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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*  
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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*

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

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## 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)

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**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.

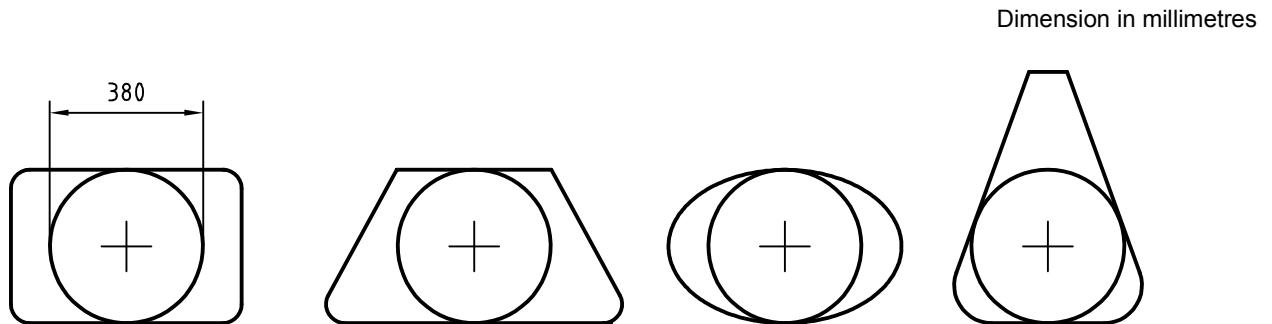


Figure 1 — Measurement of minimum clear opening

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.

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