
**Small craft — Fire protection —
Part 2:
Craft with a hull length of over 15 m**

Petits navires — Protection contre l'incendie —

Partie 2: Bateaux d'une longueur de coque supérieure à 15 m

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.ch
Web www.iso.ch

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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 9094-2 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

Whereas ISO 9094-1 generally follows established requirements for smaller boats, where “open” accommodation is the normal arrangement, this part of ISO 9094 establishes different approach, taking into account the fact that, for larger craft, separate cabins are the most likely layout. Therefore, the requirement for alternative escape routes is the prime objective. Despite this, both parts of ISO 9094 are consistent at the transitional hull length (L_H) of 15 m for “open” accommodation.

The formats of this part and ISO 9094-1 were aligned with each other in order to be as consistent as possible.

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Small craft — Fire protection —

Part 2: Craft with a hull length of over 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 , greater than 15 m and up to and including 24 m.

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 8665:1994, *Small craft — Marine propulsion engines and systems — Power measurements and declarations*

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 [ISO 9094-2:2002](https://standards.iteh.ai/catalog/standards/sist/7d877b54-de67-4f56-b815-71914321e7b/iso-9094-2-2002)
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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 4.3, which leads to the open air either directly or via other sections of the craft

3.10 section
any area of the craft that is separated from the rest of the vessel by fixed boundaries, such as decks or bulkheads, which may be fitted with a door or hatch

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

3.12 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

3.13**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.

3.14**diesel**

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

3.15**hazard area**

location where an increased risk of fire exists due to

- presence of open flames (cooker, heater, permanently installed lamps, etc.);
- presence of heat and/or the possibility of electric sparks near flammable liquids/vapour (e.g. in engine spaces);
- possibility of electric sparks near flammable liquids/vapour (e.g. in fuel spaces with live electrical equipment);
- electrical equipment with the possibility of overcurrent (e.g. main switchboard, battery banks, etc.)

3.16**escape route**

way through which a person has to pass, between any part of the craft where that person can be and the nearest exit

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4 Fire prevention

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4.1 Boat layout and design

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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/gasoline tanks shall be separated from enclosed accommodation spaces. This condition is met if 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 may 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 any 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, and engine-related components, and any source of heat, the gap being wide enough to allow for servicing the engine and its 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 Where a non-metallic flexible hose is part of a water-cooled exhaust system, an alarm at the main steering position shall be activated if there is a loss of cooling water or if the temperature inside the exhaust line surpasses a preset limit.

4.1.5 Passages through accommodation spaces shall not be obstructed.

4.2 Escape routes

4.2.1 General

The following requirements shall be met irrespective of the accommodation arrangement.

Where there are two escape routes only one may pass through, over and beside an engine space.

Where the distance between a cooking or open-flame heating-appliance burner and the nearest side of an escape route is less than 750 mm, a second escape route shall be provided. In an enclosed galley, this requirement does not apply where the dead end beyond the cooker is less than 2 m.

No escape route shall pass directly over a cooking or open-flame heating appliance.

4.2.2 Open-accommodation arrangement

Where living or sleeping accommodation is not separated from the nearest exit, i.e. people can move around without passing through any door, the following shall apply.

The distance to the nearest exit shall not exceed $(L_H/3)$ m.

The distance shall be measured in the horizontal plane as the shortest distance between the nearest part 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.

NOTE Doors of toilet or shower compartments are disregarded.

4.2.3 Enclosed accommodation arrangement

Where living or sleeping accommodation is separated from the nearest main exit by bulkheads and doors, escape routes and exits from accommodation areas shall be arranged to reduce the risk of people being trapped and the following conditions shall be met.

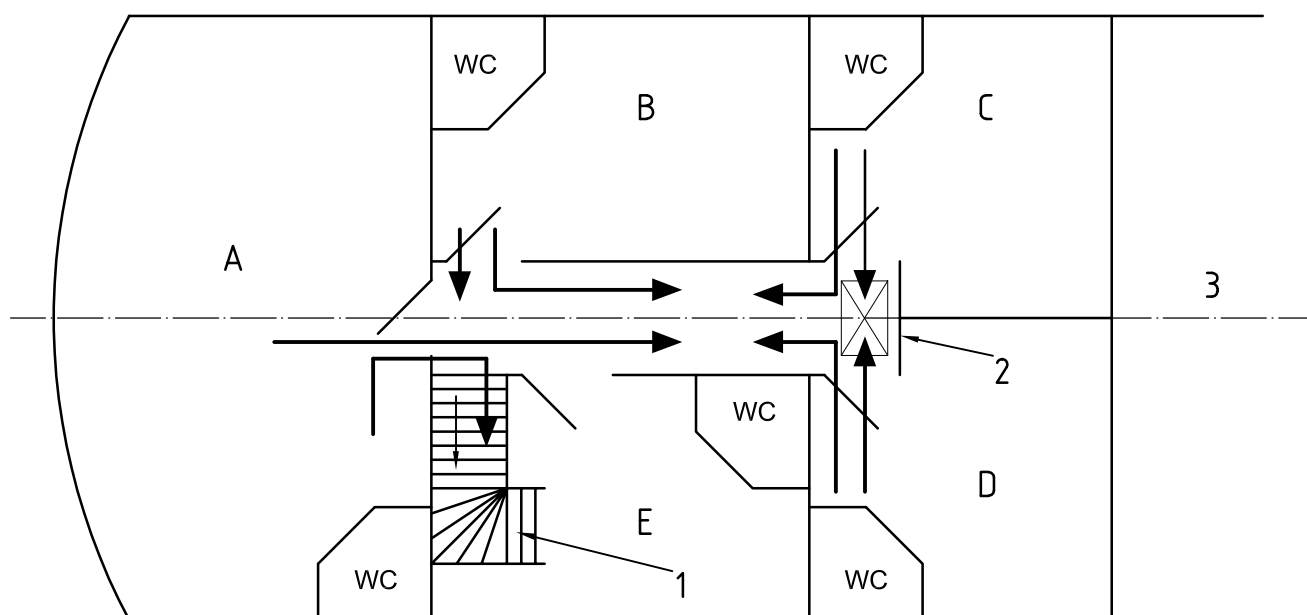
— Each accommodation section shall have more than one escape route leading finally to the open air, unless it is a single cabin or compartment intended to accommodate no more than four persons and the exit leads directly to the open air without passing through or over engine spaces or over cooking appliances. The cabin must not contain cooking or open-flame heating devices.

— For individual cabins intended to accommodate no more than four persons, and not containing cooking or open-flame heating devices, escape routes may form shared escape ways for up to 2 m, measured to a two-way escape route from the door or entrance.

— Shower and toilet compartments are regarded as part of the compartment or passageway that gives access to their doors and therefore do not require alternative escape routes.

— With multilevel arrangements, the exits shall lead to a different accommodation section or compartment, as far as practicable.

Figure 1 shows a typical cabin arrangement of a big motor yacht. According to the conditions specified above, this section of the craft requires two exits, because the shared route from cabins C and D is longer than 2 m. In this case, the two exits are the main staircase (primary exit) and a deck hatch between cabins C and D (secondary exit).



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Key

- A Cabin A
- B Cabin B
- C Cabin C
- D Cabin D
- E Cabin E
- 1 Primary exit
- 2 Secondary exit
- 3 Engine space

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Figure 1 — Escape routes and exits

4.3 Exits

Any exit from an accommodation space or from any other 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 m². The exit shall 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 2.

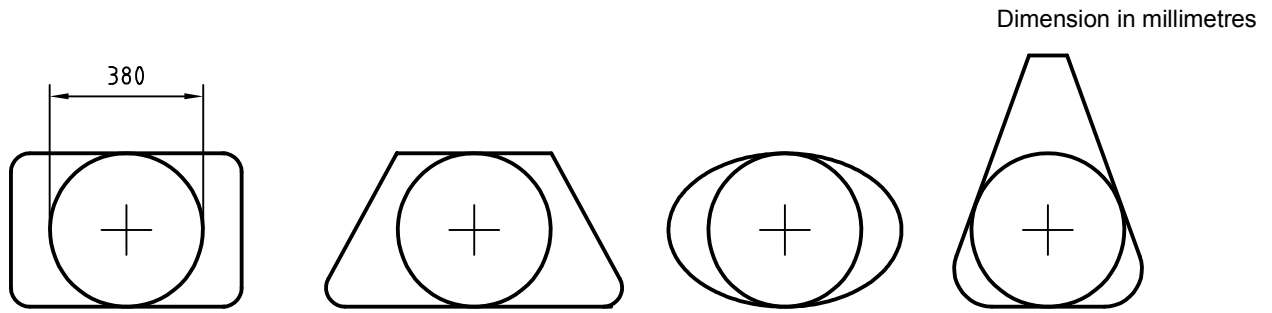


Figure 2 — Measurement of minimum clear opening

Exits shall be readily accessible. Exits leading to the weather deck or to the open air shall be capable of being opened from the inside and outside when secured and unlocked. The requirement does not apply to portlights of sufficient size to be designated as exits.

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

These aids shall be permanently located in the accommodation space (and be marked, unless their use is self-evident).

Escape facilities, unless self-evident, or doors shall be identified by the appropriate ISO or national symbol.

4.4 Cooking and heating appliances

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4.4.1 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 3 shall comply with the following requirements, taking into account the movement of the burner up to an angle of 20° for monohull sailboats and 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.
- Exposed materials installed in Zone II shall be glass, ceramics, metal or other material with similar fireproof characteristics. They shall 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.