INTERNATIONAL STANDARD

ISO 15083

First edition
2003-02-01

Small craft — Bilge-pumping systems

Petits navires — Systèmes de pompes de cale

Reference number
ISO 15083:2003(E)

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.org
Web www.iso.org

Published in Switzerland

Contents

Page

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 15083 was prepared by Technical Committee ISO/TC 188, *Small craft*.

Introduction

Bilge-pumping systems as specified in this International Standard are limited to normal amounts of water in an intact boat due to spray, rain, seepage, spillage, and occasional small amounts of water shipped from boat movements in heavy weather.

This International Standard is not intended to enable flooding resulting from hull damage, to be dealt with.

Small craft — Bilge-pumping systems

1 Scope

This International Standard specifies requirements for pumping or alternative means designed to remove normal accumulations of bilge water for small craft with a hull length, L_H, up to 24 m according to ISO 8666.

This International Standard does not set requirements for bilge pumps or bilge-pumping systems designed for damage control.

2 Normative references

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

ISO 8666:2002, *Small craft — Principal data*

ISO 8849:—[1)], *Small craft — Electrically operated bilge-pumps*

ISO 9093 (all parts), *Small craft — Seacocks and through-hull fittings*

ISO 11812:2001, *Small craft — Watertight cockpits and quick-draining cockpits*

ISO 12216:2002, *Small craft — Windows, portlights, hatches, deadlights and doors — Strength and watertightness requirements*

IEC 60529: 2001, *Degrees of protection provided by enclosures (IP Code)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply. The meanings of symbols used in the definitions are given in Clause 4.

3.1
design category
description of the sea and wind conditions for which a boat is assessed to be suitable

3.1.1
design category A
category for "ocean" sailing
boat designed for extended voyages where conditions experienced may exceed wind force 8 (Beaufort Scale) and significant wave heights of 4 m and above, but excluding abnormal conditions (e.g. hurricanes)

1) To be published. (Revision of ISO 8849:1990)

3.1.2
design category B
category for "offshore" sailing
boat designed for offshore voyages where conditions up to and including wind force 8 (Beaufort Scale) and significant wave heights up to and including 4 m may be experienced

3.1.3
design category C
category for "inshore" sailing
boat designed for voyages in coastal waters, large bays, estuaries, lakes and rivers, where conditions up to and including wind force 6 (Beaufort Scale) and significant wave heights up to and including 2 m may be experienced

3.1.4
design category D
category for sailing in "sheltered waters"
boat designed for voyages in sheltered waters, small bays, estuaries, lakes, rivers and canals, where conditions up to and including wind force 4 (Beaufort Scale) and maximum occasional wave heights up to and including 0,5 m may be experienced

3.2
sailing boat
boat for which the primary means of propulsion is by wind power, having a total profile area of all sails that may be set at one time when sailing close hauled (A_S) of greater than $0{,}07(m_{LDC})^{2/3}$

NOTE The total profile area of all sails is expressed in square metres.

3.3
fully decked boat
boat in which the horizontal projection of the sheerline comprises any combination of

— watertight deck and superstructure, and/or

— cockpits and quick-draining recesses which comply with ISO 11812, and/or

— watertight recesses complying with ISO 11812 with a combined volume of less than $L_H B_H F_M/40$,

all closing appliances being watertight in accordance with ISO 12216

NOTE Open and partially decked boats do not comply with this definition.

3.4
enclosed steering position
steering position intended to be used in severe weather, having rigid or flexible enclosures on top and at least three sides

3.5
exposed steering position
steering position intended to be used in severe weather, not having rigid or flexible enclosures on top and at least three sides

3.6
accumulation of bilge water
minor amounts of water collecting in the bilge from spray, rain, seepage, spillage, and water shipped from normal boat movements or breaking waves

3.7
critical bilge-water level
level at which bilge water will contact metallic fuel tanks, couplings, engine pans, non-submersible machinery, or non-watertight electrical circuits and connections, with the craft in the static floating position or in normal operation

3.8
maximum heeled waterline
⟨non-sailing boats⟩ level of water on the hull when the hull is inclined to an angle of 7° heel

3.9
maximum heeled waterline
⟨sailing boats⟩ level of water on the hull when the hull is inclined to an angle of 30° heel or the level of the sheerline amidships, whichever is less

3.10
submersible bilge pump
pump designed to be located below water level

3.11
water head
maximum head of water in the bilge-pump discharge line, measured vertically from the pump inlet port to the centre of the discharge line's highest position

3.12
accessible
capable of being reached for inspection, removal or maintenance without removal of any permanent element of the boat structure

3.13
readily accessible
capable of being reached for operation, inspection or maintenance without the use of tools or removal of any element of the boat structure or any item of portable equipment

4 Symbols

For the purposes of this International Standard, the symbols and associated units in Table 1 apply.

Table 1 — Symbols

Symbol	Unit	Meaning
A_S	m^2	Projected sail area, according to ISO 8666
B_H	m	Beam of the hull, according to ISO 8666
F_M	m	Freeboard, midship, to the loaded waterline according to ISO 8666
L_H	m	Length of the hull, according to ISO 8666
m_{LDC}	kg	Mass of the boat in light craft condition with the maximum total load added, according to ISO 8666
IP 56		Degree of tightness providing protection against splashing water according to IEC 60529
IP 67		Degree of tightness providing protection against the effects of temporary immersion in water according to IEC 60529

5 Requirements

5.1 Type, number and location

5.1.1 General

Bilge-pumping systems shall be capable of removing water from all main compartments of the craft where water can accumulate.

Fore and aft peaks with a combined volume of less than or including 10 % of the displacement of the craft in the fully loaded ready-for-use condition, according to ISO 8666, need not be linked to the bilge-pumping system if trapped water in those compartments can be emptied into the main bilges by a valve, or drained by other means.

Type(s), number(s) and location(s) of bilge-pumping systems shall be in accordance with requirements in 5.1.2 and 5.1.3.

5.1.2 Open and partially decked boats

For open and partially decked boats, the means of bailing shall be specified in the owner's manual.

NOTE For partially decked boats, the installation of a bilge pump is recommended.

5.1.3 Fully decked boats

5.1.3.1 General

Fully decked boats shall be fitted with one or more bilge pumps according to the requirements in 5.1.3.2 and 5.1.3.3.

5.1.3.2 Primary bilge pump

For craft in design categories A, B and C:

a) where the main steering position is exposed and the water head in the discharge line is less than 1,5 m, one manual bilge pump shall be installed, permanently attached to the boat structure and operable from within the cockpit, with all doors, hatches and other accesses to the interior of the boat closed;

b) where the main steering position is exposed and the water head in the discharge line is 1,5 m or more, one manual or powered bilge pump or bilge pumping system (e.g. electric) shall be installed, permanently attached to the boat structure and operable from the main steering position, with all doors, hatches and other accesses to the interior of the boat closed;

c) where the main steering position is enclosed within the craft, one powered bilge pump or bilge-pumping system shall be installed and the bilge pump shall be operable from the main steering position.

For craft in design category D:

— if L_H is greater than 6 m, one manual or powered bilge pump or bilge-pumping system shall be installed;

— if L_H is less than or equal to 6 m, one manual bilge pump or other means of bailing shall be available, which shall be specified in the owner's manual.

5.1.3.3 Secondary bilge pump

For craft in design categories A, B and C, one additional manual, mechanical or electric bilge pump or bilge-pumping system shall be installed, which shall be capable of removing water from all bilge compartments and which shall be operable from a readily accessible position.

For craft in design category D, no secondary bilge pump is required.

5.2 Summary of requirements

Table 2 is a summary of the requirements listed in 5.1.

Table 2 — Summary of bilge-pump requirements

Boat type	Boat characteristics	Type of pump	Bilge-pump requirements or means of bailing	Subclause
Open and partially decked boats Design categories A, B, C, D			See Owner's manual	5.1.2
Fully decked boats Design category A, B, C	Exposed steering position	Primary pump	1 manual pump (water head less than 1,5 m) 1 manual, mechanical or electric pump (water head 1,5 m or more)	5.1.3.2 a) 5.1.3.2 b)
		Secondary pump	1 manual or mechanical or electric pump	5.1.3.3
	Enclosed steering position	Primary pump	1 manual or mechanical or electric pump	5.1.3.2 c)
		Secondary pump	1 manual or mechanical or electric pump	5.1.3.3
Fully decked boats	L_H greater than 6 m	Primary pump	1 manual or mechanical or electric pump	5.1.3.2
Design category D	L_H less than or equal to 6 m	Primary pump	1 manual pump, for alternative see Owner's manual	5.1.3.2

5.3 Capacity

The capacity of each bilge pump, according to 5.1.3 shall be not less than

— 10 l/min for boats with L_H less than or equal to 6 m,

— 15 l/min for boats with L_H greater than 6 m and less than 12 m, or

— 30 l/min for boats with L_H greater than or equal to 12 m.

These volumes per minute shall be achieved when the pump is subjected to a back pressure of 10 kPa.

For manual bilge pumps, the capacity shall be rated for 45 strokes per minute.

6 Design and construction

6.1 General

6.1.1 The design and construction of bilge-pumping systems shall withstand the pressures, temperatures and stresses likely to be encountered under normal operating conditions.

Bilge pumps shall be operable within temperature limits ranging from 0 °C to + 60 °C and shall withstand storage temperatures, without operation, of – 40 °C to + 60 °C when in the dry condition.

6.1.2 Spigots/spuds of bilge pumps and other components shall be long enough to provide support for the hose, and permit the use of clamps.

6.1.3 Unless permanently fitted, bilge-pump handles shall be secured to minimize the risk of accidental loss.

6.1.4 No bilge pump may discharge into a cockpit unless the cockpit opens aft to the sea. Bilge pumps shall not be connected to cockpit drains.

6.2 Electrically operated pumps

6.2.1 Electric bilge pumps shall comply with ISO 8849.

6.2.2 Electrical connections shall be water resistant to a degree of IP 67 according to IEC 60529, and shall be placed above the maximum acceptable water level, unless submersible.

6.2.3 Where the switch is subject to spray water, it shall be water resistant to a degree of IP 56 according to IEC 60529.

7 Installation

7.1 Bilge pumps shall be mounted in an accessible location for servicing and clearing the intake.

7.2 Bilge-pump water inlets (e.g. strainers) shall be designed and installed to minimize ingestion of debris likely to cause pump failure and shall be accessible for cleaning.

7.3 Intake hoses shall not collapse under maximum pump suction.

7.4 Bilge-pump pipes and hoses shall be installed to minimize flow restriction.

7.5 Outlets on the hull shall be above the maximum heeled waterline as defined in 3.8 and 3.9, unless a seacock is installed in accordance with ISO 9093, and there is a means to prevent backflow into the boat.

7.6 Where several pumps discharge through one through-hull fitting, the system shall be designed so that the operation of one pump will not feed back through another pump, and the simultaneous operation of the pumps will not diminish the pumping capacity of the system.

7.7 Hose connections shall be secured with non-corrosive types of clamps, or with permanently attached end-fittings.

7.8 Non-submersible bilge pump motors shall be located above the critical bilge-water level.

7.9 Bilge pumps with automatic controls shall be provided with a readily accessible manual power-supply switch to activate the pump.

7.10 Automatic controls shall be provided with a visual indication showing that power is supplied to the pump and that the pump is set and ready to operate in automatic mode.