | F-T | A | 4.8.2 to 4.8.4, 4.8.6 to 4.8.8, 4.12.6, 4.17 |
| Acetone cyanohydrin | 1541 | A | S/P | 2 | 2G | Cont. | No | St | C | T | A | 4.4, 4.9, 4.12.6, 4.13, 4.14, 4.17, 4.18 |
| Acetonitrile | 1648 | III | S | 2 | 2G | Cont. | No | SP | R | F-T | A | 4.9 |
| Acrylamide solution (50% or less) | 2074 | D | S | 2 | 2G | Open | No | ST | C | No | No | 4.9.3, 4.10, 4.14.1, 4.15.1, 4.18.1 |
| Acrylic acid | 2218 | D | S | 3 | 2G | Cont. | No | SP | R | F-T | A | 4.10, 4.12.6, 4.18.1 |
| Acrylonitrile | 1093 | B | S/P | 2 | 2G | Cont. | No | SP | C | F-T | A | 4.9, 4.10, 4.12.3, 4.13.1, 4.14, 4.17 |
| Adiponitrile | 2205 | D | S | 3 | 2G | Cont. | No | St | R | T | A | – |
| Alkyl acrylate - vinyl pyridine copolymer in toluene | | (C) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkyl benzene sulphonic acid | 2584<br>2586 | C | S/P | 3 | 2G | Open | No | St | O | No | B | - |
| Allyl alcohol | 1098 | B | S/P | 2 | 2G | Cont | No | SP | C | F-T | A | 4.9, 4.13.1, 4.14, 4.17 |
| Allyl chloride | 1100 | B | S/P | 2 | 2G | Cont | No | SP | C | F-T | A | 4.9, 4.13.1, 4.14, 4.17 |
| 2 (2-Aminoethoxy) ethanol | 3055 | D | S | 3 | 2G | Open | No | St | O | No | A,C,D | 4.12.2, 4.14.1 |
| Aminoethyl ethanolamine | | ( D ) | S | 3 | 2G | Open | No | St | O | No | A | 4.12.1 |
| N-Aminoethyl piperazine | 2815 | D | S | 3 | 2G | Cont | No | St | R | T | A,C,D | 4.12.2, 4.14.1 |
| Ammonia aqueous, (28% or less) | 2672<br>( o ) | C | S/P | 3 | 2G | Cont | No | SP | R | T | C | 4.12.4, 4.12.9, 4.17[(a)] |
| Ammonium nitrate solution, (93% or less ) | 2426 | D | S | 2 | 1G | Open | No | St | O | No | No | 4.8.4, 4.8.6, 4.12.10, 4.13.2, 4.14.1, 4.19 |
| Ammonium sulphide solution (45% or less) | 2683 | B | S/P | 2 | 2G | Cont | No | SP | C | F-T | A,C | 4.9, 4.11, 4.12.1, 4.13.1, 4.14, 4.15.1, 4.17, 4.18 |

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| n-Amyl acetate | 1104 | C | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| sec-Amyl acetate | 1104 | C | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| Amyl acetate, commercial | 1104 | C | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| Aniline | 1547 | C | S/P | 2 | 2G | Cont | No | St | C | T | A | 4.9, 4.13.1, 4.14, |
| Benzene and mixtures having 10% benzene or more | 1114 (S) | C | S/P | 3 | 2G | Cont | No | SP | R | F-T | B | 4.9.1, 4.13.1, 5.2.8 |
| Benzenesulphonyl chloride | 2225 | D | S | 3 | 2G | Cont | No | St | R | T | B,D | 4.12.1, 4.14.1 |
| Benzyl alcohol | | C | P | 3 | 2G | Open | No | St | O | No | A | |
| Benzyl chloride | 1738 | B | S/P | 2 | 2G | Cont | No | St | C | T | B | 4.9, 4.10, 4.13.1, 4.14, 4.17 |
| n-Butyl acetate | 1123 | C | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |

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| n-Butyl acrylate | 2348 | D | S | 2 | 2G | Cont | No | SP | R | F-T | A | 4.10, 4.18.1, 4.18.2 |
| Butylamine (all isomers) | 1125<br>1214 | C | S/P | 2 | 2G | Cont | No | SP | R | F-T | A | 4.9, 4.12.1, 4.12.2, 4.13.1, 4.14.1, 4.17 |
| Butyl benzyl phthalate | | A | P | 2 | 2G | Open | No | St | O | No | A | 4.14.1 |
| Butyl/Decyl/Cetyl/ Eicosyl methacrylate mixture | | D | S | 3 | 2G | Cont | No | St | R | No | A,C, D | 4.10, 4.18.1, 4.18.2 |
| n-Butyl ether | 1149 | C | S/P | 3 | 2G | Cont | Inert | SP | R | F-T | A,D | 4.2.7, 4.9 |
| Butyl methacrylate | | D | S | 3 | 2G | Cont | No | SP | R | F-T | A,D | 4.10, 4.18.1, 4.18.2 |
| n-Butyraldehyde | 1129 | B | S/P | 3 | 2G | Cont | No | SP | O | F-T | A | 4.15.1 |
| Butyric acid | 2820 | B | S/P | 3 | 2G | Cont | No | St | R | No | A | 4.8.2, 4.8.3, 4.8.4, 4.8.6, 4.8.7, 4.8.8, 4.12.6 |

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| Calcium hypochlorite solution | | B | S/P | 3 | 2G | Cont | No | St | R | No | No | 4.12.5, 4.15.1 |
| Calcium naphthenate in mineral oil | | A | P | 3 | 2G | Open | No | St | O | No | A | |
| Camphor oil | 1130 | B | S/P | 2 | 2G | Cont | No | SP | O | F | B | 4.14.1 |
| Carbolic oil | | A | S/P | 2 | 2G | Cont | No | SP | C | F-T | A | 4.9, 4.14 |
| Carbon disulphide | 1131 | A | S/P | 2 | 1G | Cont | Inert | Use None | C | F-T | C | 4.1, 4.9, 4.14, 4.17 |
| Carbon tetrachloride | 1846 | B | S/P | 3 | 2G | Cont | No | St | C | T | No | 4.9, 4.13.1, 4.14.1, 4.17 |
| Cashew nut shell oil (untreated) | | D | S | 3 | 2G | Cont | No | St | R | T | B | |
| Cetyl/Eicosyl methacrylate mixture | | III | S | 3 | 2G | Open | No | St | O | No | A,C,D | 4.10, 4.18.1, 4.18.2 |
| Chloroacetic acid (80% or less) | 1750 | C | S/P | 2 | 2G | Cont | No | St | C | No | No | 4.8.2, 4.8.4, 4.8.6, 4.8.7, 4.8.8, 4.9.3, 4.12.6 (aluminium not permitted), 4.14, 5.2.8 |
| Chlorobenzene | 1134 | B | S/P | 2 | 2G | Cont | No | SP | R | F-T | B | 4.14.1 |

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| Chloroform | 1888 | B | S/P | 3 | 2G | Cont | No | St | R | T | No | 4.9, 4.17 |
| Chlorohydrins, crude | | (D) | S | 2 | 2G | Cont | No | SP | C | F-T | A | 4.9, 4.14 |
| o-Chloronitro-benzenes | 1578 | B | S/P | 2 | 2G | Cont | No | St | C | T | B, C, D | 4.9, 4.13, 4.14, 5.25, 5.28, 5A.2.2 |
| 2- or 3-Chloropropionic acid | 2511 (k) | (C) | S/P | 3 | 2G | Open | No | St | O | No | A | 4.8.2 to 4.8.4, 4.8.6 to 4.8.8, 4.12.6, 5.2.8 |
| Chlorosulphonic acid | 1754 | C | S/P | 1 | 2G | Cont | No | St | C | T | No | 4.8.2 to 4.8.8, 4.9, 4.14, 4.15.2, 4.17 |
| m-Chlorotoluene | 2238 | B | S/P | 3 | 2G | Cont | No | SP | R | F-T | B,C | |
| o-Chlorotoluene | 2238 | A | S/P | 3 | 2G | Cont | No | SP | R | F-T | B,C | |
| p-Chlorotoluene | 2238 | B | S/P | 2 | 2G | Cont | No | SP | R | F-T | B,C | 4.14.1, 5.2.8 |
| Chlorotoluenes (mixed isomers) | 2238 | A | S/P | 2 | 2G | Cont | No | SP | R | F-T | B,C | 4.14.1 |

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| Coal tar naphtha solvent | | B | S/P | 3 | 2G | Cont | No | SP | R | F-T | A,D | |
| Creosote (coal tar) | | ( C ) | S/P | 3 | 2G | Open | No | St | O | No | B,D | |
| Creosote (wood) | | A | S/P | 2 | 2G | Open | No | St | O | No | B,D | 4.14.1 |
| Cresols (mixed isomers) | 2076 | A | S/P | 2 | 2G | Open | No | St | O | No | B | 4.14.1 |
| Crotonaldehyde | 1143 | B | S/P | 2 | 2G | Cont | No | SP | R | F-T | A | 4.9, 4.13.1, 4.15.1, 4.17 |
| Cyclohexane | 1145 | C | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1, 5.2.8 |
| Cyclohexanol | | C | P | 3 | 2G | Open | No | St | O | No | A | 5.2.6; 5.2.8 |
| Cyclohexanone | 1915 | D | S | 3 | 2G | Cont | No | SP | R | F-T | A | 4.12.5 |
| Cyclohexylamine | 2357 | C | S/P | 3 | 2G | Cont | No | SP | R | F-T | A,D | 4.12.1, 4.12.2 |
| p-Cymene | 2046 | C | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| Decene | | B | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |

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| Decyl acrylate | | A | S/P | 2 | 2G | Open | No | St | O | No | A,C,D | 4.10, 4.12.2, 4.14.1, 4.18.1, 4.18.2 |
| Decyl alcohol (all isomers) | | B | P | 3 | 2G | Open | No | St | O | No | A | 5.2.8 (p) |
| Dibutylamine | | C | S/P | 3 | 2G | Cont | No | SP | R | F-T | B,D | 4.12.4 |
| Dibutyl phthalate | | A | P | 2 | 2G | Open | No | St | O | No | A | 4.14.1 |
| o-Dichlorobenzene | 1591 | B | S/P | 2 | 2G | Cont | No | St | R | T | B,D | 4.12.5, 4.14.1 |
| 1,1-Dichloroethane | 2362 | B | S/P | 3 | 2G | Cont | No | SP | R | F-T | B | 4.17 |
| Dichloroethyl ether | 1916 | B | S/P | 2 | 2G | Cont | No | SP | R | F-T | A | 4.12.5 |
| 2,2-Dichloroisopropyl ether | 2490 | C | S/P | 2 | 2G | Cont | No | St | R | T | B,C,D | 4.9, 4.12.5, 4.13.i, 4.14 |
| Dichloromethane | 1593 | D | S | 3 | 2G | Cont | No | St | R | T | No | |
| 2,4-Dichlorophenol | 2021 | A | S/P | 2 | 2G | Cont | Dry | St | R | T | B,C,D | 4.12.1, 4.14.1 |

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| 2,4-Dichlorophenoxyacetic acid, diethanolamine salt solution | | (A) | S/P | 3 | 2G | Open | No | St | O | No | No | 14.12.1 |
| 2,4- Dichlorophenoxyacetic acid, dimethylamine salt (70% or less) solution | | (A) | S/P | 3 | 2G | Open | No | St | O | No | No | 14.12.1 |
| 2,4-Dichlorophenoxyacetic acid, triisopropanolamine salt, solution | | (A) | S/P | 3 | 2G | Open | No | St | O | No | No | 14.12.1 |
| 1,2-Dichloropropane | 1279 | B | S/P | 2 | 2G | Cont | No | SP | R | F-T | B | 4.9 |
| 1,3-Dichloropropane | | B | S/P | 2 | 2G | Cont | No | SP | R | F-T | B | 4.9 |
| 1,3-Dichloropropene | 2047 | B | S/P | 2 | 2G | Cont | No | SP | C | F-T | B | 4.9, 4.13, 4.14, 4.17 |
| Dichloropropene/ Dichloropropane mixtures | | B | S/P | 2 | 2G | Cont | No | SP | C | F-T | B,C,D | 4.9, 4.13, 4.14, 4.17 |
| 2,2-Dichloropropionic acid | | D | S | 3 | 2G | Cont | Dry | St | R | No | A | 4.8.2, 4.8.4, 4.8.6 to 4.8.8, 4.12.6 (aluminium not permitted) |
| Diethanolamine | | III | S | 3 | 2G | Open | No | St | O | No | A | 4.12.2 |

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| Diethylamine | 1154 | C | S/P | 3 | 2G | Cont | No | SP | R | F-T | A | 4.12.1, 4.9, 4.17 |
| Diethylaminoethanol | 2686 | C | S/P | 3 | 2G | Cont | No | SP | R | F-T | A,D | 4.12.1, 4.12.2 |
| Diethylbenzene | 2049 | C | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| Diethylene glycol methyl ether | | C | P | 3 | 2G | Open | No | St | O | No | A | |
| Diethylenetriamine | 2079 | (D) | S | 3 | 2G | Open | No | St | O | No | A | 4.12.2 |
| Diethyl ether | 1155 | III | S | 2 | 1G | Cont | Inert | SP | C | F-T | A | 4.2, 4.11, 4.12.9, 4.14, 4.17 |
| Di-(2-ethylhexyl) phosphoric acid | 1902 | C | S/P | 3 | 2G | Open | No | St | O | No | B,C,D | 4.12.2 |
| Diethyl phthalate | | C | P | 3 | 2G | Open | No | St | O | No | A | |
| Diethyl sulphate | 1594 | (B) | S/P | 2 | 2G | Cont | No | St | C | T | A,D | 4.12.3, 4.14.1 |
| Diglycidyl ether of Bisphenol A | | B | P | 3 | 2G | Open | No | St | O | No | A | 5.2.8 |
| Diisobutylamine | 2361 | (C) | S/P | 2 | 2G | Cont | No | SP | R | F-T | B,D | 4.9.3, 4.12.1, 4.14.1 |

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| Diisobutylene | 2050 | B | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| Diisobutyl phthalate | | B | P | 3 | 2G | Open | No | St | O | No | A | 5.2.5 |
| Diisopropanolamine | | C | S/P | 3 | 2G | Open | No | St | O | No | A | 4.12.2, 5.2.6, 5.2.8 |
| Diisopropylamine | 1158 | C | S/P | 2 | 2G | Cont | No | SP | C | F-T | A | 4.9, 4.12.2, 4.14, 4.17 |
| Diisopropylbenzene (all isomers) | | A | P | 2 | 2G | Open | No | St | O | No | A | 4.14.1 |
| Dimethylamine solution (45% or less) | 1160 | C | S/P | 3 | 2G | Cont | No | SP | R | F-T | C,D | 4.9, 4.12.1, 4.17 |
| Dimethylamine solution (greater than 45% but not greater than 55%) | 1160 | C | S/P | 2 | 2G | Cont | No | SP | C | F-T | A,C,D | 4.9, 4.12.1, 4.13.1, 4.14, 4.17 |
| Dimethylamine solution (greater than 55% but not greater than 65%) | 1160 | C | S/P | 2 | 2G | Cont | No | SP | C | F-T | A,C,D | 4.9, 4.11, 4.12.1, 4.13.1, 4.14, 4.17 |
| N,N-Dimethylcyclohexyl-amine | 2264 | C | S/P | 2 | 2G | Cont | No | SP | R | F-T | A,C | 4.9, 4.12.1, 4.13.1, 4.14.1 |
| Dimethylethanolamine | 2051 | D | S | 3 | 2G | Cont | No | SP | R | F-T | A,D | 4.12.2 |

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| Dimethylformamide | 2265 | D | S | 3 | 2G | Cont | No | SP | R | F-T | A,D | |
| Dimethyl hydrogen phosphite | | | S | 3 | 2G | Cont | No | St | R | T | A,D | 4.9.1 |
| Dimethyl phthalate | | C | P | 3 | 2G | Open | No | St | O | No | A | |
| Dinitrotoluene (molten) | 1600 | B | S/P | 2 | 2G (1) | Cont | No | St | C | T | A | 4.9, 4.13.1, 4.14, 5.2.5, 5.2.8, 5A.2.2 (m) |
| 1,4-Dioxane | 1165 | D | S | 2 | 2G | Cont | No | SP | C | F-T | A | 4.9, 4.14 |
| Dipentene | 2052 | C | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| Diphenyl ether | | A | P | 3 | 2G | Open | No | St | O | No | A | |
| Diphenylmethane diisocyanate | 2489 | (B) | S/P | 2 | 2G | Cont | Dry | St (b) | C | T (b) | C (c) D | 4.9, 4.12.5, 4.13.1, 4.14.1, 4.15.2, 5.2.5, 5.2.8, 5A.2.2 |
| Diphenyl oxide/Diphenyl phenyl ether mixture | | A | P | 3 | 2G | Open | No | St | O | No | A | |
| Di-n-propylamine | 2383 | C | S/P | 3 | 2G | Cont | No | SP | R | F-T | A | 4.9.3, 4.12.2, 4.14.1 |

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| Dodecene (all isomers) | | B | P | 3 | 2G | Open | No | St | O | No | A | |
| Dodecyl alcohol | | B | P | 3 | 2G | Open | No | St | O | No | A | 5.2.5, 5.2.8<br>5A.2.2 |
| Dodecylbenzene | | C | P | 3 | 2G | Open | No | St | O | No | A | |
| Dodecyl diphenyl oxide disulphonate solution | | B | S/P | 3 | 2G | Open | No | St | O | No | No | 5.2.5, 5.2.8, 5A.2.2 |
| Dodecyl methacrylate | | III | S | 3 | 2G | Open | No | St | O | No | A,C | 4.10 |
| Dodecyl/Pentadecyl methacrylate mixture | | III | S | 3 | 2G | Open | No | St | O | No | A,C,D | 4.10, 4.18.1, 4..18.2 |
| Dodecyl phenol | | A | P | 1 | 2G | Open | No | St | O | No | A | 4.14 |
| Epichlorohydrin | 2023 | C | S/P | 2 | 2G | Cont | No | SP | C | F-T | A | 4.9, 4.13.1, 4.14, 4.17 |
| Ethanolamine | 2491 | D | S | 3 | 2G | Open | No | St | O | F-T | A | 4.12.2 |
| 2-Ethoxyethyl acetate | 1172 | C | P | 3 | 2G | Cont | No | SP | R | F | A | 4,14.1 |
| Ethyl acrylate | 1917 | B | S/P | 2 | 2G | Cont | No | SP | R | F-T | A | 4.10, 4.17, 4.18.1, 4.18.2 |

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| Ethylamine | 1036 | C | S/P | 2 | 1G | Cont | No | SP | C | F-T | C,D | 4.9, 4.11, 4.12.2, 4.17 |
| Ethylamine solutions, (72% or less ) | 2270 | C | S/P | 2 | 2G | Cont | No | SP | C | F-T | A,C | 4.9, 4.11, 4.12.1, 4.13.1, 4.14, 4.17 |
| Ethyl benzene | 1175 | C | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| N-Ethylbutylamine | | (C) | S/P | 3 | 2G | Cont | No | SP | R | F-T | A | 4.9.3, 4.12.1, 4.14.1 |
| N-Ethylcyclohexylamine | | D | S | 3 | 2G | Cont | No | SP | R | F-T | A,C | 4.12.1, 4.14.1 |
| Ethylene chlorohydrin | 1135 | C | S/P | 2 | 2G | Cont | No | SP | C | F-T | D | 4.9, 4.13.1, 4.14, 4.17 |
| Ethylene cyanohydrin | | (D) | S | 3 | 2G | Open | No | St | O | No | A | |
| Ethylenediamine | 1604 | C | S/P | 2 | 2G | Cont | No | SP | R | F-T | A | 4.12.2, 5.2.8 |
| Ethylene dibromide | 1605 | B | S/P | 2 | 2G | Cont | No | St | C | T | No | 4.9, 4.14.1, 4.17, 5.2.8 |
| Ethylene dichloride | 1184 | B | S/P | 2 | 2G | Cont | No | SP | R | F-T | B | 4.12.4, 4.14.2 |
| Ethylene oxide/Propylene oxide mixture with an ethylene content of not more than 30% by weight | 2983 | D | S | 2 | 1G | Cont | Inert | SP | C | F-T | A,C | 4.7, 4.9, 4.11, 4.14 |

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| 2-Ethylhexyl acrylate | | D | S | 3 | 2G | Open | No | St | O | No | A | 4.10, 4.18.1, 4.18.2 |
| 2-Ethylhexylamine | 2276 | B | S/P | 2 | 2G | Cont | No | SP | R | F-T | A | 4.9, 4.12.2 |
| Ethylidene norbornene | | B | S/P | 3 | 2G | Cont | No | SP | R | F-T | B,C D | 4.9.1, 4.12.4, 4.14.1, 4.15.1 |
| Ethyl methacrylate | 2277 | (D) | S | 3 | 2G | Cont | No | SP | R | F-T | B,D | 4.10, 4.18.1, 4.18.2 |
| 2-Ethyl-3-propylacrolein | | B | S/P | 3 | 2G | Cont | No | SP | R | F-T | A | 5.2.8 |
| Ethyltoluene | | (B) | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| Fatty alcohols($C_{12}$-$C_{20}$) | | B | P | 3 | 2G | Open | No | St | O | No | A | 5.2.5, 5.2.8 |
| Formaldehyde solutions (45% or less) | 1198 (d) 2209 | C | S/P | 3 | 2G | Cont | No | SP | R | F-T | A | 4.15.1, 4.17(e) |
| Formic acid | 1779 | D | S | 3 | 2G | Cont | No | SP | R | T | A | 4.8.2 to 4.8.4, 4.8.6 to 4.8.8, 4.12.7, 4.17 |
| Fumaric adduct of rosin, water dispersion | | B | P | 3 | 2G | Open | No | St | O | No | No | 5.2.5 |

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| Furfural | 1199 | C | S/P | 3 | 2G | Cont | No | SP | R | F-T | A | 4.15.1 |
| Furfuryl alcohol | 2874 | C | P | 3 | 2G | Open | No | St | O | No | A | |
| Glutaraldehyde solutions (50% or less) | | D | S | 3 | 2G | Open | No | St | O | No | No | 4.15.1 |
| Glycidyl ester of $C_{10}$ trialkylacetic acid | | B | P | 3 | 2G | Open | No | St | O | No | A | |
| Heptanol (all isomers) (q) | | (C) | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| Heptene (mixed isomers) | | C | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| Heptyl acetate | | (B) | P | 3 | 2G | Open | No | St | O | No | A | |
| Hexamethylenediamine solution | 1783 | C | S/P | 3 | 2G | Cont | No | St | R | T | A | 4.12.2, 4.14.1, 5.2.8 |
| Hexamethyleneimine | 2493 | C | S/P | 2 | 2G | Cont | No | SP | R | F-T | A,C | 4.12.1, 4.12.2 |
| 1-Hexene | 2370 | C | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| Hexyl acetate | 1233 | B | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |

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| Hydrochloric acid | 1789 | D | S | 3 | 1G | Cont | No | St | R | T | No | 4.8, 4.17(f) |
| Hydrogen peroxide solutions (over 60% but not over 70%) | 2015 | C | S/P | 2 | 2G | Cont | No | St | C | No | No | 4.14.1, 4.20.1 to 4.20.14 |
| Hydrogen peroxide solutions (over 8% but not over 60%) | 2014<br>2984 | C | S/P | 3 | 2G | Cont | No | St | C | No | No | 4.13.2, 4.14.1, 4.20.15 to 4.20.27 |
| 2-Hydroxyethyl acrylate | | B | S/P | 2 | 2G | Cont | No | St | C | T | A | 4.9, 4.10. 4.14.1, 4.18.1, 4.18.2 |
| Isoamyl acetate | 1104 | C | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| Isobutyl acetate | 1213 | C | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| Isobutyl acrylate | 2527 | D | S | 2 | 2G | Cont | No | SP | R | F-T | A | 4.10, 4.18.1, 4.18.2 |
| Isobutyraldehyde | 2045 | C | S/P | 3 | 2G | Cont | No | SP | O | F-T | A | 4.15.1 |
| Isophorone diamine | 2289 | D | S | 3 | 2G | Cont | No | St | R | T | A | 4.12.2 |
| Isophorone diisocyanate | 2290 | B | S/P | 2 | 2G | Cont | Dry | St | C | T | C(c)<br>D | 4.9, 4.12.5, 4.13.1, 4.14.1, 4.15.2 |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Isoprene | 1218 | C | S/P | 3 | 2G | Cont | No | SP | R | F | B | 4.10, 4.11, 4.18.1 4.18.2 |
| Isopropanolamine | | C | S/P | 3 | 2G | Open | No | St | O | F-T | A | 4.12.4 5.2.7, 5.2.8 |
| Isopropylamine | 1221 | C | S/P | 2 | 2G | Cont | No | SP | C | F-T | C,D | 4.9, 4.11, 4.12.2, 4.14, 4.17 |
| Isopropylbenzene | 1918 | B | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| Isopropyl ether | 1159 | D | S | 3 | 2G | Cont | Inert | SP | R | F | A | 4.2.7, 4.10.3, 4.14.1 |
| Isovaleraldehyde | 2058 | C | S/P | 3 | 2G | Cont | Inert | SP | R | F-T | A | 4.2.7, 4.15.1 |
| Maleic anhydride | 2215 | D | S | 3 | 2G | Cont | No | St | R | No | A(g) C | |
| Mercaptobenzothiazol, sodium salt, solution | | (B) | S/P | 3 | 2G | Open | No | St | O | No | No | 4.12.1, 5.2.8 |
| Mesityl oxide | 1229 | D | S | 3 | 2G | Cont | No | SP | R | F-T | A | 4.14.1 |
| Methacrylic acid | 2531 | D | S | 3 | 2G | Cont | No | St | R | T | A | 4.10, 4.12.6, 4.18.1 |
| Methacrylonitrile | | (B) | S/P | 2 | 2G | Cont | No | SP | C | F-T | A | 4.9, 4.10, 4.12.4, 4.13.1, 4.14, 4.17 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Methyl acrylate | 1919 | C | S/P | 2 | 2G | Cont | No | SP | R | F-T | B | 4.10, 4.17, 4.18.1, 4.18.2 |
| Methylamine solutions, ( 42% or less) | 1235 | C | S/P | 2 | 2G | Cont | No | SP | C | F-T | A,C,D | 4.9, 4.12.1, 4.13.1, 4.14, 4.17 |
| Methylamyl acetate | 1233 | (C) | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| Methylamyl alcohol | 2053 | (C) | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| Methyl amyl ketone | 1110 | (C) | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| 2-Methyl-6-ethyl-aniline | | C | S/P | 3 | 2G | Open | No | St | O | No | B,C,D | |
| 2-Methyl-5-ethyl-pyridine | 2300 | (B) | S/P | 3 | 2G | Open | No | St | O | No | D | 4.12.4 |
| Methyl formate | 1243 | D | S | 2 | 2G | Cont | No | SP | R | F-T | A | 4.9, 4.11, 4.14, 4.17 |
| 2-Methyl-2-hydroxy-3-butyne | | III | S | 3 | 2G | Cont | No | SP | R | F-T | A,C,D | 4.12.8, 4.14.1 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Methyl methacrylate | 1247 | D | S | 2 | 2G | Cont | No | SP | R | F-T | B | 4.10, 4.18.1, 4.18.2 |
| 2-Methyl-1-penteme | 2288 | C | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| 2-Methylpyridine | 2313 | B | S/P | 2 | 2G | Cont | No | SP | C | F | A,C | 4.9.3, 4.12.4, 4.14.1 |
| 4-Methylpyridine | 2313 | B | S/P | 2 | 2G | Cont | No | SP | C | F-T | A,C,D | 4.9.3, 4.12.4, 4.14 5.2.8 |
| N-Methyl-2-pyrrolidone | | B | P | 3 | 2G | Open | No | St | O | No | A | |
| Methyl salicylate | | (B) | P | 3 | 2G | Open | No | St | O | No | A | |
| alpha-Methylstyrene | 2303 | A | S/P | 2 | 2G | Cont | No | SP | R | F-T | D | 4.10, 4.14.1, 4.18.1 4.18.2 |
| Morpholine | 2054 | D | S | 3 | 2G | Cont | No | SP | R | F | A | 4.12.2 |
| Motor fuel anti-knock compounds | 1649 | A | S/P | 2 | 1G | Cont | No | SP | C | F-T | B,C | 4.6, 4.9, 4.13.2, 4.14 4.17 |
| Naphthalene (molten) | 2304 | A | S/P | 2 | 2G | Cont | No | SP | R | No | A,D | 4.14.1 |
| Neodecanoic acid | | (B) | P | 3 | 2G | Open | No | St | O | No | A | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nitrating acid (mixture of sulphuric and nitric acid) | 1796 | (C) | S/P | 2 | 2G | Cont | No | St | C | T | No | 4.8, 4.13.1, 4.14, 4.15.2, 4.17 |
| Nitric acid (70% and over) | 2031 2032(h) | C | S/P | 2 | 2G | Cont | No | St | C | T | No | 4.8, 4.14, 4.17 |
| Nitric acid (less than 70%) | 2031 | C | S/P | 2 | 2G | Cont | No | St | R | T | No | 4.8, 4.14, 4.17 |
| Nitrobenzene | 1662 | B | S/P | 2 | 2G | Cont | No | St | C | T | D | 4.9, 4.13, 4.14, 5.2.8 |
| o-Nitrophenol (molten) | 1663 | B | S/P | 2 | 2G | Cont | No | St | C | T | A,C,D | 4.9, 4.14.1, 5.2.5 5.2.8, 5A.2.2 |
| 1- or 2-Nitropropane | 2608 | D | S | 3 | 2G | Cont | No | SP | R | F-T | A | |
| Nitropropane (60%)/ Nitroethane (40%) mixture | | D | S | 3 | 2G | Cont | No | SP | R | F-T | A,C (n) | 4.12.4 |
| (o- and p-) Nitro-toluenes | 1664 | C | S/P | 2 | 2G | Cont | No | St | C | T | B | 4.9, 4.13.1, 4.14, 5.2.8 |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nonene | | B | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| Nonyl alcohol | | C | P | 3 | 2G | Open | No | St | O | No | A | |
| Nonylphenol | | A | P | 2 | 2G | Open | No | St | O | No | A | 4.14.1 |
| Octanol (all isomers) | | C | P | 3 | 2G | Open | No | St | O | No | A | |
| Octene (all isomers) | | B | P | 3 | 2G | Cont.. | No | SP | R | F | A | 4.14.1 |
| Olefins, straight chain mixtures | | B | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1, 5.2.5, 5.2.8 |
| alpha-Olefins ($C_6$-$C_{18}$ mixtures) | | B | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1, 5.2.5, 5.2.8 |
| Oleum | 1831 | C | S/P | 2 | 2G | Cont. | No | St | C | T | No | 4.8.2 to 4.8.8, 4.9.1, 4.13.1, 4.14, 4.15.2, 4.17, 5.2.6 |
| Paraldehyde | 1264 | C | S/P | 3 | 2G | Cont. | No | SP | R | F | A | 5.2.8 |
| Pentachloroethane | 1669 | B | S/P | 2 | 2G | Cont. | No | St | R | T | No | 4.9, 4.13.1, 4.14.1 |
| 1,3-Pentadiene | | C | S/P | 3 | 2G | Cont. | No | SP | R | F-T | B | 4.10, 4.18 |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| n-Pentane | 1265 | C | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| Pentene (all isomers) | | C | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| Perchloroethylene | 1897 | B | S/P | 3 | 2G | Cont | No | St | R | T | No | 4.9.1, 4.9.2 |
| Phenol | 2312 | B | S/P | 2 | 2G | Cont | No | St | C | T | A | 4.9, 4.14, 5.2.5 5.2.8, 5A.2.2 |
| 1-Phenyl-1-xylyl ethane | | C | P | 3 | 2G | Open | No | St | O | No | B | |
| Phosphoric acid | 1805 | D | S | 3 | 2G | Open | No | St | O | No | No | 4.8.1 to 4.8.4, 4.8.6 to 4.8.8 |
| Phosphorus, yellow or white | 2447 | A | S/P | 1 | 1G | Cont | Pad + (vent or inert) | St | C | No | C | 4.5, 4.14, 4.17 |
| Phthalic anhydride | 2214 | C | S/P | 3 | 2G | Cont | No | St | R | No | D | 5.2.8 |
| Pinene | 2368 | A | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| Polyethylene polyamines | 2734 (i) 2735 | (C) | S/P | 3 | 2G | Open | No | St | O | No | A | 4.12.2, 5.2.8 |
| Polymethylene polyphenyl isocyanate | 2206 (i) 2207 | D | S | 2 | 2G | Cont | Dry | St (b) | C | T (b) | C (c) D | 4.9, 4.12.5, 4.14.1, 4.15.2 |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Potassium hydroxide solution | 1814 | C | S/P | 3 | 2G | Open | No | St | O | No | No | 4.12.1 Copper, brass and bronze may be used, 5.2.8 |
| n-Propanolamine | | C | S/P | 3 | 2G | Open | No | St | O | No | A,D | 4.12.2, 5.2.8 |
| beta-Propiolactone | | D | S | 2 | 2G | Cont | No | St | R | T | A | |
| Propionaldehyde | 1275 | D | S | 3 | 2G | Cont | No | SP | R | F-T | A | 4.13.1, 4.15.1, 4.17 |
| Propionic acid | 1848 | D | S | 3 | 2G | Cont | No | SP | R | F | A | 4.8.2 to 4.8.4, 4.8.6 to 4.8.8, 4.12.6, 4.17 |
| Propionic anhydride | 2496 | C | S/P | 3 | 2G | Cont | No | St | R | T | A | 4.12.6 |
| Propionitrile | 2404 | C | S/P | 2 | 1G | Cont | No | SP | C | F-T | A,D | 4.9, 4.13, 4.14, 4.17 |
| n-Propylamine | 1277 | C | S/P | 2 | 2G | Cont | Inert | SP | C | F-T | C,D | 4.9, 4.12.2, 4.14, 4.17 |
| Propylene dimer | | (C) | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| Propylene oxide | 1280 | D | S | 2 | 2G | Cont | Inert | SP | C | F-T | A,C | 4.7, 4.9.1, 4.11, 4.14 |
| Propylene trimer | 2057 | B | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |

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| Pyridine | 1282 | B | S/P | 3 | 2G | Cont | No | SP | R | F | A | 4.12.4 |
| Rosin | | A | P | 3 | 2G | Open | No | St | O | No | A | |
| Rosin soap (disproportionated) solution | | B | P | 3 | 2G | Open | No | St | O | No | A | |
| Sodium borohydride, (15% or less)/Sodium hydroxide solution | | C | S/P | 3 | 2G | Open | No | St | O | No | No | 4.12.1, 5.2.6 |
| Sodium chlorate solution (50% or less) | | III | S | 3 | 2G | Open | No | St | O | No | No | 4.14.1, 4.15.1, 4.21 |
| Sodium dichromate solution, (70% or less) | | B | S/P | 2 | 2G | Open | No | St | C | No | No | 4.9.3, 4.12.2, 4.14 |
| Sodium hydrosulphide solution, (45% or less) | 2949 | B | S/P | 3 | 2G | Cont | Vent or pad (gas) | St | R | T | No | 4.15.1, 5.2.8 |
| Sodium hydrosulphide/ Ammonium sulphide solution | | B | S/P | 2 | 2G | Cont | No | SP | C | F-T | A,C | 4.9, 4.11, 4.12.1, 4.13.1, 4.14, 4.15.1, 4.17, 4.18, |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sodium hydroxide solution | 1824 | D | S | 3 | 2G | Open | No | St | O | No | No | 4.12.1, Copper, brass and bronze may be used |
| Sodium hypochlorite solution, (15% or less) | | B | S/P | 3 | 2G | Cont | No | St | R | No | No | 4.12.5, 4.15.1 |
| Styrene monomer | 2055 | B | S/P | 3 | 2G | Cont | No | SP | O | F | B | 4.10, 4.12.4, 4.18.1, 4.18.2 |
| Sulphur (molten) | 2448 | III | S | 3 | 1G | Open | Vent or pad (gas) | SP | O | F-T | Nó | 4.3 |
| Sulphuric acid | 1830 | C | S/P | 3 | 2G | Open | No | St | O | No | No | 4.8, 4.15.2, 5.2.7, 5.2.8 |
| Sulphuric acid, spent | 1832 | C | S/P | 3 | 2G | Open | No | St | O | No | No | 4.8, 4.15.2, 5.2.7, 5.2.8 |
| Tall oil, crude and distilled | | A | P | 3 | 2G | Open | No | St | O | No | A | |
| Tall oil fatty acid (resin acids less than 20%) | | (C) | P | 3 | 2G | Open | No | St | O | No | A | |
| Tall oil soap (disproportionated) solution | | B | P | 3 | 2G | Open | No | St | O | No | A | 5.2.5, 5.2.8 |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethane | 1702 | B | S/P | 3 | 2G | Cont | No | St | R | T | No | 4.9, 4.13.1 |
| Tetraethylenepentamine | 2320 | D | S | 3 | 2G | Open | No | St | O | No | A | 4.12.1 |
| Tetrahydrofuran | 2056 | D | S | 3 | 2G | Cont | No | SP | R | F-T | A,D | |
| Tetrahydronaphthalene | | C | P | 3 | 2G | Open | No | St | O | No | A | |
| Toluene | 1294 | C | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| Toluenediamine | 1709 | C | S/P | 2 | 2G | Cont | No | St | C | T | B,C,D | 4.9, 4.12.1, 4.13.1, 4.14, 4.17, 5.2.8 |
| Toluene diisocyanate | 2078 | C | S/P | 2 | 2G | Cont | Dry | St | C | F-T | C(c)<br>D | 4.9, 4.12.4, 4.13.1, 4.14, 4.15.2, 4.17, 5.2.8 |
| o-Toluidine | 1708 | C | S/P | 2 | 2G | Cont | No | St | C | T | A,C | 4.9, 4.13.1, 4.14 |
| Tributyl phosphate* | | B | P | 3 | 2G | Open | No | St | O | No | A | |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
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| 1,2,4-Trichlorobenzene | 2321 | B | S/P | 2 | 2G | Cont | No | St | R | T | C | 4.14.1, 5.2.8, 5A.2.2 |
| 1,1,1-Trichloroethane | 2831 | B | P | 3 | 2G | Open | No | St | O | No | A | |
| 1,1,2-Trichloroethane | | B | S/P | 3 | 2G | Cont | No | St | R | T | No | 4.9.1 |
| Trichloroethylene | 1710 | B | S/P | 3 | 2G | Cont | No | St | R | T | No | 4.9, 4.13.1, 4.15.1 |
| 1,2,3-Trichloropropane | | B | S/P | 2 | 2G | Cont | No | St | C | T | B,C,D | 4.9, 4.13.1, 4.14 |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | | C | P | 3 | 2G | Open | No | St | O | No | No | |
| Tricresyl phosphate (containing less than 1% ortho-isomer) | | A | P | 2 | 2G | Open | No | St | O | No | A | 4.14.1 |
| Tricresyl phosphate (containing 1% or more ortho-isomer) | 2574[j] | A | S/P | 1 | 2G | Cont | No | St | C | No | B | 4.9.3, 4.14 |
| Triethanolamine | | D | S | 3 | 2G | Open | No | St | O | No | A | 4.12.1 |
| Triethylamine | 1296 | C | S/P | 2 | 2G | Cont | No | SP | R | F-T | B | 4.9, 4.12.2, 4.17 |
| Triethylbenzene | | A | P | 2 | 2G | Open | No | St | O | No | A | 4.14.1 |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
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| Triethylenetetramine | 2259 | D | S | 3 | 2G | Open | No | St | O | No | A | 4.12.1 |
| Triethyl phosphite | 2323 | | S | 3 | 2G | Cont | No | SP | R | F-T | A,D | 4.9.1 |
| Trimethylacetic acid | | D | S | 3 | 2G | Cont | No | St | R | No | A,C | 4.8.2 to 4.8.8, 4.12.6 |
| 1,2,4-Trimethylbenzene | | B | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| Trimethylhexamethylene diamine (2,2,4- and 2,4,4-isomers) | 2327 | (D) | S | 3 | 2G | Open | No | St | O | No | A,C | 4.12.1, 4.14.1 |
| Trimethylhexamethylene diisocyanate (2,2,4- and 2,4,4-isomers) | 2328 | B | S/P | 2 | 2G | Cont | Dry | St | C | T | A,C[(c)] | 4.9, 4.13.1, 4.14.1, 4.15.2 |
| 2,2,4-Trimethyl-1, 3-Pentanediol-1-isobutyrate | | C | P | 3 | 2G | Open | No | St | O | No | A | |
| Trimethyl phosphite | 2329 | | S | 3 | 2G | Cont | No | SP | R | F-T | A,D | 4.9.1, 4.14.1, 4.15.2 |
| Trixylyl phosphate | | A | P | 1 | 2G | Open | No | St | O | No | A | 4.14 |

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| Turpentine | 1299 | B | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| 1-Undecene | | B | P | 3 | 2G | Open | No | St | O | No | A | |
| Undecyl alcohol | | B | P | 3 | 2G | Open | No | St | O | No | A | 5.2.8, 5A.2.2[F] |
| Urea, ammonium solution, (containing aqua ammonia) | | C | S/P | 3 | 2G | Cont | No | SP | R | T | A | 4.12.4, 4.12.9 |
| n-Valeraldehyde | 2058 | D | S | 3 | 2G | Cont | Inert | SP | R | F-T | A | 4.2.7, 4.15.1 |
| Vinyl acetate | 1301 | C | S/P | 3 | 2G | Cont | No | SP | O | F | A | 4.10, 4.18.1, 4.18.2 |
| Vinyl ethyl ether | 1302 | C | S/P | 2 | 1G | Cont | Inert | SP | C | F-T | A | 4.2, 4:10, 4.11, 4.12.8, 4.14, 4.17, 4.18.1, 4.18.2 |
| Vinylidene chloride | 1303 | B | S/P | 2 | 2G | Cont | Inert | SP | R | F-T | B | 4.10, 4.11, 4.12.5 4.17, 4.18.1, 4.18.2 |
| Vinyl neodecanoate | | C | S/P | 3 | 2G | Open | No | St | O | No | B | 4.10, 4.15.1, 4.18.1, 4.18.2 |
| Vinyl toluene | 2618 | A | S/P | 3 | 2G | Cont | No | SP | R | F | D | 4.10, 4.12.1, 4.14.1, 4.18.1, 4.18.2 |

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| White spirit, low (15–20%) aromatic | 1300 | (B) | P | 2 | 2G | Cont | No | SP | R | F | A | 4.14.1 |
| Xylene | 1307 | C | P | 3 | 2G | Cont | No | SP | R | F | A | 4.14.1, 5.2.8 |
| Xylenol | 2261 | B | S/P | 3 | 2G | Open | No | St | O | No | B | 5.2.8, 5A.2.2 |

a Provision 4.17 applies to ammonia aqueous, 28% or less but not below 10%.

b If the product carried contains flammable solvents such that the flashpoint is not exceeding 60°C, then special electrical systems and a flammable vapour detector are to be provided.

c Although water is suitable for extinguishing open air fires involving chemicals to which this footnote applies, water should not be allowed to contaminate closed tanks containing these chemicals because of the risk of hazardous gas generation.

d UN number 1198 only applies if flashpoint is below 60°C c.c.

e Provision 4.17 applies to formaldehyde solutions 45% or less, but not below 5%.

f Provision 4.17 applies to hydrochloric acid not below 10%.

g Dry chemical cannot be used because of the possibility of an explosion.

h UN number 2032 assigned to red fuming nitric acid.

i UN number depends on boiling point of substance.

j UN number assigned to this substance containing more than 3% of ortho-isomer.

k UN number only applies to 2-chloropropionic acid

l Dinitrotoluene should not be carried in deck tanks.

m Temperature sensors should be used to monitor the cargo pump temperature to detect overheating due to pump failures.

n Dry chemical should not be used as a fire-fighting medium

o UN number 2672 refers to 10-35% Ammonium solution.

p Applies to m-Decyl alcohol only.

q Requirements are based on those isomers having a flashpoint of 60°C or less, some isomers have a flashpoint greater than 60°C, and therefore the requirements based on flammability would not apply to such isomers.

r Provision 5A.2.2 applies to 1-undecyl alcohol only.

s UN number 1114 applies to Benzene.

## CHAPTER VII - LIST OF CHEMICALS TO WHICH THE CODE DOES NOT APPLY*

The existing text of chapter VII is replaced by the following:

1 The following are products which are not considered to come within the scope of the Code. This list may be used as a guide in considering bulk carriage of products whose hazards have not yet been evaluated.

2 Although the products listed in this chapter fall outside the scope of the Code, the attention of Administrations is drawn to the fact that some safety precautions may be needed for their safe transportation. Accordingly Administrations should prescribe appropriate safety requirements.

| Chapter VII | UN number |
|---|---|
| Acetone | 1090 |
| Alcohols ($C_{13}$ and above) | - |
| Alkyl ($C_9$-$C_{17}$) benzenes | - |
| Aluminium sulphate solution | |
| Aminoethyl diethanolamine/ Aminoethyl ethanolamine, water solution | |
| n-Amyl alcohol | 1105 |
| sec-Amyl alcohol | 1105 |
| tert-Amyl alcohol | 1105 |
| Amyl alcohol, primary | 1105 |
| Butene Oligomer | |
| sec-Butyl acetate | 1123 |
| n-Butyl alcohol | 1120 |
| sec-Butyl alcohol | 1120 |
| tert-Butyl alcohol | 1120 |

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* The product names are not always identical with the names given in the various editions of the Bulk Chemical Code (resolution A.212(VII)) or the International Bulk Chemical Code (resolution MSC.4(48)).

| Chapter VII | UN number |
|---|---|
| Butylene glycol | - |
| -Butyrolactone | - |
| Butyl stearate | - |
| Calcium alkyl salicylate | - |
| Calcium bromide solution | - |
| Calcium chloride solution | - |
| Caprolactam (molten or aqueous solutions) | - |
| Choline chloride solutions | - |
| Coconut oil fatty acid methyl ester | - |
| Dextrose solution | - |
| Diacetone alcohol | 1148 |
| Dialkyl ($C_7$-$C_{13}$) phthalates | - |
| Dicyclopentadiene | 2048 |
| Diethylene glycol | - |
| Diethylene glycol butyl ether | - |
| Diethylene glycol butyl ether acetate | - |
| Diethylene glycol dibutyl ether | - |
| Diethylene glycol diethyl ether | - |
| Diethylene glycol ethyl ether | - |
| Diethylene glycol ethyl ether acetate | - |
| Diethylene glycol methyl ether acetate | - |
| Diethylenetriamine pentaacetic acid pentasodium salt solution | - |
| Di-(2-ethyl hexyl) adipate | - |
| Di-(2-ethyl hexyl) phthalate | - |
| Diheptyl phthalate | - |
| Dihexyl phthalate | - |

| Chapter VII | UN number |
|---|---|
| Diisobutyl ketone | 1157 |
| Diisodecyl phthalate | - |
| Diisononyl adipate | - |
| Dinonyl phthalate | - |
| Diisooctyl phthalate | - |
| Diisopropyl naphthalene | - |
| 2,2-Dimethyloctanoic acid | - |
| Dioctyl phthalate | - |
| Dipropylene glycol | - |
| Dipropylene glycol methyl ether | - |
| Diundecyl phthalate | - |
| Dodecane | - |
| 2-Ethoxyethanol | 1171 |
| Ethyl acetate | 1173 |
| Ethyl acetoacetate | - |
| Ethyl alcohol | 1170 |
| Ethylcyclohexane | - |
| Ethylene carbonate | - |
| Ethylenediamine tetraacetic acid tetrasodium salt solution | - |
| Ethylene glycol | - |
| Ethylene glycol butyl ether | 2369 |
| Ethylene glycol butyl ether acetate | - |
| Ethylene glycol methyl butyl ether | - |
| Ethylene glycol methyl ether | 1188 |
| Ethylene glycol methyl ether acetate | 1189 |
| Ethylene glycol phenyl ether | - |

| Chapter VII | UN number |
|---|---|
| Ethylene glycol tert-butyl ether | - |
| Ethylene glycol phenyl ether/ Diethylene glycol phenyl ether mixture | - |
| 2-Ethylhexanoic acid | - |
| Formamide | - |
| Ethylene/Vinyl acetate copolymer (emulsion) | - |
| Glycerin | - |
| Glycine, sodium salt, solution | - |
| Ground nut oil | - |
| n-Heptane | 1206 |
| Hexamethylene diamine adipate, (50% in water) | - |
| n-Hexane | 1208 |
| 1-Hexanol | 2282 |
| Hexylene glycol | - |
| N-(Hydroxyethyl) ethylenediamine triacedic acid, trisodium salt, solution | - |
| Isoamyl alcohol | 1105 |
| Isobutyl alcohol | 1212 |
| Isobutyl formate | 2393 |
| Isododecane | - |
| Isopentane | 1265 |
| Isopentene | 2371 |
| Isophorone | - |
| Isopropyl acetate | 1220 |
| Isopropyl alcohol | 1219 |
| Lactic acid | - |

| Chapter VII | UN number |
|---|---|
| Latex:<br>Styrene butadiene rubber latex<br>Carboxylated styrene-butadiene copolymer | - |
| Lignin sulphonic acid, salt (low COD) | - |
| Magnesium chloride solution | - |
| Magnesium hydroxide slurry | - |
| 3-Methoxy-1-butanol | - |
| 3-Methoxyl butyl acetate | - |
| Methyl acetate | 1231 |
| Methyl alcohol | 1230 |
| Methyl tert-butyl ether | 2398 |
| Methyl ethyl ketone | 1193 |
| Methyl isobutyl ketone | 1245 |
| 3-Methyl-3-methoxy butanol | - |
| 3-Methyl-3-methoxy butyl acetate | - |
| Molasses | - |
| Nonane | 1920 |
| Oleic acid | - |
| Octane | 1262 |
| Olefins ($C_{13}$ and above, all isomers) | - |
| alpha-Olefins ($C_{16}$-$C_{18}$) | - |
| n-Paraffins ($C_{10}$-$C_{20}$) | - |
| Paraffin wax | - |
| Petrolatum | - |
| Petroleum naphtha | 1255 |
| Polyaluminium chloride solution | - |
| Polybutene | - |
| Polyethylene glycol | - |

| Chapter VII | UN number |
|---|---|
| Polyethylene glycol dimethyl ether | - |
| Polypropylene glycol | - |
| Polypropylene glycol methyl ether | - |
| Polysiloxane | - |
| n-Propyl acetate | 1276 |
| n-Propyl alcohol | 1274 |
| Propylene glycol | - |
| Propylene glycol ethyl ether | - |
| Propylene glycol methyl ether | - |
| Propylene tetramer | 2580 |
| Sodium aluminosilicate slurry | - |
| Sulpholane | - |
| Tridecanol | - |
| Triethylene glycol | - |
| Triethylene glycol butyl ether | - |
| Triisopropanolamine | - |
| Trimethylol propane polyethoxylate | - |
| Tripropylene glycol | - |
| Tripropylene glycol monomethyl ether | - |
| Urea solution | |
| Urea, ammonium nitrate solution | - |
| Urea, ammonium phosphate solution | - |
| Urea resin solution | - |
| Vegetable oil (those not otherwise listed) | - |
| Vegetable protein hydrolized solution | - |
| Wine | - |

APPENDIX

MODEL FORM OF CERTIFICATE OF FITNESS FOR THE CARRIAGE OF DANGEROUS CHEMICALS IN BULK

Existing form of the Certificate is replaced by the following:

CERTIFICATE OF FITNESS FOR THE CARRIAGE OF DANGEROUS CHEMICALS IN BULK

(Official seal)

Issued in pursuance of the

IMO CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK

(resolution MEPC 20(22))1/

under the authority of the Government of

.....

(full official designation of country)

by .....

(full official designation of the competent person or organization recognized by the Administration)

| Name of ship | Distinctive number or letters | Port of registry | Gross tonnage | Ship type (Code paragraph 2.2.4)2/ |
|---|---|---|---|---|
| | | | | |

Date on which keel was laid or on which the ship was at a similar stage of construction, or (in the case of a converted ship) date on which conversion to chemical tanker was commenced: .....

Date on which the building contract was placed: .....

---

The Certificate should be drawn up in the official language of the issuing country. If the language used is neither English nor French, the text should include a translation into one of these languages.

THIS IS TO CERTIFY:

1 (i) That the ship has been surveyed in accordance with the provisions of section 1.6 of the Code;

(ii) that the survey showed that the construction and equipment of the ship:

*(a) complied with the relevant provisions of the Code applicable to ships referred to in 1.7.2;

*(b) complied with the provisions of the Code applicable to ships referred to in 1.7.3.

2 That the ship has been provided with a manual in accordance with the standards for procedures and arrangements as called for by Regulation 5, 5A and 8 of Annex II of MARPOL 73/78, and that the arrangements and equipment of the ship prescribed in the manual are in all respects satisfactory and comply with the applicable requirements of the said Standards;

3 That the ship is suitable for the carriage in bulk of the following products provided that all relevant operational provisions of the Code are observed

| Products[3/4/] | Conditions of carriage[5/6/] (tank numbers etc.) |
|---|---|
| | |
| * Continued on the annexed signed and dated sheet(s) numbered 1A<br>* Tank numbers referred to in this list are identified on the annexed signed and dated tank plan numbered 2A | |

4 That, in accordance with 1.7.3/2.2.5* the provisions of the Code are modified in respect of the ship in the following manner:

5 That the ship must be loaded:

*(a) in accordance with the loading conditions provided in the approved loading manual, stamped and dated
.....
and signed by a responsible officer of the Administration, or of an organization recognized by the Administration;

*(b) in accordance with the loading limitations appended to this Certificate.

Where it is required to load the ship other than in accordance with the above instruction, then the necessary calculations to justify the proposed loading conditions should be communicated to the certifying Administration who may authorize in writing the adoption of the proposed loading condition.**

6 This certificate is valid until .....
subject to surveys in accordance with 1.6 of the Code

Issued at ..... ..... 19..
(place of issue of Certificate)

The undersigned declares that he is duly authorized by the said Government to issue this Certificate.

.....
(signature of official issuing the certificate and/or seal of issuing authority)

Notes on completion of Certificate:

1/ The Certificate can be issued only to ships entitled to fly the flags of States which are Parties to MARPOL 73/78.

2/ Ship type: Any entry under this column must relate to all relevant recommendations, e.g. an entry "Type II" should mean Type II in all respects prescribed by the Code. This column would not usually apply in the case of an existing ship and in such a case should be noted "See paragraph 1(ii)(b)."

---

* Delete as appropriate.
** Instead of being incorporated in the Certificate, this text may be appended to the Certificate if duly signed and stamped.

3/ Products: Products listed in Chapter VI of the Code, or which have been evaluated by the Administration in accordance with 1.8 of the Code, should be listed. In respect of the latter "new" products, any special requirements provisionally prescribed should be noted.

4/ Products: The list of products the ship is suitable to carry should include the noxious liquid substances of Category D which are not covered by the Code and should be identified as "Chapter VII Category D".

5/ Conditions of carriage: The limitations on the carriage of Category B or Category C substances under 5A.2 of the Code should also be indicated.

6/ Conditions of carriage: If a Certificate is issued to a ship which is modified in accordance with the provision of Regulation 1(12) of Annex II to MARPOL 73/78 the Certificate should indicate in the top of the table of products and conditions of carriage the following statement: "This ship is certificated to carry only pollution hazard chemicals"

ENDORSEMENT FOR ANNUAL AND INTERMEDIATE SURVEYS

THIS IS TO CERTIFY that at a survey required by 1.6 of the Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk, the ship was found to comply with the relevant provisions of the Code.

Annual survey:

Signed: .....
(signature of duly authorized official)

Place: .....

Date: .....

(seal or stamp of the Authority, as appropriate)

Annual*/Intermediate* survey:

Signed: .....
(signature of duly authorized official)

Place: .....

Date: .....

(seal or stamp of the Authority, as appropriate)

Annual*/Intermediate* survey:

Signed: .....
(signature of duly authorized official)

Place: .....

Date: .....

(seal or stamp of the Authority, as appropriate)

Annual survey:

Signed: .....
(signature of duly authorized official)

Place: .....

Date: .....

(seal or stamp of the Authority, as appropriate)

---

* Delete at appropriate

ATTACHMENT 1A TO THE CERTIFICATE OF FITNESS FOR THE CARRIAGE OF DANGEROUS CHEMICALS IN BULK

Continued list of products to those specified in Section 3, and their conditions of carriage

| Products | Conditions of carriage (tank numbers, etc.) |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

Date .....
(as for Certificate)

.....
(Signature of official issuing the Certificate and/or seal of issuing authority)

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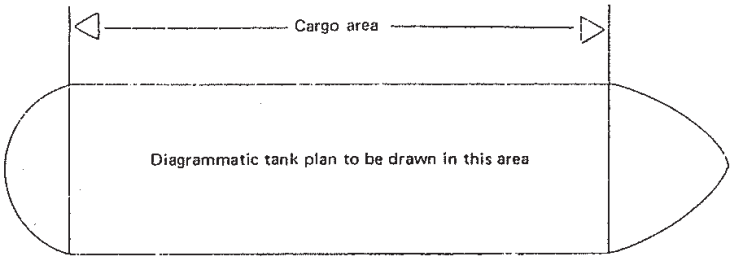
ATTACHMENT 2A TO THE CERTIFICATE OF FITNESS FOR THE CARRIAGE OF DANGEROUS CHEMICALS

TANK PLAN (specimen)

Name of ship: . . . . . .

Distinctive number or letters: . . . . . .




Date . . . . . .
*(as for certificate)*

. . . . . .
*(signature of official issuing the certificate and/or seal of issuing authority)*

MSC 57/27/Add.2

ANNEX 30

DRAFT RESOLUTION MSC.15(57)

ADOPTION OF AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (BCH CODE)

adopted on 11 April 1989

THE MARITIME SAFETY COMMITTEE,

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

RECALLING FURTHER resolution A.212(VII), by which the Assembly, at its seventh session, adopted the Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk (BCH Code), which provides safety requirements for chemical tankers supplementary to the provisions of the International Convention for the Safety of Life at Sea, 1974 (1974 SOLAS Convention),

NOTING resolution MEPC.33(27) by which the Marine Environment Protection Committee adopted amendments to the BCH Code, circulated by the Secretary-General in accordance with the procedures laid down in article 16(2) of MARPOL 73/78, at its twenty-seventh session for the purposes of that Convention,

1. ADOPTS the amendments to the BCH Code, the text of which is given in the Annex to the present resolution;

2. DECIDES that the amendment shall become effective on the date of entry into force of the amendments to the IBC Code by resolution MSC.14(57).

ANNEX

AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (BCH CODE)

The text of the amendments is contained in MEPC 27/16, annex 4.

***

ANNEX 4

Resolution MEPC 33(27)

**ADOPTION OF AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (BCH CODE)**

adopted on 17 March 1989

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING article 38(a) of the Convention on the International Maritime Organization concerning the function of the Committee conferred upon it by International Conventions for the Prevention and Control of Marine Pollution,

NOTING article 16 of the International Convention for the Prevention of Pollution from Ships, 1973 (hereinafter referred to as the "1973 Convention") and Article VI of the Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, 1973 (hereinafter referred to as the "1978 Protocol"), which together specify the amendment procedure of the 1978 Protocol and confers upon the appropriate body of the Organization the function of considering and adopting amendments to the 1973 Convention, as modified by the 1978 Protocol (MARPOL 73/78),

BEING DESIROUS of keeping the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH Code) up-to-date, and compatible with the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code), as well as Appendices II and III of Annex II of MARPOL 73/78,

NOTING FURTHER resolution MEPC 32(27) by which the Committee adopted amendments to the IBC Code,

RECOGNIZING the need to bring the corresponding amendments to the BCH Code on the date on which the amendments to the IBC Code enter into force,

HAVING CONSIDERED, at its twenty-seventh session, the amendments to the BCH Code proposed by the Sub-Committee on Bulk Chemicals at its eighteenth session and circulated in accordance with article 16(2)(a) of the 1973 Convention,

1. ADOPTS in accordance with article 16(2)(d) of the 1973 Convention amendments to the BCH Code, the text of which is set out in the Annex to the present resolution;

2. DETERMINES, in accordance with article 16(2)(f)(iii) of the 1973 Convention, that the amendments shall be deemed to have been accepted on the date on which the conditions for the entry into force of the amendments to the IBC Code adopted by the Committee by resolution MEPC 32(27) are met, unless prior to that date, not less than one-third of the Parties or the Parties, the combined merchant fleets of which constitute not less than fifty per cent of the gross tonnage of the world's merchant fleet, have communicated to the Organization their objections to the amendments;

3. INVITES the Parties to note that in accordance with article 16(2)(g)(ii) of the 1973 Convention the amendments shall enter into force six months after their acceptance in accordance with paragraph 2 above;

4. REQUESTS the Secretary-General, in conformity with article 16(2)(e) of the 1973 Convention, to transmit to all Parties to the 1978 Protocol certified copies of the present resolution and the text of the amendments contained in the Annex;

5. REQUESTS FURTHER the Secretary-General to transmit to the Members of the Organization which are not Parties to the 1978 Protocol copies of the resolution and its Annex.

W3725v/rkg

ANNEX

## PROPOSED AMENDMENTS TO THE BCH CODE

1 Chapter 3, Section E – FIRE PROTECTION: The introductory sentence is amended to read:

"Fire-extinguishing media determined to be effective for certain products are listed in column "1" in the table of chapter VI."

and the same sentence which appears in the Explanatory Notes to chapter VI under "Fire Protection" is deleted.

2 Regulation 3.14.2: The last sentence is amended to read: "Regular protein foams should not be used".

3 Regulation 4.4 Acetone cyanohydrin

.1 The words "and lactonitrile solution (80% or less)" are added to the title.

.2 The first sentence is amended to read:

"Acetone cyanohydrin and lactonitrile solution should ...".

4 New regulation 4.22 Octyl nitrates

New regulation 4.22 Octyl nitrates is added as follows:

"4.22 Octyl nitrates, all isomers

4.22.1

The carriage temperature of the cargo should be maintained below 100°C to prevent the occurrence of a self-sustaining, exothermic decomposition reaction.

4.22.2

The cargo may not be carried in independent pressure vessels permanently affixed to the vessel's deck unless:

.1 the tanks are sufficiently insulated from fire; and

.2 the vessel has a water deluge system for the tanks such that the cargo temperature is maintained below 100°C and the temperature rise in the tanks does not exceed 1.5°C/hour for a fire of 650°C (1200°F)."

5 Chapter VI, explanatory note for fire protection:

.1 a footnote is added to "D: dry chemical", as follows:

"Dry chemical powder systems when used may require an additional water system for boundary cooling. This is normally provided in sufficient quantitites by the standard fire main system required by regulation II-2/4 of the 1974 SOLAS Convention as amended."*

.2 A new note is added as follows:

"Further information on the suitability of fire-fighting media listed in column "1" of chapter VI may be found in column "1" of chapter 17 in the IBC Code."*

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* This amendment is subject to agreement by MSC.

W3725v/rkg

6 Chapter VI, the table

The table of summary of minimum requirements are replaced by the following.

| Product name | UN number | Pollution category | Hazards | Ship type | Tank type | Tank vents | Tank environmental control | Electrical requirements | Gauging | Vapour detection | Fire protection | Special requirements |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a | b | c | d | e | f | g | h | i | j | k | l | m |
| Acetic acid | 2789 | D | S | 3 | 2G | Cont. | No | SP | R | F | A | 4.8.2 to 4.8.4, 4.8.6 to 4.8.8, 4.12.6, 4.17 |
| Acetic anhydride | 1715 | D | S | 2 | 2G | Cont. | No | SP | R | F-T | A | 4.8.2 to 4.8.4, 4.8.6 to 4.8.8, 4.12.6, 4.17 |
| Acetone cyanohydrin | 1541 | A | S/P | 2 | 2G | Cont. | No | St | C | T | A | 4.4, 4.9, 4.12.6, 4.13, 4.14, 4.17, 4.18 |
| Acetonitrile | 1648 | III | S | 2 | 2G | Cont. | No | SP | R | F-T | A | 4.9 |
| Acrylamide solution (50% or less) | 2074 | D | S | 2 | 2G | Open | No | St | C | No | No | 4.9.3, 4.10, 4.14.1, 4.15.1, 4.18.1 |
| Acrylic acid | 2218 | D | S | 3 | 2G | Cont. | No | SP | R | F-T | A | 4.10, 4.12.6, 4.18.1 |
| Acrylonitrile | 1093 | B | S/P | 2 | 2G | Cont. | No | SP | C | F-T | A | 4.9, 4.10, 4.12.3, 4.13.1, 4.14, 4.17 |
| Adiponitrile | 2205 | D | S | 3 | 2G | Cont. | No | St | R | T | A | |
| Alcohol (C12-C15)poly (1-3)ethoxylates | | A | P | 2 | 2G | Open | No | St | O | No | A | 4.14.1 |
| Alcohol (C12-C15)poly (3-11)ethoxylates | | A | P | 2 | 2G | Open | No | St | O | No | A | 4.14.1 |
| Alcohol (C6-C17)(secondary) poly(3-6) ethoxylates | | A | P | 2 | 2G | Open | No | St | O | No | A | 4.14.1 |
| Alcohol (C6-C17)(secondary) poly(7-12) ethoxylates | | B | P | 3 | 2G | Open | No | St | O | No | A | 4.14.1 5.2.5, 5.2.8 |
| Alkyl acrylate-vinyl pyridine copolymer in toluene | | C | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Alkyl benzene sulphonic acid | 2586, 2584 | C | S/P | 3 | 2G | Open | No | St | O | No | B | 5.2.6, 5.2.7 |
| Alkyl benzene sulphonic acid, sodium salt solution | | C | P | 3 | 2G | Open | No | St | O | No | No | 5.2.6, 5.2.7, 5.2.8 |
| Allyl alcohol | 1098 | B | S/P | 2 | 2G | Cont. | No | SP | C | F-T | A | 4.9, 4.13.1, 4.14, 4.17 |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Allyl chloride | 1100 | B | S/P | 2 | 2G | Cont. | No | SP | C | F-T | A | 4.9, 4.13.1, 4.14, 4.17 |
| Aluminium chloride(30% or less)/Hydrochloric acid(20% or less)solution | | D | S | 3 | 1G | Cont. | No | St | R | T | No | 4.8, 4.17(f) |
| 2-(2-Aminoethoxy) ethanol | 3055 | D | S | 3 | 2G | Open | No | St | O | No | A,C,D | 4.14.1 |
| Aminoethyl ethanolamine | | (D) | S | 3 | 2G | Open | No | St | O | No | A | 4.12.1 |
| N-Aminoethylpiperazine | 2815 | D | S | 3 | 2G | Cont. | No | St | R | T | A,C,D | 4.12.2,4.14.1 |
| 2-Amino-2-methyl-1-propanol (90% or less) | | D | S | 3 | 2G | Open | No | St | O | No | A | 4.12.1 |
| Ammonia aqueous (28% or less) | 2672 (o) | C | S/P | 3 | 2G | Cont. | No | SP | R | T | C | 4.12.4, 4.12.9, 4.17 (a) |
| Ammonium nitrate solution (93% or less) | 2426 | D | S | 2 | 1G | Open | No | St | O | No | No | 4.8.4, 4.8.6, 4.12.10, 4.13.2, 4.14.1, 4.19 |
| Ammonium sulphide solution (45% or less) | 2683 | B | S/P | 2 | 2G | Cont. | No | SP | C | F-T | A,C | 4.9, 4.11, 4.12.1, 4.13.1, 4.14, 4.15.1, 4.17, 4.18 |
| Ammonium thiocyanate (25% or less)/Ammonium thiosulphate (20% or less) solution | | (C) | P | 3 | 2G | Open | No | St | O | No | No | |
| Ammonium thiosulphate solution (60% or less) | | (C) | P | 3 | 2G | Open | No | St | O | No | No | 5.2.8 |
| n-Amyl acetate | 1104 | C | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| sec-Amyl acetate | 1104 | C | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Amyl acetate,commercial | 1104 | C | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Aniline | 1547 | C | S/P | 2 | 2G | Cont. | No | St | C | T | A | 4.9, 4.13.1, 4.14 |
| Aviation alkylates (C8 paraffins and iso-paraffins BPT 95 - 120°C) | | (C) | P | 3 | 2G | Cont. | No | SP | R | F | B | 4.14.1 |
| Benzene and mixtures having 10% benzene or more | 1114(s) | C | S/P | 3 | 2G | Cont. | No | SP | R | F-T | B | 4.9.1, 4.13.1, 5.2.8 |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene sulphonyl chloride | 2225 | D | S | 3 | 2G | Cont. | No | St | R | T | B,D | 4.12.1, 4.14.1 |
| Benzylacetate | | C | P | 3 | 2G | Open | No | St | O | No | A | |
| Benzyl alcohol | | C | P | 3 | 2G | Open | No | St | O | No | A | |
| Benzyl chloride | 1738 | B | S/P | 2 | 2G | Cont. | No | St | C | T | B | 4.9, 4.10, 4.13.1, 4.14, 4.17 |
| Butene oligomer | | B | P | 3 | 2G | Open | No | St | O | No | A | 4.14.1 |
| n-Butyl acetate | 1123 | C | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| n-Butyl acrylate | 2348 | B | S/P | 2 | 2G | Cont. | No | SP | R | F-T | A | 4.10, 4.18.1, 4.18.2 |
| Butylamine ( all isomers ) | 1125, 1214 | C | S/P | 2 | 2G | Cont. | No | SP | R | F-T | A | 4.9, 4.12.1, 4.12.2, 4.13.1, 4.14.1, 4.17 |
| Butyl benzenes (all isomers) | 2709 | (A) | P | 2 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Butyl benzyl phthalate | | A | P | 2 | 2G | Open | No | St | O | No | A | 4.14.1 |
| n-Butyl butyrate | | (C) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Butyl/Decyl/Cetyl/Eicosyl methacrylate mixture | | D | S | 3 | 2G | Cont. | No | St | R | No | A,C,D | 4.10, 4.18.1, 4.18.2 |
| 1,2-Butylene oxide | 3022 | C | S/P | 3 | 2G | Cont. | Inert | SP | R | F | A,C | 4.7.1, 4.7.2, 4.7.4, 4.7.5, 4.7.8 to 4.7.11, 4.7.13, 4.7.19, 4.7.21, 4.14.1 |
| n-Butyl ether | 1149 | C | S/P | 3 | 2G | Cont. | Inert | SP | R | F-T | A,D | 4.2.7,4.9 |
| Butyl methacrylate | | D | S | 3 | 2G | Cont. | No | SP | R | F-T | A,D | 4.10, 4.18.1, 4.18.2 |
| n-Butyraldehyde | 1129 | B | S/P | 3 | 2G | Cont. | No | SP | O | F-T | A | 4.14.1, 4.15.1 |
| Butyric acid | 2820 | D | S | 3 | 2G | Cont. | No | St | R | No | A | 4.8.2 to 4.8.4, 4.8.6 to 4.8.8, 4.12.6 |
| Calcium alkyl salicylate | | C | P | 3 | 2G | Open | No | St | O | No | A | 5.2.6, 5.2.7 |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Calcium hypochlorite solution (15% or less) | | C | S/P | 3 | 2G | Cont. | No | St | R | No | No | 4.12.5, 4.15.1 |
| Calcium hypochlorite solution (more than 15%) | | B | S/P | 3 | 2G | Cont. | No | St | R | No | No | 4.12.5, 4.15.1 |
| Calcium naphthenate in mineral oil | | A | P | 3 | 2G | Open | No | St | O | No | A | 4.14.1 |
| Camphor oil | 1130 | B | S/P | 2 | 2G | Cont. | No | SP | O | F | B | 4.14.1 |
| Carbolic oil | | A | S/P | 2 | 2G | Cont. | No | SP | C | F-T | A | 4.9,4.14 |
| Carbon disulphide | 1131 | B | S/P | 2 | 1G | Cont. | Inert | use NONE | C | F-T | C | 4.1, 4.9, 4.14, 4.17 |
| Carbon tetrachloride | 1846 | B | S/P | 3 | 2G | Cont. | No | St | C | T | No | 4.9, 4.13.1, 4.14.1, 4.17 |
| Cashew nut shell oil (untreated) | | D | S | 3 | 2G | Cont. | No | St | R | T | B | |
| Cetyl/Eicosyl methacrylate mixture | | III | S | 3 | 2G | Open | No | St | O | No | A,C,D | 4.10, 4.18.1, 4.18.2 |
| Chlorinated paraffins (C10-C13) | | A | P | 1 | 2G | Open | No | St | O | No | A | 4.14 |
| Chloroacetic acid (80% or less) | 1750 | C | S/P | 2 | 2G | Cont. | No | St | C | No | No | 4.8.2, 4.8.4, 4.8.6, 4.8.7, 4.8.8, 4.9.3, 4.12.6,(ALUMINUM NOT PERMITTED), 4.14, 5.2.8 |
| Chlorobenzene | 1134 | B | S/P | 2 | 2G | Cont. | No | SP | R | F-T | B | 4.14.1 |
| Chloroform | 1888 | B | S/P | 3 | 2G | Cont. | No | St | R | T | No | 4.9, 4.14.1, 4.17 |
| Chlorohydrins (crude) | | (D) | S | 2 | 2G | Cont. | No | SP | C | F-T | A | 4.9, 4.14 |
| o-Chloronitrobenzene | 1578 | B | S/P | 2 | 2G | Cont. | No | St | C | T | B,C,D | 4.9, 4.13, 4.14, 5.2.5, 5.2.8, 5A.2.2 |
| 2- or 3- Chloropropionic acid | 2511 | (k)(C) | S/P | 3 | 2G | Open | No | St | O | No | A | 4.8.2 to 4.8.4, 4.8.6 to 4.8.8, 4.12.6, 5.2.6 to 5.2.8 |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chlorosulphonic acid | 1754 | C | S/P | 1 | 2G | Cont. | No | St | C | T | No | 4.8.2 to 4.8.8, 4.9, 4.14, 4.15.2, 4.17 |
| m-Chlorotoluene | 2238 | B | S/P | 3 | 2G | Cont. | No | SP | R | F-T | B,C | 4.14.1 |
| o-Chlorotoluene | 2238 | A | S/P | 3 | 2G | Cont. | No | SP | R | F-T | B,C | 4.14.1 |
| p-Chlorotoluene | 2238 | B | S/P | 2 | 2G | Cont. | No | SP | R | F-T | B,C | 4.14.1,5.2.8 |
| Chlorotoluenes (all isomers) | 2238 | A | S/P | 2 | 2G | Cont. | No | SP | R | F-T | B,C | 4.14.1 |
| Coal tar | | A | S/P | 2* | 2G | Cont. | No | St | R | No | B,D | 4.14.1 |
| Coal tar naphtha solvent | | B | S/P | 3 | 2G | Cont. | No | SP | R | F-T | A,D | 4.14.1 |
| Coal tar pitch (molten) | | D | S | 3 | 1G | Cont. | No | St | R | No | B,D | 4.14.1 |
| Coconut oil fatty acid | | C | P | 3 | 2G | Open | No | St | O | No | A | 5.2.6, 5.2.7, 5.2.8 |
| Creosote (coal tar) | | A | S/P | 2 | 2G | Open | No | St | O | No | B,D | 4.14.1 |
| Creosote (wood) | | A | S/P | 2 | 2G | Open | No | St | O | No | B,D | 4.14.1 |
| Cresols (all isomers) | 2076 | A | S/P | 2 | 2G | Open | No | St | O | No | B | 4.14.1 |
| Cresylic acid, sodium salt solution | | A | S/P | 2 | 2G | Open | No | St | O | No | No | 4.12.1 |
| Crotonaldehyde | 1143 | B | S/P | 2 | 2G | Cont. | No | SP | R | F-T | A | 4.9, 4.13.1, 4.14.1, 4.15.1, 4.17 |
| Cycloheptane | 2241 | (C) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Cyclohexane | 1145 | C | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1, 5.2.8 |
| Cyclohexanol | | C | P | 3 | 2G | Open | No | St | O | No | A | 5.2.6, 5.2.8 |
| Cyclohexanone | 1915 | D | S | 3 | 2G | Cont. | No | SP | R | F-T | A | 4.12.5 |
| Cyclohexyl acetate | 2243 | (B) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Cyclohexylamine | 2357 | C | S/P | 3 | 2G | Cont. | No | SP | R | F-T | A,D | 4.12.1, 4.12.2 |
| 1,3-Cyclopentadiene dimer (molten) | | B | P | 2 | 2G | Cont. | No | SP | R | F | A | 4.14.1, 5.2.5, 5.2.8, 5A.2.2 |
| Cyclopentane | 1146 | (C) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Cyclopentene | 2246 | (B) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |

*For ships constructed before the date of entry into force of the present amendments which are engaged solely on voyages from, to or between ports or terminals within the State the flag of which the ship is entitled to fly, the ship-type requirement applies ten years after entry into force of the amendments.

For ships constructed before the date of entry into force of the present amendments, which are engaged on voyages between ports or terminals within States other than the State the flag of which the ship is entitled to fly, the ship-type requirement applies five years after the entry into force of the amendments, provided that the ship satisfies all the following conditions:

1 the ship has been regularly engaged in the trade of coal tar for at least five years before the date of entry into force of the present amendments;
2 the ship is solely engaged on restricted voyages as determined by the Administration;
3 the Certificate of Fitness is endorsed to the effect that the ship is solely engaged in such restricted voyages, with the expiry date of the period of grace; and
4 the five year period of grace is agreed among the Governments concerned.

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dichloroethyl ether | 1916 | B | S/P | 2 | 2G | Cont. | No | SP | R | F-T | A | 4.12.5, 4.14.1 |
| 2,2-Dichloroisopropyl ether | 2490 | C | S/P | 2 | 2G | Cont. | No | St | R | T | B,C,D | 4.9, 4.12.5, 4.13.1, 4.14 |
| Dichloromethane | 1593 | D | S | 3 | 2G | Cont. | No | St | R | T | No | |
| 2,4-Dichlorophenol | 2021 | A | S/P | 2 | 2G | Cont. | Dry | St | R | T | B,C,D | 4.12.1, 4.14.1 |
| 2,4-Dichlorophenoxyacetic acid, diethanolamine salt solution | | A | S/P | 3 | 2G | Open | No | St | O | No | No | 4.12.1, 4.14.1 |
| 2,4-Dichlorophenoxyacetic acid, dimethylamine salt solution (70% or less) | | A | S/P | 3 | 2G | Open | No | St | O | No | No | 4.12.1, 4.14.1 |
| 2,4-Dichlorophenoxyacetic acid, triisopropanolamine salt solution | | A | S/P | 3 | 2G | Open | No | St | O | No | No | 4.12.1, 4.14.1 |
| 1,2-Dichloropropane | 1279 | B | S/P | 2 | 2G | Cont. | No | SP | R | F-T | B | 4.9, 4.14.1 |
| 1,3-Dichloropropane | | B | S/P | 2 | 2G | Cont. | No | SP | R | F-T | B | 4.9, 4.14.1 |
| 1,3-Dichloropropene | 2047 | B | S/P | 2 | 2G | Cont. | No | SP | C | F-T | B | 4.9, 4.13, 4.14, 4.17 |
| Dichloropropene/Dichloropropane mixtures | | B | S/P | 2 | 2G | Cont. | No | SP | C | F-T | B,C,D | 4.9, 4.13, 4.14, 4.17 |
| 2,2-Dichloropropionic acid | | D | S | 3 | 2G | Cont. | Dry | St | R | No | A | 4.8.2, 4.8.4, 4.8.6 to 4.8.8, 4.12.6(z) |
| Diethanolamine | | III | S | 3 | 2G | Open | No | St | O | No | A | 4.12.2 |
| Diethylamine | 1154 | C | S/P | 3 | 2G | Cont. | No | SP | R | F-T | A | 4.9, 4.12.1, 4.17 |
| Diethylaminoethanol | 2686 | C | S/P | 3 | 2G | Cont. | No | SP | R | F-T | A,C | 4.12.1, 4.12.2 |
| Diethylbenzene | 2049 | C | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Diethylene glycol methyl ether | | C | P | 3 | 2G | Open | No | St | O | No | A | |
| Diethylenetriamine | 2079 | D | S | 3 | 2G | Open. | No | St | O | No | A | 4.12.2 |
| Diethyl ether | 1155 | III | S | 2 | 1G | Cont. | Inert | SP | C | F-T | A | 4.2, 4.11, 4.12.9, 4.14, 4.17 |
| Di-(2-ethylhexyl) phosphoric acid | 1902 | C | S/P | 3 | 2G | Open | No | St | O | No | B,C,D | 4.12.2 |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Diethyl phthalate | | C | P | 3 | 2G | Open | No | St | O | No | A | |
| Diethyl sulphate | 1594 | (B) | S/P | 2 | 2G | Cont. | No | St | C | T | A,D | 4.12.3, 4.14.1 |
| Diglycidyl ether of bisphenol A | | B | P | 3 | 2G | Open | No | St | O | No | A | 4.14.1, 5.2.5 |
| Diglycidyl ether of bisphenol F | | B | P | 3 | 2G | Open | No | St | O | No | A | 4.14.1, 5.2.5 |
| Di-n-hexyl adipate | | B | P | 3 | 2G | Open | No | St | O | No | A | 4.14.1 |
| Diisobutylamine | 2361 | (C) | S/P | 2 | 2G | Cont. | No | SP | R | F-T | B,D | 4.9.3, 4.12.1, 4.14.1 |
| Diisobutylene | 2050 | B | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Diisobutyl phthalate | | B | P | 3 | 2G | Open | No | St | O | No | A | 4.14.1, 5.2.5 |
| Diisopropanolamine | | C | S/P | 3 | 2G | Open | No | St | O | No | A | 4.12.2, 5.2.6 to 5.2.8 |
| Diisopropylamine | 1158 | C | S/P | 2 | 2G | Cont. | No | SP | C | F-T | A | 4.9, 4.12.2, 4.14, 4.17 |
| Diisopropylbenzene (all isomers) | | A | P | 2 | 2G | Open | No | St | O | No | A | 4.14.1 |
| N,N-Dimethylacetamide solution (40% or less) | | D | S | 3 | 2G | Cont. | No | St | R | T | B | 4.9.1, 4.12.4, 4.13.1 |
| Dimethyl adipate | | B | P | 3 | 2G | Open | No | St | O | No | A | 4.14.1, 5.2.8 |
| Dimethylamine solution (45% or less) | 1160 | C | S/P | 3 | 2G | Cont. | No | SP | R | F-T | C,D | 4.9, 4.12.1, 4.17 |
| Dimethylamine solution (greater than 45% but not greater than 55%) | 1160 | C | S/P | 2 | 2G | Cont. | No | SP | C | F-T | A,C,D | 4.9, 4.12.1, 4.13.1, 4.14, 4.17 |
| Dimethylamine solution (greater than 55% but not greater than 65%) | 1160 | C | S/P | 2 | 2G | Cont. | No | SP | C | F-T | A,C,D | 4.9, 4.11, 4.12.1, 4.13.1, 4.14, 4.17 |
| N,N-Dimethylcyclohexylamine | 2264 | C | S/P | 2 | 2G | Cont. | No | SP | R | F-T | A,C | 4.9, 4.12.1, 4.13.1, 4.14.1 |
| Dimethylethanolamine | 2051 | D | S | 3 | 2G | Cont. | No | SP | R | F-T | A,D | 4.12.2 |
| Dimethylformamide | 2265 | D | S | 3 | 2G | Cont. | No | SP | R | F-T | A,D | |
| Dimethyl glutarate | | C | P | 3 | 2G | Open | No | St | O | No | A | |
| Dimethyl hydrogen phosphite | | | S | 3 | 2G | Cont. | No | St | R | T | A,D | 4.9.1 |
| Dimethyl octanoic acid | | (C) | P | 3 | 2G | Open | No | St | O | No | A | 5.2.7, 5.2.8 |
| Dimethyl phthalate | | C | P | 3 | 2G | Open | No | St | O | No | A | |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Diisopropanolamine | | C | S/P | 3 | 2G | Open | No | St | O | No | A | 4.12.2, 5.2.6 to 5.2.8 |
| Diisopropylamine | 1158 | C | S/P | 2 | 2G | Cont. | No | SP | C | F-T | A | 4.9, 4.12.2, 4.14, 4.17 |
| Diisopropylbenzene (all isomers) | | A | P | 2 | 2G | Open | No | St | O | No | A | 4.14.1 |
| N,N-Dimethylacetamide solution (40% or less) | | D | S | 3 | 2G | Cont. | No | St | R | T | B | 4.9.1, 4.12.4, 4.13.1 |
| Dimethyl adipate | | B | P | 3 | 2G | Open | No | St | O | No | A | 4.14.1, 5.2.8 |
| Dimethylamine solution (45% or less) | 1160 | C | S/P | 3 | 2G | Cont. | No | SP | R | F-T | C,D | 4.9, 4.12.1, 4.17 |
| Dimethylamine solution (greater than 45% but not greater than 55%) | 1160 | C | S/P | 2 | 2G | Cont. | No | SP | C | F-T | A,C,D | 4.9, 4.12.1, 4.13.1, 4.14, 4.17 |
| Dimethylamine solution (greater than 55% but not greater than 65%) | 1160 | C | S/P | 2 | 2G | Cont. | No | SP | C | F-T | A,C,D | 4.9, 4.11, 4.12.1, 4.13.1, 4.14, 4.17 |
| N,N-Dimethylcyclohexylamine | 2264 | C | S/P | 2 | 2G | Cont. | No | SP | R | F-T | A,C | 4.9, 4.12.1, 4.13.1, 4.14.1 |
| Dimethylethanolamine | 2051 | D | S | 3 | 2G | Cont. | No | SP | R | F-T | A,D | 4.12.2 |
| Dimethylformamide | 2265 | D | S | 3 | 2G | Cont. | No | SP | R | F-T | A,D | |
| Dimethyl glutarate | | C | P | 3 | 2G | Open | No | St | O | No | A | |
| Dimethyl hydrogen phosphite | | | S | 3 | 2G | Cont. | No | St | R | T | A,D | 4.9.1 |
| Dimethyl octanoic acid | | (C) | P | 3 | 2G | Open | No | St | O | No | A | 5.2.7, 5.2.8 |
| Dimethyl phthalate | | C | P | 3 | 2G | Open | No | St | O | No | A | |
| Dimethyl succinate | | C | P | 3 | 2G | Open | No | St | O | No | A | 5.2.8 |
| Dinitrotoluene (molten) | 1600 | B | S/P | 2 | 2G (1) | Cont. | No | St | C | T | A | 4.9, 4.13.1, 4.14, 5.2.5, 5.2.8, 5A.2.2(m) |
| 1,4-Dioxane | 1165 | D | S | 2 | 2G | Cont. | No | SP | C | F-T | A | 4.9, 4.14 |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dipentene | 2052 | C | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Diphenyl | | A | P | 1 | 2G | Open | No | St | O | No | B | 4.14 |
| Diphenyl/Diphenyl ether mixtures | | A | P | 1 | 2G | Open | No | St | O | No | B | 4.14 |
| Diphenyl ether | | A | P | 3 | 2G | Open | No | St | O | No | A | 4.14.1 |
| Diphenylmethane diisocyanate | 2489 | (B) | S/P | 2 | 2G | Cont. | Dry | St (b) | C | T (b) | C ,D (c) | 4.9, 4.12.5, 4.13.1, 4.14.1, 4.15.2, 5.2.5, 5.2.8, 5A.2.2 |
| Diphenylol propane-epichlorohydrin resins | | B | P | 3 | 2G | Open | No | St | O | No | A | 5.2.5 |
| Diphenyl ether/Diphenyl phenyl ether mixture | | A | P | 3 | 2G | Open | No | St | O | No | A | 4.14.1 |
| Di-n-propylamine | 2383 | C | S/P | 3 | 2G | Cont. | No | SP | R | F-T | A | 4.9.3, 4.12.2, 4.14.1 |
| Dodecene (all isomers) | | (B) | P | 3 | 2G | Open | No | St | O | No | A | 4.14.1 |
| Dodecyl alcohol | | B | P | 3 | 2G | Open | No | St | O | No | A | 4.14.1, 5.2.5, 5.2.8, 5A.2.2 |
| Dodecyl diphenyl ether disulphonate solution | | B | S/P | 3 | 2G | Open | No | St | O | No | No | 4.14.1, 5.2.5, 5.2.8. 5A.2.2 |
| Dodecyl methacrylate | | III | S | 3 | 2G | Open | No | St | O | No | A,C | 4.10 |
| Dodecyl/Pentadecyl methacrylate mixture | | III | S | 3 | 2G | Open | No | St | O | No | A,C,D | 4.10, 4.18.1, 4.18.2 |
| Dodecyl phenol | | A | P | 1 | 2G | Open | No | St | O | No | A | 4.14 |
| Drilling brines, containing Zinc salts | | (A) | P | 2 | 2G | Open | No | St | O | No | No | 4.14.1 |
| Epichlorohydrin | 2023 | C | S/P | 2 | 2G | Cont. | No | SP | C | F-T | A | 4.9, 4.13.1, 4.14, 4.17 |
| Ethanolamine | 2491 | D | S | 3 | 2G | Open | No | St | O | F-T | A | 4.12.2 |
| 2-Ethoxyethyl acetate | 1172 | C | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Ethyl acrylate | 1917 | A | S/P | 2 | 2G | Cont. | No | SP | R | F-T | A | 4.10, 4.14.1, 4.17, 4.18.1, 4.18.2 |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ethyl amyl ketone | | C | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Ethylamine | 1036 | (C) | S/P | 2 | 1G | Cont. | No | SP | C | F-T | C,D | 4.9, 4.11, 4.12.2, 4.17 |
| Ethylamine solutions (72% or less) | 2270 | (C) | S/P | 2 | 2G | Cont. | No | SP | C | F-T | A,C | 4.9, 4.11, 4.12.1, 4.13.1, 4.14, 4.17 |
| Ethylbenzene | 1175 | C | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| N-Ethylbutylamine | | (C) | S/P | 3 | 2G | Cont. | No | SP | R | F-T | A | 4.9.3, 4.12.1, 4.14.1 |
| Ethyl butyrate | 1180 | C | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Ethylcyclohexane | | (C) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| N-Ethylcyclohexylamine | | D | S | 3 | 2G | Cont. | No | SP | R | F-T | A,C | 4.12.1, 4.14.1 |
| Ethylene chlorohydrin | 1135 | C | S/P | 2 | 2G | Cont. | No | SP | C | F-T | D | 4.9, 4.13.1, 4.14, 4.17 |
| Ethylene cyanohydrin | | (D) | S | 3 | 2G | Open | No | St | O | No | A | |
| Ethylenediamine | 1604 | C | S/P | 2 | 2G | Cont. | No | SP | R | F-T | A | 4.12.2, 5.2.8 |
| Ethylene dibromide | 1605 | B | S/P | 2 | 2G | Cont. | No | St | C | T | No | 4.9, 4.14.1, 4.17, 5.2.8 |
| Ethylene dichloride | 1184 | B | S/P | 2 | 2G | Cont. | No | SP | R | F-T | B | 4.12.4, 4.14 |
| Ethylene glycol butyl ether acetate | | (C) | P | 3 | 2G | Open | No | St | O | No | A | |
| Ethylene glycol diacetate | | C | P | 3 | 2G | Open | No | St | O | No | A | |
| Ethylene oxide/Propylene oxide mixture with an Ethylene oxide content of not more than 30% in weight | 2983 | D | S | 2 | 1G | Cont. | Inert | SP | C | F-T | A,C | 4.7, 4.9, 4.11, 4.14 |
| 2-Ethylhexyl acrylate | | B | S/P | 3 | 2G | Open | No | St | O | No | A | 4.10, 4.14.1, 4.18.1, 4.18.2 |
| 2-Ethylhexylamine | 2276 | B | S/P | 2 | 2G | Cont. | No | SP | R | F-T | A | 4.9, 4.12.2, 4.14.1 |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ethylidene norbornene | | B | S/P | 3 | 2G | Cont. | No | SP | R | F-T | B,C,D | 4.9.1, 4.12.4, 4.14.1, 4.15.1 |
| Ethyl methacrylate | 2277 | (D) | S | 3 | 2G | Cont. | No | SP | R | F-T | B,D | 4.10, 4.18.1, 4.18.2 |
| o-Ethylphenol | | (A) | S/P | 3 | 2G | Open | No | St | O | No | B | 4.14.1 |
| 2-Ethyl-3-propyl- acrolein | | (B) | S/P | 3 | 2G | Cont. | No | SP | R | F-T | A | 4.14.1, 5.2.8 |
| Ethyltoluene | | (B) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Ferric chloride solutions | 2582 | C | S/P | 3 | 2G | Open | No | St | O | No | No | 4.8, 4.14.1, 5.2.8 |
| Ferric nitrate/Nitric acid solution | | C | S/P | 2 | 2G | Cont. | No | St | R | T | No | 4.8, 4.14, 4.17 |
| Formaldehyde solutions(45% or less) | 1198 (d) 2209 | C | S/P | 3 | 2G | Cont. | No | SP | R | F-T | A | 4.15.1, 4.17(e), 5.2.8 |
| Formic acid | 1779 | D | S | 3 | 2G | Cont. | No | SP | R | T(t) | A | 4.8.2 to 4.8.4, 4.8.6 to 4.8.8, 4.12.7, 4.17 |
| Fumaric adduct of rosin, water dispersion | | B | P | 3 | 2G | Open | No | St | O | No | No | 4.14.1, 5.2.5 |
| Furfural | 1199 | C | S/P | 3 | 2G | Cont. | No | SP | R | F-T | A | 4.15.1 |
| Furfuryl alcohol | 2874 | C | P | 3 | 2G | Open | No | St | O | No | A | |
| Glutaraldehyde solutions (50% or less) | | D | S | 3 | 2G | Open | No | St | O | No | No | 4.15.1 |
| Glycidyl ester of C10 trialkylacetic acid | | B | P | 3 | 2G | Open | No | St | O | No | A | 4.14.1 |
| Heptane (all isomers) | 1206 | (C) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Heptanol (all isomers)(g) | | C | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Heptene (all isomers) | | C | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Heptyl acetate | | (B) | P | 3 | 2G | Open | No | St | O | No | A | 4.14.1 |
| Hexamethylenediamine solution | 1783 | C | S/P | 3 | 2G | Cont. | No | St | R | T | A | 4.12.2, 4.14.1, 5.2.8 |
| Hexamethyleneimine | 2493 | C | S/P | 2 | 2G | Cont. | No | SP | R | F-T | A,C | 4.12.1, 4.12.2 |
| Hexane (all isomers) | 1208 | (C) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hexene (all isomers) | | (C) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Hexyl acetate | 1233 | B | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Hydrochloric acid | 1789 | D | S | 3 | 1G | Cont. | No | St | R | T | No | 4.8, 4.17(f) |
| Hydrogen peroxide solutions (over 60% but not over 70%) | 2015 | C | S/P | 2 | 2G | Cont. | No | St | C | No | No | 4.14.1, 4.20.1 to 4.20.14 |
| 2-Hydroxyethyl acrylate | | B | S/P | 2 | 2G | Cont. | No | St | C | T | A | 4.9, 4.10, 4.14.1, 4.18.1, 4.18.2 |
| Hydrogen peroxide solutions (over 8% but not over 60%) | 2014, 2984 | C | S/P | 3 | 2G | Cont. | No | St | C | No | No | 4.13, 4.14.1, 4.20.15 to 4.20.27 |
| Isoamyl acetate | 1104 | C | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Isobutyl acetate | 1213 | C | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Isobutyl acrylate | 2527 | B | S/P | 2 | 2G | Cont. | No | SP | R | F-T | A | 4.10, 4.14.1, 4.18.1, 4.18.2 |
| Isobutyraldehyde | 2045 | C | S/P | 3 | 2G | Cont. | No | SP | O | F-T | A | 4.15.1 |
| Isophoronediamine | 2289 | D | S | 3 | 2G | Cont. | No | St | R | T | A | 4.12.2 |
| Isophorone diisocyanate | 2290 | B | S/P | 2 | 2G | Cont. | Dry | St | C | T | C ,D (c) | 4.9, 4.12.5, 4.13.1, 4.14.1, 4.15.2 |
| Isoprene | 1218 | C | S/P | 3 | 2G | Cont. | No | SP | R | F | B | 4.10, 4.11, 4.18.1, 4.18.2 |
| Isopropanolamine | | C | S/P | 3 | 2G | Open | No | St | O | F-T | A | 4.12.2, 5.2.7, 5.2.8 |
| Isopropylamine | 1221 | C | S/P | 2 | 2G | Cont. | No | SP | C | F-T | C,D | 4.9, 4.11, 4.12.2, 4.14, 4.17 |
| Isopropylbenzene | 1918 | B | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Isopropylcyclohexane | | (C) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1, 5.2.6, 5.2.7 |
| Isopropyl ether | 1159 | D | S | 3 | 2G | Cont. | Inert | SP | R | F | A | 4.2.7, 4.10.3, 4.14.1 |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Isovaleraldehyde | 2058 | C | S/P | 3 | 2G | Cont. | Inert | SP | R | F-T | A | 4.2.7, 4.15.1 |
| Lactonitrile solution (80% or less) | | B | S/P | 2 | 1G | Cont. | No | St | C | T | A,C,D | 4.4, 4.9, 4.12.6, 4.13, 4.14, 4.17, 4.18, 5.2.5 |
| Lauric acid | | B | P | 3 | 2G | Open | No | St | O | No | A | 5.2.5, 5.2.8, 5A.2.2 |
| Maleic anhydride | 2215 | D | S | 3 | 2G | Cont. | No | St | R | No | A ,C(g) | |
| Mercaptobenzothiazol, sodium salt solution | | B | S/P | 3 | 2G | Open | No | St | O | No | No | 4.12.1, 4.14.1, 5.2.8 |
| Mesityl oxide | 1229 | D | S | 3 | 2G | Cont. | No | SP | R | F-T | A | 4.14.1 |
| Metam sodium solution | | A | S/P | 3 | 2G | Open | No | St | O | No | No | 4.12.1, 4.14.1 |
| Methacrylic acid | 2531 | D | S | 3 | 2G | Cont. | No | St | R | T | A | 4.10, 4.12.6, 4.18.1 |
| Methacrylonitrile | 3079 | (B) | S/P | 2 | 2G | Cont. | No | SP | C | F-T | A | 4.9, 4.10, 4.12.4, 4.13.1, 4.14, 4.17 |
| Methyl acrylate | 1919 | B | S/P | 2 | 2G | Cont. | No | SP | R | F-T | B | 4.10, 4.14.1, 4.17, 4.18.1, 4.18.2 |
| Methylamine solutions (42% or less) | 1235 | C | S/P | 2 | 2G | Cont. | No | SP | C | F-T | A,C,D | 4.9, 4.12.1, 4.13.1, 4.14, 4.17 |
| Methylamyl acetate | 1233 | (C) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Methylamyl alcohol | 2053 | (C) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Methyl amyl ketone | 1110 | (C) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Methyl butyrate | 1237 | (C) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Methylcyclohexane | 2296 | (C) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Methylcyclopentadiene dimer | | (B) | P | 3 | 2G | Cont. | No | SP | R | F | B | 4.14.1 |
| 2-Methyl-6-ethyl aniline | | C | S/P | 3 | 2G | Open | No | St | O | No | B,C,D | |
| 2-Methyl-5-ethyl pyridine | 2300 | (B) | S/P | 3 | 2G | Open | No | St | O | No | D | 4.12.4, 4.14.1 |
| Methyl formate | 1243 | D | S | 2 | 2G | Cont. | No | SP | R | F-T | A | 4.9,4.11,4.14,4.17 |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Noxious liquid, N.F, (1) n.o.s. (trade name ..., contains ...) S.T.1, Cat.A* | | A | P | 1 | 2G | Open | No | St | O | No | A | 4.14 |
| Noxious liquid, F, (2) n.o.s. (trade name ..., contains ...) S.T.1, Cat.A* | | A | P | 1 | 2G | Cont. | No | SP | R | F | A | 4.14 |
| Noxious liquid, N.F, (3) n.o.s. (trade name ..., contains ...) S.T.2, Cat.A* | | A | P | 2 | 2G | Open | No | St | O | No | A | 4.14.1 |
| Noxious liquid, F, (4) n.o.s. (trade name ..., contains ...) S.T.2, Cat.A* | | A | P | 2 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Noxious liquid, N.F, (5) n.o.s. (trade name ..., contains ...) S.T.2, Cat.B* | | B | P | 2 | 2G | Open | No | St | O | No | A | 4.14.1, [5.2.5, 5.2.8]** |
| Noxious liquid, N.F, (6) n.o.s. (trade name ..., contains ...) S.T.2, Cat.B*, mp 15°C+ | | B | P | 2 | 2G | Open | No | St | O | No | A | 4.14.1, [5.2.5]**, 5.2.8, 5A.2.2 |
| Noxious liquid, F, (7) n.o.s. (trade name ..., contains ...) S.T.2, Cat.B* | | B | P | 2 | 2G | Cont. | No | SP | R | F | A | 4.14.1, [5.2.5, 5.2.8]** |
| Noxious liquid, F, (8) n.o.s. (trade name ..., contains ...) S.T.2, Cat.B*, mp 15°C+ | | B | P | 2 | 2G | Cont. | No | SP | R | F | A | 4.14.1, [5.2.5]**, 5.2.8, 5A.2.2 |
| Noxious liquid, N.F, (9) n.o.s. (trade name ..., contains ...) S.T.3, Cat.A* | | A | P | 3 | 2G | Open | No | St | O | No | A | |
| Noxious liquid, F, (10) n.o.s. (trade name ..., contains ...) S.T.3, Cat.A* | | A | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Noxious liquid, N.F, (11) n.o.s. (trade name ..., contains ...) S.T.3, Cat.B* | | B | P | 3 | 2G | Open | No | St | O | No | A | [5.2.5, 5.2.8]** |
| Noxious liquid, N.F, (12) n.o.s. (trade name ..., contains ...) S.T.3, Cat.B*, mp 15°C+ | | B | P | 3 | 2G | Open | No | St | O | No | A | [5.2.5]**, 5.2.8, 5A.2.2 |
| Noxious liquid, F, (13) n.o.s. (trade name ..., contains ...) S.T.3, Cat.B* | | B | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1, [5.2.5, 5.2.8]** |

* In case of a specific n.o.s. cargo assessed as falling within this n.o.s. group that is carried on a ship, this entry, including the cargo's trade name and one or two principle components, should be provided in the shipping document. Abbreviations used mean:

| | | | |
|---|---|---|---|
| N.F: | Flashpoint exceeding 60°C (closed cup test) | S.T: | Ship type |
| F: | Flashpoint not exceeding 60°C (closed cup test) | Cat.: | Pollution category |
| n.o.s.: | Not otherwise specified | m.p.: | Melting point |

** For high viscosity or high melting point cargoes.

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Noxious liquid, F, (14) n.o.s. (trade name ..., contains ...) S.T.3, Cat.B*, mp 15°C+ | | B | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1, [5.2.5]**, 5.2.8, 5A.2.2 |
| Noxious liquid, N.F, (15) n.o.s. (trade name ..., contains ...) S.T.3, Cat.C* | | C | P | 3 | 2G | Open | No | St | O | No | A | [5.2.6 to 5.2.8]** |
| Noxious liquid, F, (16) n.o.s. (trade name ..., contains ...) S.T.3, Cat.C* | | C | P | 3 | 2G | Cont. | No | SP | R | F | A | [5.2.6 to 5.2.8]** |
| Octane (all isomers) | 1262 | (C) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Octanol (all isomers) | | C | P | 3 | 2G | Open | No | St | O | No | A | |
| Octene (all isomers) | | B | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Octyl aldehydes | 1191 | (B) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1, 5.2.8 |
| Octyl nitrates (all isomers) | | A | S/P | 2 | 2G | Open | No | St | O | No | B | 4.14.1, 4.18, 4.22 |
| Olefin mixtures (C5-C7) | | C | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Olefin mixtures (C5-C15) | | B | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| alpha-Olefins (C6-C18) mixtures | | B | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1, 5.2.5, 5.2.8 |
| Oleum | 1831 | C | S/P | 2 | 2G | Cont. | No | St | C | T | No | 4.8.2 to 4.8.8, 4.9.1, 4.13.1, 4.14, 4.15.2, 4.17, 5.2.6, 5.2.7 |
| Palm nut oil fatty acid | | (C) | P | 3 | 2G | Open | No | St | O | No | B | 5.2.6 to 5.2.8 |
| Paraldehyde | 1264 | C | S/P | 3 | 2G | Cont. | No | SP | R | F | A | 5.2.8 |
| Pentachloroethane | 1669 | B | S/P | 2 | 2G | Cont. | No | St | R | T | No | 4.9, 4.13.1, 4.14.1 |
| 1,3-Pentadiene | | C | S/P | 3 | 2G | Cont. | No | SP | R | F-T | B | 4.10, 4.18 |
| Pentane (all isomers) | 1265 | (C) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Pentene (all isomers) | | C | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Perchloroethylene | 1897 | B | S/P | 3 | 2G | Cont. | No | St | R | T | No | 4.9.1, 4.9.2, 4.14.1 |
| Phenol | 2312 | B | S/P | 2 | 2G | Cont. | No | St | C | T | A | 4.9, 4.14, 5.2.5, 5.2.8, 5A.2.2 |

* See footnote on page 19.

** For high viscosity or high melting point cargoes.

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Noxious liquid, N.F, (9) n.o.s. (tradename ...,contains ...) S.T.3, Cat.A* | | A | P | 3 | 2G | Open | No | St | O | No | A | |
| Noxious liquid, F, (10) n.o.s. (tradename ...,contains ...) S.T.3, Cat.A* | | A | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Noxious liquid, N.F, (11) n.o.s. (tradename ...,contains ...) S.T.3, Cat.B* | | B | P | 3 | 2G | Open | No | St | O | No | A | [5.2.5, 5.2.8]** |
| Noxious liquid, N.F, (12) n.o.s. (tradename ...,contains ...) S.T.3, Cat.B*, mp 15°C+ | | B | P | 3 | 2G | Open | No | St | O | No | A | [5.2.5]**, 5.2.8, 5A.2.2 |
| Noxious liquid, F, (13) n.o.s. (tradename ...,contains ...) S.T.3, Cat.B* | | B | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1, [5.2.5, 5.2.8]** |
| Noxious liquid, F, (14) n.o.s. (tradename ...,contains ...) S.T.3, Cat.B*, mp 15°C+ | | B | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1, [5.2.5]**, 5.2.8, 5A.2.2 |
| Noxious liquid, N.F, (15) n.o.s. (tradename ...,contains ...) S.T.3, Cat.C* | | C | P | 3 | 2G | Open | No | St | O | No | A | [5.2.6 to 5.2.8]** |
| Noxious liquid, F, (16) n.o.s. (tradename ...,contains ...) S.T.3, Cat.C* | | C | P | 3 | 2G | Cont. | No | SP | R | F | A | [5.2.6 to 5.2.8]** |
| Octane (all isomers) | 1262 | (C) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Octanol (all isomers) | | C | P | 3 | 2G | Open | No | St | O | No | A | |
| Octene (all isomers) | | B | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Octyl aldehydes | 1191 | (B) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1, 5.2.8 |
| Octyl nitrates (all isomers) | | A | S/P | 2 | 2G | Open | No | St | O | No | B | 4.14.1, 4.18, 4.22 |
| Olefin mixtures (C5-C7) | | C | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Olefin mixtures (C5-C15) | | B | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| alpha-Olefins (C6-C18) mixtures | | B | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1, 5.2.5, 5.2.8 |
| Oleum | 1831 | C | S/P | 2 | 2G | Cont. | No | St | C | T | No | 4.8.2 to 4.8.8, 4.9.1, 4.13.1, 4.14, 4.15.2, 4.17, 5.2.6, 5.2.7 |

* See footnote on page 20
** For high viscosity or high melting point cargoes

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Palm nut oil fatty acid | | (C) | P | 3 | 2G | Open | No | St | O | No | B | 5.2.6 to 5.2.8 |
| Paraldehyde | 1264 | C | S/P | 3 | 2G | Cont. | No | SP | R | F | A | 5.2.8 |
| Pentachloroethane | 1669 | B | S/P | 2 | 2G | Cont. | No | St | R | T | No | 4.9, 4.13.1, 4.14.1 |
| 1,3-Pentadiene | | C | S/P | 3 | 2G | Cont. | No | SP | R | F-T | B | 4.10, 4.18 |
| Pentane (all isomers) | 1265 | (C) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Pentene (all isomers) | | C | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Perchloroethylene | 1897 | B | S/P | 3 | 2G | Cont. | No | St | R | T | No | 4.9.1, 4.9.2, 4.14.1 |
| Phenol | 2312 | B | S/P | 2 | 2G | Cont. | No | St | C | T | A | 4.9, 4.14, 5.2.5, 5.2.8, 5A.2.2 |
| 1-Phenyl-1-xylyl ethane | | C | P | 3 | 2G | Open | No | St | O | No | B | |
| Phosphoric acid | 1805 | D | S | 3 | 2G | Open | No | St | O | No | No | 4.8.1 to 4.8.4, 4.8.6 to 4.8.8 |
| Phosphorus, yellow or white | 1381, 2447 | A | S/P | 1 | 1G | Cont. | Pad+(vent or inert) | St | C | No | C | 4.5, 4.14, 4.17 |
| Phthalic anhydride (molten) | 2214 | C | S/P | 3 | 2G | Cont. | No | St | R | No | D | 5.2.6 to 5.2.8 |
| Pinene | 2368 | B | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Polyethylene polyamines | 2734i, 2735 | (C) | S/P | 3 | 2G | Open | No | St | O | No | A | 4.12.2, 5.2.8 |
| Polyferric sulphate solution | | (C) | S/P | 3 | 2G | Open | No | St | O | No | A | 4.12.10 |
| Polymethylene polyphenyl isocyanate | 2206(i) 2207 | D | S | 2 | 2G | Cont. | Dry | St (b) | C | T | b C (c) ,D | 4.9, 4.12.5, 4.14.1, 4.15.2 |
| Potassium hydroxide solution | 1814 | C | S/P | 3 | 2G | Open | No | St | O | No | No | 4.12.1,COPPER,BRASS AND BRONZE MAY BE USED,5.2.8 |
| n-Propanolamine | | C | S/P | 3 | 2G | Open | No | St | O | No | A,D | 4.12.2, 5.2.8 |
| beta-Propiolactone | | D | S | 2 | 2G | Cont. | No | St | R | T | A | |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Propionaldehyde | 1275 | D | S | 3 | 2G | Cont. | No | SP | R | F-T | A | 4.13.1, 4.15.1, 4.17 |
| Propionic acid | 1848 | D | S | 3 | 2G | Cont. | No | SP | R | F | A | 4.8.2 to 4.8.8, 4.12.6, 4.17 |
| Propionic anhydride | 2496 | C | S/P | 3 | 2G | Cont. | No | St | R | T | A | 4.12.6 |
| Propionitrile | 2404 | C | S/P | 2 | 1G | Cont. | No | SP | C | F-T | A,D | 4.9, 4.13, 4.14, 4.17 |
| n-Propylamine | 1277 | C | S/P | 2 | 2G | Cont. | Inert | SP | C | F-T | C,D | 4.9, 4.12.2, 4.14, 4.17 |
| n-Propylbenzene | | (C) | P | 3 | 2G | Cont. | No | St | R | F | A | 4.14.1 |
| Propylene dimer | | (C) | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Propylene oxide | 1280 | D | S | 2 | 2G | Cont. | Inert | SP | C | F-T | A,C | 4.7, 4.9.1, 4.11, 4.14 |
| Propylene tetramer | 2850 | B | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Propylene trimer | 2057 | B | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Pyridine | 1282 | D | S | 3 | 2G | Cont. | No | SP | R | F | A | 4.12.4, 4.14.1 |
| Rosin | | B | P | 3 | 2G | Open | No | St | O | No | A | 4.14.1, 5.2.5, 5.2.8, 5A.2.2 |
| Rosin soap (Disproportionated) solution | | B | P | 3 | 2G | Open | No | St | O | No | A | 4.14.1 |
| Sodium borohydride (15% or less)/Sodium hydroxide solution | | C | S/P | 3 | 2G | Open | No | St | O | No | No | 4.12.1, 5.2.6 |
| Sodium chlorate solution (50% or less) | | III | S | 3 | 2G | Open | No | St | O | No | No | 4.14.1, 4.15.1, 4.21 |
| Sodium dichromate solution (70% or less) | | C | S/P | 2 | 2G | Open | No | St | C | No | No | 4.9.3, 4.12.2, 4.14 |
| Sodium hydrogen sulphite solution (35% or less) | 2693 | D | S | 3 | 2G | Open | No | St | O | No | No | |
| Sodium hydrosulphide solution (45% or less) | 2949 | B | S/P | 3 | 2G | Cont. | Vent or Pad (gas) | St | R | T | No | 4.14.1, 4.15.1, 5.2.8 |
| Sodium hydrosulphide/Ammonium sulphide solution | | B | S/P | 2 | 2G | Cont. | No | SP | C | F-T | A,C | 4.9, 4.11, 4.12.1, 4.13.1, 4.14, 4.15.1, 4.17, 4.18 |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sodium hydroxide solution | 1824 | D | S | 3 | 2G | Open | No | St | O | No | No | 4.12.1 Copper brass bronze may be used |
| Sodium hypochlorite solution (15% or less) | 1791 | C | S/P | 3 | 2G | Cont. | No | St | R | No | No | 4.12.5, 4.15.1 |
| Sodium nitrite solution | 1500 | B | S/P | 2 | 2G | Open | No | St | O | No | No | 4.9.3(a), 4.9.3(b), 4.14, 4.15.1 |
| Sodium thiocyanate (56% or less) solution | | (B) | P | 3 | 2G | Open | No | St | O | No | No | 4.14.1 |
| Styrene monomer | 2055 | B | S/P | 3 | 2G | Cont. | No | SP | O | F | B | 4.10, 4.12.4, 4.14.1, 4.18.1, 4.18.2 |
| Sulphur (molten) | 2448 | III | S | 3 | 1G | Open | Vent or Pad(gas) | SP | O | F-T | No | 4.3 |
| Sulphuric acid | 1830 | C | S/P | 3 | 2G | Open | No | St | O | No | No | 4.8, 4.15.2, 5.2.7, 5.2.8 |
| Sulphuric acid, spent | 1832 | C | S/P | 3 | 2G | Open | No | St | O | No | No | 4.8, 4.15.2, 5.2.7, 5.2.8 |
| Tall oil (crude and distilled) | | B | P | 3 | 2G | Open | No | St | O | No | A | 4.14.1, 5.2.5, 5.2.8, 5A.2.2 |
| Tall oil fatty acid (resin acids less than 20%) | | (C) | P | 3 | 2G | Open | No | St | O | No | A | 5.2.6 to 5.2.8 |
| Tall oil soap (disproportionated) solution | | B | P | 3 | 2G | Open | No | St | O | No | A | 4.14.1, 5.2.5, 5.2.8 |
| Tetrachloroethane | 1702 | B | S/P | 3 | 2G | Cont. | No | St | R | T | No | 4.9, 4.13.1, 4.14.1 |
| Tetraethylene pentamine | 2320 | D | S | 3 | 2G | Open | No | St | O | No | A | 4.12.1 |
| Tetrahydrofuran | 2056 | D | S | 3 | 2G | Cont. | No | SP | R | F-T | A,D | |
| Tetrahydronaphthalene | | C | P | 3 | 2G | Open | No | St | O | No | A | |
| 1,2,3,5-Tetramethylbenzene | | (C) | P | 3 | 2G | Open | No | St | O | No | A | |
| Toluene | 1294 | C | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Toluenediamine | 1709 | C | S/P | 2 | 2G | Cont. | No | St | C | T | B,C,D | 4.9, 4.12.1, 4.13.1, 4.14, 4.17, 5.2.6, 5.2.8 |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Toluene diisocyanate | 2078 | C | S/P | 2 | 2G | Cont. | Dry | St | C | F-T | C ,D (e) | 4.9, 4.12.4, 4.13.1 4.14, 4.15.2, 4.17, 5.2.8 |
| o-Toluidine | 1708 | C | S/P | 2 | 2G | Cont. | No | St | C | T | A,C | 4.9, 4.13.1, 4.14 |
| Tributyl phosphate | | B | P | 3 | 2G | Open | No | St | O | No | A | 4.14.1 |
| 1,2,4-Trichlorobenzene | 2321 | B | S/P | 2 | 2G | Cont. | No | St | R | T | C | 4.14.1, 5.2.8, 5A.2.2 |
| 1,1,1-Trichloroethane | 2831 | B | P | 3 | 2G | Open | No | St | O | No | A | 4.14.1 |
| 1,1,2-Trichloroethane | | B | S/P | 3 | 2G | Cont. | No | St | R | T | No | 4.9.1, 4.14.1 |
| Trichloroethylene | 1710 | B | S/P | 3 | 2G | Cont. | No | St | R | T | No | 4.9, 4.13.1, 4.14. 4.15.1 |
| 1,2,3-Trichloropropane | | B | S/P | 2 | 2G | Cont. | No | St | C | T | B,C,D | 4.9, 4.13.1, 4.14 |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | | C | P | 3 | 2G | Open | No | St | O | No | No | |
| Tricresyl phosphate (containing less than 1% ortho-isomer) | | A | P | 2 | 2G | Open | No | St | O | No | A | 4.14.1 |
| Tricresyl phosphate (containing 1% or more ortho-isomer) | 2574(j) | A | S/P | 1 | 2G | Cont. | No | St | C | No | B | 4.9.3, 4.14 |
| Triethanolamine | | D | S | 3 | 2G | Open | No | St | O | No | A | 4.12.1 |
| Triethylamine | 1296 | C | S/P | 2 | 2G | Cont. | No | SP | R | F-T | B | 4.9, 4.12.2, 4.17 |
| Triethylbenzene | | A | P | 2 | 2G | Open | No | St | O | No | A | 4.14.1 |
| Triethylenetetramine | 2259 | D | S | 3 | 2G | Open | No | St | O | No | A | 4.12.1 |
| Triethyl phosphite | 2323 | | S | 3 | 2G | Cont. | No | SP | R | F-T | A,D | 4.9.1 |
| Trimethylacetic acid | | D | S | 3 | 2G | Cont. | No | St | R | No | A,C | 4.8.2 to 4.8.8, 4.12.6 |
| Trimethylbenzenes(all isomers) | | B | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Trimethylhexamethylene diamine (2,2,4-and-2,4,4-isomers) | 2327 | D | S | 3 | 2G | Open | No | St | O | No | A,C | 4.12.1, 4.14.1 |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Trimethylhexamethylene diisocyanate (2,2,4- and 2,4,4-isomers) | 2328 | B | S/P | 2 | 2G | Cont. | Dry | St | C | T | A, C (c) | 4.9, 4.13.1, 4.14.1, 4.15.2 |
| 2,2,4-Trimethyl-1,3-pentanediol-1-isobutyrate | | C | P | 3 | 2G | Open | No | St | O | No | A | |
| Trimethyl phosphite | 2329 | | S | 3 | 2G | Cont. | No | SP | R | F-T | A,D | 4.9.1, 4.14.1, 4.15.2 |
| Trixylyl phosphate | | A | P | 1 | 2G | Open | No | St | O | No | A | 4.14 |
| Turpentine | 1299 | B | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Undecanoic acid | | (C) | P | 3 | 2G | Open | No | St | O | No | A | 5.2.6 to 5.2.8 |
| 1-Undecene | | B | P | 3 | 2G | Open | No | St | O | No | A | 4.14.1 |
| Undecyl alcohol | | B | P | 3 | 2G | Open | No | St | O | No | A | 5.2.8, 5A.2.2(r) |
| Urea/Ammonium nitrate solution (containing aqua ammonia) | | C | S/P | 3 | 2G | Cont. | No | SP | R | T | A | 4.12.4, 4.12.9 |
| n-Valeraldehyde | 2058 | D | S | 3 | 2G | Cont. | Inert | SP | R | F-T | A | 4.2.7, 4.15.1 |
| Vinyl acetate | 1301 | C | S/P | 3 | 2G | Cont. | No | SP | O | F | A | 4.10, 4.18.1, 4.18.2 |
| Vinyl ethyl ether | 1302 | C | S/P | 2 | 1G | Cont. | Inert | SP | C | F-T | A | 4.2, 4.10, 4.11, 4.12.8, 4.14, 4.17, 4.18.1, 4.18.2 |
| Vinylidene chloride | 1303 | B | S/P | 2 | 2G | Cont. | Inert | SP | R | F-T | B | 4.10, 4.11, 4.12.5, 4.14.1, 4.17, 4.18.1, 4.18.2 |
| Vinyl neodecanoate | | B | S/P | 3 | 2G | Open | No | St | O | No | B | 4.10, 4.14.1, 4.15.1, 4.18.1, 4.18.2 |
| Vinyl toluene | 2618 | A | S/P | 3 | 2G | Cont. | No | SP | R | F | D | 4.10, 4.12.1, 4.14.1, 4.18.1, 4.18.2 |

| a | b | c | d | e | f | g | h | i | j | k | l | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| White spirit, low (15-20%) aromatic | 1300 | (B) | P | 2 | 2G | Cont. | No | SP | R | F | A | 4.14.1 |
| Xylenes | 1307 | C | P | 3 | 2G | Cont. | No | SP | R | F | A | 4.14.1, 5.2.8(u) |
| Xylenol | 2261 | B | S/P | 3 | 2G | Open | No | St | O | No | B | 4.14.1, 5.2.8, 5A.2.2 |

7 Footnotes for the BCH Code:

a Provision 4.17 applies to Ammonia aqueous, 28% or less but not below 10%.

Ammonia aqueous 28% or less

b If the product to be carried contains flammable solvents such that the flashpoint does not exceed 60°C c.c., then special electrical systems and a flammable vapour detector should be provided.

Diphenylmethane diisocyanate
Polymethylene polyphenyl isocyanate

c Although water is suitable for extinguishing open-air fires involving chemicals to which this footnote applies, water should not be allowed to contaminate closed tanks containing these chemicals because of the risk of hazardous gas generation.

Diphenylmethane diisocyanate
Isophorone diisocyanate
Polymethylene polyphenyl isocyanate
Toluene diisocyanate
Trimethylhexamethylene diisocyanate (2,2,4- & 2,4,4-isomers)

d UN number 1198 only applies if flashpoint is below 60°C c.c.

Formaldehyde solution (45% or less)

e Provision 4.17 applies to Formaldehyde solutions 45% or less, but not below 5%.

Formaldehyde solutions (45% or less)

f Provision 4.17 applies to Hydrochloric acid not below 10%.

Aluminum chloride (30% or less)/Hydrochloric acid (20% or less) solution
Hydrochloric acid

g Dry chemical cannot be used because of the possibility of an explosion.

Maleic anhydride

h UN number 2032 assigned to Red fuming nitric acid.

Nitric acid (70% and over)

i UN number depends on boiling point of substance.

Polyethylene polyamines
Polymethylene polyphenyl isocyanate

j UN number assigned to this substance containing more than 3% of ortho-isomer.

Tricresyl phosphate (containing 1% or more ortho-isomer)

k UN number only applies to 2-Chloropropionic acid.

2- or 3- Chloropropionic acid

l Dinitrotoluene should not be carried in deck tanks.

Dinitrotoluene (molten)

m Temperature sensors should be used to monitor the cargo pump temperature to detect overheating due to pump failures.

Dinitrotoluene (molten)

n Dry chemical should not be used as a fire-fighting medium.

Nitropropane (60%)/Nitroethane (40%) mixture

o UN number 2672 refers to 10-35% Ammonium solution.

Ammonia aqueous (28% or less)

p Applies to n-Decyl alcohol only.

Decyl alcohol (all isomers)

q Requirements are based on those isomers having a flashpoint of 60°C c.c., and therefore the requirements based on flammability would not apply to such isomers.

Heptanol (all isomers)

r Provision 5A.2.2 applies to 1-Undecyl alcohol only.

Undecyl alcohol

s UN number 1114 applies to Benzene.

Benzene and mixtures having 10% benzene or more

t Confined space should be tested for both Formic acid vapours and Carbon monoxide gas, a decomposition product.

Formic acid

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u Applies to p-Xylene only.

Xylenes

v Applies to p-isomer and mixtures containing p-isomer viscosity of which is 25 mPa.S at 20°C.

Dichlorobenzenes (all isomers)

w Applies to p-isomer and mixtures containing p-isomer melting point of which is 0°C and above.

Dichlorobenzenes (all isomers)

x Applies to p-isomer and mixtures containing p-isomer melting point of which is 15°C and above.

Dichlorobenzenes (all isomers)

y Applies only to products with melting point above 15°C.

Nonyl phenol poly(4-12)ethoxylates

8 Chapter VII of the BCH Code should be replaced by the following:

## CHAPTER VII - LIST OF CHEMICALS TO WHICH THE CODE DOES NOT APPLY

1 The following are products which are not considered to come within the scope of the Code. This list may be used as a guide in considering bulk carriage of products whose hazards have not yet been evaluated.

2 Although the products listed in this chapter fall outside the scope of the Code, the attention of Administrations is drawn to the fact that some safety precautions may be needed for their safe transportation. Accordingly, Administrations should prescribe appropriate safety requirements.

## EXPLANATORY NOTES

| | |
|---|---|
| Product name (column a) | In some cases, the product names may not be identical with the names given in previous issues of the BCH Code or the IBC Code (for explanation see index of chemicals). |
| UN number (column b) | The number relating to each product shown in the recommendations proposed by the United Nations Committee of Experts on the Transport of Dangerous Goods. UN numbers, where available, are given for information only. |
| Pollution category (column c) | The letter D means the pollution category assigned to each product under Annex II of MARPOL 73/78. "III" means the product was evaluated and found to fall outside the categories A, B, C or D.<br><br>Pollution category in brackets indicates that the product is provisionally categorized and that further data are necessary to complete the evaluation of their pollution hazards. Until the hazard evaluation is completed, the pollution category assigned is used. |

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| a | b | c |
|---|---|---|
| Product name | UN number | Pollution Category for operational discharge (regulation 3 of Annex II) |
| Acetone | 1090 | III |
| Alcohols ($C_{13}$ and above) | – | III |
| Alcoholic beverages, n.o.s. | 3065 | III |
| Alkyl ($C_9$–$C_{17}$) benzenes | – | (D) |
| Aluminium sulphate solution | – | D |
| Aminoethyldiethanolamine/ Aminoethylethanolamine solution | – | III |
| 2–Amino–2–hydroxymethyl–1,3–propanediol solution (40% or less) | – | III |
| Ammonium sulphate solution | – | D |
| n–Amyl alcohol | 1105 | D |
| sec–Amyl alcohol | 1105 | D |

| a | b | c |
|---|---|---|
| tert-Amyl alcohol | 1105 | III |
| Amyl alcohol, primary | 1105 | D |
| Animal and fish oils, n.o.s. including Cod liver oil, Sperm oil | – | D |
| Apple juice | – | III |
| Behenyl alcohol | | III |
| Benzene tricarboxylic acid, trioctyl ester | – | III |
| Brake fluid base mix: (Poly (2-8) alkylene ($C_2$-$C_3$) glycols/ Polyalkylene ($C_2$-$C_{10}$) glycols monoalkyl ($C_1$-$C_4$) ethers and their borate esters)1/ | – | D |
| sec-Butyl acetate | 1123 | D |
| n-Butyl alcohol | 1120 | III |
| sec-Butyl alcohol | 1120 | III |
| tert-Butyl alcohol | 1120 | III |
| Butylene glycol | – | D |
| gamma-Butyrolactone | – | D |

1/ Use "Brake fluid base mix" as a proper name on the shipping document.

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| a | b | c |
|---|---|---|
| Butyl stearate | – | III |
| Calcium carbonate slurry | – | III |
| Calcium hydroxide slurry | – | D |
| Calcium nitrate/Magnesium nitrate/ Potassium chloride solution | | III |
| epsilon–Caprolactam (molten or aqueous solutions) | – | D |
| Cetyl/Stearyl alcohol | | III |
| Chlorinated paraffins ($C_{14}$–$C_{17}$) (with 52% chlorine) | | III |
| Choline chloride solutions | – | D |
| Clay slurry | | III |
| Coal slurry | | III |
| Coconut oil fatty acid methyl ester | | D |
| Decahydronaphthalene | 1147 | (D) |
| Decylbenzene | – | D |
| Dextrose solution | – | III |

| a | b | c |
|---|---|---|
| Diacetone alcohol | 1148 | D |
| Dialkyl($C_7$–$C_{13}$) phthalates | – | D |
| Diethylene glycol | – | III |
| Diethylene glycol butyl ether | – | III |
| Diethylene glycol butyl ether acetate | – | (D) |
| Diethylene glycol dibutyl ether | – | D |
| Diethylene glycol diethyl ether | – | III |
| Diethylene glycol ethyl ether | – | III |
| Diethylene glycol ethyl ether acetate | – | (D) |
| Diethylene glycol methyl ether acetate | – | (D) |
| Diethylenetriamine pentaacetic acid, pentasodium salt solution | – | III |
| Di(2-ethylhexyl)adipate | – | D |
| 1,4-Dihydro-9,10-dihydroxy anthracene, disodium salt solution | – | D |

| a | b | c |
|---|---|---|
| Diheptyl phthalate | – | III |
| Dihexyl phthalate | – | III |
| Diisobutyl ketone | 1157 | D |
| Diisodecyl phthalate | – | D |
| Diisononyl adipate | – | D |
| Diisooctyl phthalate | – | III |
| Diisopropyl naphthalene | – | D |
| 2,2-Dimethylpropane-1,3-diol | – | (D) |
| Dinonyl phthalate | – | D |
| Dioctyl phthalate | – | III |
| Dipropylene glycol | – | III |
| Dipropylene glycol methyl ether | – | (D) |
| Ditridecyl phthalate | – | D |
| Diundecyl phthalate | – | D |
| Dodecane (all isomers) | – | III |

| a | b | c |
|---|---|---|
| Dodecenyl succinic acid, dipotassium salt solution | – | (D) |
| Dodecyl benzene | – | III |
| Drilling brines:<br><br>Calcium bromide solution<br>Calcium chloride solution<br>Sodium chloride solution | – | III |
| 2-Ethoxyethanol | 1171 | D |
| Ethyl acetate | 1173 | D |
| Ethyl acetoacetate | – | (D) |
| Ethyl alcohol | 1170 | III |
| Ethylene carbonate | – | III |
| Ethylenediamine tetraacetic acid, tetrasodium salt solution | – | D |
| Ethylene glycol | – | D |
| Ethylene glycol acetate | – | (D) |
| Ethylene glycol butyl ether | 2369 | III |
| Ethylene glycol isopropyl ether | – | D |
| Ethylene glycol methyl butyl ether | – | D |

| a | b | c |
|---|---|---|
| Ethylene glycol methyl ether | 1188 | D |
| Ethylene glycol methyl ether acetate | 1189 | D |
| Ethylene glycol phenyl ether | – | D |
| Ethylene glycol phenyl ether/ Diethylene glycol phenyl ether mixture | – | D |
| Ethylene glycol tert–butyl ether | – | III |
| 2–Ethylhexanoic acid | – | D |
| Ethylene/Vinyl acetate copolymer (emulsion) | – | III |
| Ethyl propionate | 1195 | D |
| Fatty acid (saturated $C_{13}$ and above) | – | III |
| Ferric hydroxyethylethylene diamine triacetic acid, trisodium salt solution | – | D |
| Formamide | – | D |
| Glucose solution | – | III |
| Glycerin | – | III |
| Glycerol polyalkoxylate | – | III |

| a | b | c |
|---|---|---|
| Glyceryl triacetate | — | (III) |
| Glycine, sodium salt solution | — | III |
| Glyoxal solution (40% or less) | — | D |
| n-Heptanoic acid | — | D |
| Hexamethylenediamine adipate solution (50% or less) | — | D |
| Hexamethylene glycol | — | III |
| Hexamethylenetetramine solutions | — | D |
| Hexanoic acid | — | D |
| Hexanol | 2282 | D |
| Hexylene glycol | — | III |
| N-(Hydroxyethyl)ethylenediamine triacetic acid, trisodium salt solution | — | D |
| Isoamyl alcohol | 1105 | D |
| Isobutyl alcohol | 1212 | III |
| Isobutyl formate | 2393 | D |
| Isophorone | — | D |

| a | b | c |
|---|---|---|
| Isopropyl acetate | 1220 | III |
| Isopropyl alcohol | 1219 | III |
| Kaolin slurry | – | III |
| Lactic acid | – | D |
| Lard | – | III |
| Latex: | | |
| Styrene–butadiene rubber | | |
| Carboxylated styrene–butadiene copolymer | – | III |
| Lignin sulphonic acid, sodium salt solution | – | III |
| Magnesium chloride solution | – | III |
| Magnesium hydroxide slurry | – | III |
| 3–Methoxy–1–butanol | – | III |
| 3–Methoxybutyl acetate | – | D |
| Methyl acetate | 1231 | III |
| Methyl acetoacetate | – | D |
| Methyl alcohol | 1230 | III |

| a | b | c |
|---|---|---|
| Methyl butenol | – | (D) |
| Methyl tert–butyl ether | 2398 | D |
| Methyl butyl ketone | – | D |
| Methyl butynol | – | D |
| Methyl ethyl ketone | 1193 | III |
| Methyl isobutyl ketone | 1245 | D |
| 3–Methyl–3–methoxy butanol | – | III |
| 3–Methyl–3–methoxy butyl acetate | – | III |
| Molasses | – | III |
| Naphthalene sulphonic acid–formaldehyde copolymer, sodium salt solution | – | D |
| Nitrilotriacetic acid, trisodium salt solution | – | D |
| Nonanoic acid (all isomers) | – | D |
| Nonyl methacrylate monomer | – | (D) |

| a | b | c |
|---|---|---|
| Noxious liquid, n.o.s. (17) (trade name .....,<br>containing .....) Cat. D[1/] | – | D |
| Non-noxious liquid, n.o.s. (18) (trade name .....,<br>containing .....) Appendix III[1/] | – | III |
| Octanoic acid (all isomers) | – | D |
| Octyl decyl adipate | – | III |
| Oleic acid | – | D |
| n-Octyl acetate | 1262 | D |
| Olefins ($C_{13}$ and above, all isomers) | – | III |
| alpha-Olefins ($C_{13}$-$C_{18}$) | – | III |
| Palm oil fatty acid methyl ester | – | D |
| Palm stearin | – | D |
| n-Paraffins ($C_{10}$-$C_{20}$) | – | III |

1/ In case of a specific n.o.s. (not otherwise specified) cargo assessed as falling within this n.o.s. group that is carried on a ship, this entry, including the cargo's trade name and one or two principle components, should be provided in the shipping document.

| a | b | c |
|---|---|---|
| Paraffin wax | – | III |
| Pentaethylenehexamine | – | D |
| Pentanoic acid | – | D |
| Petrolatum | – | (III) |
| Polyaluminium chloride solution | – | III |
| Polybutene | – | III |
| Polyethylene glycol | – | III |
| Polyethylene glycol dimethyl ether | – | III |
| Polypropylene glycol | – | D |
| Polypropylene glycol methyl ether | – | III |
| Polysiloxane | – | III |
| n-Propyl acetate | 1276 | D |
| n-Propyl alcohol | 1274 | III |
| Propylene-butylene copolymer | – | III |
| Propylene glycol | – | III |
| Propylene glycol ethyl ether | – | (D) |

| a | b | c |
|---|---|---|
| Propylene glycol methyl ether | – | (D) |
| Propylene glycol monoalkyl ether | – | (D) |
| Sodium aluminosilicate slurry | – | III |
| Sodium carbonate solution | – | D |
| Sodium silicate solution | – | D |
| Sorbitol solutions | – | III |
| Sulpholane | – | D |
| Tallow | – | D |
| Tallow fatty acid | – | (D) |
| Tetraethylene glycol | – | III |
| Tridecane | – | III |
| Tridecanoic acid | – | (III) |
| Triethylene glycol | – | III |
| Triethylene glycol butyl ether | – | III |
| Triethylene glycol ethyl ether | – | (D) |
| Triethylene glycol methyl ether | – | (D) |

| a | b | c |
|---|---|---|
| Triisopropanolamine | – | III |
| Trimethylol propane polyethoxylate | – | D |
| Tripropylene glycol | – | III |
| Tripropylene glycol methyl ether | – | (D) |
| Urea/Ammonium mono- and di-hydrogen phosphate/Potassium chloride solution | – | (D) |
| Urea/Ammonium nitrate solution | – | D |
| Urea/Ammonium phosphate solution | – | D |
| Urea formaldehyde resin solution | – | III |
| Urea solution | – | III |
| Vegetable oil, n.o.s. including: Castor oil, Camphor oil, Coconut oil, Corn oil, Groundnut oil, Linseed oil, Olive oil, Palm nut oil, Palm oil, Rape seed oil, Rice bran oil, Safflower oil, Sesame oil, Soya bean oil, Sunflower oil, Tung oil | – | D |
| Vegetable protein solution (hydrolysed) | – | III |
| Water | – | III |

***

MSC 58/25/Add.1

ANNEX 5

RESOLUTION MSC.18(58)

adopted on 24 May 1990

ADOPTION OF AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (BCH CODE)

(Harmonized System of Survey and Certification)

THE MARITIME SAFETY COMMITTEE,

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

RECALLING ALSO resolution MSC.9(53) by which the Committee adopted the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH Code), which provides safety requirements for chemical tankers supplementary to the provisions of the International Convention for the Safety of Life at Sea, 1974 (SOLAS 1974), as amended,

NOTING resolution 10 of the International Conference on Tanker Safety and Pollution Prevention, 1978 and resolution 4 of the International Conference on the Harmonized System of Survey and Certification, 1988, which recommended that IMO take the necessary action to introduce the harmonized system of survey and certification into various conventions and codes,

NOTING FURTHER resolution MEPC.41(29) by which the Marine Environment Protection Committee adopted amendments to the BCH Code introducing the harmonized system of survey and certification for the purposes of the International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978 relating thereto (MARPOL 73/78),

1. ADOPTS amendments to the BCH Code, the text of which is given in the annex to the present resolution;

2. DECIDES that the amendments shall become effective on the date of entry into force of the correponding amendments adopted by the Marine Environment Protection Committee by resolution MEPC.41(29).

W/5700X/EWP

ANNEX

AMENDMENTS TO THE BCH CODE

1.4 Definitions

New definition should be added as follows:

"1.4.16.C "Anniversary date" means the day and the month of each year which will correspond to the date of expiry of the Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk".

1.6 Survey requirements

The existing title is replaced by the following:

"Survey and Certification"

The existing text of section 1.6 should be replaced by the following:

"1.6.1 Survey procedure

1.6.1.1 The survey of ships, so far as regards the enforcement of the provisions of the regulations and granting of exemptions therefrom, should be carried out by officers of the Administration. The Administration may, however, entrust the surveys either to surveyors nominated for the purpose or to organizations recognized by it.

1.6.1.2 The Administration nominating surveyors or recognizing organizations to conduct surveys should, as a minimum, empower any nominated surveyor or recognized organization to:

.1 require repairs to a ship; and

.2 carry out surveys if requested by the appropriate authorities of a port State.

The Administration should notify the Organization of the specific responsibilities and conditions of the authority delegated to nominated surveyors or recognized organizations for circulation to the Contracting Governments.

1.6.1.3 When a nominated surveyor or recognized organization determines that the condition of the ship or its equipment does not correspond substantially with the particulars of the Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk, or is such that the ship is not fit to proceed to sea without danger to the ship, or persons on board, or without presenting unreasonable threat of harm to the marine environment, such surveyor or organization should immediately ensure that corrective action is taken and should in due course notify the Administration. If such corrective action is not taken the Certificate should be withdrawn and the Administration should be notified immediately; and, if the ship is in a port of another Contracting Government, the appropriate authorities of the port State should also be notified immediately. When an officer of the Administration, a nominated

surveyor or a recognized organization has notified the appropriate authorities of the port State, the Government of the port State concerned should give such officer, surveyor or organization any necessary assistance to carry out their obligations under this paragraph. When applicable, the Government of the port State concerned should take such steps as will ensure that the ship does not sail until it can proceed to sea or leave the port for the purpose of proceeding to the nearest appropriate repair yard available without danger to the ship or persons on board or without presenting an unreasonable threat of harm to the marine environment.

1.6.1.4 In every case, the Administration should guarantee the completeness and efficiency of the survey, and should undertake to ensure the necessary arrangements to satisfy this obligation.

1.6.2 Survey requirements

1.6.2.1 The structure, equipment, fittings, arrangements and material (other than items in respect of which a Cargo Ship Safety Construction Certificate, Cargo Ship Safety Equipment Certificate and Cargo Ship Safety Radio Certificate or Cargo Ship Safety Certificate are issued) of a chemical tanker should be subjected to the following surveys:

.1 an initial survey before the ship is put in service or before the Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk is issued for the first time, which should include a complete examination of its structure, equipment, fittings, arrangements and material in so far as the ship is covered by the Code. This survey should be such as to ensure that the structure, equipment, fittings, arrangements and material fully comply with the applicable provisions of the Code.

.2 a renewal survey at intervals specified by the Administration, but not exceeding 5 years, except where 1.6.6.2.2, 1.6.6.5, 1.6.6.6 or 1.6.6.7 is applicable. The renewal survey should be such as to ensure that the structure, equipment, fittings, arrangements and material fully comply with the applicable provisions of the Code.

.3 an intermediate survey within 3 months before or after the second anniversary date or within 3 months before or after the third anniversary date of the Certificate which should take the place of one of the annual surveys specified in 1.6.2.1.4. The intermediate survey should be such as to ensure that the safety equipment and other equipment, and associated pump and piping systems fully comply with the applicable provisions of the Code and are in good working order. Such intermediate surveys should be endorsed on the Certificate issued under 1.6.4 or 1.6.5.

.4 an annual survey within 3 months before or after each anniversary date of the Certificate, including a general inspection of the structure, equipment, fittings, arrangements and material referred to in 1.6.2.1.1 to ensure that they have been maintained in accordance with 1.6.3 and that they remain satisfactory for the service for which the ship is intended. Such annual surveys should be endorsed on the Certificate issued under 1.6.4 or 1.6.5.

.5 an additional survey, either general or partial according to the circumstances, should be made when required after an investigation prescribed in 1.6.3.3, or whenever any important repairs or renewals are made. Such a survey should ensure that the necessary repairs or renewals have been effectively made, that the material and workmanship of such repairs or renewals are satisfactory; and that the ship is fit to proceed to sea without danger to the ship or persons on board or without presenting unreasonable threat of harm to the marine environment.

1.6.3 Maintenance of conditions after survey

1.6.3.1 The condition of the ship and its equipment should be maintained to conform with the provisions of the Code to ensure that the ship will remain fit to proceed to sea without danger to the ship or persons on board or without presenting unreasonable threat of harm to the marine environment.

1.6.3.2 After any survey of the ship under 1.6.2 has been completed, no change should be made in the structure, equipment, fittings, arrangements and material covered by the survey, without the sanction of the Administration, except by direct replacement.

1.6.3.3 Whenever an accident occurs to a ship or a defect is discovered, either of which affects the safety of the ship or the efficiency or completeness of its life-saving appliances or other equipment covered by the Code, the master or owner of the ship should report at the earliest opportunity to the Administration, the nominated surveyor or recognized organization responsible for issuing the Certificate, who should cause investigations to be initiated to determine whether a survey, as required by 1.6.2.1.5, is necessary. If the ship is in a port of another Contracting Government, the master or owner should also report immediately to the appropriate authorities of the port State and the nominated surveyor or recognized organization should ascertain that such a report has been made.

1.6.4 Issue or endorsement of Certificate of Fitness.

1.6.4.1 A Certificate called a Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk, should be issued after an initial or renewal survey to a chemical tanker engaged in international voyages which complies with the relevant provisions of the Code.

1.6.4.2 The Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk should be drawn up in the form corresponding to the model given in the appendix. If the language is neither English nor French, the text should include the translation into one of these languages.

1.6.4.3 The Certificate issued under provisions of this section should be available on board for examination at all times.

1.6.4.4 Notwithstanding any other provisions of the amendments to this Code adopted by the Marine Environment Protection Committee (MEPC) by resolution MEPC.41(29) and the Maritime Safety Committee (MSC) by resolution MSC.18(58), any Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk, which is current when these amendments enter into force, should remain valid until it expires under the terms of this Code prior to the amendments entering into force.

1.6.5 Issue or endorsement of Certificate of Fitness by another Government

1.6.5.1 A Party to MARPOL 73/78 may, at the request of another Party, cause a ship entitled to fly the flag of the other State to be surveyed and, if satisfied that the provisions of the Code are complied with, issue or authorize the issue of the Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk to the ship, and, where appropriate, endorse or authorize the endorsement of the Certificate on board the ship in accordance with the Code. Any Certificate so issued should contain a statement to the effect that it has been issued at the request of the Government of the State whose flag the ship is entitled to fly.

1.6.6 Duration and validity of Certificate of Fitness

1.6.6.1 A Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk should be issued for a period specified by the Administration which should not exceed 5 years.

1.6.6.2.1 Notwithstanding the provisions of 1.6.6.1, when the renewal survey is completed within 3 months before the expiry date of the existing Certificate, the new Certificate should be valid from the date of completion of the renewal survey to a date not exceeding 5 years from the date of expiry of the existing Certificate.

1.6.6.2.2 When the renewal survey is completed after the expiry date of the existing Certificate, the new Certificate should be valid from the date of completion of the renewal survey to a date not exceeding 5 years from the date of expiry of the existing Certificate.

1.6.6.2.3 When the renewal survey is completed more than 3 months before the expiry date of the existing Certificate, the new Certificate should be valid from the date of completion of the renewal survey to a date not exceeding 5 years from the date of completion of the renewal survey.

1.6.6.3 If a Certificate is issued for a period of less than 5 years, the Administration may extend the validity of the Certificate beyond the expiry date to the maximum period specified in 1.6.6.1, provided that the surveys referred to in 1.6.2.1.3 and 1.6.2.1.4 applicable when a Certificate is issued for a period of 5 years are carried out as appropriate.

1.6.6.4 If a renewal survey has been completed and a new Certificate cannot be issued or placed on board the ship before the expiry date of the existing Certificate, the person or organization authorized by the Administration may endorse the existing Certificate and such a Certificate should be accepted as valid for a further period which should not exceed 5 months from the expiry date.

1.6.6.5 If a ship at the time when a Certificate expires is not in a port in which it is to be surveyed, the Administration may extend the period of validity of the Certificate but this extension should be granted only for the purpose of allowing the ship to complete its voyage to the port in which it is to be surveyed, and then only in cases where it appears proper and reasonable to do so. No Certificate should be extended for a period longer than 3 months, and a ship to which an extension is granted should not, on its arrival in the port in which it is to be surveyed, be entitled by

virtue of such extension to leave that port without having a new Certificate. When the renewal survey is completed, the new Certificate should be valid to a date not exceeding 5 years from the date of expiry of the existing Certificate before the extension was granted.

1.6.6.6 A Certificate issued to a ship engaged on short voyages which has not been extended under the foregoing provisions of this section may be extended by the Administration for a period of grace of up to one month from the date of expiry stated on it. When the renewal survey is completed, the new Certificate should be valid to a date not exceeding 5 years from the date of expiry of the existing Certificate before the extension was granted.

1.6.6.7 In special circumstances, as determined by the Administration, a new Certificate need not be dated from the date of expiry of the existing Certificate as required by 1.6.6.2.2, 1.6.6.5 or 1.6.6.6. In these special circumstances, the new Certificate should be valid to a date not exceeding 5 years from the date of completion of the renewal survey.

1.6.6.8 If an annual or intermediate survey is completed before the period specified in 1.6.2, then:

.1 The anniversary date shown on the Certificate should be amended by endorsement to a date which should not be more than 3 months later than the date on which the survey was completed;

.2 The subsequent annual or intermediate survey required by 1.6.2 should be completed at the intervals prescribed by that section using the new anniversary date;

.3 The expiry date may remain unchanged provided one or more annual or intermediate surveys, as appropriate, are carried out so that the maximum intervals between the surveys prescribed by 1.6.2 are not exceeded.

1.6.6.9 A Certificate issued under 1.6.4 or 1.6.5 should cease to be valid in any of the following cases:

.1 If the relevant surveys are not completed within the periods specified under 1.6.2;

.2 If the Certificate is not endorsed in accordance with 1.6.2.1.3 or 1.6.2.1.4;

.3 Upon transfer of the ship to the flag of another State. A new Certificate should only be issued when the Government issuing the new Certificate is fully satisfied that the ship is in compliance with the requirements of 1.6.3.1 and 1.6.3.2. In the case of a transfer between Parties, if requested within 3 months after the transfer has taken place, the Government of the Party whose flag the ship was formerly entitled to fly should, as soon as possible, transmit to the Administration copies of the Certificate carried by the ship before the transfer and, if available, copies of the relevant survey reports."

Appendix

MODEL FORM OF CERTIFICATE OF FITNESS FOR THE CARRIAGE OF DANGEROUS CHEMICALS IN BULK

The existing Model Form of Certificate should be replaced by the following:

"CERTIFICATE OF FITNESS FOR THE CARRIAGE OF DANGEROUS CHEMICALS IN BULK

(Official seal)

Issued under the provisions of the

CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK

(resolution MEPC.20(22) and resolution MSC.9(53), as amended by resolution MEPC.41(29) and resolution MSC.18(58))

under the authority of the Government of

.....
(full designation of country)

by .....
(full designation of the competent person or organization recognized by the Administration)

Particulars of ship 1/

Name of ship .....

Distinctive number or letters .....

Port of registry .....

Gross tonnage .....

Ship type (Code paragraph 2.2.4) .....

IMO Number2/ .....

Date on which keel was laid or ship was at a similar stage of construction or, (in the case of a converted ship) date of which conversion to a chemical tanker was commenced .....

Date on which the building contract was placed .....

The ship also complies fully with the following amendments to the Code:

.....
.....

The ship is exempted from compliance with the following provisions of the Code:

.....
.....

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THIS IS TO CERTIFY:

1 That the ship has been surveyed in accordance with the provisions of section 1.6 of the Code.

2 That the survey showed that the construction and equipment of the ship and the condition thereof are in all respects satisfactory and that the ship complies with the relevant provisions of the Code applicable to:

.1 ships referred to in 1.7.2 3/;

.2 ships referred to in 1.7.3 3/.

3 That the ship has been provided with a Manual in accordance with the Standards for Procedures and Arrangements as called for by regulations 5, 5A and 8 of Annex II of MARPOL 73/78, and that the arrangements and equipment of the ship prescribed in the Manual are in all respects satisfactory and comply with the applicable requirements of the said Standards.

4 That the ship is suitable for the carriage in bulk of the following products, provided that all relevant operational provisions of the Code are observed.

| Products | Conditions of carriage (tank numbers, etc.) |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

Continued on attachment 1 3/

Tank numbers referred to in this list are identified on attachment 2.

5 That, in accordance with 1.7.3/2.2.5 3/, the provisions of the Code are modified in respect of the ship in the following manner:

.....

6 That the ship must be loaded:

.1 in accordance with the loading conditions provided in the approved loading Manual, stamped and dated ..... and signed by a responsible officer of the Administration, or of an organization recognized by the Administration;3/

.2 in accordance with the loading limitations appended to this Certificate.3/

Where it is required to load the ship other than in accordance with the above instruction, then the necessary calculations to justify the proposed loading conditions should be communicated to the certifying Administration who may authorize in writing the adoption of the proposed loading condition.4/

This Certificate is valid until .....5/ subject to surveys in accordance with 1.6 of the Code.

Issued at .....
(Place of issue of Certificate)

..... .....
(Date of issue) (Signature of authorized official issuing the Certificate)

(Seal or stamp of the authority, as appropriate)

Notes on completion of Certificate:

1/ The Certificate can be issued only to ship entitled to fly the flags of States which are Parties to MARPOL 73/78.

2/ Ship type: Any entry must relate to all relevant recommendations, e.g. an entry "type 2" should mean type 2 in all respects prescribed by the Code. This column would not usually apply in the cases of an existing ship and in such a case should be noted "see paragraph 2.2".

3/ Products: Products listed in chapter VI of the Code, or which have been evaluated by the Administration in accordance with 1.8 of the Code, should be listed. In respect of the latter "new" products, any special requirements provisionally prescribed should be noted.

4/ Products: The list of products the ship is suitable to carry should include the noxious liquid substances of category D which are not covered by the Code and should be identified as "chapter VII category D".

Notes on completion of Certificate (cont'd):

5/ Conditions of carriage: The limitations on the carriage of category B or category C substances under 5A.2 of the Code should also be indicated.

6/ Conditions of carriage: If a Certificate is issued to a ship which is modified in accordance with the provision of regulation 1(12) of Annex II to MARPOL 73/78 the Certificate should indicate in the top of the table of products and conditions of carriage the following statement: "This ship is certificated to carry only pollution hazard chemicals".

ENDORSEMENT FOR ANNUAL AND INTERMEDIATE SURVEYS

THIS IS TO CERTIFY that, at a survey required by 1.6.2 of the Code the ship was found to comply with the relevant provisions of the Code:

Annual survey:

Signed .....
(Signature of authorized official)

Place .....

Date .....

(Seal or stamp of the authority, as appropriate)

Annual/Intermediate3/ survey:

Signed .....
(Signature of authorized official)

Place .....

Date .....

(Seal or stamp of the authority, as appropriate)

Annual/Intermediate3/ survey:

Signed .....
(Signature of authorized official)

Place .....

Date .....

(Seal or stamp of the authority, as appropriate)

Annual survey:

Signed .....
(Signature of authorized official)

Place .....

Date .....

(Seal or stamp of the authority, as appropriate)

Annual/intermediate survey in accordance with 1.6.6.8.3

THIS IS TO CERTIFY that, at an annual/intermediate3/ survey in accordance with 1.6.6.8.3 of the Code, the ship was found to comply with the relevant provisions of the Code.

Signed .....
(Signature of authorized official)

Place .....

Date .....

(Seal or stamp of the authority, as appropriate)

Endorsement to extend the Certificate if valid for less than 5 years where 1.6.6.3 applies

The ship complies with the relevant provisions of the Code, and this Certificate should, in accordance with 1.6.6.3 of the Code, be accepted as valid until .....

Signed .....
(Signature of authorized official)

Place .....

Date .....

(Seal or stamp of the authority, as appropriate)

Endorsement where the renewal survey has been completed and 1.6.6.4 applies

The ship complies with the relevant provisions of the Code, and this Certificate should, in accordance with 1.6.6.4 of the Code, be accepted as valid until .....

Signed .....
(Signature of authorized official)

Place .....

Date .....

(Seal or stamp of the authority, as appropriate)

Endorsement to extend the validity of the Certificate until reaching the port of survey or for a period of grace where 1.6.6.5/1.6.6.6 applies

This Certificate should, in accordance with 1.6.6.5/1.6.6.6 3/ of the Code, be accepted as valid until .....

Signed .....
(Signature of authorized official)

Place .....

Date .....

(Seal or stamp of the authority, as appropriate)

Endorsement for advancement of anniversary date where 1.6.6.8 applies

In accordance with 1.6.6.8 of the Code, the new anniversary date is .....

Signed .....
(Signature of authorized official)

Place .....

Date .....

(Seal or stamp of the authority, as appropriate)

In accordance with 1.6.6.8 of the Code, the new anniversary date is .....

Signed .....
(Signature of authorized official)

Place .....

Date .....

(Seal or stamp of the authority, as appropriate)

---

1/ Alternatively, the particulars of the ship may be placed horizontally in boxes.

2/ In accordance with resolution A.600(15) - IMO Ship Identification Number Scheme, this information may be included voluntarily.

3/ Delete as appropriate.

4/ Instead of being incorporated in the Certificate, this text may be appended to the Certificate if signed and stamped.

5/ Insert the date of expiry as specified by the Administration in accordance with 1.6.6.1 of the Code. The day and the month of this date correspond to the anniversary date as defined in 1.4.16C of the Code, unless amended in accordance with 1.6.6.8 of the Code.

ANNEX 5
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ATTACHMENT 1

TO THE

CERTIFICATE OF FITNESS FOR THE CARRIAGE OF
DANGEROUS CHEMICALS IN BULK

Continued list of products to those specified in section 4, and conditions of their carriage

| Products | Conditions of carriage (tank numbers etc.) |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

Date.....
(as for Certificate)

.....
(Signature of official issuing the Certificate and/or seal or stamp of issuing authority)

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ATTACHMENT 2

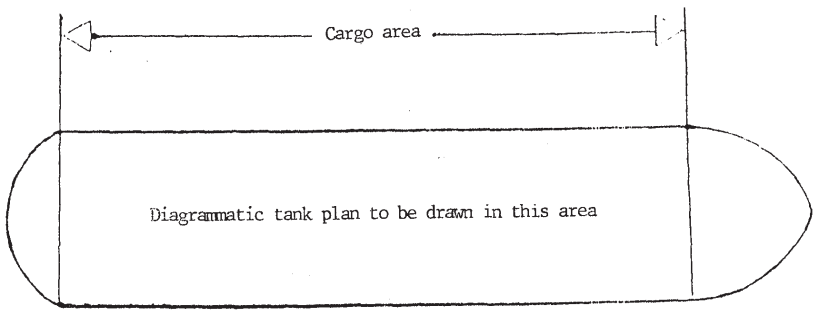
TO THE

CERTIFICATE OF FITNESS FOR THE CARRIAGE OF
DANGEROUS CHEMICALS IN BULK

TANK PLAN (Specimen)

Name of ship: .....

Distinctive number or letters: .....




Date.....
(as for Certificate)

.....
(Signature of official issuing the Certificate
and/or seal or stamp of issuing authority)"

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W/5700X/EWP

MSC 61/21/Add.1

ANNEX 5

RESOLUTION MSC.29(61)
adopted on 11 December 1992

ADOPTION OF AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (BCH CODE)

THE MARITIME SAFETY COMMITTEE,

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

RECALLING ALSO resolution A.212(VII), by which the Assembly, at its seventh session, adopted the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH Code), which provides safety requirements for chemical tankers supplementary to the provisions of the International Convention for the Safety of Life at Sea, 1974 (1974 SOLAS Convention), as amended,

RECALLING FURTHER resolution MSC.9(53), by which the Committee, at its fifty-third session, adopted the revised BCH Code,

NOTING resolution MEPC.56(33), by which the Marine Environment Protection Committee adopted, on 30 October 1992, amendments to the BCH Code in accordance with article 16(2)(d) of the International Convention for the Prevention of Pollution from Ships, as modified by the 1978 Protocol related thereto (MARPOL 73/78),

NOTING FURTHER resolution MSC.28(61), by which the Committee adopted amendments to the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code),

RECOGNIZING the need to bring the corresponding amendments to the BCH Code in force on the date on which the amendments to the IBC Code enter into force,

HAVING CONSIDERED, at its sixty-first session, amendments to the BCH Code proposed by the Sub-Committee on Bulk Chemicals,

1. ADOPTS amendments to the BCH Code, the text of which is given in the annex to the present resolution;

2. DETERMINES that the amendments shall become effective on 1 July 1994 upon their acceptance and entry into force of the corresponding amendments to the IBC Code adopted by resolution MSC.28(61).

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ANNEX

AMENDMENTS TO THE BCH CODE

The existing text of the last sentence of 1.1 is amended by addition of the following words:

... of chapter 17 of the IBC Code.

The last two sentences of the existing text of 1.2.1 is amended to read as follows:

The Code is at present limited to the liquids shown in the summary of minimum requirements in chapter 17 of the IBC Code. Products that have been reviewed and determined not to present safety and pollution hazards to such an extent as to warrant application of the Code are found in chapter 18 of the IBC Code.

The existing text of 1.4.16A is replaced by the following:

Noxious liquid substance means any substance referred to in Appendix II of Annex II of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78) or provisionally assessed under the provisions of regulation 3(4) of that Annex as falling into category A, B, C or D.

The following new 1.4.16C is added after the existing 1.4.16B:

The IBC Code means the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk adopted by the Maritime Safety Committee and the Marine Environment Protection Committee of the Organization by resolutions MSC.4(48) and MEPC.19(22) respectively, as amended.

The existing text of 3.16.10(a) is replaced by the following:

filter type respiratory protection is unacceptable;

The following words are inserted after the third sentence of the existing text of 4.7.21:

Remote manual operation should be arranged such that remote starting of pumps supplying the water spray system and remote operation of any normally closed valves in the system can be carried out from a suitable location outside the cargo area, adjacent to the accommodation spaces and readily accessible and operable in the event of fire in the areas protected.

The existing text of 4.10 is amended as follows:

4.10 Cargoes protected by additives

4.10.1 Certain cargoes with a reference in column 'm' in the table of chapter VI, by the nature of their chemical make-up, tend under certain conditions of temperature, exposure to air or contact with a catalyst, to undergo polymerization, decomposition, oxidation or other chemical changes. Mitigation of this tendency is carried out by introducing small amounts of chemical additives into the liquid cargo or by controlling the cargo tank environment.

4.10.2 No change.

4.10.3 Care should be taken to ensure that these cargoes are sufficiently protected to prevent deleterious chemical change at all times during the voyage. Ships carrying such cargoes should be provided with a certificate of protection from the manufacturer and kept during the voyage specifying:

.1 the name and amount of additive present;

.2 whether the additive is oxygen dependent;

.3 date additive was put in the product and duration of effectiveness;

.4 any temperature limitations qualifying the additives' effective lifetime; and

.5 the action to be taken should the length of voyage exceed the effective lifetime of the additives.

4.10.4 Ships using the exclusion of air as the method of preventing oxidation of the cargo should comply with 2.19.3.

4.10.5 A product containing an oxygen dependent additive should be carried without inertion.

4.10.6 As existing 4.10.5.

4.10.7 As existing 4.10.6.

New 4.23 is added as follows:

4.23 Temperature sensors

Temperature sensors should be used to monitor the cargo pump temperature to detect overheating due to pump failures.

Chapter VI

The existing text of Chapter VI is replaced by the following:

CHAPTER VI - SUMMARY OF MINIMUM REQUIREMENTS

The summary of minimum requirements of the products covered by the Code is set out in chapter 17 of the IBC Code.

For the purpose of application of the minimum requirements under this Code, the cross references in the IBC Code shown in the left hand column of the following table should be taken to mean references to the BCH Code shown in the right hand column. Where a reference is made in the BCH Code to column "m" in the table of chapter VI it should be taken to mean any of the columns "m", "n" and "o" in the table of chapter 17 of the IBC Code.

IBC/BCH CODES CROSS REFERENCES TO THE REQUIREMENTS

| IBC Code chapter 17 items | IBC Code reference | BCH Code reference |
|---|---|---|
| Ship type (column e) | | |
| 1 = ship type 1 | (2.1.2) | (2.2.4(a)) |
| 2 = ship type 2 | (2.1.2) | (2.2.4(b)) |
| 3 = ship type 3 | (2.1.2) | (2.2.4(c)) |
| Tank type (column f) | | |
| 1 = independent tank | (4.1.1) | (2.3.2) |
| 2 = integral tank | (4.1.2) | (2.3.1) |
| G = gravity tank | (4.1.3) | (2.4) |
| P = pressure tank | (4.1.4) | - |
| Tank environmental control (column h) | | |
| Inert: inerting | (9.1.2.1) | (2.19.2(a)) |
| Pad: liquid or gas | (9.1.2.2) | (2.19.2(b)) |
| Dry: drying | (9.1.2.3) | (2.19.2(c)) |
| Vent: natural or forced | (9.1.2.4) | (2.19.2(d)) |

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| IBC Code chapter 17 items | IBC Code reference | BCH Code reference |
|---|---|---|
| Electrical equipment (column i) | | |
| NF: non-flammable product | (10.1.6) | Standard electrical system |
| Yes: Flashpoint exceeding 60°C (closed cup) | (10.1.6) | Standard electrical system |
| No: Product having a a flashpoint not exceeding 60°C (closed cup) | (10.1.6) | Special electrical systems |
| Gauging (column j) | | |
| O: open gauging | (13.1.1.1) | Open device (3.9(a)) |
| R: restricted gauging | (13.1.1.2) | Restricted device (3.9(b)) |
| C: closed gauging | (13.1.1.3) | Closed device (3.9(c)) |
| I: indirect gauging | (13.1.1.3) | Indirect device (3.9(d)) |
| Materials and construction (column m) | | |
| | N1 | 4.12.1 |
| | N2 | 4.12.2 |
| | N3 | 4.12.3 |
| | N4 | 4.12.4 |
| | N5 | 4.12.5 |
| | N6 | 4.12.8 |
| | N7 | 4.12.9 |
| | N8 | 4.12.1, except copper and copper alloys may be used |
| | Z | - |
| | Y1 | 4.12.6 |
| | Y2 | 4.12.7(a) |
| | Y3 | 4.12.7(b) |
| | Y4 | 4.12.10 |
| | Y5 | 4.12.6 except aluminium is not permitted |
| Respiratory and eye protection (column n) | E: see 14.2.8 | 3.16.10 |

| IBC Code chapter 17 items | IBC Code reference | BCH Code reference |
|---|---|---|
| Special requirements (column o) | 15.1 | 4.4 |
| | 15.2 | 4.19 |
| | 15.3 | 4.1 |
| | 15.4 | 4.2 |
| | 15.5.1 - 13 | 4.20.1 - 14 |
| | 15.5.14 - 26 | 4.20.15 - 27 |
| | 15.6 | 4.6 |
| | 15.7 | 4.5 |
| | 15.8 | 4.7 |
| | 15.9 | 4.21 |
| | 15.10 | 4.3 |
| | 15.11 | 4.8 |
| | 15.12 | 4.9 |
| | 15.13 | 4.10 |
| | 15.14 | 4.11 |
| | 15.16 | 4.15 |
| | 15.17 | 4.13.1 |
| | 15.18 | 4.13.2 |
| | 15.19 | 4.14 |
| | 15.19.6 | 4.14.1 |
| | 15.20 | 4.22 |
| | 15.21 | 4.23 |
| | 16.2.6 | 5.2.5 |
| | 16.2.7 | 5.2.6 |
| | 16.2.8 | 5.2.7 |
| | 16.2.9 | 5.2.8 |
| | 16.6 | 4.18 |
| | 16A.2.2 | 5A.2.2 |

Chapter VII

The existing text of Chapter VII is replaced by the following:

CHAPTER VII - LIST OF CHEMICALS TO WHICH
THE CODE DOES NOT APPLY

The list of chemicals which have been reviewed for their safety and pollution hazards and determined not to present hazards to such an extent as to warrant the application of the Code is set out in chapter 18 of the IBC Code.

New chapter VIII is added as follows:

## CHAPTER VIII - TRANSPORT OF LIQUID CHEMICAL WASTES

### 8.1 Preamble

8.1.1 Maritime transport of liquid chemical wastes could present a threat to human health and to the environment.

8.1.2 Liquid chemical wastes should, therefore, be transported in accordance with relevant international conventions and recommendations and, in particular, where it concerns maritime transport in bulk, with the requirements of this Code.

### 8.2 Definitions

For the purpose of this chapter:

8.2.1 "Liquid chemical wastes" are substances, solutions or mixtures, offered for shipment, containing or contaminated with one or more constituents which are subject to the requirements of this Code and for which no direct use is envisaged but which are carried for dumping, incineration or other methods of disposal other than at sea.

8.2.2 "Transboundary movement" means maritime transport of wastes from an area under the national jurisdiction of one country to or through an area under the national jurisdiction of another country, or to or through an area not under the national jurisdiction of any country, provided at least two countries are concerned by the movement.

### 8.3 Applicability

8.3.1 The requirements of this chapter are applicable to the transboundary movement of liquid chemical wastes in bulk by seagoing ships and should be considered in conjunction with all other requirements of this Code.

8.3.2 The requirements of this chapter do not apply to:

.1 wastes derived from shipboard operations which are covered by the requirements of MARPOL 73/78;

.2 liquid chemical wastes carried by ships engaged in the incineration of such wastes at sea which are covered by chapter 19 of the IBC Code; and

.3 substances, solutions or mixtures containing or contaminated with radioactive materials which are subject to the applicable requirements for radioactive materials.

8.4 Permitted shipments

8.4.1 Transboundary movement of wastes is permitted to commence only when:

.1 notification has been sent by the competent authority of the country of origin, or by the generator or exporter through the channel of the competent authority of the country of origin, to the country of final destination; and

.2 the competent authority of the country of origin, having received the written consent of the country of final destination stating that the wastes will be safely incinerated or treated by other methods of disposal, has given authorization to the movement.

8.5 Documentation

8.5.1 In addition to the documentation specified in 5.2 of this Code ships engaged in transboundary movement of liquid chemical wastes should carry on board a waste movement document issued by the competent authority of the country of origin.

8.6 Classification of liquid chemical wastes

8.6.1 For the purpose of the protection of the marine environment all liquid chemical wastes transported in bulk should be treated as Category A noxious liquid substances, irrespective of the actual evaluated category.

8.7 Carriage and handling of liquid chemical wastes

8.7.1 Liquid chemical wastes should be carried in ships and cargo tanks in accordance with the minimum requirements for liquid chemical wastes specified in chapter 17 of the IBC Code, unless there are clear grounds indicating that the hazards of the wastes would warrant:

.1 carriage in accordance with the ship type 1 requirements; or

.2 any additional requirements of this Code applicable to the substance or, in case of a mixture, its constituent presenting the predominant hazard.

***

MSC 66/24/Add.1

**ANNEX 6**

**RESOLUTION MSC.51(66)**
**(adopted on 4 June 1966)**

**ADOPTION OF AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (BCH CODE)**

THE MARITIME SAFETY COMMITTEE,

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

RECALLING ALSO resolution A.212(VII), by which the Assembly, at its seventh session, adopted the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH Code), which provides safety requirements for chemical tankers supplementary to the provisions of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended,

RECALLING FURTHER resolution MSC.29(61), by which the Committee, at its sixty-first session, adopted the revised BCH Code,

NOTING resolution MSC.50(66), by which the Committee adopted amendments to the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code),

RECOGNIZING the need to bring the corresponding amendments to the BCH Code in force on the date on which the corresponding amendments to the IBC Code enter into force,

1. ADOPTS amendments to the BCH Code the text of which is given in the Annex to the present resolution;

2. DETERMINES that the amendments shall become effective on 1 July 1998 upon acceptance and entry into force of the corresponding amendments to the IBC Code adopted by resolution MSC.50(66).

ANNEX

**AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (BCH CODE)**

**Chapter IV - Special requirements**

1 New paragraph 4.18.4 is added to chapter IV as follows:

"4.18.4 In order to avoid elevated temperatures, this cargo should not be carried in deck tanks."

**Chapter VI - Summary of minimum requirements**

2 The cross-reference between 16.6 of the IBC Code and 4.18 of the BCH Code is replaced by the following:

| **IBC Code reference** | **BCH Code reference** |
|---|---|
| 16.6.1 | 4.18.1 |
| 16.6.2 | 4.18.2 |
| 16.6.3 | 4.18.3 |
| 16.6.4 | 4.18.4 |

**

DOCUMENT2

**ANNEX 14**

**RESOLUTION MSC.106(73)**
**(adopted on 5 December 2000)**

**ADOPTION OF AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (BCH CODE)**

THE MARITIME SAFETY COMMITTEE,

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

RECALLING ALSO resolution A.212(VII), by which the Assembly, at its seventh session, adopted the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH Code), which provides safety requirements for chemical tankers supplementary to the provisions of the International Convention for the Safety of Life at Sea (SOLAS), 1974 as amended,

RECALLING FURTHER resolution MSC.29(61), by which, at its sixty-first session, it adopted the revised BCH Code,

NOTING resolutions MSC.102(73) and MEPC.79(43), respectively, by which it, and the Marine Environment Protection Committee, adopted relevant amendments to the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code),

NOTING ALSO resolution MEPC.80(43), by which the Marine Environment Protection Committee adopted relevant amendments to the BCH Code,

HAVING CONSIDERED, at its seventy-third session, amendments to the BCH Code proposed by the Sub-Committee on Bulk Liquids and Gases at its third and fourth sessions and approved by the Committee at its seventieth and seventy-second sessions,

RECOGNIZING the need to bring the approved amendments to the BCH Code into force on the date on which the corresponding amendments to the IBC Code enter into force,

1. ADOPTS amendments to the BCH Code, the text of which is set out in the Annex to the present resolution;

2. DETERMINES that the said amendments shall become effective on 1 July 2002 upon acceptance and entry into force of the corresponding amendments to the IBC Code adopted by resolution MSC.102(73).

ANNEX

## AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (BCH CODE)

## CHAPTER II
## CARGO CONTAINMENT

### 2.12 Cargo hoses carried aboard the ship

1 The existing section 2.12 is replaced by the following:

"2.12 Ship's cargo hoses

2.12.1 Paragraphs 2.12.2 to 2.12.4 apply to cargo hoses installed on board ships on or after 1 July 2002.

2.12.2 Liquid and vapour hoses used for cargo transfer should be compatible with the cargo carried and suitable for the cargo temperature.

2.12.3 Hoses subject to tank pressure or the discharge pressure of pumps should be designed for a bursting pressure not less than 5 times the maximum pressure the hose will be subject to during cargo transfer.

2.12.4 Each new type of cargo hose, complete with end-fittings, should prototype-tested at a normal ambient temperature with 200 pressure cycles from zero to at least twice the specified maximum working pressure. After this cycle pressure test has been carried out, the prototype test should demonstrate a bursting pressure of at least 5 times its specified maximum working pressure at the extreme service temperature. Hoses used for prototype testing should not be used for cargo service. Thereafter, before being placed in service, each new length of cargo hose produced should be hydrostatically tested at ambient temperature to a pressure not less than 1.5 times its specified maximum working pressure, but not more than two-fifths of its bursting pressure. The hose should be stencilled or otherwise marked with the date of testing, its specified maximum working pressure and, if used in services other than the ambient temperature services, its maximum and minimum service temperature, as applicable. The specified maximum working pressure should not be less than 10 bar gauge."

### 2.14 Types of tank vent systems

2 The following new paragraph 2.14.3 is added after the existing paragraph 2.14.2:

"2.14.3 The controlled tank venting systems as provided in paragraph 2.14.2 above should consist of a primary and a secondary means of allowing full flow relief of vapour to prevent over-pressure or under-pressure in the event of failure of one means. Alternatively, the secondary means may consist of pressure sensors fitted in each tank with a monitoring system in the ship's cargo control room or position from which cargo operations are normally carried out. Such monitoring equipment should also provide an alarm facility which is activated by detection of over-pressure or under-pressure

conditions within a tank. Ships should comply with the requirements of this paragraph by the date of the first schedule dry-docking after 1 July 2002, but not later than 1 July 2005. However, the Administration may accept relaxation from the application of this paragraph for ships of less than 500 gross tonnage."

3 The existing paragraphs 2.14.3 and 2.14.4 are renumbered as paragraphs 2.14.4 and 2.14.5.

## CHAPTER III
## SAFETY EQUIPMENT AND RELATED CONSIDERATION

4 The existing paragraph 3.16.11 is replaced by the following:

"3.16.11 The ship should have on board medical first-aid equipment, including oxygen resuscitation equipment and antidotes for cargoes to be carried, based on the guidelines developed by the Organization.*

---

* Reference is made to the Medical First Aid Guide for Use in Accidents Involving Dangerous Goods (MFAG), which provides advice on the treatment of casualties in accordance with the symptoms exhibited as well as equipment and antidotes that may be appropriate for treating the casualty."

## CHAPTER IV

## SPECIAL REQUIREMENTS

5 The existing text of section 4.1 is replaced by the following:

**"4.1 Carbon disulphide**

Carbon disulphide may be carried either under water pad or under suitable inert gas pad as specified in the following paragraphs.

**Carriage under water pad**

4.1.1 Provision should be made to maintain a water pad in the cargo tank during loading, unloading and transit. In addition, a suitable inert gas pad should be maintained in the ullage space during transit.

4.1.2 All openings should be in the top of the tank, above the deck.

4.1.3 Loading lines should terminate near the bottom of the tank.

4.1.4 A standard ullage opening should be provided for emergency sounding.

4.1.5 Cargo piping and vent lines should be independent of piping and vent lines used for other cargo.

4.1.6 Pumps may be used for discharging cargo, provided they are of the deepwell or hydraulically driven submersible types. The means of driving a deepwell pump should not present a source of ignition for carbon disulphide and should not employ equipment that may exceed a temperature of 80°C.

4.1.7 If a cargo discharge pump is used, it should be inserted through a cylindrical well extending from the tank top to a point near the tank bottom. A water pad should be formed in this well before attempting pump removal unless the tank has been certified as gas-free.

4.1.8 Water or inert gas displacement may be used for discharging cargo, provided the cargo system is designed for the expected pressure and temperature.

4.1.9 Safety relief valves should be of stainless steel construction.

4.1.10 Because of its low ignition temperature and close clearances required to arrest its flame propagation, only intrinsically safe systems and circuits should be permitted in the hazardous locations described in 10.2.3.

**Carriage under suitable inert gas pad**

4.1.11 Carbon disulphide should be carried in independent tanks with a design pressure of not less than 0.6 bar gauge.

4.1.12 All openings should be located on the top of the tank, above the deck.

4.1.13 Gaskets used in the containment system should be of a material which does not react with, or dissolve in, carbon disulphide.

4.1.14 Threaded joints should not be permitted in the cargo containment system, including the vapour lines.

4.1.15 Prior to loading, the tank(s) should be inerted with suitable inert gas until the oxygen level is 2% by volume or lower. Means should be provided to automatically maintain a positive pressure in the tank using suitable inert gas during loading, transport and discharge. The system should be able to maintain this positive pressure between 0.1 and 0.2 bar gauge, and should be remotely monitored and fitted with over/underpressure alarms.

4.1.16 Hold spaces surrounding an independent tank carrying carbon disulphide should be inerted by a suitable inert gas until the oxygen level is 2% or less. Means should be provided to monitor and maintain this condition throughout the voyage. Means should also be provided to sample these spaces for carbon disulphide vapour.

4.1.17 Carbon disulphide should be loaded, transported and discharged in such a manner that venting to the atmosphere does not occur. If carbon disulphide vapour is returned to

shore during loading or to the ship during discharge, the vapour return system should be independent of all other containment systems.

4.1.18 Carbon disulphide should be discharged only by submerged deepwell pumps or by a suitable inert gas displacement. The submerged deepwell pumps should be operated in a way that prevents heat build-up in the pump. The pump should also be equipped with a temperature sensor in the pump housing with remote readout and alarm in the cargo control room. The alarm should be set at 80°C. The pump should also be fitted with an automatic shut-down device, if the tank pressure falls below atmospheric pressure during the discharge.

4.1.19 Air should not be allowed to enter the cargo tank, cargo pump or lines while carbon disulphide is contained in the system.

4.1.20 No other cargo handling, tank cleaning or deballasting should take place concurrent with loading or discharge of carbon disulphide.

4.1.21 A water spray system of sufficient capacity should be provided to blanket effectively the area surrounding the loading manifold, the exposed deck piping associated with product handling and the tank domes. The arrangement of piping and nozzles should be such as to give a uniform distribution rate of 10 $l/m^2$/min. Remote manual operation should be arranged such that remote starting of pumps supplying the water-spray system and remote operation of any normally closed valves in the system can be carried out from a suitable location outside the cargo area adjacent to the accommodation spaces and readily accessible and operable in the event of fire in the areas protected. The water-spray system should be capable of both local and remote manual operation, and the arrangement should ensure that any spilled cargo is washed away. Additionally, a water hose with pressure to the nozzle when atmospheric temperature permits, should be connected ready for immediate use during loading and unloading operations.

4.1.22 No cargo tanks should be more than 98% liquid-full at the reference temperature (R).

4.1.23 The maximum volume ($V_L$) of cargo to be loaded in a tank should be:

$$V_L = 0.98\ V \frac{\rho_R}{\rho_L}$$

where:

| | | |
|---|---|---|
| V | = | volume of the tank |
| $\rho_R$ | = | relative density of cargo at the reference temperature (R) |
| $\rho_L$ | = | relative density of cargo at the loading temperature |
| R | = | reference temperature, i.e. the temperature at which the vapor pressure of the cargo corresponds to the set pressure of the pressure-relief valve. |

4.1.24 The maximum allowable tank filling limits for each cargo tank should be indicated for each loading temperature which may be applied, and for the applicable

maximum reference temperature, on a list approved by the Administration. A copy of the list should be permanently kept on board by the master.

4.1.25 Zones on open deck, or semi-enclosed spaces on open deck within three metres of a tank outlet, gas or vapour outlet, cargo pipe flange or cargo valve of a tank certified to carry carbon disulphide, should comply with the electrical equipment requirements specified for carbon disulphide in column "i", chapter 17 of the IBC Code. Also, within the specified zone, no other heat sources, like steam piping with surface temperatures in excess of 80°C should be allowed.

4.1.26 Means should be provided to ullage and sample the cargo without opening the tank or disturbing the positive suitable inert gas blanket.

4.1.27 The product should be transported only in accordance with a cargo handling plan that has been approved by the Administration. Cargo handling plans should show the entire cargo piping system. A copy of the approved cargo-handling plan should be available on board. The Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk should be endorsed to include reference to the approved cargo handling plan."

## CHAPTER V
## OPERATIONAL REQUIREMENTS

6 The existing paragraph 5.3.3 is replaced by the following:

"5.3.3 Officers should be trained in emergency procedures to deal with conditions of leakage, spillage or fire involving the cargo, based on the guidelines developed by the Organization*, and a sufficient number of them should be instructed and trained in essential first aid for cargoes carried.

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* Refer to the Medical First Aid Guide for Use in Accidents Involving Dangerous Goods (MFAG), which provides advice on the treatment of casualties in accordance with the symptoms exhibited as well as equipment and antidotes that may be appropriate for treating the casualty, and to the relevant provisions of the STCW Code, parts A and B."

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**ANNEX 15**

**RESOLUTION MSC.181(79)**
**(adopted on 9 December 2004)**

**ADOPTION OF AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK, AS AMENDED (BCH Code)**

THE MARITIME SAFETY COMMITTEE,

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

RECALLING ALSO resolution A.212(VII) by which the Assembly, at its seventh session, adopted the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH Code), which provides safety requirements for chemical tankers supplementary to the provisions of the International Convention for the Safety of Life at Sea, 1974, as amended,

RECALLING FURTHER resolution MEPC.20(22) by which the Marine Environment Protection Committee adopted the BCH Code to make it mandatory under MARPOL 73/78,

NOTING resolution MSC.29(61) by which, at its sixty-first session, it adopted the revised BCH Code,

NOTING ALSO resolution MSC.176(79) by which it adopted amendments to the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code),

HAVING CONSIDERED, at its seventy-ninth session, amendments to the BCH Code proposed by the Sub-Committee on Flag State Implementation, at its eleventh session, which were approved by the Committee at its seventy-eighth session,

RECOGNIZING the need to bring the approved amendments to the BCH Code into force on the date on which corresponding amendments to the IBC Code enter into force,

1. ADOPTS amendments to the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH Code), as amended, the text of which is set out in the Annex to the present resolution;

2. DETERMINES that the said amendments should become effective on 1 January 2007* upon acceptance and entry into force of the corresponding amendments to the IBC Code adopted by resolution MSC.176(79).

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* Date of entry into force of the aforementioned amendments to the IBC Code, which is linked to the date of entry into force of the revised Annex II to MARPOL 73/78.

ANNEX

**AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK, AS AMENDED**

**APPENDIX**

**MODEL FORM OF CERTIFICATE OF FITNESS FOR THE CARRIAGE OF DANGEROUS CHEMICALS IN BULK**

1 In the form of the Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk, the following new section is inserted between the section commencing with the words "This certificate is valid until" and the section commencing with the words "Issued at":

"Completion date of the survey on which this certificate is based: ……".
(*dd/mm/yyyy*)

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MSC 81/25/Add.2

**ANNEX 24**

**RESOLUTION MSC.212(81)**
**(adopted on 18 May 2006)**

**ADOPTION OF AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (BCH CODE)**

THE MARITIME SAFETY COMMITTEE,

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

RECALLING ALSO resolution A.212(VII) by which the Assembly, at its seventh session, adopted the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH Code), which provides safety requirements for chemical tankers supplementary to the provisions of the International Convention for the Safety of Life at Sea, 1974, as amended,

RECALLING FURTHER resolution MEPC.20(22) by which the Marine Environment Protection Committee (MEPC) adopted the BCH Code to make it mandatory under MARPOL 73/78,

NOTING resolution MSC.29(61) by which it adopted the revised BCH Code,

NOTING ALSO resolution MSC.144(54) by which the MEPC, at its fifty-fourth session, adopted amendments to the BCH Code,

CONSIDERING that it is highly desirable for the provisions of the BCH Code which are mandatory under MARPOL 73/78 and recommendatory from a safety standpoint, to remain identical when adopted by the Marine Environment Protection Committee and the Maritime Safety Committee,

HAVING CONSIDERED, at its eighty-first session, amendments to the BCH Code proposed by the Sub-Committee on Bulk Liquids and Gases, at its ninth session,

1. ADOPTS amendments to the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH Code), as amended, the text of which is set out in the Annex to the present resolution;

2. DETERMINES that the said amendments should become effective on 1 August 2007[*].

[*] Date of entry into force of the identical amendments to the BCH Code adopted by the aforementioned resolution MEPC.144(54).

ANNEX

**AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (BCH CODE)**

The BCH Code is amended as follows:

**Preamble**

1 The following new paragraph is added:

"7 The Code has been revised to reflect the 2007 revision of MARPOL Annex II".

**CHAPTER I**
**GENERAL**

**1.1 Purpose**

2 In the second sentence, the words "as defined in regulation 1(1) of Annex II thereof" are deleted and the references to (Pollution Category) "A, B or C" are replaced by "X, Y or Z".

**1.4 Definitions**

3 Paragraph 1.4.16A is replaced by the following:

"1.4.16A *Noxious Liquid Substance* means any substance indicated in the Pollution Category column of chapter 17 or 18 of the International Bulk Chemical Code, or the current MEPC.2/Circular or provisionally assessed under the provisions of regulation 6.3 of the amendments to the Annex of the Protocol of 1978 relative to the International Convention for the Prevention of Pollution from Ships, 1973, as falling into Category X, Y or Z."

4 In paragraph 1.4.16B the existing text is deleted and the word "Deleted" is inserted.

5 The paragraph number of the definition of "anniversary date" which was adopted as "1.4.16C" by resolution MEPC.41(29) is amended to read "1.4.16D".

**1.7 Effective date**

6 In the second sentence of paragraph 1.7.2, the reference to "regulation 1(12)" is replaced by "regulation 1.17".

**1.8 New products**

7 In the first sentence of paragraph 1.8, the reference to (Pollution Category) "A, B or C" is replaced by "X, Y or Z".

## CHAPTER II
## CARGO CONTAINMENT

G – MATERIALS OF CONSTRUCTION

### 2.17 General

8 The existing text is replaced by the following:

"2.17.1 Structural materials used for tank construction, together with associated piping, pumps, valves, vents and their jointing materials, should be suitable at the temperature and pressure for the cargo to be carried in accordance with recognized standards. Steel is assumed to be the normal material of construction.

2.17.2 Where applicable, the following should be taken into account in selecting the material of construction:

.1 notch ductility at the operating temperature;

.2 corrosive effect of the cargo; and

.3 possibility of hazardous reactions between the cargo and the material of construction.

2.17.3 The shipper of the cargo is responsible for providing compatibility information to the ship operator and/or master. This must be done in a timely manner before transportation of the product. The cargo shall be compatible with all materials of construction such that:

.1 no damage to the integrity of the materials of construction is incurred; and

.2 no hazardous, or potentially hazardous reaction is created.

2.17.4 When a product is submitted to IMO for evaluation, and where compatibility of the product with materials referred to in paragraph 2.17 renders special requirements, the GESAMP/EHS Product Data Reporting Form shall provide information on the required materials of construction. These requirements shall be reflected in chapter IV and consequentially be referred to in *column o* of chapter 17 of the IBC Code. The reporting form shall also indicate if no special requirements are necessary. The producer of the product is responsible for providing the correct information."

### 2.18 Additional requirements

9 In paragraph 2.18, the existing text is deleted and the word "Deleted" is inserted.

**CHAPTER III**
**SAFETY EQUIPMENT AND RELATED CONSIDERATIONS**

E – FIRE PROTECTION

10 After the heading, the following words are inserted:

"(SOLAS regulations referred to in Part E mean, unless expressly provided otherwise, regulations in chapter II-2 of the International Convention for the Safety of Life at Sea, 1974 and its relevant amendments adopted before by resolution MSC.99(73))".

**3.13 Fire safety arrangements**

11 In paragraph 3.13.3 the existing text is deleted and the word "Deleted" is inserted.

12 The following new paragraph 3.13.5 is added:

"3.13.5 The following requirements in SOLAS chapter II-2, as adopted by MSC.99(73), should apply:

(a) regulations II-2/4.5.10.1.1 and 4.5.10.1.4 and a system for continuous monitoring of the concentration of flammable vapours shall be fitted on ships of 500 gross tonnage and over by the date of the first scheduled dry-docking after 1 August 2007, but not later than 1 August 2010. Sampling points or detector heads should be located in suitable positions in order that potentially dangerous leakages are readily detected. When the flammable vapour concentration reaches a pre-set level which shall not be higher than 10% of the lower flammable limit, a continuous audible and visual alarm signal shall be automatically effected in the pump-room and cargo control room to alert personnel to the potential hazard. However, existing monitoring systems already fitted having a pre-set level not greater than 30% of the lower flammable limit may be accepted. Notwithstanding the above provisions, the Administration may exempt ships not engaged on international voyages from those requirements;

(b) regulations 13.3.4.2 to 13.3.4.5 and 13.4.3 should apply to ships of 500 gross tonnage and over;

(c) regulations in Part E of chapter II-2 of SOLAS Convention except regulations 16.3.2.2 and 16.3.2.3 thereof, should apply to ships, regardless of their sizes;

(d) where deep-fat cooking equipment is newly installed, regulation 10.6.4 should apply; and

(e) fire-extinguishing systems using Halon 1211, 1301, and 2402 and perfluorocarbons should not be newly installed as prohibited by regulation 10.4.1.3."

F – PERSONAL PROTECTION

13 After the heading, the following words are inserted:

"(SOLAS regulations referred to in Part F mean, unless expressly provided otherwise, regulations in chapter II-2 of the International Convention for the Safety of Life at Sea, 1974 and its relevant amendments adopted before by resolution MSC.99(73))".

## CHAPTER IV
## SPECIAL REQUIREMENTS

### 4.12 Materials of construction

14 In paragraph 4.12, the existing text is deleted and the word "Deleted" is inserted.

### 4.15 Cargo contamination

15 In paragraph 4.15.1, the existing text is deleted and the word "Deleted" is inserted.

## CHAPTER V
## OPERATIONAL REQUIREMENTS

### 5.2 Cargo information

16 In paragraph 5.2.5, the viscosity figure "25 mPa", which appears twice, is replaced with "50 mPa".

17 In paragraph 5.2.6, the existing text is deleted and the word "Deleted" is inserted.

18 In paragraph 5.2.7, the existing text is deleted and the word "Deleted" is inserted.

## CHAPTER VA
## ADDITIONAL MEASURES FOR THE PROTECTION OF THE MARINE ENVIRONMENT

19 The existing text is deleted and the word "Deleted" is inserted.

## CHAPTER VI
## SUMMARY OF MINIMUM REQUIREMENTS

20 The IBC/BCH cross-references to the requirements under Materials of construction (column *m*) and the following cross-references under special requirements (column *o*) are deleted:

| "IBC Code reference | BCH Code reference |
|---|---|
| 15.16.1 | 4.15.1 |
| 16.2.7 | 5.2.6 |
| 16.2.8 | 5.2.7 |
| 16A.2.2 | 5A.2.2" |

**CHAPTER VIII**
**TRANSPORT OF LIQUID CHEMICAL WASTES**

21 In paragraph 8.3.2.2 reference to "chapter 19" of the IBC Code is replaced by "chapter 20".

**APPENDIX**

**MODEL FORM OF CERTIFICATE OF FITNESS FOR THE CARRIAGE OF DANGEROUS CHEMICALS IN BULK**

22 The existing form is replaced by the following:

"**MODEL FORM OF CERTIFICATE OF FITNESS FOR THE CARRIAGE OF DANGEROUS CHEMICALS IN BULK**

**CERTIFICATE OF FITNESS FOR THE CARRIAGE OF DANGEROUS CHEMICALS IN BULK**

(*Official seal*)

Issued under the provisions of the

CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK
(resolutions MSC.9(53) and MEPC.20(22), as amended)

under the authority of the Government of

……
(*full official designation of country*)

by……
(*full designation of the competent person or organization recognized by the Administration*)

**Particulars of ship**[1]

Name of ship …….
Distinctive number or letters …….
Port of registry …….
Gross tonnage …….
Ship Type (Code paragraph 2.2.4) …….
IMO Number[2] ……..

Date on which keel was laid or on which the ship was at a similar stage of construction or (in the case of a converted ship) date on which conversion to chemical tanker was commenced …….

The ship also complies fully with the following amendments to the Code:

……
……

[1] Alternatively, the particulars of the ship may be placed horizontally in boxes.
[2] In accordance with IMO ship identification number scheme adopted by the Organization by resolution A.600(15).

The ship is exempted from compliance with the following provisions of the Code:

……
……

THIS IS TO CERTIFY:

1 That the ship has been surveyed in accordance with the provisions of section 1.6 of the Code;

2 That the survey showed that the construction and equipment of the ship and the condition thereof are in all respects satisfactory and that the ship:

.1 complies with the relevant provisions of the Code applicable to ships referred to in 1.7.2;

.2 complies with the relevant provisions of the Code applicable to ships referred to in 1.7.3;

3 That the ship has been provided with a manual in accordance with Appendix 4 of MARPOL Annex II as called for by regulation 14 of the Annex, and that the arrangements and equipment of the ship prescribed in the Manual are in all respects satisfactory;

4 That the ship meets the requirements for the carriage in bulk of the following products, provided that all relevant operational provisions of the Code and MARPOL Annex II are observed:

| Product | Conditions of carriage (tank numbers, etc.) | Pollution Category |
|---|---|---|
| | | |
| | | |
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| Continued on attachment 1, additional signed and dated sheets[3]<br>Tank numbers referred to in this list are identified on attachment 2, signed and dated tank plan. | | |

5 That, in accordance with 1.7.3/2.2.5[3], the provisions of the Code are modified in respect of the ship in the following manner:

……

6 That the ship must be loaded:

.1 in accordance with the loading conditions provided in the approved loading manual, stamped and dated ..... and signed by a responsible officer of the Administration, or of an organization recognized by the Administration[3];

.2 in accordance with the loading limitations appended to this Certificate[3].

[3] Delete as appropriate.

Where it is required to load the ship other than in accordance with the above instruction, then the necessary calculations to justify the proposed loading conditions should be communicated to the certifying Administration who may authorize in writing the adoption of the proposed loading condition[4].

This Certificate is valid until ……...……[5]
subject to surveys in accordance with 1.6 of the Code.

Completion date of the survey on which this certificate is based: ……
(*dd/mm/yyyy*)

Issued at ….……
(*Place of issue of certificate*)

…… ……
(*Date of issue*) (*Signature of authorized official issuing the certificate*)

(*Seal or stamp of the authority, as appropriate*)

Notes on completion of Certificate:

1 The Certificate can be issued only to ships entitled to fly the flags of States which are a Party to MARPOL 73/78.

2 Ship Type: Any entry under this column must relate to all relevant recommendations, e.g., an entry "Type 2" should mean Type 2 in all respects prescribed by the Code. This column would not usually apply in the cases of an existing ship and in such a case should be noted "see paragraph 2.2".

3 Products: Products listed in chapter 17 of the Code, or which have been evaluated by the Administration in accordance with 1.8 of the Code, should be listed. In respect of the latter "new" products, any special requirements provisionally prescribed should be noted.

4 Products: The list of products the ship is suitable to carry should include the noxious liquid substances of Category Z which are not covered by the Code and should be identified as "chapter 18 Category Z".

5 *deleted*

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[4] Instead of being incorporated in the Certificate, this text may be appended to the Certificate if signed and stamped.

[5] Insert the date of expiry as specified by the Administration in accordance with 1.6.6.1 of the Code. The day and the month of this day correspond to the anniversary date as defined in 1.4.16D of the Code, unless amended in accordance with 1.6.6.8 of the Code.

6 Conditions of carriage: If a Certificate is issued to a ship which is modified in accordance with the provision of regulation 1(12) of MARPOL Annex II the Certificate should indicate in the top of the table of products and conditions of carriage the following statement: "This ship is certificated to carry only pollution hazard chemicals".

**ENDORSEMENT FOR ANNUAL AND INTERMEDIATE SURVEYS**

THIS IS TO CERTIFY that at a survey required by 1.6.2 of the Code the ship was found to comply with the relevant provisions of the Code.

Annual survey: Signed .....
(*Signature of duly authorized official*)
Place .....
Date (*dd/mm/yyyy*) .....

(*Seal or stamp of the Authority, as appropriate*)

Annual/Intermediate[3] survey: Signed .....
(*Signature of duly authorized official*)
Place .....
Date (*dd/mm/yyyy*) .....

(*Seal or stamp of the Authority, as appropriate*)

Annual/Intermediate[3] survey: Signed .....
(*Signature of duly authorized official*)
Place .....
Date (*dd/mm/yyyy*) .....

(*Seal or stamp of the Authority, as appropriate*)

Annual survey: Signed .....
(*Signature of duly authorized official*)
Place .....
Date (*dd/mm/yyyy*) .....

(*Seal or stamp of the Authority, as appropriate*)

[3] Delete as appropriate.

**ANNUAL/INTERMEDIATE SURVEY IN ACCORDANCE WITH PARAGRAPH 1.6.6.8.3**

THIS IS TO CERTIFY that, at an annual/intermediate[3] survey in accordance with paragraph 1.6.6.8.3 of the Code, the ship was found to comply with the relevant provisions of the Convention:

Signed .....
(*Signature of duly authorized official*)

Place .....

Date (*dd/mm/yyyy*) .....

(*Seal or stamp of the Authority, as appropriate*)

**ENDORSEMENT TO EXTEND THE CERTIFICATE IF VALID FOR LESS THAN 5 YEARS WHERE PARAGRAPH 1.6.6.3 APPLIES**

The ship complies with the relevant provisions of the Convention, and this Certificate shall, in accordance with paragraph 1.6.6.3 of the Code, be accepted as valid until .....

Signed .....
(*Signature of duly authorized official*)

Place .....

Date (*dd/mm/yyyy*) .....

(*Seal or stamp of the Authority, as appropriate*)

**ENDORSEMENT WHERE THE RENEWAL SURVEY HAS BEEN COMPLETED AND PARAGRAPH 1.6.6.4 APPLIES**

The ship complies with the relevant provisions of the Convention, and this Certificate shall, in accordance with paragraph 1.6.6.4 of the Code, be accepted as valid until .....

Annual survey:

Signed .....
(*Signature of duly authorized official*)

Place .....

Date (*dd/mm/yyyy*) .....

(*Seal or stamp of the Authority, as appropriate*)

[3] Delete as appropriate.

**ENDORSEMENT TO EXTEND THE VALIDITY OF THE CERTIFICATE UNTIL REACHING THE PORT OF SURVEY OR FOR A PERIOD OF GRACE WHERE PARAGRAPH 1.6.6.5 OR 1.6.6.6 APPLIES**

This Certificate shall, in accordance with paragraph 1.6.6.5/1.6.6.6[3] of the Code, be accepted as valid until ……...……

Signed .....
(*Signature of duly authorized official*)

Place .....

Date (*dd/mm/yyyy*) .....

(*Seal or stamp of the Authority, as appropriate*)

**ENDORSEMENT FOR ADVANCEMENT OF ANNIVERSARY DATE WHERE PARAGRAPH 1.6.6.8 APPLIES**

In accordance with paragraph 1.6.6.8 of the Code, the new anniversary date is .....

Signed .....
(*Signature of duly authorized official*)

Place .....

Date (*dd/mm/yyyy*) .....

(*Seal or stamp of the Authority, as appropriate*)

In accordance with paragraph 1.6.6.8, the new anniversary date is .....

Signed .....
(*Signature of duly authorized official*)

Place .....

Date (*dd/mm/yyyy*) .....

(*Seal or stamp of the Authority, as appropriate*)

[3] Delete as appropriate.

**ATTACHMENT 1**
**TO THE**
**CERTIFICATE OF FITNESS FOR THE CARRIAGE OF DANGEROUS CHEMICALS IN BULK**

Continued list of products to those specified in section 3, and their conditions of carriage.

| Products | Conditions of carriage (tank numbers, etc.) | Pollution Category |
|---|---|---|
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Date

(*as for Certificate*)

.....

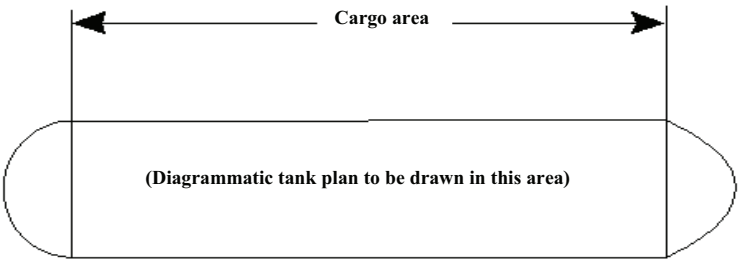
(*Signature of official issuing the Certificate and/or seal of issuing authority*)

**ATTACHMENT 2**
**TO THE**
**CERTIFICATE OF FITNESS FOR THE CARRIAGE OF DANGEROUS CHEMICALS IN BULK**

TANK PLAN (specimen)

Name of ship: .....

Distinctive number or letters: .....




Date .....

(*as for Certificate*)

.....

(*Signature of official issuing the Certificate and/or seal of issuing authority*)"

***

**ANNEX 12**

**RESOLUTION MSC.376(93)**
**(adopted on 22 May 2014)**

**AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (BCH CODE)**

THE MARITIME SAFETY COMMITTEE,

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

RECALLING ALSO resolution A.212(VII) by which the Assembly, at its seventh session, adopted the *Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk* (BCH Code), which provides safety requirements for chemical tankers supplementary to the provisions of the International Convention for the Safety of Life at Sea, 1974, as amended,

RECALLING FURTHER resolution MEPC.20(22) by which the Marine Environment Protection Committee adopted the BCH Code to make it mandatory under MARPOL,

NOTING resolution MSC.29(61) by which, at its sixty-first session, it adopted the revised BCH Code,

NOTING ALSO resolutions MSC.369(93) and MEPC.250(66), respectively, by which it, and the Marine Environment Protection Committee, adopted corresponding amendments to the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code),

NOTING FURTHER resolution MEPC.249(66) by which the MEPC, at its sixty-sixth session, adopted amendments to the BCH Code,

CONSIDERING that it is highly desirable for the provisions of the BCH Code which are mandatory under MARPOL and recommendatory from a safety standpoint, to remain identical when adopted by the Marine Environment Protection Committee and the Maritime Safety Committee,

HAVING CONSIDERED, at its ninety-third session, amendments to the BCH Code proposed by the Sub-Committee on Stability and Load Lines and Fishing Vessels Safety, at its fifty-fifth session, which were approved by the Committee at its ninety-second session,

RECOGNIZING the need to bring the approved amendments to the BCH Code into force on the date on which corresponding amendments to the IBC Code enter into force,

1 ADOPTS amendments to the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH Code), as amended, the text of which is set out in the annex to the present resolution;

2 DETERMINES that the said amendments shall become effective on 1 January 2016 upon acceptance and entry into force of the corresponding amendments to the IBC Code adopted by resolution MSC.369(93).

ANNEX

**AMENDMENTS TO THE CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (BCH CODE)**

**Chapter II – Cargo containment**

**Part A – Physical protection (Siting of cargo tanks; ship stability)**

1 Existing subparagraph 2.2.1 is replaced by the following:

"2.2.1 General: Ships subject to this Code may be assigned the minimum freeboard permitted by the International Convention on Load Lines, 1966. The additional requirements in paragraph 2.2.4, taking into account any empty or partially filled tank as well as the specific gravities of cargoes to be carried, however, should govern the allowed operating draught for any actual condition of loading.

2.2.1.1 All ships engaged in the transport of chemicals in bulk should be supplied with loading and stability manuals for the information and guidance of the master. These manuals should contain details concerning the loaded conditions of full and empty or partially empty tanks, the position of these tanks in the ship, the specific gravities of the various parcels of cargoes carried, and any ballast arrangements in critical conditions of loading. Provisions for evaluating other conditions of loading should be contained in the manuals.

2.2.1.2 All ships subject to the Code, shall be fitted with a stability instrument, capable of verifying compliance with intact and damage stability requirements approved by the Administration, at the first scheduled renewal survey of the ship on or after 1 January 2016, but not later than 1 January 2021, having regard to the performance standards recommended by the Organization*:

.1 notwithstanding the above, a stability instrument fitted on a ship before 1 January 2016 need not be replaced provided it is capable of verifying compliance with intact and damage stability, to the satisfaction of the Administration; and

.2 for the purposes of control under regulation 16 of MARPOL Annex II, the Administration shall issue a document of approval for the stability instrument.

* Refer to part B, chapter 4, of the International Code on Intact Stability, 2008 (2008 IS Code), as amended; the *Guidelines for the Approval of Stability Instruments* (MSC.1/Circ.1229), annex, section 4, as amended; and the technical standards defined in part 1 of the *Guidelines for verification of damage stability requirements for tankers* (MSC.1/Circ.1461).

2.2.1.3 The Administration may waive the requirements of paragraph 2.2.1.2 for the following ships provided the procedures employed for intact and damage stability verification maintain the same degree of safety as being loaded in accordance with the approved conditions**. Any such waiver shall be duly noted on the Certificate of Fitness referred to in paragraph 1.6.3:

.1 ships which are on a dedicated service, with a limited number of permutations of loading such that all anticipated conditions have

been approved in the stability information provided to the master in accordance with the requirements of paragraph 2.2.1.1;

.2 ships where stability verification is made remotely by a means approved by the Administration;

.3 ships which are loaded within an approved range of loading conditions; or

.4 ships provided with approved limiting KG/GM curves covering all applicable intact and damage stability requirements.

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** Refer to operational guidance provided in part 2 of the *Guidelines for verification of damage stability requirements for tankers* (MSC.1/Circ.1461).

**Certificate of Fitness**

2 Paragraph 6 is replaced with the following:

"6 That the ship must be loaded:

.1*** only in accordance with loading conditions verified compliant with intact and damage stability requirements using the approved stability instrument fitted in accordance with paragraph 2.2.1.2 of the Code;

.2*** where a waiver permitted by paragraph 2.2.1.3 of the Code is granted and the approved stability instrument required by paragraph 2.2.1.2 of the Code is not fitted, loading shall be made in accordance with one or more of the following approved methods:

(i) *** in accordance with the loading conditions provided in the approved loading manual, stamped and dated ..... and signed by a responsible officer of the Administration, or of an organization recognized by the Administration; or

(ii) *** in accordance with loading conditions verified remotely using an approved means ……..……; or

(iii) *** in accordance with a loading condition which lies within an approved range of conditions defined in the approved loading manual referred to in (i) above; or

(iv) *** in accordance with a loading condition verified using approved critical KG/GM data defined in the approved loading manual referred to in (i) above;

.3*** in accordance with the loading limitations appended to this Certificate.

Where it is required to load the ship other than in accordance with the above instruction, then the necessary calculations to justify the proposed loading conditions shall be communicated to the certifying Administration who may authorize in writing the adoption of the proposed loading condition.

---

*** Delete as appropriate."

***