

system complying with Clause 4.9 and Chapter 12. The extinguishing system shall protect all parts of each deck and vehicle platform.

NOTE: *Fixed fire-extinguishing systems* employing other types of extinguishing media that have been shown by full-scale test to be effective in controlling fires likely to occur in such a space could be considered as an equivalent solution, taking into account persons within the space may, in some circumstances, be passengers. Testing should occur in conditions simulating a flowing petrol fire in the space. See Clause 2.10.

6.5.8 Fire hose appliances

Within any *Ro-Ro space*, hydrants shall be arranged so that the water jets from two different hydrants can reach any location within the space, each jet being supplied by a single length of hose.

6.5.9 Other fire appliances

Each *Ro-Ro space* shall be provided with the following *fire appliances*:

- a) *Water fog applicators* to the extent specified in Table 34, complying with Chapter 12.
- b) *Foam making branch pipes* and foam concentrate to the extent specified in Table 34, complying with Chapter 12 and Annex J.
- c) Portable fire extinguishers suitable for Class B fires, complying with Clause 4.10 and Chapter 12. At least one portable extinguisher shall be located at each access to the space for fire control. The total number and location of portable fire extinguishers shall be such that no point in the space is more than approximately 15 m walking distance from an extinguisher.

Table 34 — Foam making branch pipes and water fog applicators in *Ro-Ro spaces*

| Category | Foam making branch pipes | Water fog applicators |
|-------------------------------|--------------------------|-----------------------|
| <i>Fire Risk Category I</i> | Not required | 1 |
| <i>Fire Risk Category II</i> | 1 | 2 |
| <i>Fire Risk Category III</i> | 1 | 3 |
| <i>Fire Risk Category IV</i> | 2 | 3 |

6.5.10 Scuppers and drainage

Where the *fixed fire-extinguishing system* fitted in a *Ro-Ro space* is a fixed pressure water-spraying system, the *Ro-Ro space* shall be provided with scuppers or drainage and pumping facilities to ensure that water discharged from the system is rapidly discharged overboard. If the scuppers are normally kept closed to maintain watertight or weathertight integrity, they shall be capable of being opened from a place outside the protected space.

NOTE: The accumulation of quantities of water on the deck or decks consequent to the operation of the fixed pressure water-spraying system could lead to a serious loss of stability and possible capsizing of the vessel.

6.6 CARGO SPACES CONTAINING DANGEROUS GOODS

6.6.1 Application

The requirements of Clause 6.6 shall apply to vessels and cargo spaces used for the carriage of *dangerous goods*. It excludes:

- a) spaces containing *limited quantities* of *dangerous goods*;
- b) store spaces containing *minor quantities* of *dangerous goods* of *flammable* or *combustible liquids* that comply with Clause 6.8; and
- c) spaces containing *flammable and combustible vessel's stores* that comply with Clause 6.8.

NOTE: Clause 6.6 is intended to be complementary to any specific laws within a jurisdiction pertaining to the carriage of *dangerous goods*. Where there is any conflict, the laws pertaining to the carriage of *dangerous goods* have precedence.

EXAMPLE

Examples of *dangerous goods*:

Explosives,
kerosene,
petrol,
gas oil,
bottled LPG,
battery acid and wet batteries,
paint thinners, oil paints.

6.6.2 Classes of dangerous goods voyages

For the purposes of Clause 6.6, there are two classes of *dangerous goods* voyages:

DGV 1—

A voyage where *dangerous goods* are carried not meeting the voyage criteria specified for DGV 2.

DGV 2—

A voyage that is—

- a) made by a Class 2 or Class 3;
- b) within Class B geographical limits;
- c) carrying *dangerous goods* on the *weather deck*; and
- d) where the total quantity of *dangerous goods* carried does not exceed—
 - i) 5000 kg of packaged *dangerous goods*; or
 - ii) 2000 kg of *flammable liquids* or gases.

PREVENTION OF FIRE AND EXPLOSION

6.6.3 Packaging, containment and stowage

The requirements for *dangerous goods* in this Section are predicated on the assumption that the packaging, containment, stowage, segregation, marking of, and declarations for *dangerous goods* on vessels comply with the National Standard for the Storage and Handling of Workplace Dangerous Goods. The fire training manual and fire safety operational

booklet required in Chapter 5 shall include appropriate directions and information to promote and facilitate such compliance by those operating the vessel.

NOTE: Jurisdictions have specific legislation pertaining to the carriage and storage of *dangerous goods* that must be met.

FIRE FIGHTING

6.6.4 Additional requirements for fire hose appliances

6.6.4.1 DGV 1 vessels and DGV 2 vessels

Vessels carrying *dangerous goods* shall, except where specifically stated in SOLAS Chapter II-2 Regulation 19, or HSC Code Clause 7.17, be provided with fire hose appliances that comply with the following:

- a) Pumps and piping shall provide water of sufficient pressure and quantity to simultaneously supply the number of water jets specified in Table 35. The performance of each water jet shall comply with Clause 4.7.2.
- b) Hydrants shall be located to enable the required number of water jets to be simultaneously trained on any part of the *dangerous goods* cargo space when empty. Two water jets shall be supplied by a single length of fire hose and the remainder may be supplied by two lengths of fire hose.

6.6.4.2 DGV 1 vessels

On a DGV 1 vessel there shall be an immediate availability of water for the fire hose appliances.

NOTE: This can be achieved either by permanent pressurisation to effect automatic starting of the pump, or by suitably placed remote starting arrangements for the pump.

Table 35 — Number of simultaneous water jets to be trained on any part of a cargo space for *dangerous goods*

| Category | DGV 1 | DGV 2 |
|-------------------------------|-------|---------------|
| <i>Fire Risk Category I</i> | 3 | 2 |
| <i>Fire Risk Category II</i> | 3 | 2 |
| <i>Fire Risk Category III</i> | 3 | Not permitted |
| <i>Fire Risk Category IV</i> | 4 | Not permitted |

Table 36 — Additional *dangerous goods* fire safety requirements

| Requirement | DGV 1 | DGV 2 |
|---|--------------------------|--|
| Cooling or flooding of under deck cargo space | As per SOLAS or HSC Code | Not required |
| Sources of ignition (1) | As per SOLAS or HSC Code | Not required |
| <i>Fixed fire detection and fire alarm system</i> | As per SOLAS or HSC Code | Visual monitoring or fire patrol |
| Ventilation | As per SOLAS or HSC Code | Not required |
| Bilge pumping | As per SOLAS or HSC Code | Not required |
| Personal protection | As per SOLAS or HSC Code | Protective clothing as per SOLAS or HSC Code but only one set required |
| Portable fire extinguishers | As per SOLAS or HSC Code | 1 x 12 kg dry powder extinguisher or equivalent |
| <i>Fixed fire-extinguishing system</i> | As per SOLAS or HSC Code | Not required |
| Separation of <i>Ro-Ro spaces</i> | As per SOLAS or HSC Code | Not required |
| Separation between <i>Ro-Ro space</i> and <i>weather deck</i> | As per SOLAS or HSC Code | As per SOLAS or HSC Code |

KEY:

(1) The electrical installation shall be designed, manufactured and installed to operate safely in hazardous conditions applicable to the particular class of *dangerous goods*, refer to NSCV Part C Section 5B.

6.6.4.3 **DGV 2 vessels**

On a DGV 2 vessel there shall be ready availability of water for the fire hose appliances.

NOTE: Additional pumping capacity may be needed on a vessel in order to comply with this requirement. This additional capacity may be provided by a powered fixed or portable pump complying with Clause 4.7.4 of capacity to provide the aggregate water supply required by Clause 6.6.4.1.

6.6.5 **Other fire safety requirements**

In addition to Clause 6.6.4, a vessel engaged in the carriage of *dangerous goods* shall be provided with fire safety measures specified in SOLAS Chapter II-2 Regulation 19, or HSC Code Clause 7.17 to the extent specified in Table 36, as applicable to the particular class of *dangerous goods*, mode of carriage and type of *dangerous goods* voyage.

6.6.6 **Document of compliance**

A special service notation (DG) on the Certificate of Survey shall record the compliance of a vessel with the requirements of Clause 6.6 for

construction and equipment. The allowable class or classes of *dangerous goods* shall be recorded as a condition on the Certificate of Survey.

NOTE: Refer to Part B Chapter 3 for further information on special service notation.

6.7 HELIDECKS

6.7.1 Application

The provisions of this Clause apply to vessels equipped with *helidecks*.

NOTE: Where helicopters land or conduct winching operations on an occasional or emergency basis on vessels without *helidecks*, the fire-fighting equipment specified elsewhere in this Section would normally be utilised.

CONTAINMENT OF FIRE

6.7.2 Structure

6.7.2.1 Construction

Helidecks shall be of steel or other *non-combustible* material. If the *helideck* forms the deckhead of a deckhouse or superstructure, it shall be insulated in accordance with Table 7, Table 8 or Table 9.

NOTE: The heat of a fire may adversely affect the strength of platforms of aluminium or other low melting point metal. Upon exposure to fire, the structure of such platforms would normally be subject to structural analysis to determine its suitability for further use.

6.7.2.2 Protection of spaces beneath the helideck

Where the *helideck* platform is located above a deckhouse—

- a) the deckhouse top shall have no openings;
- b) the bulkheads forming exposed boundaries of the deckhouse under the platform shall have no openings; and
- c) windows under the platform shall be provided with shutters of *non-combustible material*.

Subclauses b) and c) need not apply where the *helideck* overhangs the deckhouse beneath not less than 1 m beyond the boundary of the deckhouse and the overhang is—

- a) of steel; or
- b) of *non-combustible material* protected to the level of a *fire-resisting division*.

6.7.3 Drainage

Drainage systems for *helidecks* shall—

- a) be constructed of steel;
- b) lead directly overboard independent of any other system; and
- c) be designed so that drainage does not fall onto any part of the vessel.

MEANS OF ESCAPE

6.7.4 Means of escape

A *helideck* shall be provided with at least two points of access, each capable of serving as both a means of escape and access for fire-fighting and rescue personnel. The access points shall be located as far apart from each other as practicable, preferably on opposite sides of the *helideck*.

6.7.5 Emergency equipment

The following equipment shall be stored in a location that both provides protection from the elements and facilitates the immediate use of the equipment:

- a) Adjustable wrench, 300 mm.
- b) Blanket, woollen or similar fire-resistant type.
- c) Cutters, bolt 600 mm.
- d) Hook, grab or salving.
- e) Hacksaw, heavy duty complete with 6 spare blades.
- f) Ladder, 3 m in length.
- g) Life line 5 mm diameter x 15 m in length.
- h) Pliers, side cutting.
- i) Set of assorted screwdrivers.
- j) Harness knife complete with sheath.

FIRE FIGHTING

6.7.6 Fire hose appliances

Each fire main pump and the fire main piping shall provide water of sufficient pressure and quantity to simultaneously supply at least two water jets from nozzles of dual-purpose type. The performance of each of the water jets shall comply with Clause 4.7.2. The hydrants shall be located to enable the two water jets to reach any part of the *helideck* using a single length of fire hose.

6.7.7 Foam application system

A foam application system shall be provided and stored near a means of access to the *helideck*. The foam application system shall consist of a fire monitor or *foam making branch pipe* capable of delivering foam to all parts of the *helideck* in all weather conditions in which helicopters can operate.

The foam application system shall—

- a) be capable of delivering the discharge rate specified in Table 37 for at least five minutes; and

- b) have a principal agent suitable for use with salt water⁵.

A foam making branch pipe, where provided, shall comply with Chapter 12 and Annex J apart from the increased discharge rate specified in Table 37 and the omission of the requirement to carry spare concentrate.

Table 37 — Helideck foam applicator system discharge rates

| Helicopter overall length | Discharge rate of foam solution (L/min) |
|---------------------------|---|
| < 15 m | 250 |
| ≥ 15 m and > 24 m | 500 |
| ≥ 24 m and > 35 m | 800 |

6.7.8 Fire extinguishers

The following fire extinguishers, complying with Chapter 12, shall be provided and stored near the means of access to the *helideck*:

- a) At least two wheeled dry powder extinguishers having a total capacity of not less than 45 kg.
- b) Portable carbon dioxide extinguishers of a total capacity of not less than 18 kg.

6.7.9 Fire-fighters' outfits

In addition to those that might be specified in Clause 4.11, two sets of fire-fighters' outfits shall be stored in close proximity to the *helideck*.

6.7.10 Helicopter refuelling and hangar facilities

Where provided on a vessel, helicopter refuelling and hangar facilities shall comply with the requirements of SOLAS Chapter II-2 Regulation 18.7.

NOTE: Standards specified in SOLAS Chapter II-2 Regulation 18.7 include requirements for the location of fuel tanks, remote shut-down of fuel, spillage of fuel, operation of fuel pumping units, electrical installations, electrical bonding and ventilation.

6.8 STORE SPACES CONTAINING PACKAGED FLAMMABLE OR COMBUSTIBLE LIQUIDS

6.8.1 Application

Clause 6.8 shall apply to store spaces containing no more than 1000 L of *flammable* and *combustible liquids*, except—

- a) Store spaces that contain *flammable* and/or *combustible liquids* that are classified as *dangerous goods* (NOHSC 15) in a quantity that exceeds the applicable *minor quantity of dangerous goods*. Such spaces shall comply with Clause 6.6.

⁵ Refer to the International Civil Aviation Organization Airport Services Manual, part 1 - Rescue and Fire fighting, Chapter 8 - Extinguishing Agent Characteristics, Paragraph 8.1.5 - Foam Specifications, Table 8-1, Level 'B'.

- b) Spaces containing freestanding non-portable tanks for fuel that comply with Part C Subsection 5A Chapter 4.
- c) Spaces complying with relevant provisions of Clauses 6.9.4 or 6.9.5.

PREVENTION OF EXPLOSION AND IGNITION

6.8.2 Prevention of accumulated vapours and gases

Storage spaces containing *flammable liquids* or gases shall have direct access from open decks only. Pressure-adjusting devices and relief valves shall exhaust within the compartment.

The ventilation of store spaces shall be sufficient under normal conditions to prevent accumulation of flammable or explosive vapours or dangerous gases. The ventilation arrangements shall be kept separate from other spaces on the vessel.

6.8.3 Electrical equipment

Except as necessary for service within the space, electrical wiring and fittings shall not be permitted within compartments used for the storage of packaged *flammable* or *combustible liquids*.

Any electrical equipment and wiring that is fitted within such compartments shall be installed at least 450 mm above the deck. The electrical installation in such spaces, and in any ventilation ducting serving such spaces, shall be designed, manufactured and installed to operate safely in hazardous conditions that may arise from spilt *flammable* or *combustible liquids* or explosive mixtures of vapour or gas.

NOTE: Refer to NSCV Part C Section 7B for the requirements applicable to electrical installations in hazardous conditions. Guidance on the installation of electrical equipment in hazardous areas is available in Standards Australia Handbook HB13: *Electrical equipment for hazardous areas*.

6.8.4 Information to reduce the likelihood and consequences of fire

Where required in Chapter 5, the fire training manual and fire safety operational booklet shall include:

- a) appropriate directions and information on packaging, containment and stowage of *flammable* and/or *combustible liquids* to promote and facilitate compliance with the National Standard for the Storage and Handling of Workplace Dangerous Goods, see Clause 6.6.3; and
- b) instructions requiring *flammable* and/or *combustible liquids* to be stored only in spaces specified.

SPREAD OF FIRE

6.8.5 Separation from other spaces

Store spaces containing *flammable liquids* shall be separated from other spaces on the vessel by gas-tight bulkheads or enclosures to enable the space to be sealed in the event of a fire.

FIRE DETECTION

6.8.6 Fixed fire detection and fire alarm system

Spaces containing *flammable liquids* shall be provided with a *fixed fire detection and fire alarm system* complying with Clause 4.5.

FIRE FIGHTING

6.8.7 Fixed fire-extinguishing system

Spaces containing *flammable liquids* shall be protected by a *fixed fire-extinguishing system* complying with Clause 4.9. The *fixed fire-extinguishing system* shall be operable from outside the protected space.

6.9 FLAMMABLE AND COMBUSTIBLE VESSEL'S STORES

6.9.1 Quantity of stores

Arrangements for the storage of *flammable and combustible vessel's stores* shall be designed to provide for the minimum quantity of such stores needed for the operation or function of the vessel. The design quantity of *flammable and combustible vessel's stores* shall not exceed the quantity listed under Clause 6.8.1.

6.9.2 Information to reduce the likelihood and consequences of fire

Where required in Chapter 5, the fire training manual and fire safety operational booklet shall include:

- a) appropriate directions and information on packaging, containment and stowage of *flammable and combustible vessel's stores* to promote and facilitate compliance with the National Standard for the Storage and Handling of Workplace Dangerous Goods, see Clause 6.6.3; and
- b) instructions requiring *flammable and combustible vessel's stores* to be kept to the minimum necessary and stored only in spaces specified.

6.9.3 Location

In designing the arrangement of a vessel, *flammable and combustible vessel's stores* other than gas cylinders shall be stored—

- a) in store spaces complying with Clause 6.8;
- b) on the open deck complying with Clause 6.9.4; or
- c) in a stores locker complying with Clause 6.9.5.

The storage of gas cylinders shall comply with Clause 6.10.

6.9.4 Open deck storage

Flammable or combustible liquids stored on the open deck shall be stowed in the weather and located so that they may be readily jettisoned overboard in the event of a fire. Stowage locations shall not be in the vicinity of hatches and doors, *galley's*, locations where hot work is performed, ventilation intakes or exhausts, or in locations where helicopter engine exhaust could impinge

on such storage. Stowage shall be aft, if possible, and in the location that poses the least threat to the vessel in the event of fire or explosion of the *flammable or combustible liquids*.

6.9.5 Stores locker

6.9.5.1 Application

Clause 6.9.5 applies to stores lockers for *flammable and combustible vessel's stores* of volume not greater than 10 m³ that are remote from *Accommodation Spaces*.

6.9.5.2 General

The stores locker shall comply with the requirements of Clause 6.8, except that the requirement for a *fixed fire-extinguishing system* in Clause 6.8.7 shall be replaced by the requirements listed in Clause 6.9.5.3.

6.9.5.3 Fire extinguishing

The stores locker shall be provided with one of the following:

- a) A portable fire extinguisher and discharge opening complying with Clause 7.4.3. The required portable fire extinguisher shall be stowed adjacent to the discharge opening.
- b) A fire hydrant adjacent to the space and a port leading into the space arranged to facilitate the use of a fire hose appliance fitted with a fog spray nozzle without having to enter the protected space.
- c) A fixed branch connection and valve from the fire main to a fog spray nozzle located within the protected space.
- d) A dry powder *fixed fire-extinguishing system* complying with Chapter 12, designed to deliver a quantity of powder at least 0.5 kg/m² of deck area.

6.10 STORAGE OF GAS CYLINDERS FOR COMPRESSED, LIQUEFIED OR DISSOLVED GASES FOR THE VESSEL'S USE

6.10.1 Marking

Gas cylinders for the vessel's use shall be clearly marked by means of—

- a) prescribed identifying colours;
- b) a clearly legible identification of the name; and
- c) chemical formula of their contents .

6.10.2 Gas cylinder storage location

Cylinders containing gases and expended cylinders of the same shall be stored on open decks or in lockers located above the weather deck.

Storage for gas cylinders on open decks shall comply with Clause 6.9.4. Lockers for cylinders of flammable gases shall comply with Clause 6.9.5. Lockers for cylinders of gases that are not flammable shall comply with Clauses 6.8.2 and 6.8.5 above.

Separate storage shall be provided for each type of gas. Lockers used for the storage of gases shall not be used for storage of other combustible products nor for tools or objects not part of the gas distribution system.

6.10.3 Protection of cylinders and piping

Cylinders shall be secured against movement and shall be protected against excessive variations in temperature and the direct rays of the sun. All valves, pressure regulators and pipes leading from gas cylinders shall be protected against damage.

CHAPTER 7 MODERATE FIRE RISK SPACES

7.1 SCOPE

This Chapter lists requirements from Chapter 3 and Chapter 4 that are applicable to *Moderate Fire Risk Spaces* and specifies particular requirements that are additional to or modify the general requirements in Chapter 3 and Chapter 4.

7.2 APPLICATION

This Chapter applies to spaces defined by Clause 1.8 as *Moderate Fire Risk Spaces*. Specific clauses within this Chapter that apply are listed in Table 38.

Table 38 — Application of Chapter 7

| Clause | Subject |
|------------|--|
| Clause 7.3 | General requirements applicable to Moderate Fire Risk Spaces |
| Clause 7.4 | Machinery space of moderate fire risk |
| Clause 7.5 | Galley spaces |

7.3 GENERAL REQUIREMENTS APPLICABLE TO MODERATE FIRE RISK SPACES

7.3.1 General

Moderate Fire Risk Spaces shall comply with the clauses in Chapter 3 and Chapter 4 specified in Table 39.

Table 39 — General deemed-to-satisfy provisions applicable to *Moderate Fire Risk Spaces*

| Clause | Subject |
|--------------|---|
| Clause 3.3 | Engine exhausts, boiler and galley uptakes |
| Clause 3.4 | Certain highly flammable materials prohibited |
| Clause 3.5 | Insulation |
| Clause 3.6 | Paints, varnishes & other finishes on passenger vessels |
| Clause 3.7 | Structural fire protection |
| Clause 3.7.4 | Combustible veneers |
| Clause 3.9 | Maintenance of structural integrity |
| Clause 3.10 | Materials for overboard fittings |

(continued...)

Table 39 cont.

| Clause | Subject |
|--------------|---|
| Clause 4.2 | Remote stops for ventilation and exhaust fans |
| Clause 4.3 | Ventilation closing appliances |
| Clause 4.4 | Centralised fire control functions on passenger vessels |
| Clause 4.5 | Fire detection and fire alarm system |
| Clause 4.7.5 | Fire main and hydrants for fire hose appliances |
| Clause 4.7.6 | Fire hoses and nozzles |
| Clause 4.9 | Fixed |
| Clause 4.10 | Portable and wheeled fire extinguishers |

FIRE GROWTH POTENTIAL

7.3.2 Primary deck materials and coverings

Primary deck materials, floor plates, floor plate supporting structure and coverings within *Moderate Fire Risk Spaces* shall—

- a) be of material that is *non-combustible* unless, in the case of deck materials and floor plate supporting structure, they form part of the primary hull structure of a vessel constructed of *combustible materials*; and
- b) not absorb oil or other combustible or flammable liquids.

FIRE FIGHTING

7.3.3 Portable fire extinguishers

Except as specified otherwise in this Chapter, one portable fire extinguisher complying with Clause 4.10 shall be provided in, or adjacent to, each *Moderate Fire Risk Space*.

7.4 MACHINERY SPACE OF MODERATE FIRE RISK

PREVENTION OF FIRE AND EXPLOSION

7.4.1 Fuel tanks

The following fuel tanks shall not be situated within machinery spaces of *Moderate Fire Risk*:

- a) Fuel tanks not complying with Clause 6.4.1.2.
- b) Fuel tanks containing fuel of flashpoint less than 60°C.

Fuel and lubricating oil tanks shall be located to ensure that any spillage or leakage cannot constitute a fire or explosion hazard by falling on heated surfaces.

DETECTION AND ALARM

7.4.2 Fixed fire detection and fire alarm system

7.4.2.1 Application

A fixed fire detection and fire alarm system complying with Clause 4.5 shall be installed in machinery spaces of *Moderate Fire Risk* on vessels other than those of *Fire Risk Category I*.

7.4.2.2 Design

The fixed fire detection and fire alarm system required in Clause 7.4.2.1 shall be designed, and the detectors positioned so as to detect rapidly the onset of fire in any part of the machinery spaces. Fire detection shall operate correctly over the normal ranges of machinery operation, variations of ventilation and anticipated ambient temperature.

7.4.2.3 Limitations on the use of thermal detectors

Detection systems using only thermal detectors shall not be used in spaces higher than 5 m.

NOTE: Dual spectrum flame detectors are more effective than thermal detectors in spaces of restricted height of less than 5 m.

FIRE FIGHTING

7.4.3 Small machinery spaces

7.4.3.1 Portable fire extinguisher

The portable fire extinguisher referred to in Clause 7.3.3 that is provided for a *small machinery space* shall comply with the following:

- a) The extinguishing agent shall be discharged into the *small machinery space* from outside the space without having to open the primary access. The *small machinery space* shall be provided with a discharge opening complying with Clause 7.4.3.2.
- b) The portable extinguisher shall be stowed outside the *small machinery space*.
- c) The extinguishing agent of the portable fire extinguisher shall be able to flood the entire space and extinguish a fire within the *small machinery space*.
- d) The extinguishing capacity of the portable extinguisher shall be sufficient for the volume of the *small machinery space*.

NOTES:

1. A 5 kg carbon dioxide fire extinguisher is needed to flood a space having a volume of 4.7 m³.
2. A 4.5 kg dry powder extinguisher is needed to flood a space having a volume of 5 m³.
3. A 9 kg dry powder extinguisher is needed to flood a space having a volume of 10 m³.

7.4.3.2 Discharge opening

The discharge opening shall be—

- a) readily identifiable;
- b) sized to accept the discharge nozzle;
- c) open or able to be opened to provide ready access for discharge of the agent into the engine space; and
- d) located so the required size of extinguisher can be operated in a position that will allow discharge of the extinguishing agent.

7.5 GALLEY SPACES

PREVENTION OF FIRE

7.5.1 Restraint of cooking utensils

Means shall be provided on the top surfaces of cooking ranges to prevent both deep and shallow cooking utensils from sliding across or off the range, at pitch or roll angles up to 30° from the horizontal in any direction.

NOTES:

1. Fiddle bars on the top of marine cooking ranges are usually provided to restrain cooking utensils, see Figure 6.
2. Proposals to omit fiddle bars on larger vessels operating in smooth waters would be assessed as an equivalent solution taking into account the likely motions and operating accelerations.

FIRE GROWTH POTENTIAL

7.5.2 Fire protection in way of cooking appliances

7.5.2.1 *General*

Cooking appliances shall be installed to reduce the risks of fire caused by—

- a) heat radiated from the cooking element or flame; and
- b) ignition of cooking fats and oils.

7.5.2.2 *Adjacent fittings*

Materials, shelves, range hoods and exhaust fans adjacent to a cooking appliance shall comply with Table 40 modified for marine applications as specified in Clause 7.5.2.4

Table 40 — Applicable standards for adjacent fittings

| <i>Energy source</i> | <i>Large galleys</i> | <i>Small galleys</i> |
|----------------------|----------------------|--|
| Gas | Clause 7.5.2.3 (1) | Modified AS 5601 for domestic cooking appliances or ISO 9094 (1) |
| Electricity | Clause 7.5.2.3 | Modified AS 5601 for domestic cooking appliances or ISO 9094 |
| Liquid fuel | Clause 7.5.2.3 | ISO 9094 |

KEY:

- (1) Where ISO 9094 is applied, the gas energy legislation of a jurisdiction may require that materials adjacent to gas installations also comply with AS 5601.

7.5.2.3 Large galleys

Materials adjacent to a cooking appliance in a *large galley* within 250 mm of the perimeter shall be protected by *non-combustible* surfaces. This protection shall extend from 100 mm below the cooking surface of the appliance to a distance E above the cooking surface determined from Table 41. See Figure 6(a).

Table 41 — Dimension E in large galleys

| Appliance | Dimension E mm |
|--|-------------------|
| Solid grill plate, deep fryer (top of pan) | 600 |
| Open flame appliance (i.e. hotplate burner) | 1050 |
| Chinese cooking table, griddle, barbecue, char grill or open top flare grill | 1350 |

7.5.2.4 Modifications to AS 5601 applicable to small galleys

Materials adjacent to a domestic cooking appliance in a *small galley* shall comply with the following:

- a) In addition to the protection of combustible surfaces near a domestic cooking appliance required under AS5601 Clause 5.12.1, bulkheads, linings and cabinets not so protected but within 200 mm of the periphery of a burner of a cooking appliance shall be constructed of materials complying with Table 42. These materials shall extend from 10 mm below the lowest point of the *hob* to 450 mm above the highest point of the *hob* of the appliance. See Figure 6(b).
- b) Where a gimballed cooking range is fitted, the enclosure shall comply with Table 42 and dimensions A, B, C, D defining the extent of protection of combustible surfaces in Clause 5.12.1 of AS 5601 shall take into account the extreme limits of movement of the cooking surface. See Figure 6(c).

Table 42 — Fire properties of adjacent bulkheads, linings and cabinets in small galleys

| Category | Properties of adjacent bulkheads, linings and cabinets |
|-------------------------------|--|
| <i>Fire Risk Category I</i> | <i>Non-combustible or low flame spread</i> |
| <i>Fire Risk Category II</i> | <i>Non-combustible or low flame spread</i> |
| <i>Fire Risk Category III</i> | <i>Non-combustible or low flame spread</i> |
| <i>Fire Risk Category IV</i> | <i>Non-combustible</i> |

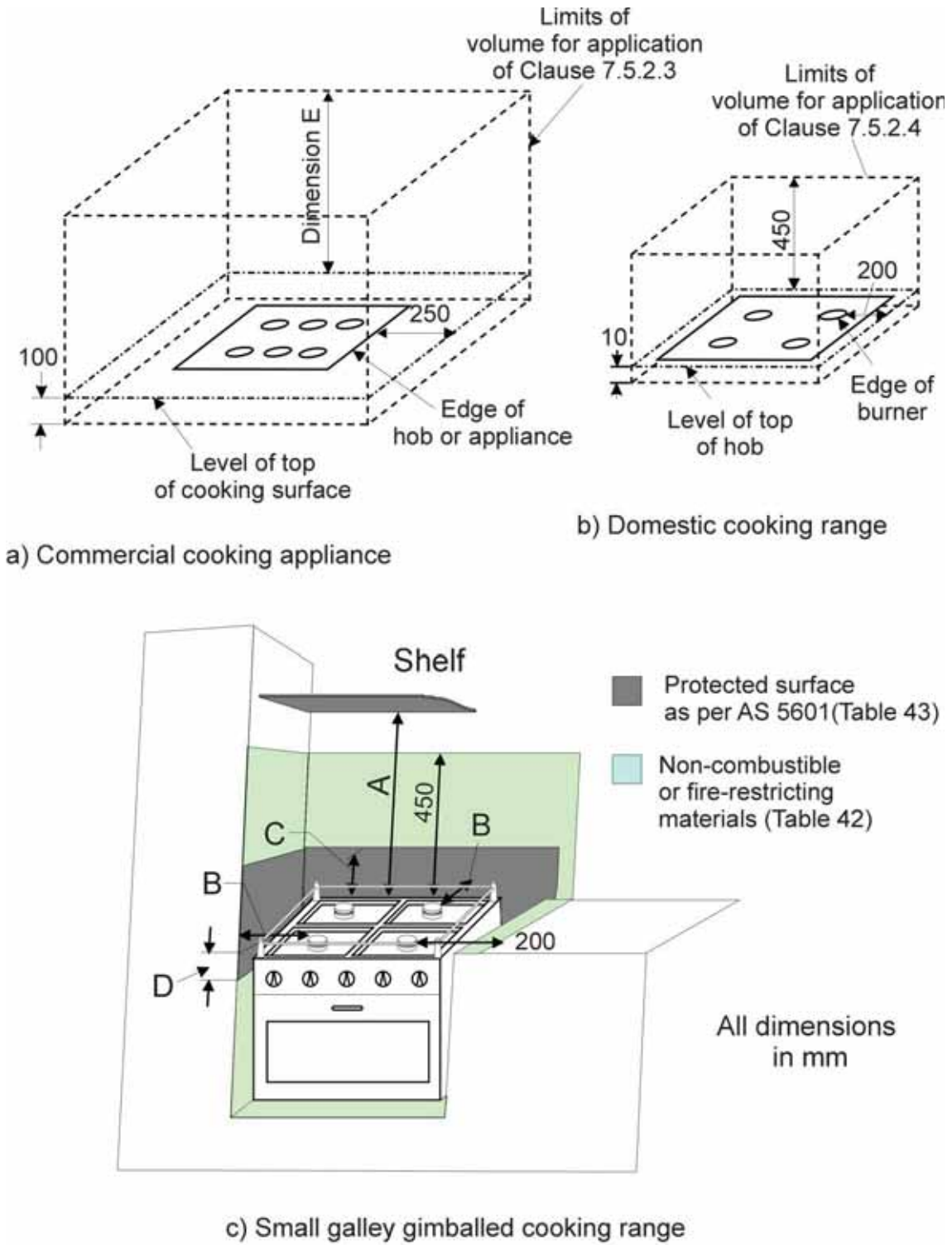


Figure 6 — Protection in vicinity of a cooking range

Table 43 — Key to Figure 6(c)

| Measurement | Key in Figure 6 | Description of surfaces to be protected by non-combustible materials |
|--------------------------|-----------------|--|
| Overhead clearance | A | Downward facing combustible surfaces between the highest part of the <i>hob</i> and a line not less than 600 mm above the highest part of the <i>hob</i> ; see Clause 7.5.2.5. NOTE: Downward facing surfaces shall not be fitted less than 450 mm above the highest part of the <i>hob</i> . |
| Upper vertical clearance | B & C | Vertical combustible surfaces between the periphery of the nearest burner to a point 200 mm horizontally from the periphery of the burner, and between the highest part of the <i>hob</i> and a line 150 mm above the highest part of the <i>hob</i> ; see Clause 7.5.2.5. |
| Lower vertical clearance | B & D | Vertical combustible surfaces between the periphery of the nearest burner to a point 200 mm horizontally from the periphery of the burner, and between the highest part of the <i>trivet</i> and a line 10 mm below the highest part of the <i>hob</i> ; see Clause 7.5.2.5. |

7.5.2.5 Protection of a combustible substrate near a cooking appliance

If, when complying with the requirements for a protected surface under AS 5601 Clause 12.1, a *non-combustible* surface is applied over a *combustible* substrate, additional protection shall be provided for the *combustible material* to ensure that its temperature does not exceed 65° C above ambient after a period of prolonged normal operation. Protection of the *combustible* substrate may be by—

- a) covering the substrate with sheet metal having a minimum thickness of 0.4 mm; thermally insulated from the supporting substrate to prevent combustion of the substrate;

NOTE: The thermal insulation may be achieved by an air gap or the use of a suitable material. Refer to AS 5601 Appendix C.

- b) an integral splash-back on the appliance; or
- c) the fixing of 5 mm thick ceramic tiles to the surface of the *combustible* substrate.

7.5.2.6 Curtains and fabrics

Free hanging curtains or other fabrics shall not be fitted in *large galleys*. In *small galleys*, free hanging curtains or other fabrics shall not be fitted within 300 mm of the perimeter of a cooking range. These curtains and fabrics shall not come closer than 700 mm above the highest point of the *hob* of the cooking range.

7.5.3 Exhaust hoods and ducts

7.5.3.1 Application

A *large galley* shall be provided with an exhaust hood and duct serving each *galley* range, deep fat cooker, or similar appliance.

7.5.3.2 General requirements for exhaust hoods and ducts

The exhaust hood and duct shall be—

- a) constructed of steel or similar metal;
- b) insulated in accordance with the requirements of Clause 3.3;
- c) fitted with a grease trap that is readily removable for cleaning;
- d) fitted with suitably located hatches for inspection and cleaning;
- e) fitted with a *fire flap* located in the lower end of the duct; and
- f) provided with remote-control arrangements near the entrance to the *galley* for —
 - i) operating the *fire flap* in the lower end of the duct; and
 - ii) shutting off the exhaust fans.

NOTE: The regular cleaning of grease traps is an activity that should be addressed as part of operational preparedness required in Part E of this standard.

CONTROL OF SMOKE SPREAD

7.5.4 Separation of galley spaces

Unless otherwise specified in Table 44, a *galley* space shall be separated from other spaces by *smoke-tight* divisions.

Table 44 — Separation of galleys from other spaces

| Category | Large galleys | Small galleys |
|-------------------------------|---------------|-----------------------------|
| <i>Fire Risk Category I</i> | Required | Not required |
| <i>Fire Risk Category II</i> | Required | Required if > 36 passengers |
| <i>Fire Risk Category III</i> | Required | Required |
| <i>Fire Risk Category IV</i> | Required | Required |

7.5.5 Fire flaps in ventilation ducts

Where a galley is required to be separated under Clause 7.5.4, an automatically operated *fire flap* shall be fitted in the *galley* ventilation duct near its opening into the *galley*.

7.5.6 Separation of ventilation ducts

Ventilation ducts to and from *galley* spaces on vessels of *Fire Risk Category III* or *IV* shall be separated from each other and from the ventilation systems serving other spaces. On other vessels having *galleys* that are required to be separated under Clause 7.5.4, the ventilation systems need not be completely separated, but shall have separate ducts if served from a ventilation unit that serves other spaces.

FIRE FIGHTING

7.5.7 Portable fire extinguishers and fire blankets

Portable fire extinguishers and fire blankets shall be provided for *galley* spaces in accordance with Table 45. Fire blankets shall comply with Chapter 12 and shall be of minimum size 1.8 m x 1.2 m.

NOTE: One fire extinguisher for a *galley* may be located immediately outside the *galley* entrance.

Table 45 — Portable fire extinguishers and fire blankets for *galleys*

| <i>Galley description</i> | Extinguishers for Class F fires | | Fire blankets | |
|---------------------------|------------------------------------|--------------------------------------|------------------------------------|--------------------------------------|
| | <i>Fire Risk Category I and II</i> | <i>Fire Risk Category III and IV</i> | <i>Fire Risk Category I and II</i> | <i>Fire Risk Category III and IV</i> |
| <i>Small galley</i> | 0 (A) | 1 | 1 | 1 |
| <i>Large galley</i> | 1 | 2 | 1 | 2 |

KEY:

(A) At least one *Accommodation Space* extinguisher rated for Class B fires shall be located in a place readily accessible from the *galley*.

7.5.8 Galley automatic local fire-extinguishing system

A galley automatic local fire-extinguishing system shall be fitted to protect each deep fat cooker on any vessel and each cooking range or similar appliance in *large galleys* on vessels of *Fire Risk Category III* or *IV* carrying more than 36 passengers.

The automatic local fire-extinguishing system shall comply with Chapter 12 and shall protect the appliance, hood plenum and exhaust duct.

The local fire-extinguishing system shall be provided with the following:

- a) An alarm located within the *galley* indicating operation of the local fire-extinguishing system.
- b) Clearly labelled remote controls located near the entrance to the *galley* for manually operating the local fire-extinguishing system.

In addition to the requirements of Clause 7.5.2.5, the exhaust duct shall be provided with a remotely operated *fire flap* in the upper end of the duct, and remote-control controls near the entrance to the *galley* for operating this *fire flap*.

Cooking appliances shall be provided with arrangements for automatically shutting off the electrical power or gas supply when the local fire-extinguishing system is activated.

NOTE: Local fire-extinguishing systems for cooking appliances are normally of the wet chemical type.

7.5.9 Additional requirement for deep fat cookers

Deep fat cookers shall be provided a primary and backup thermostat with an alarm to alert the operator in the event of failure of either thermostat.

CHAPTER 8 ACCOMMODATION SPACES

8.1 SCOPE

This Chapter lists requirements from Chapter 3 and Chapter 4 that are applicable to passenger and crew *Accommodation Spaces* (Clause 1.8) and specifies particular requirements that are additional to or modify the general requirements in Chapter 3 and Chapter 4.

8.2 GENERAL REQUIREMENTS APPLICABLE TO ACCOMMODATION SPACES

Accommodation Spaces shall comply with the clauses in Chapter 3 and Chapter 4 specified in Table 46.

Table 46 — General deemed-to-satisfy provisions applicable to *Accommodation Spaces*

| Clause | Subject |
|--------------|---|
| Clause 3.3 | Engine exhausts, boiler and galley uptakes |
| Clause 3.4 | Certain highly flammable materials prohibited |
| Clause 3.5 | Insulation |
| Clause 3.6 | Paints, varnishes & other finishes on passenger vessels |
| Clause 3.7 | Structural fire protection |
| Clause 3.7.4 | Combustible veneers |
| Clause 4.2 | Remote stops for ventilation and exhaust fans |
| Clause 4.3 | Ventilation closing appliances |
| Clause 4.4 | Centralised fire control functions on passenger vessels |
| Clause 4.5 | Fire detection and fire alarm system |
| Clause 4.6 | Emergency escape breathing devices |
| Clause 4.7.5 | Fire main and hydrants for fire hose appliances |
| Clause 4.7.6 | Fire hoses and nozzles |
| Clause 4.9 | Fixed |
| Clause 4.10 | Portable and wheeled fire extinguishers |

PREVENTION OF FIRE

8.3 SMOKING

For the purposes of this standard, smoking shall be prohibited in *Accommodation Spaces* for berthed persons. Adequate non-smoking notices shall be displayed in compartments where smoking is not allowed.

Suitable *non-combustible* ash containers shall be provided in compartments where smoking is allowed.

8.4 HEATING APPLIANCES

Electric radiators or other heating appliances, if used, shall be fixed in position and so constructed as to reduce fire risks to a minimum. No heater shall be fitted with an exposed element or flame.

8.5 WASTE RECEPTACLES

Waste receptacles shall be constructed of *non-combustible* materials with no openings in the sides or bottom.

Table 47 — Fire-restricting materials

| Space without aqueous fixed fire-extinguishing system | Fire Risk Category I | Fire Risk Category II | Fire Risk Category III | Fire Risk Category IV |
|---|--------------------------------|----------------------------|------------------------|---|
| Space with aqueous fixed fire-extinguishing system | Fire Risk Category I or II (1) | Fire Risk Category III (1) | Fire Risk Category IV | |
| Linings and ceilings | Clause 3.4 | Group 1, 2 or 3 | Group 1 or 2 | Group 1 or <i>non-combustible</i> or FTP Code (2) |
| Furniture | Clause 3.4 | Clause 3.4 | Clause 3.4 | Required |
| Draperies & curtains | Clause 3.4 | Clause 3.4 | Clause 3.4 | Required |
| Upholstery | Clause 3.4 | Clause 3.4 | Clause 3.4 | Required |
| Bedding | Clause 3.4 | Clause 3.4 | Clause 3.4 | Required |
| Deck finish materials | Clause 3.4 | Level 1, 2 or 3 | Level 1 or 2 | Level 1 or <i>non-combustible</i> or FTP Code (2) |

KEY:

Group 1, Group 2 and Group 3 refer to materials that comply with specified standards for ceilings and linings contained in the Building Code of Australia; see Chapter 12.

Level 1, Level 2 and Level 3 refer to materials that comply with specified standards for floor coverings specified in the Building Code of Australia; see Chapter 12.

FTP Code: Refers to materials that comply with the Fire Test Procedures Code, see Chapter 12.

Applies refers to furniture, upholstery and bedding that comply with Chapter 12.

Clause 3.4: No specific requirement other than compliance with Clause 3.4.

(2) The fitting of an aqueous *fixed fire-extinguishing system* is not required under Clause 8.20 on vessels of *Fire Risk Category* I, II or III. However, optional fitting of such systems allows a reduction in *fire-restricting materials* on vessels of *Fire Risk Category* II and III.

(3) See also Clause 3.6.

FIRE GROWTH POTENTIAL

8.6 ADDITIONAL RESTRICTIONS ON THE USE OF COMBUSTIBLE MATERIALS

8.6.1 Fire-restricting materials

Ceilings and linings, furniture, draperies and curtains, upholstery, bedding and deck finish materials within *Accommodation Spaces* shall be of *fire-restricting materials* complying with Table 47. On vessels of *Fire Risk Category II* or *III* where an aqueous *fixed fire-extinguishing system* has been fitted as an option to protect the accommodation space, the requirements on the use of fire restricting materials may be reduced (Table 47).

8.6.2 Exposed surfaces in Accommodation Spaces

8.6.2.1 Combustible bulkheads, deckheads or decks

Where *fire-restricting materials* are specified in Table 47, exposed portions of combustible bulkheads, deckheads or decks in *Accommodation Spaces* that are not constructed of *fire-restricting materials*, including any partial bulkheads or decks, shall be enclosed with linings, ceiling or floor coverings as applicable complying with the applicable standards in Clause 8.6.1 and Chapter 12.

8.6.2.2 Doors not passing through fire-resisting divisions

8.6.2.2.1 Construction

Doors in *Accommodation Spaces* not passing through *fire-resisting divisions* shall be constructed from material of equivalent fire characteristics to the linings of the bulkhead specified in Table 47 through which they pass.

8.6.2.2.2 Ventilation openings

Ventilation openings may be included in the lower portion of doors not passing through *fire-resisting divisions*. The total net area of any such opening or openings shall not exceed 0.05 m² and shall be fitted with a grille of *non-combustible* material.

8.6.3 Facings, mouldings, decorations and veneers

8.6.3.1 Combustible veneers permitted

On vessels other than *Fire Risk Category I*, *Accommodation Spaces* with bulkheads and ceilings that are required by Table 8, Table 9 or Clause 8.12 to be *fire-resisting divisions* or of *non-combustible* materials may be faced with *combustible materials*, facings, mouldings, decorations and veneers.

These facings, mouldings, decorations and veneers shall—

- a) have a calorific value⁶ not exceeding 45 MJ/m² of the area for the thickness used; and

⁶ * Refer to the recommendations published by the International Organization for Standardization, in particular, Publication ISO 1716:1973 on *Determination of calorific potential*.

- b) not have a total volume exceeding the volume equivalent to a 2.5 mm veneer on the combined area of the walls and ceiling. This provision does not apply if the space is fitted with a *fixed fire-extinguishing system* complying with Clause 8.20.

NOTE: The requirements of this paragraph do not apply to furniture fixed to linings or bulkheads.

8.7 OIL PIPING IN ACCOMMODATION SPACES

Pipes conveying oil or other *combustible liquids* through *Accommodation Spaces* shall be of a material, or otherwise arranged, to ensure that their integrity is unaffected by fire within the accommodation space.

8.8 GROUPING OF MEANS FOR CONTROLLING POWER VENTILATION

In vessels of *Fire Risk Category* III and IV, power ventilation for *Accommodation Spaces* shall be fitted with controls grouped so that all fans within a space may be stopped from either of two separate positions. These positions shall be situated as far apart as practicable.

CONTROL OF SMOKE SPREAD

8.9 SMOKE ZONES

Where specified in Table 48, *Accommodation Spaces* on Class 1 passenger vessels shall be divided by *smoke-tight* divisions into at least two smoke zones.

Table 48 — Smoke zones and alternative safe areas on Class 1 passenger vessels

| Day passengers | ≤ 200 | > 200 and ≤ 450 | > 450 and ≤ 800 | > 800 |
|-------------------------------|--------------|----------------------|-----------------------|-----------------------|
| Berthed passengers | | > 12 and ≤ 36 | > 36 | |
| <i>Fire Risk Category</i> I | Not required | No application | No application | No application |
| <i>Fire Risk Category</i> II | Not required | Smoke or ASA or FFE | No application | No application |
| <i>Fire Risk Category</i> III | Not required | Smoke or ASA or FFE | Smoke or ASA or FFE | Smoke and ASA, or FFE |
| <i>Fire Risk Category</i> IV | Not required | Smoke or ASA (1) (2) | Smoke and ASA (1) (2) | Smoke and ASA (1) |

KEY:

No application: means that the number of passengers falls outside the definition of the particular *Fire Risk Category*.

Smoke: means the vessel shall have smoke zones complying with Clause 8.9.

ASA: means the vessel shall have an alternative safe area complying with Clause 8.13.

FFE: means the *Accommodation Spaces* may, as an alternative to smoke zones and/or alternative safe areas, be protected by an aqueous *fixed fire-extinguishing system* complying with Clause 8.20.

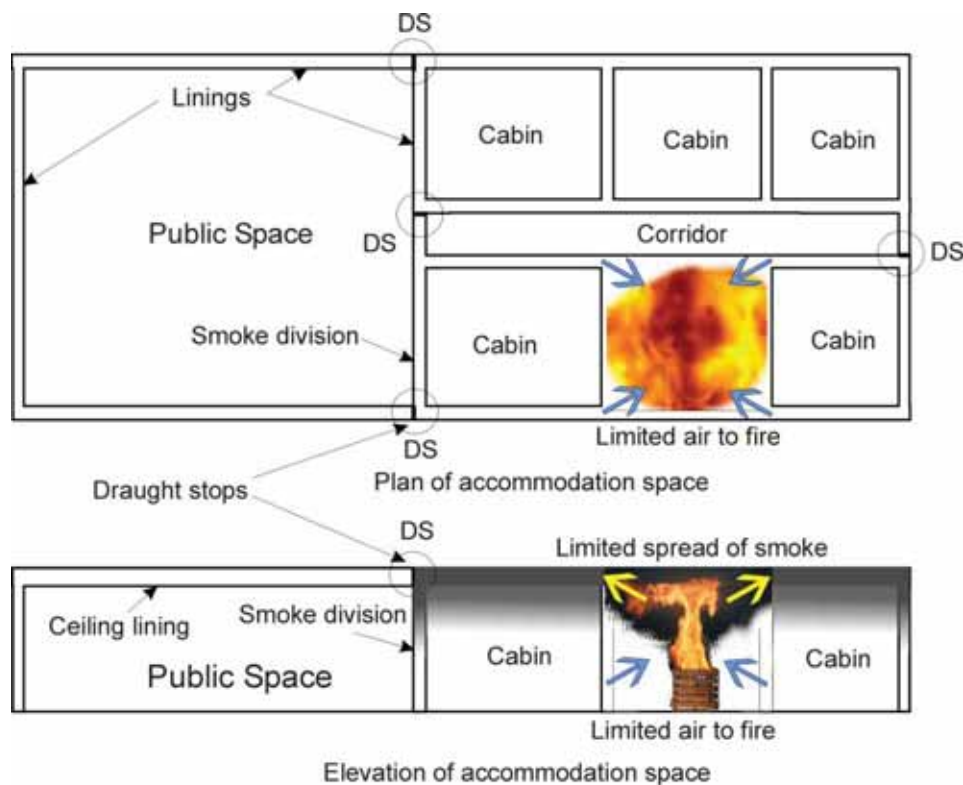
(1) FFE is required if more than 200 day passengers or more than 36 berthed passengers, see Clause 8.20.

(2) FFE is also an option to smoke zones or alternative safe areas if 200 day passengers or less and 36 berthed passengers or less.

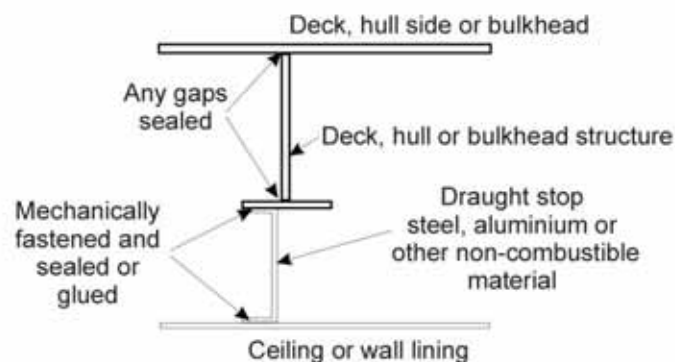
Smoke zones shall comply with the following:

- a) The mean length of each zone shall not exceed 40 m.
- b) Divisions separating smoke zones shall—
 - i) be *smoke-tight*;
 - ii) be constructed of *non-combustible* or *fire-restricting materials* complying with Clause 8.6; and
 - iii) extend from deck to deck.

NOTE: Smoke zones may also be required to serve as alternative safe areas, see Clause 8.12 below.



a) Illustration showing function of draught stops



b) Typical detail of draught stop

Figure 7 — Draught stops

8.10 DRAUGHT STOPS

Where required in Table 49, air spaces enclosed behind ceilings, panelling or linings shall be divided by close-fitting draught stops spaced not more than 14 m apart. Vertically, such enclosed air spaces, including those behind linings of stairways and trunks shall be closed at each deck. See Figure 7.

Table 49 — Draught stops in Accommodation Spaces

| Category | Application |
|------------------------|--|
| Fire Risk Category I | Not required |
| Fire Risk Category II | Required if smoke zones in Clause 8.9 fitted |
| Fire Risk Category III | Required if smoke zones in Clause 8.9 fitted |
| Fire Risk Category IV | Required |

8.11 SMOKE EXTRACTION SYSTEMS IN ATRIUMS OF PASSENGER VESSELS

Atriums shall be equipped with a smoke extraction system. The smoke extraction system shall be activated by the required smoke detection system and be capable of manual control. The fans shall be sized such that the entire volume within the space can be exhausted in 10 minutes or less.

MEANS OF ESCAPE

8.12 BLIND CORRIDORS

Where the total length of any blind corridor, including any stairway, exceeds 5 m the corridor bulkheads, doors opening on to the corridor and stairway bulkheads shall be of *non-combustible* material.

NOTE: Refer to Part C Section 1—*Arrangement, accommodation and personal safety* for details of the location and size of exits from spaces.

8.13 ALTERNATIVE SAFE AREAS

Where specified in Table 48, Class 1 vessels shall have a minimum of two safe areas to provide for the alternative assembly of passengers and crew should smoke enter or be generated within any part of the *Accommodation Space*. Safe areas shall comply with the following:

- a) A safe area shall be—
 - i) one of two or more smoke zones complying with Clause 8.9;
 - ii) a passenger space separated from other safe areas by *smoke-tight* or *fire-resisting divisions*; or
 - iii) an open space on deck that does not expose persons to other hazards.

NOTE: The exposed bow area of a seagoing vessel may not provide a suitable alternative safe area.

- b) The capacity of a safe area shall be determined by allowing for one person for each seat within the space and 0.35 m² per person of the net remaining deck area.

- c) The total capacity of safe areas on the vessel shall be sufficient to accommodate the maximum number of persons carried on the vessel assuming any one area of the *Accommodation Space* is rendered unusable in an emergency.
- d) A safe area shall be, as far as practicable, located adjacent to the smoke zone or *Accommodation Space* it is intended to serve. There shall be at least two exits from each smoke zone or *Accommodation Space*, located as far away from each other as possible, leading to the safe area.
- e) Each safe area shall incorporate evacuation routes to survival craft to enable all passengers and crew to be safely evacuated.

8.14 INTERNAL STAIRWAYS

8.14.1 Application

Table 50 specifies enclosures required on internal stairways between accommodation decks. These enclosures shall prevent the passage of smoke between decks and facilitate the escape and evacuation of persons.

NOTE: Refer also to Chapter 11 for fire safety measures applicable to *Escape or Evacuation Routes*.

Table 50 — Fire and smoke integrity of internal stairways

| Category | 2 decks | 3 or more decks (A) |
|-------------------------------|---------------|---------------------|
| | Clause 8.14.2 | Clause 8.14.3 |
| <i>Fire Risk Category I</i> | Not required | Not required |
| <i>Fire Risk Category II</i> | Required (B) | Required |
| <i>Fire Risk Category III</i> | Required | Required |
| <i>Fire Risk Category IV</i> | Required | Required |

KEY:

(A) Includes open decks intended for more than 36 passengers that lie above the accommodation deck.

(B) To the extent required to satisfy Clauses 8.9 and 8.13.

8.14.2 Two decks of accommodation

8.14.2.1 Stairways generally

Subject to Clause 8.14.2.2, internal stairways that serve only two decks of accommodation shall be enclosed on at least one level with a *smoke-tight* division of *non-combustible* or *fire-restricting materials*, see Figure 8. Where one or both of the decks contain accommodation for berthed passengers, the doors shall be self-closing.

NOTE: Option 1 is preferable to option 2 because the enclosure does not trap smoke, reducing the potential for exposure of persons to smoke. Hence, option 1 provides the better solution where there is no alternative route for escape other than through the smoke filled lower level.

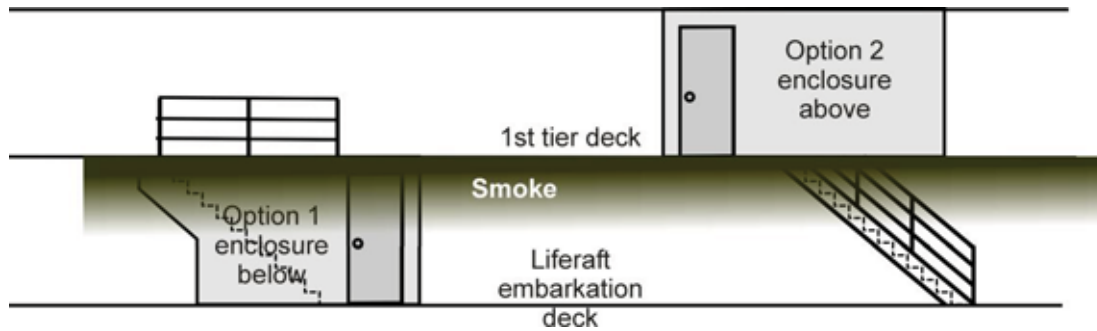


Figure 8 — Stairs penetrating 2 decks

8.14.2.2 Stairways in public spaces

Unless required to be *smoke-tight* to comply with Clauses 8.9 and 8.13, internal stairways that serve only two decks of accommodation may be fitted in the open in a *public space*, provided they lie wholly within the *public space* and the *public space* is provided with smoke detectors complying with Clause 8.15.2.

8.14.3 Three or more decks of accommodation

Where a vessel has three or more decks of accommodation, arrangements shall be provided to permit the escape of persons past a smoke filled intermediate deck if this path is required for evacuation into survival craft. An open deck above enclosed accommodation that is capable of accommodating more than 36 passengers shall be considered a deck of accommodation for the purposes of this Clause.

EXAMPLES:

An enclosed stairway tower of the type described in Clause 11.6, see .

External stairs complying with Clause 11.7.

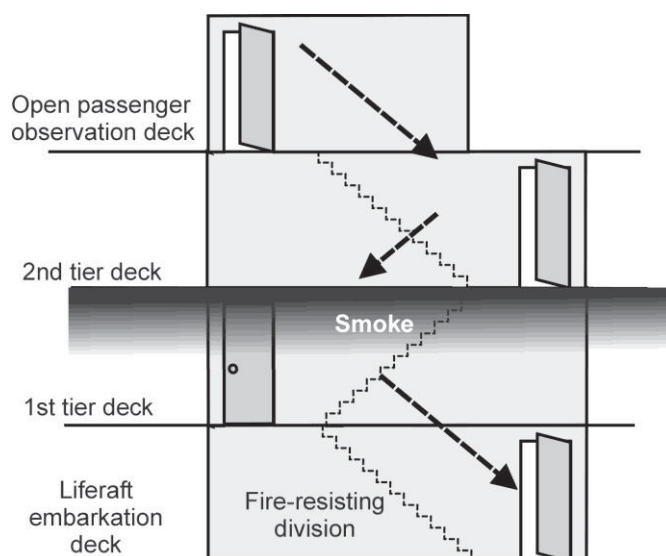


Figure 9— Stairway tower penetrating 3 or more decks

DETECTION AND ALARM

8.15 SMOKE DETECTORS IN ACCOMMODATION SPACES

8.15.1 Application

Smoke detectors complying with either Clauses 8.15.2 or 8.15.3 shall be fitted in *Accommodation Spaces* on vessels with accommodation for more than 4 berths or certified to carry more than 36 day passengers.

NOTE: Smoke detectors may be an integrated part of a *fixed fire detection and fire alarm system* or self-contained *smoke alarms*. Clauses 8.15.2 and 8.15.3 limit the use of self-contained *smoke alarms* to lower fire risk vessels.

8.15.2 Fixed fire detection and fire alarm system

A *fixed fire detection and fire alarm system* complying with Chapter 12 shall be installed to provide smoke detection in *Accommodation Spaces* on vessels specified in Table 51. Smoke detectors need not be fitted in spaces having little or no fire risk such as private bathrooms and public toilets lined with *non-combustible* materials.

NOTE: The installation of special purpose smoke detectors within ventilation ducting may provide an equivalent solution to fitting detectors within the space.

Table 51 — Fixed fire detection and fire alarm systems and manual call points in Accommodation Spaces

| Category | Application |
|-------------------------------|---|
| <i>Fire Risk Category I</i> | Not required |
| <i>Fire Risk Category II</i> | Required on vessels carrying more than 200 passengers (1) |
| <i>Fire Risk Category III</i> | Required |
| <i>Fire Risk Category IV</i> | Required |

KEY:

(1) Also applies to a public space comprising 2 enclosed decks connected by an open stairway, see Clause 8.14.2.2.

8.15.3 Self contained smoke alarm

8.15.3.1 Specification

On vessels specified in Clause 8.15.1 that are not fitted with a fixed fire detection and fire alarm system, self contained photo-optical smoke alarms complying with AS 3786 and connected to a reliable power source shall be installed in each *Accommodation Space*.

NOTE: Reliable power supply means a power supply not relying solely on a self-contained dry cell battery. A self-contained dry cell battery may provide the emergency power to maintain the function of the detector in the absence of another emergency source of power.

8.15.3.2 Number and location

Smoke alarms shall be located—

- a) in accordance with the manufacturer's recommendations;
- b) on or near the ceiling of each deck of accommodation;

- c) between each area containing cabins or berths and the remainder of the vessel, or in the connecting corridor forming the means of escape from cabins;
- d) where cabins are not grouped in a common area or no connecting corridor exists, then an alarm shall be located within 1.5 m of the entrance to each cabin; and
- e) in enclosed portions of the path of travel persons must take to evacuate the vessel.

8.16 MANUALLY OPERATED CALL POINTS

Manually operated call points complying with Chapter 12 shall be installed throughout the *Accommodation Spaces* on those vessels specified in Table 51.

One manually operated call point shall be located at each exit from *Accommodation Spaces*. Manually operated call points shall be—

- a) readily accessible in the corridors and *public spaces* of each deck; and
- b) located so that no part of the corridor or space is more than 20 m walking distance from a manually operated call point.

8.17 INSPECTION HATCHES

On vessels of *Fire Risk Category IV* carrying more than 36 berthed passengers, the ceilings and linings shall incorporate inspection hatches or other means to enable inspection of concealed and inaccessible places. Inspection hatches are not required in locations where there is no risk of fire originating. The hatches or other means of inspection shall not impair the efficiency of the fire protection.

NOTE: For vessels carrying more than 36 berthed passengers, the requirements of this Section have been developed on the assumption that an efficient patrol system will be maintained so that an outbreak of fire may be promptly detected. Compliance with this Clause enables the fire patrol to investigate any smoke originating in concealed and inaccessible places.

FIRE FIGHTING

8.18 FIRE HOSE APPLIANCES

8.18.1 Minimum required flow at hydrants in Accommodation Spaces

The minimum flow rate of each fire hose appliance jet within *Accommodation Spaces* need not exceed that in Table 17 for single orifice nozzles of 12 mm diameter. Larger sizes of nozzle may be used in *Accommodation Spaces* where the layout and contents of the space would permit ready and effective use of a larger fire hose in emergency situations.

8.18.2 Fire hose reels

Fire hose reels complying with Chapter 12 that are incorporated into the fire main and are additional to hydrants may be substituted for fire hoses within *Accommodation Spaces* provided the hydrant pressure provided by

the fire main is not less than the minimum required for correct operation of the fire hose reel.

NOTE: The throw and flow performance of fire hose reels is less than that of a 12 mm diameter single orifice nozzle. However, fire hose reels provide a ready and effective means to fight fire that can still be supplemented by normal fire hoses connected to fire hydrants within *Accommodation Spaces* should the need arise.

8.19 PORTABLE FIRE EXTINGUISHERS

8.19.1 Number and type of fire extinguishers

Accommodation Spaces shall be provided with portable fire extinguishers of a type appropriate to the potential fire hazards within the space. The number of fire extinguishers in *Accommodation Spaces* shall be in accordance with Table 52. Where two extinguishers are to be provided in an enclosed *Accommodation Space* above the bulkhead deck, one extinguisher shall be available for use on each side of the vessel.

Table 52 — Portable fire extinguishers for *Accommodation Spaces*

| Category | Number of fire extinguishers per space (A) |
|-------------------------------|--|
| <i>Fire Risk Category I</i> | 1 |
| <i>Fire Risk Category II</i> | 2 |
| <i>Fire Risk Category III</i> | 2 |
| <i>Fire Risk Category IV</i> | 2 |

KEY:

(A) For the purposes of this table, decks, watertight bulkheads, or smoke zones or a combination of these are considered to form the boundaries of an *Accommodation Space*.

8.19.2 Carbon dioxide fire extinguishers

Carbon dioxide fire extinguishers shall not be placed in *Accommodation Spaces* containing berthed accommodation.

8.20 AQUEOUS FIXED FIRE-EXTINGUISHING SYSTEMS

8.20.1 Application

Crew and passenger *Accommodation Spaces* on *Fire Risk Category IV* vessels carrying more than 200 day passengers or more than 36 berthed passengers shall be fitted with an aqueous *fixed fire-extinguishing system* in accordance with Table 53. The *fixed fire-extinguishing system* shall comply with MSC Resolution MSC.44(65), Clause 4.9 and Chapter 12. *Accommodation Spaces* having little or no fire risk such as voids and public toilets need not be fitted with a *fixed fire-extinguishing system*. Where a *fixed fire-extinguishing system* is fitted in a space containing a suspended ceiling, the fire extinguishing system shall protect the area above the suspended ceiling.

NOTE: While not required on vessels of *Fire Risk Category II* or *III* and some vessels of *Fire Risk Category IV*, the optional fitting of an aqueous *fixed fire-extinguishing system* in *Accommodation Spaces* allows a reduction in the requirements for *fire-restricting materials* within those spaces under Clause 8.6 or provides alternatives to the provision of smoke zones or alternative safe areas under Clauses 8.9 and 8.13.

Table 53 — Aqueous fixed fire-extinguishing systems for Accommodation Spaces on Fire Risk Category IV vessels

| | Class A, B | | Class C, D, E | |
|---------------------------|----------------------------------|--|------------------------------------|---------------------------------------|
| Day passengers | ≤ 200 passengers Not required | > 200 passengers Required manual or automatic | ≤ 200 passengers No application | > 200 passengers Not required |
| Berthed passengers | ≤ 36 passengers Not required | > 36 passengers No application | ≤ 36 passengers No application | > 36 passengers Required automatic |

8.20.2 Automatic activation

Where specified in Table 53, the *fixed fire-extinguishing system* shall be arranged for automatic activation.

8.20.3 Manual activation

Where permitted in Table 53, manually operated *fixed fire-extinguishing systems* shall be divided into sections to limit the quantity of water being discharged at any one time while at the same time providing sufficient water to extinguish the likely fire hazard. Sections and pumps shall comply with MSC Resolution MSC 44(65). The valves for each section, start of pumps, and alarms shall be capable of being operated from two spaces separated as widely as possible, one of which shall be the continuously manned *Control Station* specified in Clause 4.4.

NOTE: Manually operated aqueous *fixed fire-extinguishing systems* are not as effective as automatically operated systems because automatic systems tend to operate more quickly and operate in a manner better targeted to the source and extent of fire.

CHAPTER 9 MINOR FIRE RISK SPACES

9.1 SCOPE

This Chapter lists requirements from Chapter 3 and Chapter 4 that are applicable to *Minor Fire Risk Spaces* and specifies particular requirements that are additional to or modify the general requirements applicable to vessels in Chapter 3 and Chapter 4.

9.2 APPLICATION

This Chapter applies to spaces in vessels defined by Clause 1.8 as being *Minor Fire Risk Spaces*.

9.3 GENERAL REQUIREMENTS APPLICABLE TO MINOR FIRE RISK SPACES

Minor Fire Risk Spaces shall comply with the clauses in Chapter 3 and Chapter 4 specified in Table 54

Table 54 — General deemed-to-satisfy provisions applicable to spaces of minor fire risk

| Clause | Subject |
|--------------|--|
| Clause 3.2 | Storage of combustible or flammable oils (including diesel fuel tanks) |
| Clause 3.3 | Engine exhausts, boiler and galley uptakes |
| Clause 3.4 | Certain highly flammable materials prohibited |
| Clause 3.5 | Insulation |
| Clause 3.7 | Structural fire protection |
| Clause 3.7.4 | Combustible veneers |
| Clause 4.2 | Remote stops for ventilation and exhaust fans |
| Clause 4.3 | Ventilation closing appliances |
| Clause 4.4 | Centralised fire control functions on passenger vessels |
| Clause 4.5 | Fire detection and fire alarm system |
| Clause 4.7.5 | Fire main and hydrants for fire hose appliances |
| Clause 4.7.6 | Fire hoses and nozzles |
| Clause 4.9 | Fixed fire-extinguishing systems |

9.4 CARGO SPACES

9.4.1 Application

Clause 9.4 applies to cargo spaces that are not *Ro-Ro spaces* or do not contain *dangerous goods*.

NOTE: Cargo spaces that are *Ro-Ro spaces* or contain *dangerous goods* are classified as *High Fire Risk Spaces*; refer to Chapter 6.

CONTAINMENT OF FIRE

9.4.2 Separation of ventilation systems

The ventilation systems for cargo spaces shall be separated from each other and from the ventilation systems serving other spaces.

9.4.3 Closing down and sealing of cargo spaces

Vessels specified in Table 55 shall be provided with effective means for closing all ventilators and other openings leading to the cargo spaces.

NOTE: Refer also to NSCV Part C Section 2: Watertight and Weathertight Integrity for additional requirements pertaining to weathertight integrity of openings to cargo spaces.

9.4.4 Hatch covers

Cargo spaces on vessels specified in Table 55 shall be provided with hatch covers of steel or equivalent material.

Table 55 — Closing appliances for cargo spaces for fire safety (1)

| Categories | Sealing of cargo spaces | Steel or equivalent hatch covers |
|-------------------------------|-------------------------|----------------------------------|
| <i>Fire Risk Category I</i> | Required (2) | Not required |
| <i>Fire Risk Category II</i> | Required (2) | Required (2) |
| <i>Fire Risk Category III</i> | Required | Required |
| <i>Fire Risk Category IV</i> | Required | Required |

KEY:

(1) Refer to Part C Section 2: Watertight and weathertight integrity for additional requirements pertaining to weathertight integrity.

(2) Does not apply to *low risk cargo spaces*.

Table 56 — Fixed fire detection and fire alarm system in cargo spaces of Class 1 vessels

| <i>Fire Risk Category</i> | <i>Closed vehicle spaces (1)</i> | <i>Other cargo spaces excepting low risk cargo spaces (2)</i> |
|-------------------------------|----------------------------------|---|
| <i>Fire Risk Category I</i> | Required | Not required |
| <i>Fire Risk Category II</i> | Required | Not required |
| <i>Fire Risk Category III</i> | Required | Required |
| <i>Fire Risk Category IV</i> | Required | Required |

KEY:

(1) Refer to definition of *closed vehicle space* in Clause 1.4. For *Ro-Ro spaces*, see Clause 6.6.

(2) Refer to definition of *low risk cargo spaces* in Clause 1.5.

DETECTION AND ALARM

9.4.5 Fixed fire detection and fire alarm system

On Class 1 vessels specified in

Table 56, a *fixed fire detection and fire alarm system* or a sample extraction smoke detection system shall be provided in any cargo space. This provision does not apply to *low risk cargo spaces* or stowage spaces for luggage, provided that the latter is readily accessible for inspection at all times.

FIRE FIGHTING

9.4.6 Fixed fire-extinguishing systems for cargo spaces

9.4.6.1 Application

Cargo spaces, other than *low risk cargo spaces*, on vessels specified in Table 57 shall be protected by either—

- a) a manually operated carbon dioxide or inert gas *fixed fire-extinguishing system* complying with Clause 4.9 and Chapter 12; or
- b) another type of *fixed fire-extinguishing system* that gives equivalent protection.

The supply of extinguishing medium that serves the cargo spaces may also be used to protect machinery spaces provided—

- a) the extinguishing medium is suited for use in a machinery space;
- b) the performance of the *fixed fire-extinguishing systems* is not reduced;
- c) the system has the necessary isolating valves to properly regulate the quantity of medium discharged into each particular space; and
- d) there is sufficient quantity of extinguishing medium for at least one discharge in any one space served.

Table 57 — Fixed fire-extinguishing systems for cargo spaces on vessels

| Fire category | Closed vehicle spaces (1) | Other cargo spaces (2) excepting low risk cargo spaces (3) |
|-------------------|---------------------------|--|
| Fire category I | Required | Not required |
| Fire category II | Required | Required if measured length \geq 55 m |
| Fire category III | Required | Required if measured length \geq 55 m |
| Fire category IV | Required | Required if measured length \geq 45 m |

KEY:

- (1) Refer to the definition of *closed vehicle space* in Clause 1.4. For *Ro-Ro spaces*, see Clause 6.6.
- (2) A fixed gas fire-extinguishing system is ineffective on coal cargoes.
- (3) Refer to definition of *low risk cargo spaces* in Clause 1.4.

9.4.6.2 Carbon-dioxide fixed fire-extinguishing systems

For cargo spaces, the quantity of carbon dioxide available shall be sufficient to give a minimum volume of free gas equal to 30% of the gross volume of the largest cargo space so protected in the vessel.

9.4.7 Low risk cargo spaces

The Certificate of Survey issued to a Class 2 vessel with cargo spaces classified as *low risk cargo spaces* shall list the cargoes the vessel is permitted to carry in those spaces.

CHAPTER 10 CONTROL STATIONS

10.1 SCOPE

This Chapter lists requirements from Chapter 3 and Chapter 4 that are applicable to *Control Stations* and specifies particular requirements that are additional to or modify the general requirements applicable to vessels in Chapter 3 and Chapter 4.

10.2 APPLICATION

This Chapter applies to spaces in vessels defined by Clause 1.8 as being *Control Stations*.

10.3 GENERAL REQUIREMENTS APPLICABLE TO CONTROL STATIONS

Control Stations shall comply with the clauses in Chapter 3 and Chapter 4 specified in Table 58.

Table 58 — General deemed-to-satisfy provisions applicable to *Control Stations*

| Clause | Subject |
|--------------|---|
| Clause 3.3 | Engine exhausts, boiler and galley uptakes |
| Clause 3.4 | Certain highly flammable materials prohibited |
| Clause 3.5 | Insulation |
| Clause 3.6 | Paints, varnishes & other finishes on passenger vessels |
| Clause 3.7 | Structural fire protection |
| Clause 3.7.4 | Combustible veneers |
| Clause 3.9 | Maintenance of structural integrity |
| Clause 4.3 | Ventilation closing appliances |
| Clause 4.4 | Centralised fire control functions on passenger vessels |
| Clause 4.5 | Fire detection and fire alarm system |
| Clause 4.7.5 | Fire main and hydrants for fire hose appliances |
| Clause 4.7.6 | Fire hoses and nozzles |
| Clause 4.9 | Fixed fire-extinguishing systems |
| Clause 4.10 | Portable and wheeled fire extinguishers |

FIRE GROWTH POTENTIAL

10.4 EXPOSED SURFACES

Linings, ceilings and deck finish materials in *Control Stations* shall be faced with *fire-restricting materials* complying with Table 47.

10.5 CONCEALED OR INACCESSIBLE SPACES

Surfaces and grounds in concealed or inaccessible spaces adjacent to electrical or other fire hazards in *Control Stations* shall be faced with *low flame spread* materials that comply with Chapter 12.

CONTROL OF SMOKE SPREAD

10.6 VENTILATION OF CONTROL STATIONS

The ventilation of *Control Stations* on vessels shall be such that, in the event of fire, personnel can continue to carry out essential safety functions within the *Control Station*. The ventilation of *Control Stations* shall be separate from the ventilation of spaces required to have *smoke-tight* divisions (including *fire-resisting divisions*) in Table 7, Table 8 and Table 9. For *Control Stations* not opening to open decks, two separate air supplies shall be provided. The air inlets of the two sources of supply shall be positioned so that the risk of both inlets drawing in smoke simultaneously is minimised.

NOTE: This clause effectively requires the *operating compartment* to be separated from the *Accommodation Space*.

DETECTION AND ALARM

10.7 SMOKE DETECTORS IN CONTROL STATIONS

On vessels specified in Table 59, *Control Stations* containing electrical equipment and other potential sources of fire shall be provided with smoke detectors integrated into a *fixed fire detection and fire alarm system*. Smoke detectors shall be installed to provide effective smoke detection within the whole *Control Station*. Smoke detectors need not be fitted in control stations having little or no fire risk such as carbon dioxide rooms.

Table 59 — Requirement for smoke detectors and manually operated call points in *Control Stations*

| Category | Smoke detectors | Manually operated call points |
|-------------------------------|-----------------------------|----------------------------------|
| <i>Fire Risk Category I</i> | Not required | Not required |
| <i>Fire Risk Category II</i> | Required if >200 passengers | Required if > 200 passengers (1) |
| <i>Fire Risk Category III</i> | Required | Required (1) |
| <i>Fire Risk Category IV</i> | Required | Required (1) |

KEY:

(1) Not required in the *operating compartment* where the fire detector control panel is located in the *operating compartment*.

10.8 MANUALLY OPERATED CALL POINTS

Control Stations on the vessels specified in Table 59 shall be fitted with manually operated call points complying with Chapter 12. Manually operated call points need not be provided in the *operating compartment* of

a vessel where the fire detector control panel is located within the *operating compartment*.

FIRE FIGHTING

10.9 PORTABLE FIRE EXTINGUISHERS

A portable fire extinguisher complying with Clause 4.10 shall be located in each *Control Station*. Vessels of *Fire Risk Category I* or *II* need not be fitted with this extinguisher provided that—

- a) there is at least one *Accommodation Space* or machinery space extinguisher located in close proximity to and visible from the *Control Station*; and
- b) the extinguisher in (a) is suited to the fire hazards likely to arise within the *Control Station*, see Clause 4.10.2.

CHAPTER 11 ESCAPE OR EVACUATION ROUTES

11.1 SCOPE

This Chapter lists requirements from Chapter 3 and Chapter 4 that are applicable to *Escape or Evacuation Routes* and specifies particular requirements that are additional to or modify the general requirements applicable to vessels in Chapter 3 and Chapter 4.

11.2 APPLICATION

This Chapter applies to spaces in vessels defined by Clause 1.8 as being *Escape or Evacuation Routes*.

NOTE: NSCV Part C Chapter 1: Arrangement, accommodation and personal safety contains requirements for escape or evacuation routes including the minimum width of corridors, stairways and stairway towers.

11.3 GENERAL REQUIREMENTS APPLICABLE TO ESCAPE OR EVACUATION ROUTES

Escape or Evacuation Routes shall comply with the clauses in Chapter 3 and Chapter 4 specified in Table 60.

Table 60 — General deemed-to-satisfy provisions applicable to *Escape or Evacuation Routes*

| Clause | Subject |
|--------------|---|
| Clause 3.3 | Engine exhausts, boiler and galley uptakes |
| Clause 3.4 | Certain highly flammable materials prohibited |
| Clause 3.5 | Insulation |
| Clause 3.6 | Paints, varnishes & other finishes on passenger vessels |
| Clause 3.7 | Structural fire protection |
| Clause 3.7.4 | Combustible veneers |
| Clause 3.9 | Maintenance of structural integrity |
| Clause 4.3 | Ventilation closing appliances |
| Clause 4.4 | Centralised fire control functions on passenger vessels |
| Clause 4.5 | Fire detection and fire alarm system |
| Clause 4.7.5 | Fire main and hydrants for fire hose appliances |
| Clause 4.7.6 | Fire hoses and nozzles |

FIRE GROWTH POTENTIAL

11.4 EXPOSED SURFACES IN CORRIDORS AND STAIRWAY ENCLOSURES

Linings, ceilings and deck finish materials in corridors and stairway enclosures shall be faced with *fire-restricting materials* complying with Table 47.

11.5 FURNITURE IN STAIRWAY ENCLOSURES

Furniture, if located in stairway enclosures on a Class 1 vessel, shall be of *fire-restricting materials* where specified in Table 47.

NOTE: Additional requirements limiting the use of furniture in stairway enclosures are listed in Part C Section 1: *Arrangement, accommodation and personal safety*.

ESCAPE AND EVACUATION

11.6 STAIRWAY TOWERS

11.6.1 Boundaries

Stairway towers (see Clause 8.14.3 and) that serve three or more decks of accommodation shall be enclosed at all levels by *fire-resisting divisions*. The *time rating* of such *fire-resisting divisions* shall be the applicable time specified in Table 7, Table 8 or Table 9 or 15 minutes, whichever is greater.

11.6.2 Doors

Doors to stairway towers shall be self-closing and shall comply with the requirements for penetrations through *fire-resisting divisions* specified in Clause 3.8 and Chapter 12. Where none of the decks served by the stairway tower contain accommodation for berthed persons, the self-closing doors may be arranged with catches to keep them open under normal conditions.

11.6.3 Limitations on spaces having access to stairway towers

Direct access to stairway towers shall be limited to the following spaces:

- a) *Public spaces*.
- b) Corridors.
- c) Lifts.
- d) Public toilets.
- e) *Special category spaces* and *open Ro-Ro spaces* to which passengers can have access.
- f) External areas.

11.6.4 Ventilation

On vessels of *Fire Risk Category* III and IV carrying more than 36 passengers, the ventilation of stairway towers shall be independent of the spaces they serve.

11.7 EXTERNAL OPEN STAIRWAYS

Boundaries facing external open stairways and passageways forming part of an escape route and boundaries in such a position that their failure during a fire would impede movement to the embarkation deck shall be *fire-resisting divisions* of *time rating* specified in Table 7, Table 8 or Table 9.

11.8 PROTECTION OF SURVIVAL CRAFT

Survival craft shall be protected from spaces of *High Fire Risk* or *Moderate Fire Risk* by *fire-resisting divisions* of *time rating* specified in Table 7, Table 8 or Table 9.

NOTE: Refer to Part C Section 7A for the definition of survival craft.

DETECTION AND ALARM**11.9 FIXED FIRE DETECTION AND FIRE ALARM SYSTEM**

On vessels specified in Table 61, a *fixed fire detection and fire alarm system* shall be installed and arranged to provide smoke detection in enclosed corridors, stairways and escape routes within *Accommodation Spaces*.

Table 61 — Fixed fire detection and fire alarm systems in enclosed corridors, stairways and escape routes

| Category | Application |
|-------------------------------|---|
| <i>Fire Risk Category I</i> | Not required |
| <i>Fire Risk Category II</i> | Required if a <i>fixed fire detection and fire alarm system</i> is specified under Clause 8.15. |
| <i>Fire Risk Category III</i> | Required |
| <i>Fire Risk Category IV</i> | Required |

CHAPTER 12 FIRE PROTECTION MEASURES—DESIGN, CONSTRUCTION AND INSTALLATION

12.1 SCOPE

This Chapter specifies the requirements for the design, construction, testing and installation of components, systems and installations of *active* and *passive fire protection measures*.

12.2 OBJECTIVE

The objective of this Chapter is to ensure that the actual performance of *active* and *passive fire protection measures* on a vessel is no less than that intended for the fire safety solutions specified earlier within this Section.

REQUIRED OUTCOMES

12.3 TYPE

Components, systems and installations that comprise the *active* and *passive fire protection measures* on a vessel, including materials and *fire equipment*, must be of a type appropriate to control to acceptable levels the risks associated with potential or actual fire on the vessel.

12.4 PERFORMANCE

Each component and system of the *active* and *passive fire protection measures* must be designed, constructed and arranged to significantly enhance the probability of survival by —

- a) preventing the occurrence of fire;
- b) reducing the consequences in the event of a fire incident; or
- c) both a) and b).

12.5 SAFETY OF PERSONNEL

Each component and system of the *active* and *passive fire protection measures* must be designed, constructed and arranged to avoid unacceptable risks to personnel associated with their presence, intentional operation or accidental operation.

12.6 AVAILABILITY

All *fire equipment* must be readily available in the event of a fire incident.

12.7 RELIABILITY

All components, systems and installations of *active* and *passive fire protection measures* must be designed, constructed, arranged and maintained to function reliably at time of need.

12.8 OPERATING INSTRUCTIONS

Persons must have access to all relevant information that may be needed to prepare for and facilitate the effective use of all available *active* and *passive fire protection measures* in an emergency.

DEEMED-TO-SATISFY SOLUTIONS

12.9 COMPLIANCE

For the purpose of this Chapter, components, systems and installations of *active* and *passive fire protection measures* shall be deemed-to-satisfy the Required Outcomes in Clauses 12.3 to 12.8, if they comply with Clause 12.10.

NOTE: Products that meet the standards specified under Clause 12.10 may also be subject to provisions specified elsewhere in this Section. For example, specific clauses that do not permit the automatic activation of certain *fixed fire-extinguishing systems*.

12.10 STANDARDS FOR FIRE SAFETY MATERIALS AND EQUIPMENT

12.10.1 Specification

The components, systems and installations of *active* and *passive fire protection measures* specified in column 1 of Table 62 shall comply with the standards specified in column 2 of Table 62.

12.10.2 Assessment and verification

Each component, system or installation of *active* or *passive fire protection measures* shall be type assessed and verified as meeting the applicable standard or specification or test. To be deemed-to-satisfy this requirement they shall be—

- a) tested and specifically listed for the purpose specified in this Section by a recognised testing and listing Organisation in Australia, such as a NATA accredited laboratory, or a specialised laboratory such as the Scientific Service Laboratory (SSL);
- b) certified by a JAS-ANZ accredited product certification body;
- c) type approved by a ship classification society recognised by the Australian Maritime Safety Authority (AMSA); or
- d) certified by an AMSA-recognised Notified Body in accordance with the EU Marine Equipment Directive, Module B (MED-B).

NOTE: A listing of fire safety materials and equipment that has been verified as complying with the NSCV is available on the Register of Compliant Equipment published by the NMSC at www.nmsc.gov.au.

12.11 INSTALLATION AND TESTING

Components and systems of *active* and *passive fire protection measures* shall be installed on the vessel and tested by competent persons in accordance with specifications for installation that may form part of the standard specified in Table 62 and in relevant approval documentation arising from Clause 12.10.2.

NOTE: The installer may be required to supply an installation certificate following commissioning declaring that the installation meets the required standards for installation and testing.

Table 62 — Standards for components, systems and installations of active and passive fire protection measures

| Item | Applicable deemed-to-satisfy standard (1) | References |
|--|--|--|
| Fire growth potential | | |
| <i>Non-combustible material</i> | Fire Test Procedures Code—Part 1, or Annex D of this Section (Includes FTP Code Class B and C rated divisions) | 1.5, 3.3, 3.5, 3.7.1(Table 9), 3.7.4, 6.3.3, 6.5.2.1, 6.7.2.1, 6.7.2.2, 7.3.2,7.5.2.4, 7.5.2.5, 8.3, 8.5, 8.6.1(Table 47), 8.6.2.2.2, 8.6.3.1, 8.9, 8.12, 8.14.2.1, 8.15.2 |
| <i>Low flame spread surface</i> | Fire Test Procedures Code—Part 5, or Annex E of this Section | 1.4, 3.5.2(Table 6), 3.7.4, 7.5.2.4, 7.5.2.5, 8.6.1 (Table 47), 10.5 |
| <i>Fire-restricting materials — Bulkheads & Ceilings, Groups 1, 2 and 3</i> | Annex F of this Section (2) | 1.5, 3.7.1(Table 9), 6.5.2.1, 8.6.1 (Table 47), 8.6.2.1, 8.6.2.2, 8.9, 8.13, 8.14.2.1, 10.4, 11.4 |
| <i>Fire-restricting materials —Floor materials and floor coverings: Levels 1, 2 and 3.</i> | Annex G of this Section | 1.4, 3.7.1 (Table 9), 8.6.1 (Table 47), 8.6.2.1, 8.9, 8.13, 8.14.2.1, 10.4, 11.4 |
| <i>Fire-restricting materials —FTP Code bulkhead and ceilings</i> | Fire Test Procedures Code Part 2 (2) | 1.4, 3.7.1 (Table 9), 6.5.2.1, 8.6.1 (Table 47), 8.6.2.1, 8.6.2.2, 8.9, 8.13, 8.14.2.1, 10.4, 11.4 |
| <i>Fire-restricting materials —FTP Code deck finish materials</i> | Fire Test Procedures Code Part 2 and Part 6 | 1.4, 3.7.1 (Table 9), 6.5.2.1, 8.6.1 (Table 47), 8.6.2.1, 8.6.2.2, 8.9, 8.13, 8.14.2.1, 10.4, 11.4 |
| <i>Fire-restricting materials — Furniture</i> | FTP Code Part 8 plus Annex H of this Section, or BS 7176 low hazard rating | 8.6.1 (Table 47), 11.5 |
| <i>Fire-restricting materials — Draperies & curtains</i> | FTP Code Part 7 | 8.6.1 (Table 47) |
| <i>Fire-restricting materials — Upholstery</i> | FTP Code Part 8 | 8.6.1 (Table 47) |
| <i>Fire-restricting materials — Bedding (3)</i> | FTP Code Part 9, or BS 7177 low hazard rating | 8.6.1 (Table 47) |
| <i>Combustible sound or thermal insulation</i> | Annex I of this Section | 3.5.2 (Table 6) |

(Continued...)

Table 62 cont.

| Item | Applicable deemed-to-satisfy standard (1) | References |
|--|--|---|
| Containment of fire | | |
| <i>Fire-resisting divisions</i> | Class A divisions, Fire Test Procedures Code—Part 3 or HSC Code 7.2 and Fire Test Procedures Code—Resolution MSC45(65) | 1.5, 3.7.1 (Table 7, Table 8, Table 9), 3.7.2, 3.7.3, 3.7.4, 6.4.11, 6.7.2.1, 8.6.3.1, 11.6.1, 11.7, 11.8 |
| Doors penetrating <i>fire-resisting divisions</i> | Class A divisions, Fire Test Procedures Code—Part 3 | 3.8.6, 6.4.10, 6.5.4.3, 11.6.2 |
| Self-closing doors | SOLAS Reg. 9 Clause 4.1.1.4 | 3.8.2, 3.8.6, 6.4.10, 6.5.4.3, 11.6.2 |
| Pipe penetrations of <i>fire-resisting divisions</i> | Class A divisions, Fire Test Procedures Code—Part 3 | 3.8.2, 3.8.3 |
| <i>Fire dampers and duct penetrations</i> | Class A divisions, Fire Test Procedures Code—Part 3 | 3.8.2, 3.8.5, 6.5.2.1, |
| Cable transits | Class A divisions, Fire Test Procedures Code—Part 3 | 3.8.2 |
| Smoke generation potential and toxicity | | |
| Smoke and toxicity | Fire Test Procedures Code—Part 2, or Fire Test Procedures Code—Annex 2 | 3.6 |
| Structural integrity | | |
| Standard fire test | Fire Test Procedures Code—Part 3 | 3.9 |
| Detection and alarm | | |
| <i>Fire detection and fire alarm system</i> | Fire Safety Systems Code—Chapter 9, or HSC Code Clause 7.7, or AS 1603 | 4.4, 4.5, 6.4.12, 6.5.6, 6.6.5 (Table 36), 6.8.6, 7.4.2, 8.15, 8.16, 9.4.5, 10.7, 11.9 |
| Fire control and indicating equipment | SOLAS Regulation 6.9 HSC Code Clause 7.7 AS 1603 and AS 4428 component standards | 4.4, 4.5, 6.4.12, 6.5.6, 6.5.6.2, 6.6.5 (Table 36), 6.8.6, 7.4.2, 8.15, 9.4.5, 10.7, 10.8, 11.9 |
| Manually operated call points | AS 1603.5 component standards | 6.5.6.2, 8.16, 10.8 |
| <i>Fixed fire detection and fire alarm system including manually operated call points.</i> | Fire Safety Systems Code—Chapter 9, or AS 1670 | 4.4, 4.5, 6.4.12, 6.5.6, 6.5.6.2, 6.6.5 (Table 36), 6.8.6, 7.4.2, 8.15, 9.4.5, 10.7, 10.8, 11.9 |
| Self-contained <i>smoke alarm</i> | AS 3786 | 8.15.3 |

(Continued...)

Table 62 cont.

| Item | Applicable deemed-to-satisfy standard (1) | References |
|---|---|---|
| Means of escape | | |
| Emergency escape breathing devices | Fire Safety Systems Code—Chapter 3, or AS 1716 where equivalent | 4.6 |
| Fire fighting | | |
| Portable fire extinguishers | Fire Safety Systems Code—Chapter 4, or AS/NZS 1841 component standards | 4.10, 6.4.14, 6.4.15, 6.4.16, 6.5.9, 6.6.5(Table 36), 6.7.8, 6.9.5.3, 7.3.3, 7.4.3.1, 7.5.7, 8.19, 10.9 |
| <i>Foam making branch pipe</i> | Annex J of this Section Fire Safety Systems Code—Chapter 4 (Portable foam applicator unit) | 1.4, 6.4.15, 6.5.9, 6.7.7 |
| <i>Water fog applicator</i> | Clause 1.5 | 1.4, 6.5.9 |
| Wheeled fire extinguishers | Marine Orders Part 15 Appendix 2, Clauses 1, 2 & 3, or AS 4265 | 4.10, 6.4.15, 6.7.8 |
| <i>Gaseous fixed fire-extinguishing systems</i> | Fire Safety Systems Code—Chapter 5, or AS 4214 | 4.9, 6.4.11, 6.4.13, 6.6.5, 6.8.7, 9.4.6 |
| <i>High-expansion foam fixed fire-extinguishing systems</i> | Fire Safety Systems Code—Chapter 6 | 4.9, 6.4.11, 6.4.13, 6.6.5, 6.8.7, 9.4.6 |
| <i>Aerosol fixed fire-extinguishing systems</i> | IMO MSC/Circ.1007 | 4.9, 6.4.11, 6.4.13, 6.6.5, 6.8.7, 9.4.6 |
| <i>Pressure water fixed fire-extinguishing systems (including automatic fire sprinkler systems)</i> | Fire Safety Systems Code—Chapter 7 & Chapter 8, or NFPA 15, or NFPA 750, or AS 2118, or AS 4587, or SP-method 2377 | 4.9, 6.4.11, 6.4.13, 6.5.7, 6.6.5, 6.8.7, 8.20, 9.4.6 |
| <i>Dry chemical fixed fire-extinguishing systems</i> | NFPA 17 | 6.9.5.3 |
| Galley automatic local fire extinguishing systems | UL 300 (4), or ISO 15371, or NFPA 17 | 7.5.8 |

(Continued...)

Table 62 cont.

| Item | Applicable deemed-to-satisfy standard (1) | References |
|--------------------------------|--|---------------------------|
| Fire-fighting (cont) | | |
| Lay-flat fire hoses | AS 2792 | 4.7, 4.7.2, 4.7.6, 8.18.1 |
| Fire hose reels | AS/NZS 1221 | 8.18.2 |
| International shore connection | Figure 5 Fire Safety Systems Code— Chapter 2 | 4.7.5.9 |
| Fire-fighters' outfits | Fire Safety Systems Code— Chapter 3 | 4.11, 6.7.9 |
| Fire blankets | AS 3504 and AS 2444, or EN 1869 and relevant parts of AS 2444. | 7.5.7 |

NOTES:

- (1) Where more than one standard is specified as applicable to an item of equipment or a component and there is nothing in other chapters that specifies otherwise, either standard may be used. There is no implication that the standards are fully equivalent.
- (2) The Room Corner Test is a large scale and expensive test. The Cone Calorimeter (ISO 5660) is a small-scale test method that may be used in lieu of the Room Corner Test for quality control and the testing of minor changes such as surface thickness, type and colour.
- (3) Bedding comprises blankets, quilts, bedspreads, pillows and mattresses, including thin, light mattresses used on top of other mattresses.
- (4) The UL 300 test specification has been prepared to accommodate the use of new vegetable oils with a high auto-ignition temperature.

CHAPTER 13 SERVICING OF FIRE EQUIPMENT

13.1 SCOPE

This Chapter specifies requirements for the servicing of *fire equipment*.

13.2 OBJECTIVE

The objective of this Chapter is to specify minimum standards for the servicing of *fire equipment* so that the effectiveness of these fire safety protection measures can be maintained.

NOTES:

1. The servicing of *fire equipment* effectively renews the reliability of the equipment until the next date of servicing, excluding any damage or tampering after servicing. Servicing also provides the opportunity for a delegated periodic survey inspection of the equipment on behalf of the Authority.
2. When procuring *fire equipment* that requires servicing, consideration should be given to the long-term availability and geographic proximity of persons or organisations competent and qualified to service the *fire equipment*.

REQUIRED OUTCOMES

13.3 MAINTENANCE OF FUNCTION

The effectiveness of all *fire equipment* must be maintained over the life of the vessel.

13.4 RELIABILITY

The reliability of items of *fire equipment* must not reduce over time.

13.5 QUALITY

Persons or organisations engaged in the servicing of *fire equipment* must establish and apply appropriate management processes to control the quality of servicing outcomes and allow these outcomes to be verified.

DEEMED-TO-SATISFY SOLUTIONS

13.6 COMPLIANCE

For the purpose of this National Standard, *fire equipment* shall be deemed-to-satisfy the Required Outcomes in Clauses 13.3 to 13.5, if it is serviced in accordance with Clause 13.7.

NOTE: An arrangement for the servicing of *fire equipment* that gives a servicing warranty provides evidence of compliance with the required outcomes.

13.7 SERVICING SCOPE AND FREQUENCY

Items of *fire equipment* shall be serviced in accordance with AS 1851.

Emergency escape breathing devices and breathing apparatus on fire-fighters' outfits shall be serviced in accordance with AS/NZS 1715.

13.8 COMPETENCE

Only competent persons or organisations shall undertake the servicing of fire safety equipment. Competence shall be relevant to the particular type of equipment. Competent persons or organisations shall be one of the following—

- a) Accredited or licensed by an appropriate Authority or fire administration within the jurisdiction;
- b) The manufacturer, an agent of the manufacturer or a service station approved by the manufacturer; or
- c) Accredited or licensed by a Classification Society.

NOTE: Subclause a) above provides that members of the vessel's crew may undertake servicing functions specified in AS 1851 to the extent that those functions fall within the crewmember's level of competence.

ANNEX A FIRE HAZARD ANALYSIS

A1 SCOPE

Annex A summarises the key fire hazards addressed by the provisions of this section and other sections of the NSCV. The table forms the basis for the requirements contained in this Section.

This informative Annex is referenced in Clause 1.6.4 of this Section.

Table A.1 – Fire hazard analysis

| Hazard | Likelihood risk factor | Deemed-to-satisfy solutions | Consequence risk factor | Deemed-to-satisfy solutions |
|---|-----------------------------|--|------------------------------|---|
| Collection of explosive or flammable vapours Petrol storage Petrol systems Petrol machinery Petrol cargo Gas storage Gas appliances Gas machinery Ro-Ro spaces Cargo spaces Battery compartments | Fuel type | Limitations on fuel types Packaging of <i>dangerous goods</i> | Proximity of ignition source | Prohibition on enclosed petrol motors Earthing of components Design of in-built petrol tanks Electrical equipment for use in hazardous areas |
| | Enclosed space | Location of portable petrol tanks Design of built-in petrol tanks Prohibition on enclosed petrol motors Storage of gas cylinders Ventilation Battery compartment design | Proximity of persons | Separation of spaces |
| | Leakage of flammable vapour | Piping design and construction Design of built-in petrol tanks Gas alarms Flame failure devices | | |

Table A1 cont.

| Hazard | Likelihood risk factor | Deemed-to-satisfy solutions | Consequence risk factor | Deemed-to-satisfy solutions |
|---|---|---|--|---|
| Spillage or escape of combustible or flammable liquids Fuel Lubricating oil Cooking oil Hydraulic oil Other flammable liquid Oil cargo Ro-Ro spaces | Fuel type | Special requirements for below decks petrol tanks | Proximity of ignition sources | Location of tanks Design of petrol tanks Shielding Containment of fuel |
| | Combustible or flammable liquids under pressure | Mechanisms to avoid overpressure Pressure monitoring Limits on flexible piping Pipe & coupling design Filter design | Quantity of spilt or escaped combustible or flammable liquids (fluid pressure and pipe size) | Monitoring of pressures Early fire detection and extinguishing Remote shutoff of pumps, tanks, machinery, etc. Fire patrol or CCTV monitoring Early fire extinction |
| | Complexity of machinery | Fire detection and fire alarm system Fire extinguishing | Duration of fire | Shut down of space openings Early fire detection Early fire extinguishing |
| | Poor design | Design requirements for Tank construction & location Piping Filling & venting | Number of passengers | Emergency Plan Fire detection and fire alarm system Fire extinguishing |
| | | | Berthed passengers | Fire detection and fire alarm system Fire extinguishing Emergency Plan Marking of Escapes |
| | | | Time until rescue | Fire detection and fire alarm system Fire extinguishing Life saving equipment |

(Continued...)

Table A1 cont.

| Hazard | Likelihood risk factor | Deemed-to-satisfy solutions | Consequence risk factor | Deemed-to-satisfy solutions |
|--|-----------------------------|---|------------------------------------|---|
| Sources of heat or ignition Exhaust piping, Galley equipment, Electrical failures, Turbochargers Smoking Arson Lightning | Exposed flames | Prohibition on smoking Prohibition on exposed flames in spaces. Fire patrols Heat & smoke detectors Limits on the use of nitrocellulose | Proximity to combustible materials | Isolation of sources of heat in separate spaces; e.g. machinery spaces, galleys Use of <i>non-combustible</i> materials in immediate proximity to the hazard Limits on combustion characteristics of materials Insulation Structural fire protection Provisions for <i>dangerous goods</i> |
| | Electrical failure | Insulation Circuit breakers Cable cross-section Dry running pumps | Number of passengers | Early fire detection Early fire extinguishing Structural fire protection Emergency plan Marking of escapes Fire alarms |
| | Heat generated by machinery | Ventilation Temperature monitoring Insulation Water-cooled exhausts Shielding Heat & smoke detectors | Berthed passengers | Early fire detection Early fire extinguishing Structural fire protection Emergency plan Evacuation drills Marking of escapes Fire alarms |
| | | | Time until rescue | Early fire detection Fire suppression systems Structural fire protection Life saving equipment |

(Continued...)

Table A1 cont.

| Hazard | Likelihood risk factor | Deemed-to-satisfy solutions | Consequence risk factor | Deemed-to-satisfy solutions |
|--|---------------------------------------|--|-------------------------|---|
| Smoke & heat tolerance Smoke toxicity Smoke quantity Excessive temperature | Materials of construction | Non-combustible materials Limits on types of materials Linings | Duration of fire | Smoke & heat detection Fire patrols Fire extinguishing |
| | Materials for linings and furnishings | Standards for smoke developed, toxicity | Number of passengers | Alternative assembly areas Early fire detection Early fire extinguishing Structural fire protection Emergency plan Marking of escapes Fire alarms |
| | Likelihood of fire | Prohibition on smoking Prohibition on naked flames Fire patrols Limitations on ignitability Limitations on spread of fire Limitations on heat developed | Berthed passengers | Early fire detection Early fire extinguishing Structural fire protection Emergency plan Evacuation drills Marking of escapes Fire alarms |
| | | | Time until rescue | Early fire detection Fire suppression Structural fire protection Life saving equipment |

(Continued ...)

Table A1 cont.

| Hazard | Likelihood risk factor | Deemed-to-satisfy solutions | Consequence risk factor | Deemed-to-satisfy solutions |
|--|--------------------------|---|------------------------------------|---|
| Spread of fire Structural failure Transmission of fire Loss of secure space Forced evacuation | Material of construction | Non-combustible materials Structural fire protection | Duration of fire | Early detection Early extinction in space of origin |
| | Likelihood of fire | See Spillage & heat sources above | Temperature rise in adjacent space | Fire hydrant cooling |
| | | | Number of passengers | Alternative assembly areas Early fire detection Early fire extinguishing Fire suppression Structural fire protection Emergency plan Marking of escapes Fire alarms |
| | | | Berthed passengers | Early fire detection Early fire extinction Fire suppression Structural fire protection Emergency plan Evacuation drills Marking of escapes Fire alarms |
| | | | Time until rescue | Early fire detection Fire suppression Structural fire protection Life saving equipment |

(Continued...)

Table A1 cont.

| Hazard | Likelihood risk factor | Deemed-to-satisfy solutions | Consequence risk factor | Deemed-to-satisfy solutions |
|--|------------------------|--|-------------------------|--|
| Fire-induced failure of essential systems Lifesaving Communications Electrical power Bilge pumping Fire fighting Watertight integrity | Likelihood of fire | See Spillage & heat sources above | Number of passengers | Redundancy of systems Protection of systems |
| | Proximity of systems | Isolation of <i>Control Stations</i> from areas of high risk Structural fire protection | Berthed passengers | Redundancy of systems Protection of systems |
| | | | Time until rescue | Redundancy of systems Protection of systems |

ANNEX B EQUIVALENT SOLUTIONS FOR FIRE SAFETY SYSTEMS

B1 OBJECTIVE

The objective of this Annex is to provide a methodology for developing equivalent solutions for fire safety. It forms a normative part of this document.

This Annex is referenced in Clause 2.10 of this Section.

B2 GENERAL

Fire safety design and arrangements may deviate from the deemed-to-satisfy solution set out in Chapter 3 to Chapter 12, provided that the equivalent solution meets the required fire safety outcomes of Chapter 2.

B3 ASSESSMENT METHODS

Engineering analysis, evaluation and approval of the equivalent solution shall be carried out in accordance with this Annex.

B3.1 Engineering analysis

The engineering analysis shall be prepared and submitted for independent review by a competent organisation⁷, and shall include, as a minimum, the following elements:

- a) Description of the vessel type and space(s) concerned.
- b) Identification of deemed-to-satisfy requirement(s) with which the vessel or the space(s) will not comply.
- c) Identification of the fire and explosion hazards of the vessel or the space(s) concerned, including:
 - i) Identification of the possible ignition sources.
 - ii) Identification of the fuel loading for each space concerned.
 - iii) Identification of the fire growth potential of each space concerned.
 - iv) Identification of the smoke and toxic effluent generation potential for each space concerned.
 - v) Identification of the potential for the spread of fire, smoke or toxic effluent from the space(s) concerned to other spaces.
- d) Determination of the required fire safety performance criteria for the vessel or the space(s) concerned addressed by the deemed-to-satisfy requirement(s). Performance criteria shall:
 - i) be based on the fire safety objectives and on the functional requirements of this section;

⁷ Refer to enabling legislation of the jurisdiction. Usually this is the relevant Authority of the jurisdiction.

- ii) provide a degree of safety not less than that achieved by using the deemed-to-satisfy requirements; and
 - iii) be quantifiable and measurable.
- e) Detailed description of the equivalent solution, including:
- i) A list of the assumptions used in the design.
 - ii) Any engineering software together with the assumptions and limitations of use.
 - iii) Any changes to fixed system design and installation standards.
 - iv) Any proposed operational restrictions or conditions.
- f) Technical justification demonstrating that the equivalent solution meets the required fire safety performance criteria.

B3.2 Evaluation of the equivalent solution

The engineering analysis required in Clause B3.1 shall be evaluated and approved by the competent organisation.

B4 DOCUMENTATION

A copy of the documentation, as approved by a competent organisation on behalf of an Authority, indicating that the alternative design and arrangements comply with this Annex shall be supplied to the Authority of a receiving jurisdiction should the vessel transfer to another jurisdiction.

NOTE: The approving Authority should communicate to the other Australian Authorities pertinent information concerning alternative design and arrangements approved by them.

B5 RE-EVALUATION DUE TO CHANGE OF CONDITIONS

If the assumptions and operational restrictions that were stipulated in the equivalent solution are changed, the engineering analysis shall be carried out under the changed conditions and shall be approved by a competent organisation on behalf of the Authority.

ANNEX C TESTING OF FIRE HOSE APPLIANCES

C1 SCOPE

This Annex specifies the procedure for testing the throw of fire hose appliance water jets. This Annex forms a normative part of this document. This Annex is referenced in Clause 4.7.2.2.

C2 APPLICATION

This Annex applies to fire hose appliances specified in Clause 4.7.

C3 REQUIRED OUTCOME

The risks from fire to persons that operate *fire appliances* must be minimised.

C4 TESTING PROCEDURE

The fire hose shall be tested in accordance with the following procedure (see also Figure 10):

- a) The test shall be conducted with only one fire pump operating.
- b) If more than one main fire pump is fitted, the pump of smallest capacity shall be used.
- c) The test shall be conducted using a hose connected to the highest hydrant on the vessel, or a hydrant that is the most remote from the pumps if that would result in a greater pressure loss.
- d) If the vessel is to have more than one jet of water operating simultaneously (Table 17), the test shall be conducted with the required number of jets running simultaneously.
- e) The nozzle of the fire hose appliance shall be located 1 m above the deck on which the hydrant is located.
- f) The nozzle of the fire hose appliance may be oriented at the most favourable angle to achieve maximum throw of the water jet.
- g) The throw of the water jet shall be measured to the point at which the jet strikes the horizontal deck surface. This surface is the baseline from which the height of the nozzle jet is measured.

C5 ACCEPTANCE CRITERIA

The test shall be deemed acceptable provided the throw of the water jet is no less than that specified in Table 17.

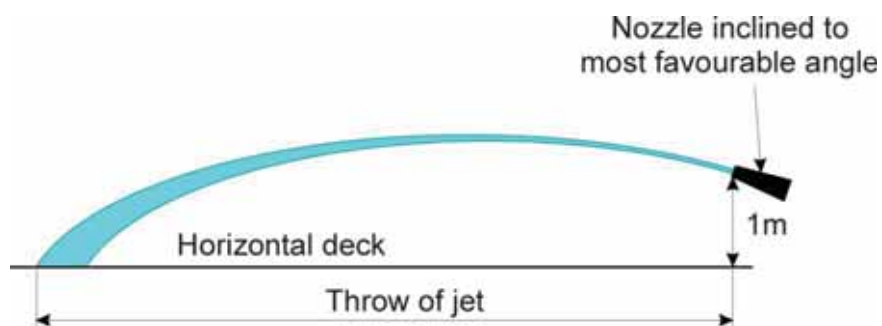


Figure 10 — Test for performance of fire hoses appliances

ANNEX D NON-COMBUSTIBLE MATERIALS

D1 SCOPE

This Annex specifies requirements for *non-combustible* materials that are alternative to the requirements contained in the FTP Code. This Annex forms a normative part of this document.

This Annex is referenced in Table 62.

D2 APPLICATION

This Annex applies to materials required to be *non-combustible* within this Section.

D3 REQUIRED OUTCOME

Materials designated as *non-combustible* must not add to the fire growth potential within a space.

D4 TESTING PROCEDURE

The material shall be tested in accordance with AS 1530 Part 1.

D5 ACCEPTANCE CRITERIA

To be accepted, the material, when heated to a temperature of 750°C—

- a) does not flame, or flames for no more than 10 seconds;
- b) exhibits a rise in surface temperature, if any, to no more than 800°C; and
- c) causes a rise in the temperature of the test furnace, if any, to no more than 800°C.

ANNEX E LOW FLAME SPREAD SURFACES

E1 SCOPE

This Annex specifies requirements for *low flame spread* surfaces that are alternative to the requirements contained in the FTP Code. This Annex forms a normative part of this document.

This Annex is referenced in Table 62.

E2 APPLICATION

This Annex applies to surfaces required to be *low flame spread* within this Section.

E3 REQUIRED OUTCOME

Surfaces designated as *low flame spread* must inhibit fire growth potential, heat production and smoke production within a space.

E4 TESTING PROCEDURE

The material shall be bonded to a substrate and tested in accordance with AS/NZS 1530 Part 3 to determine its early fire hazard properties.

E5 ACCEPTANCE CRITERIA

The material shall have early fire hazard properties in accordance with Acceptance Criteria 1 or 2 as follows:

E5.1 Acceptance criteria 1

The material shall have early fire hazard properties as follows:

- a) Spread of Flame Index shall not exceed 3.
- b) Ignitability Index plus Heat Evolved Index shall not exceed 7 (in total).
- c) Smoke Developed Index shall not exceed 4.

E5.2 Acceptance criteria 2

Alternatively, the material shall have early fire hazard properties as follows:

- a) Spread of Flame Index shall not exceed 1.
- b) Ignitability Index plus Heat Evolved Index shall not exceed 3 (in total).
- c) Smoke Developed Index shall not exceed 5.

ANNEX F CRITERIA FOR GROUP 1, GROUP 2 AND GROUP 3 EXPOSED BULKHEAD AND CEILING MATERIALS AND LININGS

F1 SCOPE

This Annex specifies criteria for Group 1, Group 2 and Group 3 *fire-restricting materials* applicable to exposed bulkhead and ceiling materials and linings. This Annex forms a normative part of this document.

This Annex is referenced in Table 62.

F2 APPLICATION

This Annex applies to materials required to be Group 1, Group 2 or Group 3 exposed bulkhead and ceiling materials and linings.

F3 REQUIRED OUTCOME

Exposed bulkhead and ceiling materials and linings designated *fire-restricting materials* must inhibit fire growth potential and smoke production within a space.

F4 DEFINITIONS

Average specific extinction area—

the average specific extinction area for smoke as determined by AS/NZS 3837.

Group 1 material—

a material that complies with the criteria listed in Clause F6.1.

Group 2 material—

a material that complies with the criteria listed in Clause F6.2.

Group 3 material—

a material that complies with the criteria listed in Clause F6.3.

Smoke growth rate index—

the index number for smoke ($SMOGR_{RC}$), predicted in accordance with Specification A2.4 using data obtained by testing of the material in accordance with ISO 9705.

F5 TESTING PROCEDURES

F5.1 Testing for groups

Tests to determine whether a wall or ceiling lining is a Group 1, Group 2 or Group 3 material shall comply with ISO 9705; or

NOTE: Groups may also be predicted in accordance with Clause 3 of BCA Specification A2.4 using data obtained by testing of the material at 50 kW/m² irradiance in accordance with AS/NZS 3837.

F5.2 Smoke growth rate index

The material shall be tested to determine the instantaneous rate of light-obscuring smoke in accordance with ISO 9705. The results of this test

shall then be used to predict the smoke growth rate index for wall and ceiling linings in accordance with Clause 4 of BCA Specification A2.4.

F5.3 Average specific extinction area

For the determination of the *average specific extinction area* for wall and ceiling linings AS/NZS 3837 at an irradiance of 50 kW/m² shall be used.

F6 ACCEPTANCE CRITERIA

F6.1 Group 1 material

Subject to Clause F6.4, and when tested in accordance with Clause F5, the material shall not reach flashover when exposed to 100 kW for 600 sec followed by exposure 300 kW for 600 sec.

F6.2 Group 2 material

Subject to Clause F6.4, and when tested in accordance with Clause F5, the material shall not reach flashover when exposed to 100 kW for 600 sec; but reaches flashover following exposure to 300 kW for less than 600 sec.

F6.3 Group 3 material

Subject to Clause F6.4, and when tested in accordance with Clause F5, the material shall not reach flashover in 120 sec or less when exposed to 100 kW, but reaches flashover in less than 600 sec when exposed to 100 kW.

F6.4 Materials in spaces not fitted with an aqueous fixed fire-extinguishing system

Group 1, Group 2, or Group 3 materials used in spaces not fitted with an aqueous *fixed fire-extinguishing system* complying with the requirements of this section, shall also have—

- a) a smoke growth rate index not more than 100; or
- b) an average specific extinction area less than 250 m²/kg.

F7 TRANSITIONAL ARRANGEMENTS

The criteria above harmonise with new provisions in the new Specification 1.10a under the BCA. Alternative criteria for Group 1, 2 and 3 *fire-restricting* materials are specified in Annex K. As a transitional arrangement, materials currently accepted under BCA Specification C1.10 will continue to be accepted until they are progressively replaced with materials accepted under BCA Specification C1.10a.

ANNEX G CRITERIA FOR LEVEL 1, LEVEL 2 AND LEVEL 3 EXPOSED FLOOR MATERIALS AND COVERINGS

G1 SCOPE

This Annex specifies criteria for Level 1, Level 2 and Level 3 *fire-restricting materials* applicable to exposed floor materials and coverings. This Annex forms a normative part of this document.

This Annex is referenced in Table 62.

G2 APPLICATION

This Annex applies to exposed floor materials and coverings required to be *fire-restricting materials* of Level 1, Level 2 or Level 3.

G3 REQUIRED OUTCOME

Exposed floor materials and coverings designated as Level 1, Level 2 or Level 3 *fire-restricting materials* must inhibit fire growth potential and smoke production within a space.

G4 DEFINITIONS

Critical radiant flux—

the critical heat flux at extinguishment as determined by ISO 9239-1.

Level 1 material—

a material that complies with the criteria listed in Clauses G6.1 and G6.4.

Level 2 material—

a material that complies with the criteria listed in Clauses G6.2 and G6.4.

Level 3 material—

a material that complies with the criteria listed in Clauses G6.3 and G6.4.

Smoke development rate—

the development rate for smoke as determined by ISO 9239-1.

G5 TESTING PROCEDURE

Tests to determine the critical radiant flux and smoke development rate of floor materials and floor coverings shall comply with ISO 9239-1.

G6 ACCEPTANCE CRITERIA

G6.1 Level 1 material

Subject to Clause G6.4, and when tested in accordance with Clause G5, the material shall have a critical radiant flux not less than 4.5.

G6.2 Level 2 material

Subject to Clause G6.4, and when tested in accordance with Clause G5, the material shall have a critical radiant flux not less than 2.4.

G6.3 Level 3 material

Subject to Clause G6.4, and when tested in accordance with Clause G5, the material shall have a critical radiant flux not less than 1.2.

G6.4 Materials in spaces not fitted with an aqueous fixed fire-extinguishing system

Level 1 or Level 2 materials used in spaces not fitted with an aqueous *fixed fire-extinguishing system* complying with the requirements of this section, shall also have a maximum smoke development rate of 750 per cent-minutes.

G7 TRANSITIONAL ARRANGEMENTS

The criteria above harmonise with new provisions in the new Specification 1.10a under the BCA. Alternative criteria for Level 1, 2 and 3 *fire-restricting* materials are specified in Annex K. This is a transitional arrangement while materials currently accepted under BCA Specification C1.10 are progressively replaced with materials under BCA Specification C1.10a.

ANNEX H CRITERIA FOR FURNITURE THAT COMPLIES WITH THE REQUIREMENTS FOR FIRE-RESTRICTING MATERIALS

H1 SCOPE

This Annex specifies requirements for furniture that complies with the requirements for *fire-restricting materials*. This Annex forms a normative part of this document.

This Annex is referenced in Table 62.

H2 APPLICATION

This Annex applies to one of the deemed-to-satisfy solutions for furniture specified in Table 62.

H3 REQUIRED OUTCOME

Furniture complying with this Annex must inhibit fire growth potential, heat flux, heat release and smoke production within a space.

H4 ACCEPTANCE CRITERIA

H4.1 Case furniture

All case furniture shall be constructed entirely of approved *non-combustible* or *fire-restricting materials*, except that a combustible veneer with a calorific value not exceeding 45 MJ/m² may be used on the exposed surface of such articles.

H4.2 Chairs, sofas and tables

All furniture such as chairs, sofas and tables shall be constructed with frames of *non-combustible* or *fire-restricting materials*.

ANNEX J PERFORMANCE OF FOAM MAKING BRANCH PIPES

J1 SCOPE

This Annex specifies requirements for *foam making branch pipes* that are designed to connect with the fire main. This Annex forms a normative part of this document.

This Annex is referenced in Clause 12.10.1.

J2 APPLICATION

This Annex applies to vessels required to be provided with *foam making branch pipes* under Clauses 6.4.15, 6.5.9 and 6.7.7

J3 DESCRIPTION

The *foam making branch pipe* shall consist of an air foam nozzle of an inductor type capable of being connected to the fire main by a fire hose, and drawing from a drum of foam concentrate.

J4 PERFORMANCE

The *foam making branch pipe* shall be capable of producing a solution rate of not less than 200 L/min and sufficient foam concentrate to operate for not less than 5 minutes. The *foam making branch pipe* shall be capable of producing finished foam with a minimum expansion ratio of 7.5:1 suitable for extinguishing a B-class fire.

NOTE: The actual minimum fire main pressure may need to be above that specified in Clause 4.7.2.1 to achieve the performance specified in this clause.

J5 SPARE CONCENTRATE

Spare drums of foam concentrate shall be carried on the vessel to supply the branch pipe for a further 5 minutes at the performance specified in Clause J4.

ANNEX K TRANSITIONAL ARRANGEMENTS FOR FIRE-RESTRICTING MATERIALS

K1 SCOPE

This Annex specifies requirements for *fire-restricting* bulkhead, ceiling and floor materials as an alternative to those specified in Annex F and Annex G. This Annex forms a normative part of this document.

This Annex is referenced in Annex F and Annex G.

K2 APPLICATION

This Annex applies as a transition arrangement while materials currently accepted under BCA Specification C1.10 are progressively replaced with materials under BCA Specification C1.10a. This Annex ceases to apply when BCA Specification C1.10 is superseded from that standard.

K3 TESTING PROCEDURE

The material shall be bonded to a substrate and tested in accordance with AS 1530 Part 3 to determine its early fire hazard properties.

K4 ACCEPTANCE CRITERIA

K4.1 Alternative to Group 3 bulkhead and ceiling materials and linings and Level 3 exposed floor materials and coverings

A material or component shall have a:

- a) Spread-of-Flame Index not more than 9; and
- b) Smoke Developed Index not more than 8 if the Spread-of-Flame Index is more than 5.

K4.2 Alternative to Group 2 bulkhead and ceiling materials and linings

A material or component shall have a:

- a) For ceilings—
 - i) Spread-of-Flame Index of not more than 6; and
 - ii) Smoke Developed Index of not more than 3.
- b) For bulkheads—
 - i) Spread-of-Flame Index of not more than 6; and
 - ii) Smoke Developed Index of not more than 5.

K4.3 Alternative to Level 2 exposed floor materials and coverings

A material or component shall have a:

- a) Spread-of-Flame Index of not more than 7; and
- b) Smoke Developed Index of not more than 5.

K4.4 Alternative to Group 1 bulkhead and ceiling materials and linings and Level 1 exposed floor materials and coverings

Apply the requirements for *low flame spread* surfaces in Annex E.