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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Small craft — Fire protection

Petits navires — Protection contre l'incendie

(Revision of ISO 9094-1:2003 and ISO 9094-2:2004)

ICS 47.080

ISO/CEN PARALLEL PROCESSING

This draft has been developed within the International Organization for Standardization (ISO), and processed under the **ISO-lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five-month enquiry.

Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

Pour accélérer la distribution, le présent document est distribué tel qu'il est parvenu du secrétariat du comité. Le travail de rédaction et de composition de texte sera effectué au Secrétariat central de l'ISO au stade de publication.

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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 2.

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 document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

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

This first edition of ISO 9094 cancels and replaces ISO 9094-1:2003 and ISO 9094-2:2002.

The major technical changes concern:

— change in definition of "readily accessible" being for "emergency conditions";

— added definitions and requirements for cooking, solid fuel stoves and heating appliance installations;

— requirements for cooking and heating appliances using liquid fuel;

— specific requirements addressing compartments containing petrol tanks and containers and portable petrol driven engines;

— added requirements for fire protection for "domed glass" deck lights;

— fire detection requirements for craft over 12 m;

— clarification of escape routes for quarter cabin arrangements;

— detailed requirements for access to deck hatches designated as fire exits;

— changes to engine and engine space fire extinguishing requirements;

— fixed fire extinguishing systems to be "approved systems";

— requirement for diesel engine shut down and "shut off dampers";

— audible alarm requirements required only for protected spaces able to be occupied.

Introduction

This International Standard covers the prevention of fire and the protection of life in case of fire on small craft.

The requirements in this document may not be effective against some battery chemistries (for example Lithium based products). Battery manufacturers should be consulted for appropriate methods of fire suppression.

Small craft — Fire protection

1 Scope

This International Standard defines a practical degree of fire prevention and protection intended to provide enough time for craft occupants to escape a fire on board small craft. The standard specifies minimum requirements for craft layout, the installation of craft systems, fire fighting and escape and provides guidance on fire detection.

It applies to all small craft of up to 24 m hull length.

Personal watercraft are excluded from the scope of this standard.

3 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3941:2007, Classification of fires

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

ISO 5923:1989, Fire protection -- Fire extinguishing media -- Carbon dioxide

ISO 6309:1987, Fire protection -- Safety signs

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

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

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

ISO 10239, *Small craft — Liquefied petroleum gas systems*

ISO 10240:2004, Small craft — Owners manual

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

ISO 12216, *Small craft — Windows, portlights, hatches, deadlights and doors — Strength and watertightness requirements*

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

ISO 14895, *Small craft — Liquid fuelled galley stoves*

ISO 21487, *Small craft — Permanently installed petrol and diesel fuel tanks*

IEC 60092-507:2008, *Electrical installations in ships — Part 507: Small vessels*

EN 1869:1997, Fire blankets

4 Terms and definitions

For the purposes of this standard, 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 1 to entry: 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 quickly and safely for effective use under emergency conditions without the use of tools

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

3.4
fuel space
space or compartment surrounded by permanent boat structure containing permanently installed fuel tank(s) or designated for the storage of portable fuel tanks

3.5
fixed fire extinguishing system
system having all components fixed in position and having automatic activation and/or manual release from outside of the space protected

Note 1 to entry: In the following text this system is called "a fixed system".

3.6
fire exit
any door, hatch, or aperture designated as an exit in case of fire and leading either directly or via other areas of the craft, to the open air

Note 1 to entry: An exit not specifically designated as a fire exit can be considered as a fire exit if it fulfils the requirements in 6.2

3.7
open-flame device
any appliance where direct bodily contact with an exposed open flame is possible during normal operation

3.8
room sealed combustion chamber
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

3.9
petrol/gasoline
hydrocarbon fuel or blends thereof which is liquid at atmospheric pressure and is used in spark ignition engines

3.10
diesel
hydrocarbon fuel or blends thereof which is liquid at atmospheric pressure and is used in compression ignition engines

3.11
asphyxiant (extinguishing medium or gas)
any fire extinguishing medium that can dilute or displace oxygen in air, leading to asphyxiation if inhaled

3.12
toxic (extinguishing medium or gas)
any fire extinguishing medium that can be poisonous or harmful if inhaled

3.13
escape route
way through which a person has to pass to access the nearest exit or fire exit

3.14
cooking appliance
appliance intended to be used for the preparation of food and that makes use of burners, electrical heating elements, an oven, grill, a broiler or any combination of these items

3.15
habitable space
space surrounded by permanent boat structure in which there is provision for any of the following activities: sleeping, cooking, eating, washing/toilet, navigation, steering.

Note 1 to entry: Spaces intended exclusively for storage, open cockpits with or without canvas enclosures and engine rooms are not included.

3.16
radiated heat device
any appliance intended to transfer heat over 65 °C from its surfaces to adjacent surfaces during normal operation by way of radiation

Note 1 to entry: For example solid fuel stoves used for comfort heating, however note that most radiant heat devices also transfer heat to the air using conduction and convection.

3.17
solid fuel stove
heating appliance intended to be fueled by solid fuel minerals, natural or manufactured wood logs or pellets including solidified alcohol

3.18
hazard area
location where an increased risk of fire exists due to presence of open flame or radiated heat devices or presence of heat and/or the possibility of electric sparks or over-current near flammable liquids/vapour

Note 1 to entry: For example cookers, heaters, solid fuel stoves, permanently installed lamps, etc. in ~~spaces~~ space to accommodate cooking appliances and sparks in engine spaces.

3.19
heating appliance
appliance intended to be used for comfort heating with or without integral heat sources and irrespective of the fuel type

3.20
domed glass decklight
a clear glass deck fitting usually no more that 200 mm diameter providing daytime lighting to dimly lit inboard spaces by refracting sunlight

3.21
shut off damper
air damper or rated fire damper device that closes or reduces air flow at engine space air intakes and/or exhaust ventilators

3.22
portlight
openable window in the hull of the craft below the sheer line and above the waterline

5 Fire prevention

5.1 Cooking and heating appliances

5.1.1 General

Cooking and heating appliances shall be designated by the appliance manufacturer as suitable for use in a marine environment.

When selecting appliances consideration should be given to the size and design of the space into which the appliance is to be installed and the appliance’s claimed heat output.

Cooking and heating appliances shall be installed in accordance with the manufacturer's instructions for small craft installations and secured against accidental or unintended movement.

Gimballed appliances shall include a retaining mechanism that meets this requirement.

5.1.2 Appliances with flues’

Where flues and associated flue pipes are installed they shall be:

— installed in accordance to manufacturer's instructions;

— routed directly to the open air so that no exhaust gases can enter the interior of the craft;

— insulated or shielded in accordance with sub-clause 4.2.3.1, where necessary to avoid overheating or damage to adjacent material or to the structure of the craft.

5.1.3 Cooking and heating appliances using liquid fuel

5.1.3.1 General

For cooking and heating appliances using fuel which is liquid at atmospheric pressure the requirements of ISO 14895 shall apply. In addition:

— open flame burners shall be fitted with a readily accessible drip pan to contain any fuel overflowing from the priming fuel container;

— 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 used.

5.1.3.2 Fixed fuel systems

Fixed (non-integral) tanks and supply lines using fuel which is liquid at atmospheric pressure shall meet the applicable requirements of ISO 21487 and ISO 10088 respectively. In addition:

— fixed fuel tanks shall be securely fastened and shall be installed outside Zone II according to Figure 1;

— filler openings for tanks shall be prominently identified to indicate the type of fuel to be used with the system;

— a readily accessible shut-off valve shall be installed in the supply line at the tank connection. If this is outside the space containing the appliance a second valve shall be fitted in the fuel line in the space containing the cooking appliance, outside Zone II according to Figure 1, but not behind the appliance;

This requirement does not apply where the tank is located lower than the cooker/heater and there is no possibility of back siphoning or where a fire or fusible valve that prevents fuel from continuing to flow to an appliance in the event of a fire is installed in the appliance or near to the final fuel supply joint to it.

— any shut-off valve installed on a tank which is located inside an engine space shall include a means to be remotely operated from outside the space.

5.2 Materials near cooking or heating appliances

5.2.1 General

The following clauses address the potential for the ignition of materials adjacent to cooking and heating appliances.

Materials and finishes used in the vicinity of open flame devices within the ranges as defined in Figure 1 shall comply with 4.2.2, 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.

NOTE Further information about the selection of materials and soft furnishings in all other areas is provided in Annex F.

These requirements do not apply to the materials of the appliance itself.

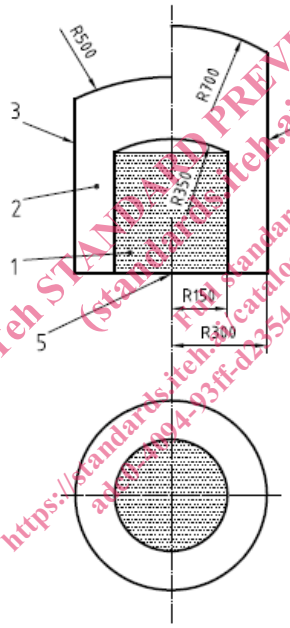
5.2.2 Protection from open flames

4.2.2.1 Free hanging curtains or other fabrics adjacent to open flame devices shall not be fitted in Zone I and Zone II according to Figure 1.

4.2.2.2 Exposed materials adjacent to open flame devices installed in Zone I and 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 of the substrate exceeds 80°C. (See Annex A, Fire test)

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

Dimensions in millimetres



Key

1 Zone I

2 Zone II

3 Limit of zone II for LPG, CNG or electric appliances

4 Limit of zone II for liquid fuel appliances

5 Centre of burner

NOTE Measurements are taken from the centre of the burner.

Figure 1 — Areas of special material requirements