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**Small craft — Fire protection —**

Part 1:  
**Craft with a hull length of up to and  
including 15 m**

*Petits navires — Protection contre l'incendie —*

*Partie 1: Bateaux d'une longueur de coque inférieure ou égale à 15 m*



Reference number  
ISO 9094-1:2003(E)

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Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@iso.org)  
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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO 9094 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 9094-1 was prepared by Technical Committee ISO/TC 188, *Small craft*.

ISO 9094 consists of the following parts, under the general title *Small craft — Fire protection*:

- *Part 1: Craft with a hull length of up to and including 15 m*
- *Part 2: Craft with a hull length of over 15 m*

Annexes A and B form a normative part of this part of ISO 9094.

## Introduction

This part of ISO 9094 had received wide agreement when, due to the Montreal Protocol, Halon (the most suitable extinguishing medium in small craft) was banned. The requirements in clause 7 therefore had to be altered, and are defined in the form of “extinguishing capacity” which allows for further developments.

Special emphasis is given to the prevention of fire rather than fighting fires. Therefore, all other International Standards which have been developed by ISO/TC 188 were investigated concerning these preventive measures. They are referenced in clause 2 and the bibliography.

The formats of this part and ISO 9094-2 were aligned with each other in order to be as consistent as possible.

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# Small craft — Fire protection —

## Part 1:

## Craft with a hull length of up to and including 15 m

### 1 Scope

This part of ISO 9094 defines procedures to achieve a practical degree of fire protection, specifies portable fire-fighting equipment and sets requirements for fixed fire-fighting systems.

It applies to small craft of all types with a hull length,  $L_H$ , not exceeding 15 m. For small craft with a hull length greater than 15 m, ISO 9094-2 applies.

Personal watercraft are excluded from the scope of this part of ISO 9094.

### 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 9094. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 9094 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 3941:1977, *Classification of fires*

ISO 4589-3:1996, *Plastics — Determination of burning behaviour by oxygen index — Part 3: Elevated-temperature test*

ISO 5923:1989, *Fire protection — Fire extinguishing media — Carbon dioxide*

ISO 7840:1994, *Small craft — Fire-resistant fuel hoses*

ISO 8846:1990, *Small craft — Electrical devices — Protection against ignition of surrounding flammable gases*

ISO 10088:2001, *Small craft — Permanently installed fuel systems and fixed fuel tanks*

ISO 10133:2000, *Small craft — Electrical systems — Extra-low-voltage d.c. installations*

ISO 10239:2000, *Small craft — Liquefied petroleum gas (LPG) systems*

ISO 11105:1997, *Small craft — Ventilation of petrol engine and/or petrol tank compartments*

ISO 13297:2000, *Small craft — Electrical systems — Alternating current installations*

EN 1869: 1997, *Fire blankets*

### 3 Terms and definitions

For the purposes of this part of ISO 9094, the following terms and definitions apply.

**3.1 accessible**  
capable of being reached for inspection, removal or maintenance without removal of permanent boat structure

NOTE Hatches are not regarded as permanent boat structures in this sense, even if tools are needed to open them.

**3.2 readily accessible**  
capable of being reached for operation, inspection or maintenance without the removal of any part of the boat structure or use of tools or removal of any item of portable equipment, stowed in places intended for the storage of portable equipment, such as lockers, drawers or shelves

**3.3 engine space**  
space or compartment of the boat, containing main or auxiliary engine(s)

**3.4 fuel space**  
space containing permanently installed fuel tank(s) or intended for the storage of portable fuel tanks

**3.5 galley space**  
space to accommodate cooking stove(s)

**3.6 fixed fire-extinguishing system**  
system having components fixed in position

NOTE Hereinafter this system is called "a fixed system".

**3.7 manual fire-extinguishing system**  
system requiring manual operation by someone in attendance

**3.8 automatic fire-extinguishing system**  
system automatically activated when a preset temperature limit is reached, as it senses the presence of fire

**3.9 exit**  
any door, hatch, or aperture fulfilling the requirements of 4.2.2 to 4.2.5, leading to the open air

**3.10 open-flame device**  
any appliance where direct bodily contact with an open flame is possible

**3.11 room-sealed appliance**  
unit having a combustion system in which incoming combustion air and outgoing combustion products pass through sealed ductwork connected to the enclosed combustion chamber and terminating outside the craft

**3.12 petrol/gasoline**  
hydrocarbon fuel, or blends thereof, which is liquid at atmospheric pressure and is used in spark-ignition engines

NOTE In this context, kerosene is not regarded as petrol.



**3.13****diesel**

hydrocarbon fuel, or blends thereof, which is liquid at atmospheric pressure and is used in compression-ignition engines

**4 Fire prevention****4.1 Boat layout and design**

**4.1.1** Bilges that may contain spillage of flammable liquids shall be accessible for cleaning.

**4.1.2** Compartments containing petrol/gasoline engines and/or petrol tanks shall be separated from enclosed accommodation spaces. This condition is met where the structure fulfils the following requirements:

- a) the boundaries are continuously sealed (e.g. welded, brazed, glued, laminated or otherwise sealed);
- b) penetrations for cables, piping, etc. are closed by fittings, seals and/or sealants;
- c) access openings, such as doors, hatches, etc., are equipped with fittings so that they can be secured in the closed position.

The effectiveness of the boundary joints or sealing can be demonstrated either by documentation or visual inspection.

**4.1.3** Petrol/gasoline tanks within an engine room shall be in accordance with the requirements of ISO 10088 and shall be insulated from the engine or other source of heat by either

- a) a physical barrier between the tank and engine, engine-mounted components including fuel- and water-supply lines, and any source of heat (e.g. bulkhead, wall, insulating material, etc.), or
- b) an air gap to prevent any contact between the tank and engine, engine-mounted components, and any source of heat, the gap being wide enough to allow for servicing the engine and related components. The air gap shall be at least
  - 100 mm between a petrol engine and a fuel tank, or
  - 250 mm between a dry exhaust and a fuel tank.

**4.1.4** Passages through accommodation spaces shall not be obstructed.

**4.2 Escape routes and exits**

**4.2.1** The distance to the nearest exit to the open air shall not exceed 5 m.

Where the exit route passes beside an engine space, the distance to the nearest exit shall not exceed 4 m.

The distance shall be measured in the horizontal plane as the shortest distance between the centre of the exit and

- the farthest point where a person can stand (minimum height 1,60 m), or
- the midpoint of a berth,

whichever is the greater distance.

Where only one escape route is provided, this shall not pass directly over a cooker.

Where living or sleeping accommodation is separated from the nearest exit by a solid partition (e.g. a door) and leads directly past a cooker or engine space, an alternative exit shall be provided.

4.2.2 Any exit from an accommodation space shall have the following minimum clear openings:

- circular shape: diameter 450 mm;
- any other shape: minimum dimension of 380 mm and minimum area 0,18 m<sup>2</sup>. The dimension must be large enough to allow for a 380 mm diameter circle to be inscribed.

The measurement of the minimum clear opening is illustrated in Figure 1.

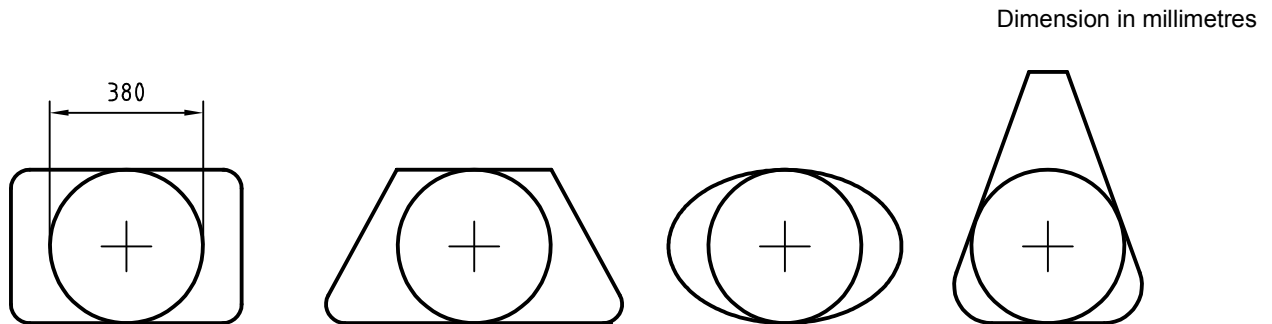


Figure 1 — Measurement of minimum clear opening

4.2.3 Exits shall be readily accessible and shall be capable of being opened from the inside and the outside when secured and unlocked.

4.2.4 Where deck hatches are designated as exits, footholds, ladders, steps or other means shall be provided. These aids shall be permanently installed and non-removable. The vertical distance between the upper foothold and the exit shall not exceed 1,2 m.

4.2.5 Exits other than the main companionway/door shall be identified by the appropriate ISO or national symbol.

### 4.3 Cooking and heating appliances

#### 4.3.1 Materials near cooking or heating appliances

Materials and finishes used in the vicinity of open-flame cooking and heating devices within the ranges defined in Figure 2 shall comply with the following requirements, taking into account the movement of the burner up to an angle of 20° for monohull sailboats or 10° for multihulls and monohull motorboats, where gimballed stoves are fitted.

- Free-hanging curtains or other fabrics shall not be fitted in Zone I and Zone II.
- Exposed materials installed in Zone I shall be glass, ceramics, aluminium, ferrous metals, or other materials with similar fireproof characteristics, or be thermally insulated.
- Exposed materials installed in Zone II shall be glass, ceramics, metal or other materials with similar fireproof characteristics, or be thermally insulated from the supporting substrate to prevent combustion of the substrate, if the surface temperature exceeds 80 °C. (See the fire test specified in annex A.)

NOTE The thermal insulation may be achieved by an air gap or the use of a suitable material.

These requirement do not apply to the materials of the cooker itself.

#### 4.3.2 General safety provisions

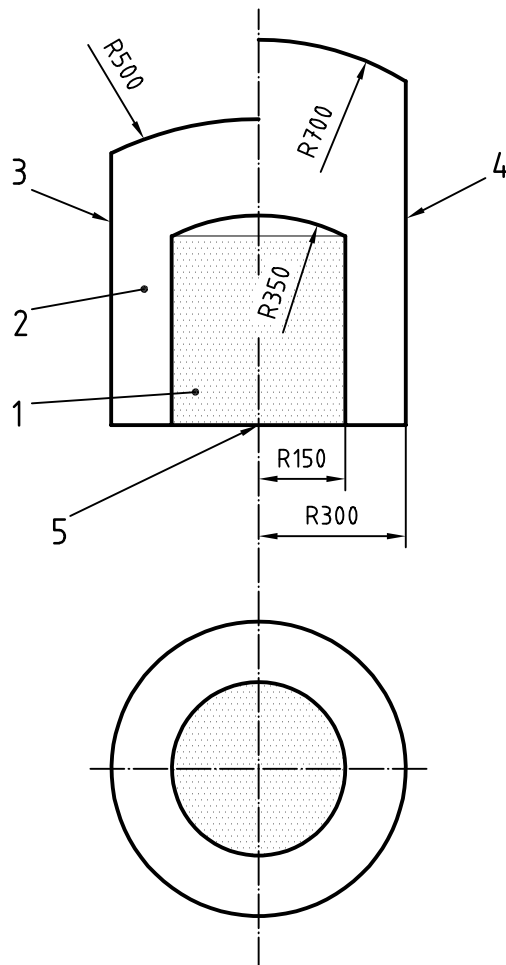
4.3.2.1 Where flues are installed, they shall be insulated or shielded to avoid overheating or damage to adjacent material or to the structure of the craft.

**4.3.2.2** For cooking and heating units using fuel which is liquid at atmospheric pressure (see ISO 14895), the following shall apply.

- Stoves and heating units shall be securely fastened.
- Open-flame burners shall be fitted with a readily accessible drip-pan.
- Where open-flame-type water heaters are installed, adequate ventilation and flue protection shall be provided.
- Where a pilot light is installed, the combustion chamber shall be room sealed, except for cookers.
- Appliances using petrol for priming, or as a fuel, shall not be installed.

For non-integral tanks and supply lines, the applicable requirements of ISO 10088 shall apply.

- Non-integral tanks shall be securely fastened and shall be installed outside Zone II, Figure 2.
- A readily accessible shut-off valve shall be installed on the tank. If this is outside the galley, a second valve shall be fitted in the fuel line in the galley space, outside Zone II, Figure 2, but not behind the cooker. This requirement does not apply where the tank is located lower than the cooker/heater and there is no possibility of back siphoning.
- Filler openings for tanks shall be visibly identified to indicate the type of fuel to be used with the system.



**Key**

- 1 Zone I
- 2 Zone II
- 3 LPG appliances
- 4 Liquid fuel appliances
- 5 Centre of burner

Measurements are taken from the centre of the burner.

**Figure 2 — Areas of special material requirements**

**4.4 Engine and fuel spaces**

**4.4.1** Material used for the insulation of engine spaces shall

- be fire retardant and shall present a non-fuel-absorbent surface towards the engine, and
- have an oxygen index (OI) of at least 21 in accordance with ISO 4589-3 at an ambient temperature of 60 °C.

Engine and fuel spaces shall be ventilated to prevent the build-up of possibly explosive gases.

For petrol/gasoline engines and petrol/gasoline fuel spaces, the requirements of ISO 11105 shall be fulfilled. ISO 11105 covers natural and powered ventilation.

#### 4.5 Electrical installations

D.C. electrical installations shall be in accordance with ISO 10133.

A.C. electrical installations shall be in accordance with ISO 13297.

These International Standards cover

- battery installation and shielding,
- conductor sizes, routing and protection, and
- overcurrent protection.

#### 4.6 Fuel installations

The installation of fuel systems and fixed fuel tanks shall be in accordance with ISO 10088 which covers

- fuel tanks: design, construction, material, grounding,
- fuel lines: diameter, routing, fastening, fire resistance,
- fill and vent lines: diameter, outlets, fire resistance, and
- fittings, valves, filters.

#### 4.7 Liquefied petroleum gas (LPG) systems

LPG systems shall be in accordance with ISO 10239 which covers

- working pressure of the system,
- stowage of gas containers,
- material and routing of LPG supply lines,
- installation, ventilation,
- appliances and their connection, and
- leakage tests.

#### 4.8 Ignition protection

Only ignition-protected items in accordance with ISO 8846 shall be installed in compartments that contain

- petrol engines,
- petrol fuel tanks,
- LPG or CNG cylinders,
- petrol fuel-line fittings,
- LPG- or CNG-line fittings, with the exception of connections in the accommodation space near the appliance, and
- portable petrol tanks or outboard motors with integral petrol fuel tanks.

## 5 Fire-extinguishing equipment

### 5.1 ISO classification of fires

ISO 3941 defines classes of fires according to the nature of the material undergoing combustion. In consequence, it does not define a particular class of fire involving an electrical risk.

The following designations are used to identify and classify fires according to their type and the effectiveness of various extinguishers and extinguishants,

- ISO Class A: fires involving solid materials, usually of organic nature, in which combustion normally takes place with the formation of glowing embers.
- ISO Class B: fires involving liquids or liquefiable solids.
- ISO Class C: fires involving gases.
- ISO Class D: fires involving metals.

### 5.2 Suitability of extinguishing medium

Account shall be taken of the suitability of a specific extinguishing medium to fight fires of a certain category.

### 5.3 Requirements

#### 5.3.1 General

Provisions shall be made for the craft to be equipped with fire-fighting equipment according to the boat size and engines, and to the presence of open-flame devices.

#### 5.3.2 Accommodation

The accommodation area shall be equipped with either

- portable fire extinguishers according to clause 6, or
- fixed fire-extinguishing systems according to clause 7, plus one or more portable fire extinguishers according to clause 6.

#### 5.3.3 Galley

The galley shall be protected either

- by a portable fire extinguisher (clause 6), or
- by a fire blanket (clause 9), or
- by water-fog systems.

Sprinkler-type systems shall not be used.

#### 5.3.4 Engine and/or fuel spaces

##### 5.3.4.1 Protection of engine and/or fuel spaces

The protection of engine and/or fuel spaces shall be achieved according to the requirements given in Table 1.

Table 1 — Protection of the engine and/or fuel space

Engine position	Type and rating of engine	Protection achieved by
Open boat with engine(s) or part of engines above cockpit sole, nearly vertical casing	Petrol inboard engine of less than 120 kW Diesel engine	— fixed fire-fighting system (clause 7), or — portable fire extinguisher sized and suited to flood the engine space through a fire port in the engine casing
Open boat with transom-mounted outboard motor, and portable fuel tank stowage in the open atmosphere	Petrol outboard engine	No requirement for single outboard engine < 25 kW (clause 6.4 applies)
Open boat with transom-mounted outboard motor(s), and more than one portable fuel tank per engine or tank(s) installed in an enclosed space	Petrol outboard engine	— fixed fire-fighting system to protect the fuel space (clause 7), or — portable fire extinguisher sized and suited to flood the fuel space through a fire port in the fuel-space boundary
Engine below cockpit level or inside boat	Petrol inboard engine	— fixed fire-fighting system (clause 7)
	Diesel inboard engine(s) of less than or equal to 120 kW combined rating (main and auxiliaries)	— fixed fire-fighting system (clause 7), or — portable fire extinguisher of a type and size suitable to flood the engine space through a fire port in the engine casing
	Diesel inboard engine(s) of more than 120 kW combined rating (main and auxiliaries)	— fixed fire-fighting system (clause 7)

#### 5.3.4.2 Extinguishing medium and capacity

The extinguishing medium shall be suitable for extinguishing an engine room fire, and flooding the entire space.

The extinguishing capacity of the portable extinguisher shall be sufficient for the volume of the engine space.

A discharge opening shall be provided so that the extinguishing medium can be discharged into the engine space without opening the primary access.

NOTE For engine spaces with a gross volume  $\leq 1 \text{ m}^3$ , any extinguishing medium suitable for extinguishing Class B fires is considered to fulfil this requirement.

#### 5.3.4.3 Fire port

The fire port shall be

- identified,
- sized to accept the discharge nozzle,
- open or openable to provide ready access for discharge of the medium into the engine space,
- located so that the required size of extinguisher can be operated in a position that will allow complete discharge of the extinguishing medium.

## 6 Portable fire extinguisher

### 6.1 Purpose

This clause specifies type(s), size(s), number, location and storage of portable fire extinguishers on board. This part of ISO 9094 is not intended to regulate the requirements for the extinguishers themselves, which are subject to national regulations.

The number, type and capacity of portable fire extinguishers and the extinguishing media may also be subject to national regulations.

### 6.2 General requirements

**6.2.1** Any portable fire extinguisher shall be readily accessible.

**6.2.2** If the portable fire extinguisher is located where it is exposed to water spray, the extinguisher operating nozzle and triggering device shall be shielded, unless the extinguisher is certified or listed for marine service.

**6.2.3** The extinguisher may be stowed away in a locker or other protected or enclosed space. The locker or the opening part of the enclosed-space door shall carry the appropriate ISO symbol.

**6.2.4** Portable carbon dioxide (CO<sub>2</sub>) extinguishers may only be located in accommodation spaces where energized electrical equipment is located (e.g. electric motor space, battery space, switchboard) or flammable liquids are present (e.g. galley).

The requirements of ISO 5923 apply for CO<sub>2</sub> as an extinguishing medium.

### 6.3 Type, capacity and number

**6.3.1** The craft shall be protected in the manner described in 6.3.2 to 6.3.8.

**6.3.2** The number of portable extinguishers shall be determined according to the requirements of 6.3.7, 6.3.8 and 6.4.

**6.3.3** No A/B-rated individual fire extinguisher shall be rated less than 5A/34B.

**6.3.4** Any individual CO<sub>2</sub> extinguisher shall have a maximum capacity of 2 kg.

**6.3.5** There may be no more than one CO<sub>2</sub> extinguisher in each hazard area.

**6.3.6** Where a CO<sub>2</sub> extinguisher is provided, except for open boats, a warning notice shall be affixed near such an extinguisher (see normative annex B, Notice No. 4 in B.4.5).

**6.3.7** Boats fitted with an open-flame device, e.g. stove, heater or lamp, shall carry either

- one or more portable fire extinguisher(s) with a minimum combined capacity of 8A/68B, or
- 1 fire blanket for the protection of the cooker/galley according to clause 9 and a portable fire extinguisher with a minimum capacity of 5A/34B.

**6.3.8** Boats with an outboard motor of more than 25 kW shall carry one or more portable fire extinguisher(s) with a minimum combined capacity of 8A/68B.

### 6.4 Location

The minimum number of portable fire extinguishers to be carried shall meet the requirements of 6.3 and the following.



There shall be a portable fire extinguisher located

- within 1 m from the main helm position or the cockpit for boats with  $L_H < 10$  m,
- within 2,5 m from the main helm position or the cockpit for boats with  $L_H$  from 10 m to 15 m,
- within 2 m from any cooker or permanently installed open-flame device, but so located that it is accessible in the event of fire, unless it is replaced by a fire blanket in accordance with clause 9,
- outside the engine space but no more than 2 m from the fire port, and
- within 5 m from the centre of a berth, measured according to Figure 1.

A single extinguisher may meet more than one of these requirements.

## 7 Fixed fire-extinguishing systems

### 7.1 Purpose

This clause specifies requirements for fixed fire-fighting systems, manually or automatically put into operation, if fitted, using extinguishing media suitable for total coverage or flooding of an enclosed space and capable of extinguishing fires of Class A and B. These requirements are relative to size, location and installation.

This part of ISO 9094 does not specify the technical requirements for the cylinders themselves which may be subject to national regulations.

### 7.2 Requirements

#### 7.2.1 Manual system

A fixed system put into operation manually shall be activated from the main steering position.

If that position is more than 5 m away from the section or space to be protected, a means of local activation shall be provided near that space.

#### 7.2.2 Automatic system

A fixed system that is automatically activated shall comply with the requirements of 7.4.

#### 7.2.3 Manual/automatic combined system

The arrangement of a combined manual/automatic system shall be such that the operator can manually override the automatic mode. The system shall comply with the requirements of 7.4.

### 7.3 Application

The installation of a fixed system using an asphyxiant as the extinguishing medium is limited to spaces in a boat that are not intended for accommodation purposes and are separated from the accommodation area. This requirement is fulfilled if the spaces have no permanent openings other than for the following purposes:

- connection to the surrounding bilges;
- ventilation of engine space and supply of combustion air;
- openings for piping and cables;
- openings for access to equipment.

If the extinguishing medium is an asphyxiant, the separating structure shall be constructed to minimize the flow of the medium into the accommodation area.

## 7.4 Installation

### 7.4.1 General

The components of a fixed system shall be securely fastened to the boat's structure to withstand motions, shock and vibrations during normal running conditions.

Cylinders, distribution lines and controls shall be located so that they will not be subject to temperatures outside the system's designed operating range, while the boat is in service.

### 7.4.2 Cylinders/containers

Cylinders/containers may be installed either inside or outside the space to be protected.

To minimize corrosion, cylinders shall be mounted clear of the anticipated bilge-water level. They shall be accessible for removal, and the controls and dials shall be readily accessible and visible. Cylinders shall be mounted to provide clearance above surfaces on which water may accumulate.

### 7.4.3 Manual system, release device

The release device shall be visible or its location visibly labelled and the protected space identified.

The release device shall be readily accessible and operable.

### 7.4.4 Distribution line

Non-metallic components of the distribution line(s), including fixtures that are not intended to melt as part of the fire-fighting system as installed, shall be fire resistant in accordance with ISO 7840.

Solder or brazing material used for metallic lines or fittings shall have a melting temperature of not less than 600 °C.

The number and location of discharge nozzle(s) shall ensure effective extinguishing of fires within the space.

## 7.5 Discharge and control

7.5.1 A visual indication of discharge shall be provided.

7.5.2 The system shall be installed such that the discharge shall be completed according to the extinguisher manufacturer's specification.

7.5.3 If the extinguishing medium is an asphyxiant and if the protected space is of sufficient size to be occupied by a person (working or carrying out another action), upon activating the system an alarm, which is audible throughout the craft, shall sound prior to the extinguishing medium being released.

7.5.4 If more than one system is installed in a hazard space, each system shall be capable of individually protecting the space, unless they are simultaneously discharged.

## 7.6 Operation

### 7.6.1 Range of operation

The fixed system shall be capable of operating above an ambient temperature of 0 °C.

### 7.6.2 Discharge instructions

A label showing how to discharge the system shall be provided immediately adjacent to the release device.

### 7.6.3 Operating instructions

Operating instructions shall be provided for each system. If the extinguishing medium is an asphyxiant, these shall include directions on how to ventilate the space prior to entering for damage assessment and subsequent restarting of the engine.

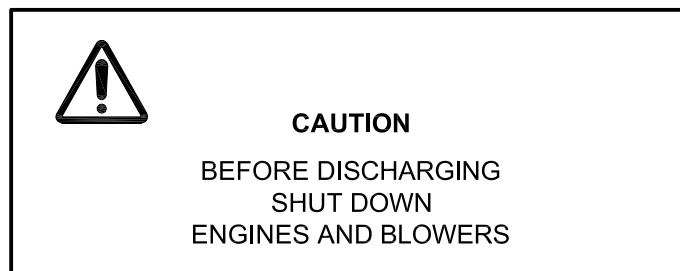
### 7.7 Design concentration

The extinguishing capacity of the system shall be based on the net volume of the compartment (volume of air plus 20 %).

## 8 Displayed information

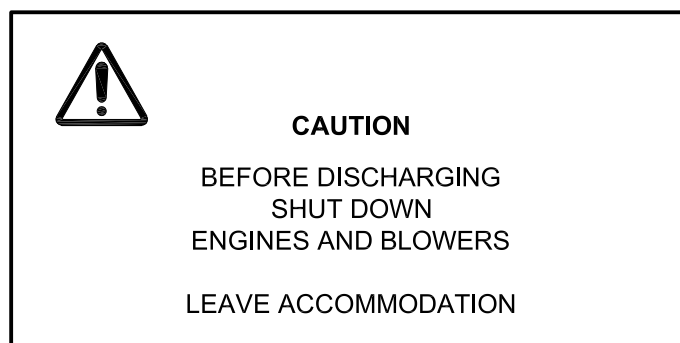
**8.1** Where a space which is regarded as being separated from adjacent accommodation is protected by a fixed system, the following information shall be displayed near the release device.

*Background: Yellow*



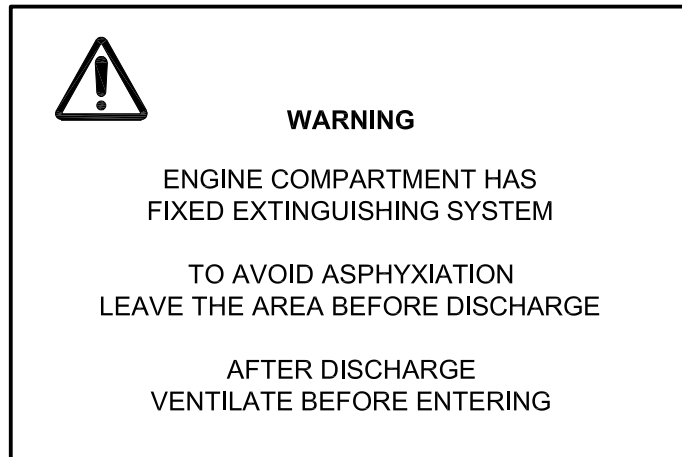
**8.2** Where a space which cannot be regarded as being separated from adjacent accommodation is protected by a fixed system, the following information shall be displayed near the release device.

*Background: Yellow*



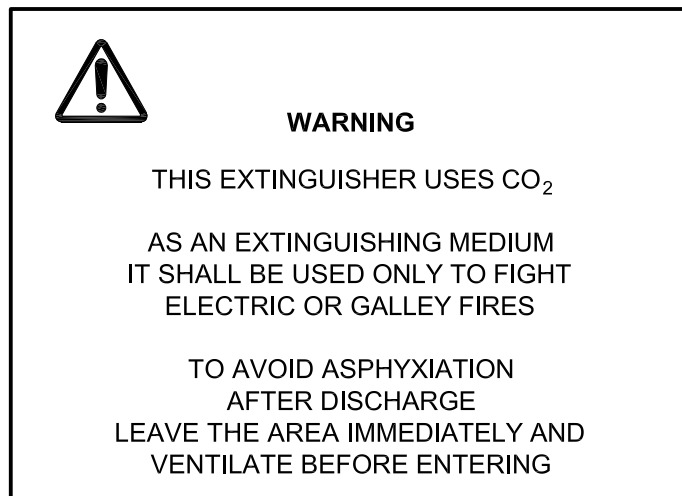
8.3 The following information shall be displayed at any entrance to the protected space(s), if the extinguishing medium is an asphyxiant.

*Background: Yellow or orange*



8.4 The following information shall be displayed near any CO<sub>2</sub> portable extinguisher

*Background: Yellow or orange*



8.5 The information shall be in the appropriate language, and it may be represented by symbols in accordance with ISO 6309 or other relevant standards.

## 9 Fire blanket

A fire blanket, in accordance with EN 1869, shall be placed within reach of any open-flame cooker or deep fat fryer, but not so located that it may be inaccessible in the event of a fire.

The fire blanket shall be readily accessible and ready for immediate use.

## 10 Owner's manual

The information and instructions to be included in the owner's manual are specified in annex B.

## **Annex A**

(normative)

### **Fire test**

For conducting the test, each of the open-flame burners shall be covered by a metal plate of diameter 200 mm and a thickness of  $3 \text{ mm} \pm 0,2 \text{ mm}$ . The flames shall burn for 10 min, the controls being set to the maximum. At the end of the burning period, the surface temperature of any material around the open-flame device shall be measured.

## Annex B (normative)

### Instructions and information to be provided in the owner's manual

#### B.1 Fire-fighting equipment

##### B.1.1 Portable fire extinguishers

This boat, when in service, shall be equipped with portable fire extinguishers of the following extinguishing capacities and in the following locations:

(Sketch or description of position).

No. 1:	Location .....	Fire rating .....
No. 2:	Location .....	Fire rating .....
No. <i>n</i> :	Location .....	Fire rating .....

##### B.1.2 Fire blanket

A fire blanket shall be placed in the following location:

(Description of position).

##### B.1.3 Servicing of fire-fighting equipment

The boat owner/operator shall

- have fire-fighting equipment checked at the intervals indicated on the equipment,
- replace portable fire extinguishers, if expired or discharged, by devices of identical fire-fighting capacity, and
- have fixed systems refilled or replaced when expired or discharged.

#### B.2 Responsibility of boat owner/operator

It is the responsibility of the boat owner/operator

- a) to ensure that fire-fighting equipment is readily accessible when the boat is occupied, and
- b) to inform members of the crew about
  - the location and operation of fire-fighting equipment,
  - the location of discharge openings into the engine space, and
  - the location of routes and exits.

## B.3 Cautionary notices to the boat operator

### B.3.1 General

Keep the bilges clean and check for fuel and gas vapours or fuel leaks frequently.

When replacing parts of the fire-fighting installation, only matching components shall be used, bearing the same designation or having equivalent technical and fire-resistant capabilities.

Do not fit free-hanging curtains or other fabrics in the vicinity of, or above, cookers or other open-flame devices.

Do not stow combustible material in the engine space. If non-combustible materials are stowed in the engine space, they shall be secured against falling into machinery and shall cause no obstruction to access into or from the space.

Exits other than the main companionway doors or hatches with permanently fixed ladders are identified by a symbol (see Table B.1).

### B.3.2 Specific warnings

Never

- obstruct passageways to exits and hatches,
- obstruct safety controls, e.g. fuel valves, gas valves, switches of the electrical system,
- obstruct portable fire extinguishers stowed in lockers,
- leave the craft unattended when cooking and/or heating appliances are in use,
- modify any of the craft's systems (especially electrical, fuel and gas) or allow unqualified personnel to modify any of the craft's systems,
- fill any fuel tank or replace gas bottles when machinery is running, or when cooking or heating appliances are in use,
- smoke while handling fuel or gas.

## B.4 Displayed warning notices

**B.4.1** The warning notices in B.4.2 to B.4.5 shall be displayed in the craft in the form of labels.

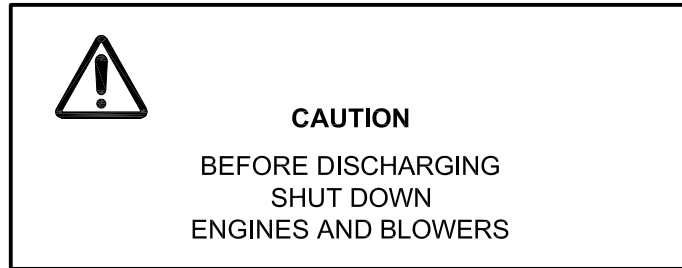
The boat manufacturer shall select the appropriate notice(s) from the following selection.

The applicable caution and warning notices shall be displayed in the owner's manual or their wording be repeated, as specified in clause 8.

**B.4.2** Where a space which is regarded as being sealed is protected by a fixed system, the following information shall be displayed near the release device.

**Notice No. 1**

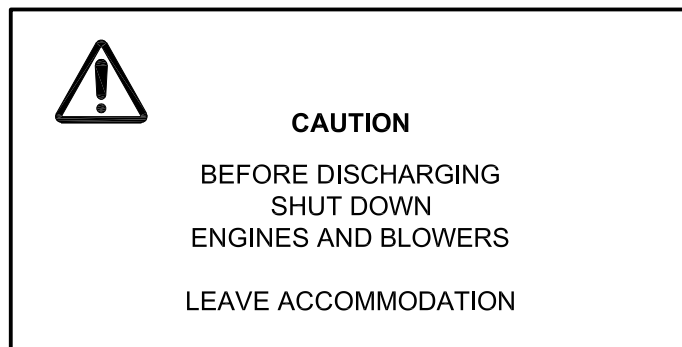
*Background: Yellow*



**B.4.3** Where a space, which is protected by a fixed system, cannot be regarded as being sealed from adjacent accommodation, the following information shall be displayed near the release device.

**Notice No. 2**

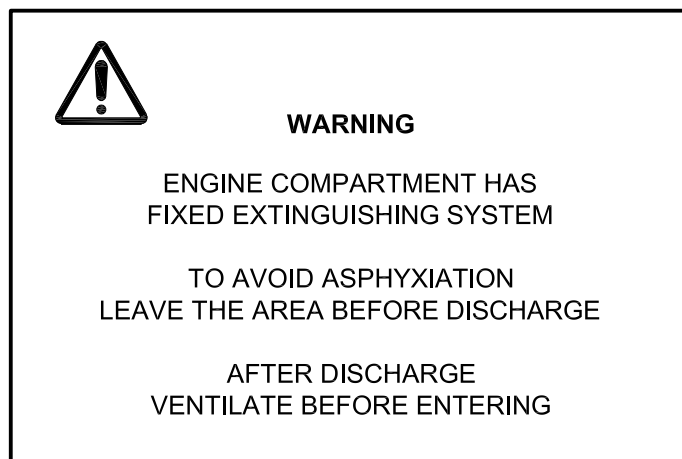
*Background: Yellow*



**B.4.4** The following information shall be displayed at any entrance to the protected space(s), if the extinguishing medium is an asphyxiant.

**Notice No. 3**

*Background: Yellow or orange*

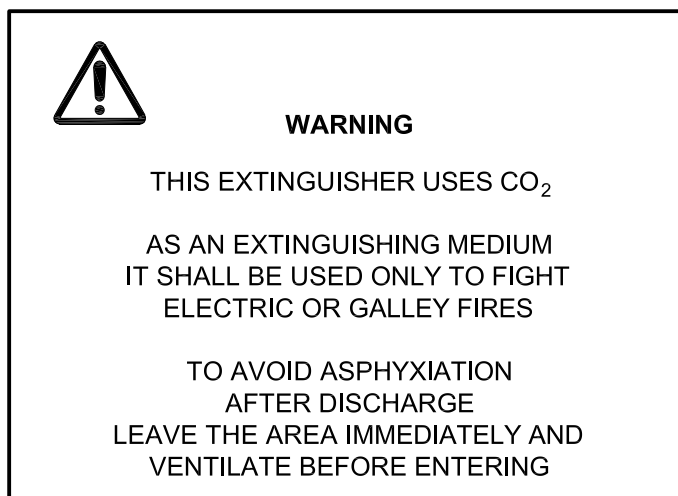


**B.4.5** The following information shall be displayed near any CO<sub>2</sub> portable extinguisher:



**Notice No. 4**


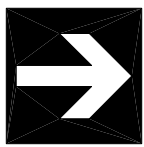
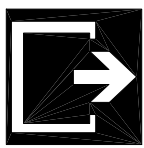
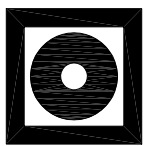

Background: Yellow or orange



**B.5 Displayed symbols**

The following symbols shall be displayed in the small craft where appropriate.

**Table B.1 — Symbols**

Symbol	Colour		Application	Source
	Symbol/Text	Background		
	white	red	Designated place of portable fire extinguisher or locker where it is stowed	ISO 6309:1987: No. 11
	white	green	Direction to escape	ISO 3864-1:2002, Figure 15
	white	green	Near escape, e. g. escape hatches	ISO 7001:1990, Sheet No. 27
	white	red	To indicate the manual control of a fixed fire-extinguishing system	ISO 6309:1987: No. 1
	Circular band: red Diagonal bar: red Match symbol: black	white	Near flammable liquids (filler caps, tanks, LPG locker)	ISO 3684:1984: B.1.2
NOTE Other symbols may be used as appropriate, preferably from ISO 6309:1987.				

## Bibliography

- [1] ISO 6309:1987, *Fire protection — Safety signs*
- [2] ISO 7165:1999, *Fire-fighting — Portable fire extinguishers — Performance and construction*
- [3] ISO 8665:1994, *Small craft — Marine propulsion engines and systems — Power measurements and declarations*
- [4] ISO 14895:2000, *Small craft — Liquid-fuelled galley stoves*
- [5] EN 3:1996, (all parts), *Portable fire extinguishers*

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