INTERNATIONAL STANDARD

ISO 6185-4

First edition
2011-07-01

Inflatable boats —

Part 4: Boats with a hull length of between 8 m and 24 m with a motor power rating of 15 kW and greater

Bateaux pneumatiques —

Partie 4: Bateaux d'une longueur de coque comprise entre 8 m et 24 m et d'une puissance moteur nominale supérieure ou égale à 15 kW

Reference number
ISO 6185-4:2011(E)

COPYRIGHT PROTECTED DOCUMENT

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 6185-4 was prepared by Technical Committee ISO/TC 188, *Small craft*.

This first edition, together with ISO 6185-1, ISO 6185-2 and ISO 6185-3, cancels and replaces ISO 6185:1982, which has been technically revised.

ISO 6185 consists of the following parts, under the general title *Inflatable boats*:

— *Part 1: Boats with a maximum motor power rating of 4,5 kW*

— *Part 2: Boats with a maximum motor power rating of 4,5 kW to 15 kW inclusive*

— *Part 3: Boats with a maximum motor power rating of 15 kW and greater*

— *Part 4: Boats with a hull length of between 8 m and 24 m with a motor power rating of 15 kW and greater*

Introduction

ISO 6185 is subdivided into four parts as shown in Figure 1.

It excludes

a) single-chamber boats,

b) boats of less than 1 800 N buoyancy, and

c) boats made from unsupported materials of more than 12 kN inflated buoyancy and powered by motors of power $P > 4{,}5$ kW.

It is not applicable to aquatic toys, nor to inflatable liferafts which are specified in ISO 9650.

ISO 6185-1:

— Type I Boats with $L_H < 8$ m propelled exclusively by manual means.

— Type II Powered boats with $L_H < 8$ m with a power $P \leq 4{,}5$ kW.

— Type III Canoes and kayaks with $L_H < 8$ m.

— Type IV Sail boats with $L_H < 8$ m with a sail area less than or equal to 6 m^2.

ISO 6185-2:

— Type V Powered boats with $L_H < 8$ m with a power 4,5 kW $< P \leq 15$ kW.

— Type VI Sail boats with $L_H < 8$ m with a sail area greater than 6 m^2.

ISO 6185-3:

— Type VII Powered boats with $L_H < 8$ m with a power $P \geq 15$ kW.

— Type VIII Powered boats with $L_H < 8$ m with a power $P \geq 75$ kW.

ISO 6185-4:

— Type IX Powered boats (design categories C and D) with 8 m $< L_H \leq 24$ m with power $P \geq 15$ kW.

— Type X Powered boats (design category B) with 8 m $< L_H \leq 24$ m with power $P \geq 75$ kW.

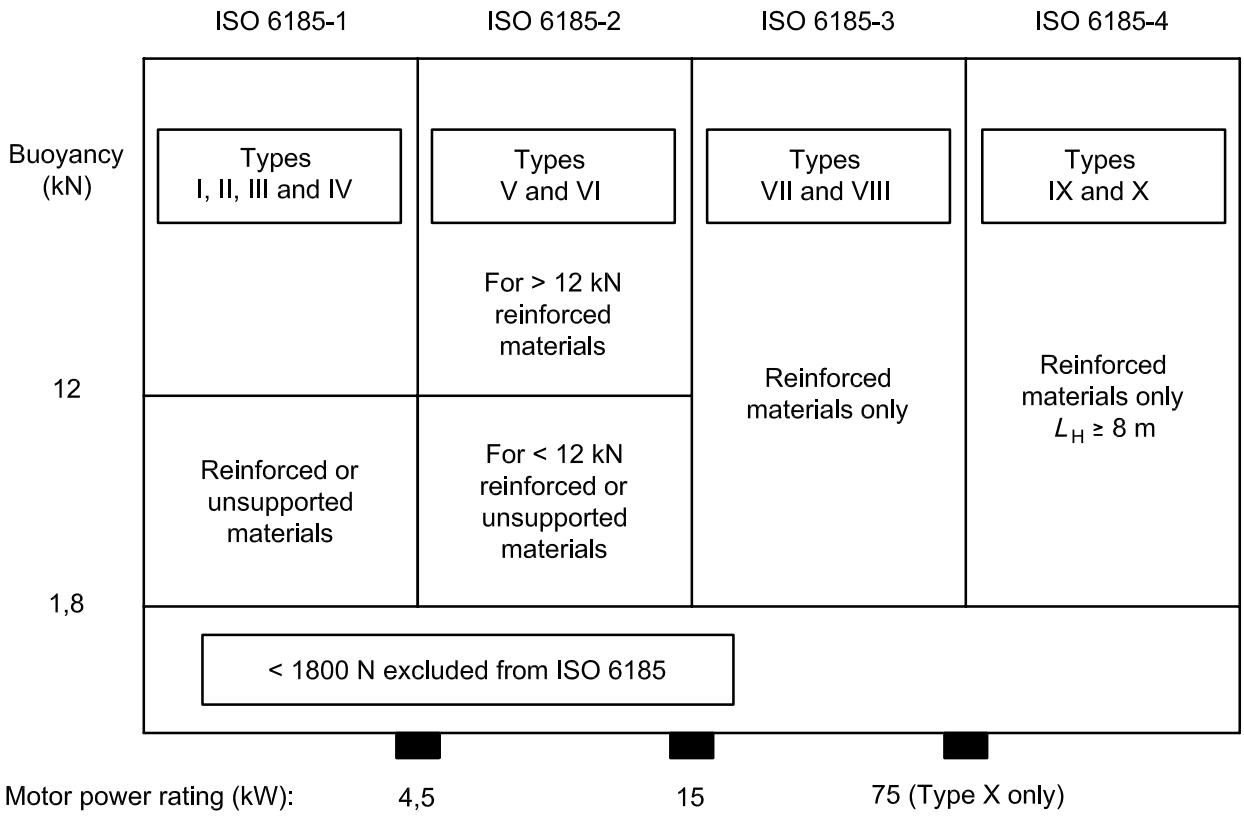


Figure 1 — Illustration of how ISO 6185 is subdivided

This part of ISO 6185 enables the boat to be assigned to a design category appropriate to its design and maximum load. The categories used align with those in the Recreational Craft Directive of the European Union, EU Directive 94/25/EC as amended by Directive 2003/44/EC.

Inflatable boats —

Part 4:
Boats with a hull length of between 8 m and 24 m with a motor power rating of 15 kW and greater

WARNING — Attention is drawn to the completion process whereby structural items, for example steering consoles, seats and superstructures, are installed by parties other than the manufacturer of the boat. These items should be installed to comply with the relevant clauses of this part of ISO 6185 so it can be ensured that any such installations do not invalidate the original assessment.

1 Scope

This part of ISO 6185 specifies the minimum safety characteristics required for the design, materials, manufacture and testing of rigid inflatable boats (RIBs) with a hull length of between 8 m and 24 m and with a motor power rating of 15 kW and greater.

This part of ISO 6185 is applicable to Type IX and Type X RIBs intended for use within the operating temperatures of −20 °C to +60 °C.

— Type IX: Powered boats, fitted with a buoyancy tube covering at least 85 % of the port and starboard sides, suitable for navigation in inshore and sheltered waters, up to and including wind force 6 Beaufort and significant wave heights up to 2 m (design categories C and D), with a hull length of between 8 m and 24 m and with a motor power rating of 15 kW and greater.

— Type X: Powered boats, fitted with a buoyancy tube covering at least 85 % of the port and starboard sides, suitable for navigation in waters, up to wind force 8 Beaufort and significant wave heights up to 4 m (design category B), with a hull length of between 8 m and 24 m and with a motor power rating of 75 kW and greater.

NOTE 1 General arrangements of typical boats of Types IX and X are given in Annexes A and B, respectively.

NOTE 2 For boats with power ratings of 4,5 kW and less, refer to ISO 6185-1. For boats with power ratings of 4,5 kW to 15 kW inclusive, refer to ISO 6185-2. For boats with a hull length of less than 8 m and power rating of 15 kW and greater, refer to ISO 6185-3.

Boats outside these types or outside of Type IX and Type X, as defined, are outside of the scope of ISO 6185.

NOTE 3 For inflatable boats with a hull length greater than 8 m, it is suggested to use the requirements of ISO 6185-3.

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 1817, *Rubber, vulcanized — Determination of the effect of liquids*

ISO 2411, *Rubber- or plastics-coated fabrics — Determination of coating adhesion*

ISO 3011, *Rubber- or plastics-coated fabrics — Determination of resistance to ozone cracking under static conditions*

ISO 4674-1, *Rubber- or plastics-coated fabrics — Determination of tear resistance — Part 1: Constant rate of tear methods*

ISO 4675, *Rubber- or plastics-coated fabrics — Low-temperature bend test*

ISO 6185-3:2001, *Inflatable boats — Part 3: Boats with a maximum motor power rating of 15 kW and greater*

ISO 7010:2011, *Graphical symbols — Safety colours and safety signs — Registered safety signs*

ISO 8099, *Small craft — Toilet waste retention systems*

ISO 8666, *Small craft — Principal data*

ISO 8847, *Small craft — Steering gear — Cable and pulley systems*

ISO 8848, *Small craft — Remote steering systems*

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

ISO 9094, *Small craft — Fire protection*[1)]

ISO 10087, *Small craft — Craft identification — Coding system*

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

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

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

ISO 10240, *Small craft — Owner's manual*

ISO 10592, *Small craft — Hydraulic steering systems*

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

ISO 11591, *Small craft, engine-driven — Field of vision from helm position*

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

ISO 12215-3:2002, *Small craft — Hull construction and scantlings — Part 3: Materials: Steel, aluminium alloys, wood, other materials*

ISO 12215-5, *Small craft — Hull construction and scantlings — Part 5: Design pressures for monohulls, design stresses, scantlings determination*

ISO 12215-6, *Small craft — Hull construction and scantlings — Part 6: Structural arrangements and details*

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

---

1) To be published. (Technical revision of ISO 9094-1:2003 and ISO 9094-2:2002.)

ISO 12217-1:—[2)], *Small craft — Stability and buoyancy assessment and categorization — Part 1: Non-sailing boats of hull length greater than or equal to 6 m*

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

ISO 14945, *Small craft — Builder's plate*

ISO 14946:2001, *Small craft — Maximum load capacity*

ISO 15084, *Small craft — Anchoring, mooring and towing — Strong points*

ISO 15085:2003, *Small craft — Man-overboard prevention and recovery*

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

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
rigid inflatable boat
RIB
buoyant structure comprising two essential parts: a lower hull formed by a rigid structure, achieving part of its intended shape with a non-rigid buoyancy tube that is of either inflatable or foam-filled type and where the buoyant volume of the buoyancy tube comprises not less than 50 % of the total required buoyant volume of the boat (3.4)

NOTE Tubes made from rigid aluminium, rotomoulded polyethylene, glass-reinforced plastic or other rigid materials are excluded.

3.2
inflatable buoyancy tube
multi-chambered inflatable buoyancy tube attached to the length of both port and starboard sides of the hull when the boat is in use, and inflated with air

3.3
foam-filled buoyancy tube
buoyancy tube attached to the length of both port and starboard sides of the hull when the boat is in use, and filled with resilient closed-cell type foam

NOTE For material requirements, see 5.7.

3.4
buoyancy of a RIB
buoyancy comprising the buoyant volumes of the buoyancy tube (3.2 and 3.3), added to the permanent inherent buoyancy (3.5), added to the permanent sealed buoyancy (3.6), added to the inherent buoyancy of the rigid parts of the boat (3.7)

3.5
permanent inherent buoyancy
buoyancy provided by non-intercellular (closed-cell) foam or other materials, contained within the hull and cockpit, which are less dense than fresh water

NOTE For material requirements, see ISO 12217-1:—, Annex F.

2) To be published. (Technical revision of ISO 12217-1:2002.)

3.6
permanent sealed buoyancy
buoyancy provided by two or more sealed compartments, contained within the hull and cockpit, filled with air

NOTE For material requirements, see column “Air containers” in ISO 12217-1:—, Table F.1.

3.7
inherent buoyancy of the rigid parts of the boat
volume of the inherent buoyancy of the rigid parts of the boat calculated in accordance with ISO 12217-3:—, Annex D

3.8
reinforced materials
materials which have a coated base cloth

3.9
inboard area
internal surface area defined by a vertical plane tangential to the innermost side of the buoyancy tube and perpendicular to the cockpit sole

3.10
crew limit
CL
maximum number of persons to be carried when the boat is underway, as displayed on the builder's plate

3.11
design category
description of the sea and wind conditions for which a boat is assessed by this part of ISO 6185 to be suitable

NOTE The definitions of these design categories align with those used in the Recreational Craft Directive of the European Union, EU Directive 94/25/EC as amended by Directive 2003/44/EC.

3.11.1
design category B “offshore”
category of boats considered suitable to operate in seas with significant wave heights up to 4 m and winds of Beaufort force 8 or less

3.11.2
design category C “inshore”
category of boats considered suitable to operate in seas with significant wave heights up to 2 m and a typical steady wind force of Beaufort force 6 or less

3.11.3
design category D “sheltered waters”
category of boats considered suitable to operate in waters with significant wave heights of up to and including 0,3 m with occasional waves of 0,5 m height, for example from passing boats, and a typical steady wind force of Beaufort force 4 or less

4 Symbols

Unless specifically otherwise defined, the symbols and units used in this part of ISO 6185 are as given in Table 1.

Table 1 — Symbols and units

Symbol	Designation	Unit	(Sub)clause
A_{LV}	windage area of hull in profile at the appropriate loading condition	m^2	7.4
B_{max}	maximum beam, measured in accordance with ISO 8666 with the inflatable buoyancy tubes inflated to nominal pressure	m	7.2
d	maximum buoyancy tube diameter, measured within the straight sections of the buoyancy tube	m	5.2.2.5
F_t	tear resistance force	N	5.2.2.5
F_s	static load force	N	5.2.2.7
L_H	length of the hull, measured in accordance with ISO 8666 with the inflatable buoyancy tubes inflated to nominal pressure	m	Introduction
L_{max}	maximum length, measured in accordance with ISO 8666 with the inflatable buoyancy tubes inflated to nominal pressure	m	7.2
L_{STS}	length of the sample buoyancy tube section	m	7.14.3
L_T	total length of the buoyancy tube on all sides of the boat	m	7.14.3
m_t	mass of test weights	kg	7.14.3
m_T	mass of boat when towed on a trailer, as defined in ISO 8666	kg	6.12
m_{LC}	mass of the boat in the light craft condition, as defined in ISO 12217-1:—	kg	7.2
m_{LDC}	mass of the loaded boat, as defined in ISO 8666	kg	7.6.1 & 7.14.3
N	number of buoyancy compartments	unit	7.7
p	nominal pressure at 20 °C	bar[a]	5.2.2.5
P_{calc}	motor power rating	kW	7.2
V	total buoyant volume of the boat	m^3	7.6.1
V_c	volume of each compartment	m^3	7.7

[a] 1 bar = 0,1 MPa = 10^5 Pa; 1 Mpa = 1 N/mm^2.

5 Materials

5.1 General

All materials shall be selected according to the stresses to which the boat is to be subjected (shape, dimensions, maximum load, installed power, etc.) and also to the intended service conditions. Use under normal seagoing conditions shall not materially impair their performance and they shall meet the requirements of 5.2 to 5.7.

5.2 Materials making up the buoyancy tube

5.2.1 Requirements

All materials contributing to the integrity of the buoyancy tube shall meet the requirements of 5.2.2 and shall retain their full serviceability within the operating temperature range of −20 °C to +60 °C.

5.2.2 Test methods

5.2.2.1 Sampling

Carry out the test with test pieces taken from the constituent materials prior to making the buoyancy tube. If the buoyancy tubes are vulcanized during manufacture, the test pieces shall also be vulcanized.

5.2.2.2 Resistance to liquids

Carry out the test on the external side, or the sides of the material in contact with the ambient environment, as specified in ISO 1817 using IRM 901 oil (A) and salt water (B).

In both case A and case B, shown in Table 2, the change in mass per unit area shall not exceed 100 g/m^2 following the stipulated period of contact with the test fluid at a temperature of (70 ± 2) °C.

Table 2 — Duration of test

Parameter	A	B
Test liquid	IRM 901 oil[a]	Salt water[b]
Period of contact	(22 ± 0,25) h	≥ 336 h
[a] IRM 901 oil has replaced ASTM oil No. 1.		
[b] Components of salt water: distilled water + 30 g of sodium chloride per litre.		

5.2.2.3 Resistance to ozone

Carry out the test on the external face of the fabric in contact with the ambient environment as specified in ISO 3011.

— Exposure time: 72 h.

— Temperature of test: (30 ± 2) °C.

— Concentration: a volume fraction of $0{,}5 \times 10^{-6}$.

— Mandrel diameter: 5 times the material thickness.

There shall be no signs of cracking on completion of the test when test samples are examined under 10 × magnification.

5.2.2.4 Resistance to cold

All materials shall satisfy the requirements of ISO 4675 at a temperature of −20 °C.

5.2.2.5 Tear resistance

Carry out the test as specified in ISO 4674-1, method B.

The minimum value of tear resistance, F_t, is given by

$$F_t = 0{,}375d\left(1{,}14p + 0{,}14\right)$$

In all cases, F_t shall be not less than 75 N.

5.2.2.6 Coating adhesion

Carry out the test in accordance with ISO 2411 at room temperature and a machine rate of (100 ± 10) mm/min. The minimum adhesion value shall be 40 N per 25 mm.

Alternatively to the preparation of test strips according to ISO 2411, it is permissible to cut a test strip 25 mm wide by extending cuts A and B and ignoring cut C. In order for the test strips to be gripped, 50 mm shall be left unbounded at one end. The test piece shall be "peeled" at (100 ± 10) mm/min and the surface coating cut back to the fabric and allowed to run down the fabric/coating interface for at least 25 mm.

5.2.2.7 Seam strength testing of buoyancy tubes

Join two pieces of material together in the same manner as used in the buoyancy tube construction (method, material and dimensions) to form a 50 mm wide test piece. Apply a static load, F_s, at 60 °C over a period of 4 h. Where more than one method of seam construction is used in the manufacture of the buoyancy tube, carry out the test for each method.

The minimum value of F_s is given by

$$F_s = 0{,}375d\left(1{,}14p + 0{,}14\right)$$

There shall be no slipping or other failure at any part of the seam.

5.3 Wood

5.3.1 General

The types of timber and plywood shall comply with ISO 12215-3.

All exposed timber and plywood shall be given weather-tight protection, such as paint, varnish or preservative, suitable for a marine environment.

In the selection of protective coatings, national, regional and international regulations for the protection of the environment shall be followed.

5.3.2 Plywood

Plywoods used may incorporate hardwoods or softwood plies and the bonding adhesive shall be waterproof and boil-proof.

If the wood used for plies is not hardwood, the plies shall be treated to give protection against rot, fungal decay and marine borers, and/or reinforced (laminate), where necessary.

All adjoining edges and/or surfaces, including any end grain, shall be effectively sealed.

Timber used shall be seasoned and free from sapwood, decay, insect attack, splits and other imperfections likely to adversely affect the performance of the material. The timber shall be generally free from knots but an occasional sound intergrown knot is acceptable.

5.3.3 Constructional timbers

Timber used in the construction shall be seasoned, and free from sapwood, shakes and other defects.

5.4 Metal parts

The types of metal shall comply with the requirements of ISO 12215-3:2002, Clause 4.

5.5 Glass-reinforced plastics

Resins, reinforcements and laminates shall be arranged and protected against effects of the marine environment to comply with the requirements of 7.15.

5.6 Other materials

Parts other than metal or wood shall comply with the requirements of ISO 12215-3:2002, Clause 6.

5.7 Buoyant material used in foam-filled buoyancy tubes

5.7.1 General

Buoyant materials used in foam-filled buoyancy tubes shall comply with the tests prescribed in 5.7.2

5.7.2 Tests

5.7.2.1 General

Ten samples of the buoyant material shall be subjected to the tests prescribed in 5.7.2.2 to 5.7.2.4. They shall be at least 300 mm square and of the same thickness as used in the buoyancy tube.

The dimensions of the samples shall be recorded at the end of the 10 day cycle.

The samples shall be carefully examined at the end of the tests and shall not show any sign of external change of structure or of mechanical properties. Furthermore, two of the samples shall be cut open and shall not show any sign of internal change of structure.

Six of the samples shall be used for the water absorption test in 5.7.2.3, two of which shall be so tested after they have been subjected to the fuel resistance test in 5.7.2.4.

The results shall state the mass in kilograms which each sample can support in the water after one and seven days of immersion. (The selection of a test method suitable for obtaining this result directly or indirectly is left to the discretion of the testing body.) The reduction of buoyancy shall not exceed 16 % for samples which have been exposed to the diesel oil conditioning and shall not exceed 5 % for all other samples. The samples shall show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities.

5.7.2.2 Tests for stability under temperature cycling

Six samples shall be alternately subjected for 8 h to surrounding temperatures of −30 °C and +65 °C. These alternating cycles need not follow immediately after each other; the following procedure is acceptable.

a) On the first day, store the samples for 8 h at +65 °C.

b) Remove the samples from the warm chamber that same day and leave them exposed under ordinary room conditions until the second day.

c) On the second day, store the samples in a cold chamber for 8 h at −30 °C.

d) Remove the samples from the cold chamber that same day and leave them exposed under ordinary room conditions until the third day.

Repeat the procedure until the cycle (a,b,c,d) has been repeated 10 times.

5.7.2.3 Tests for water absorption

The tests shall be carried out in fresh water and the sample shall be immersed for a period of seven days under a 1,25 m head of water.

The tests shall be carried out

a) on two samples as supplied, and

b) on two samples which have been subjected to the temperature cycling as prescribed in 5.7.2.2, and

c) on six samples which have been subjected to the temperature cycling as prescribed in 5.7.2.2 followed by the fuel resistance test prescribed in 5.7.2.4.

5.7.2.4 Fuel resistance test

The six samples to be tested shall be immersed horizontally for a period of 24 h at normal room temperature under a 100 mm head of the following fuels:

— two samples under diesel oil,

— two samples under petrol, and

— two samples under biofuel.

After this test, the samples shall show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities.

6 Functional components

6.1 Conditioning

All tests shall be performed at a temperature of (20 ± 3) °C unless stated otherwise in a cited International Standard.

6.2 Buoyancy tube and hull fittings (items bonded to the buoyancy tube)

6.2.1 General

The materials and method of construction used shall be compatible with that of the buoyancy tube and hull themselves. Any load-bearing fitting attached to the boat (see 3.1 and 3.2) shall not, when loaded as described in 6.2.2, result in any impairment in airtightness or water integrity.

6.2.2 Test method

Any cordage used for test purposes shall have a diameter of 8 mm.

Gradually load the fittings in any direction up to the load specified in a) or b) and maintain this load for 1 min.

a) For strong points required by ISO 15084: in accordance with ISO 15084.

b) For all other attachments: 2 kN.

6.3 Valves (if applicable)

6.3.1 Inflation

The assemblies shall be of corrosion-resistant materials and shall not be capable of damaging the boat materials.

The type and arrangement of the inflation valves fitted to a RIB shall ensure the following:

a) the valves will be readily accessible for connection of the inflation device whether the boat is on land or in the water;

b) the valves will not inconvenience the persons in their predetermined seating positions;

c) the valves will not interfere with the operation of the boat;

d) the valves will not interfere with loading and unloading of the boat;

e) the valves cannot be damaged or torn off by lines, safety ropes or movable components of the boat construction or by normal movements of the passengers and load;

f) the valves are equipped with a cap that can independently seal the valve and the cap is connected to the valve in a secure manner that prevents it from being accidentally lost;

g) a controlled reduction in buoyancy chamber pressure and of measuring that pressure is possible.

6.3.2 Deflation

Deflation of the buoyancy tube shall be by manual operation either by using the inflation valve or by using a separate device.

Where separate devices are fitted, these shall be made of corrosion-resistant materials and shall not be capable of damaging the boat material. The design and location of such devices shall meet the requirements of 6.3.1 b) to e) inclusive.

The deflation of any one compartment shall not cause a loss of air or gas from any of the remaining compartments.

6.4 Transom

The transom or motor mount and its attachment to the boat shall be designed to comply with ISO 12215-5 and ISO 12215-6 and to withstand, under normal use, the maximum stresses arising from

— the output power and torque of the motor(s), and

— the mass of such motor(s).

6.5 Hull interior drainage

For boats fitted with an integral closed hull/cockpit assembly which is not filled with closed-cell foam or equivalent, a drain plug shall be provided for draining water from the interior part of the hull (bilge). Means to prevent the accidental discharge of oily waste shall be provided.

6.6 Remote steering system (where offered as standard or optional equipment)

Any remote steering system shall conform to at least one of the following International Standards: ISO 8847, ISO 8848 and ISO 10592.

For boats fitted with a single inboard engine and remote steering systems, a manual means of emergency steering at reduced speed shall be provided.

Type X boats shall be fitted with a remote steering system approved by the boat manufacturer.

If remote steering and control consoles are fitted, these structures shall meet the strength requirements of 7.16.

6.7 Towing, anchoring and mooring strong points

All boats shall have towing, anchoring and mooring devices in accordance with ISO 15084.

6.8 Seating and attachment systems (where offered as standard or optional equipment)

Seating shall be as defined in ISO 14946:2001, 3.2.

Where a seat structure or seat structures is/are supplied and permanently fitted to the boat by means of an attachment system, the seat and the attachment system shall meet the strength requirements of 7.16. Seating and handholds shall provide support for spinal neutral alignment and postural stability for each person up to the crew limit and also to prevent them from falling or being thrown on deck or overboard (see also 7.10).

Buoyancy tubes shall not be used for seating areas.

Particular attention is also drawn to ISO 15085:2003, Clause 15.

6.9 Electrical installations (where offered as standard or optional equipment)

Any electrical installations shall conform to ISO 10133 or ISO 13297, as applicable.

6.10 Engine and engine spaces

6.10.1 Inboard engines

For boats fitted with an inboard engine or engines, these shall be installed in an enclosure separated from living quarters in a manner to minimize the risk of fires and spread of fires as well as the hazards from toxic fumes, heat, noise or vibration.

Parts of the engine that need frequent inspection and/or servicing shall be readily accessible.

The material used for sound insulation inside engine spaces shall present a non-fuel-absorbent surface towards the engine, and shall not sustain combustion as specified in ISO 9094.

6.10.2 Fuel systems

Permanently-installed fuel systems and fixed fuel tanks shall conform to ISO 10088 and ISO 21487.

Type X boats shall be fitted with a permanent fuel system including permanent fuel tank(s).

6.11 Ventilation of petrol motor and petrol tank compartments (where applicable)

Ventilation of free spaces greater than three litres in volume in petrol motor and petrol tank compartments shall conform to ISO 11105.

6.12 Devices for lifting the boat (if applicable)

Lifting attachments that are permanently fitted to the cockpit and transom and lifting slings shall be designed to withstand at least $6 \times m_T$. These devices shall be type tested by applying a force that would be applied to them when lifting, in the intended configurations, $2 \times m_T$. There shall be no signs of permanent deformation or structural failure to the lifting device, its fastening elements or the supporting and surrounding structure immediately after the test.

Alternatively, lifting attachments may be proven to pass such a test by direct calculation.

The use of lifting devices and their associated fittings, such as straps and lifting slings, shall be described in the owner's manual.

6.13 Fire protection (if applicable)

Boats shall conform to ISO 9094.

6.14 Openings in hull, deck or superstructure

Windows, portlights, doors, hatch covers and other openings in the hull, cockpit and superstructures shall comply with ISO 12216.

Sea cocks shall comply with ISO 9093.

6.15 Gas systems

Liquefied petroleum gas (LPG) systems for domestic use, where fitted, shall comply with ISO 10239.

6.16 Navigation lights

Navigation lights, where fitted, shall comply with international regulations or national regulations of the country of sale.

6.17 Discharge prevention

Craft shall be constructed so as to prevent the accidental discharge of pollutants (oil, fuel) overboard.

Craft fitted with permanently installed toilets shall be fitted with holding tanks that comply with ISO 8099 or shall have provision to fit such holding tanks.

Any through-the-hull piping for toilet discharge shall be fitted with seacocks complying with ISO 9093 that can be secured in the closed position.

6.18 Noise emissions (applicable to inboard engines installations without integral exhaust)

Boats fitted with inboard engines shall be designed and constructed so that noise emission levels are in accordance with national or international requirements.

7 Safety requirements of the completed boat

7.1 Maximum permissible number of persons (crew limit)

The crew limit, as defined in 3.10, shall not exceed the number of persons for which seating has been assigned or the limitations imposed by 7.3, 7.4, 7.5 and 7.9.

7.2 Motor power calculation

The motor power, expressed in kilowatts, is calculated as follows:

$$P_{\text{calc}} = L_{\text{max}} \times B_{\text{max}} \times \sqrt[3]{m_{\text{LC}}}$$

If the calculated motor power fitted to either inboard- or outboard-driven boats exceeds P_{calc}, the boat shall conform to the maximal manoeuvring speed requirements in 7.3.

For waterjet-driven boats, the engine maximum power rating determined above may be increased by 35 %.

7.3 Maximal manoeuvring speed (if applicable)

7.3.1 Requirements

A maximal manoeuvring speed shall be determined for all boats that are capable of a top speed of 48 km/h or more (26 knots) by either the quick turn test (7.3.3) or by the avoidance line test (7.3.4). If a maximal manoeuvring speed is determined to be less than the top speed of the boat, a warning label containing the determined maximal manoeuvring speed and the related information shall be posted on the boat, in a legible manner, and in a location visible to the operator. A speed measuring device shall be installed.

The warning label shall contain a general warning sign in accordance with ISO 7010:2011, W001, together with the following message:

“SUDDEN TURNS ABOVE XX km/h (YY knots) MAY CAUSE LOSS OF BOAT CONTROL, WHICH COULD RESULT IN SERIOUS INJURY OR DEATH. REDUCE SPEED BEFORE ATTEMPTING A SUDDEN SHARP TURN. READ OWNER'S MANUALS FOR ADDITIONAL INFORMATION.”

7.3.2 Test procedures (for both tests)

7.3.2.1 Boat preparation

The boat shall be rigged with equipment recommended or provided for the safe operation of the boat and engine and tested with the highest-power production power plant(s) for which the boat is to be rated (outboard), or which is to be installed in the boat (inboard). If available, engines rated at the propeller shaft shall be used. If the maximum power can be met with single or twin engines, the single-engine installation shall be tested.

Equipment shall be installed in accordance with industry standards. A speed measuring device shall be used.

Install the lowest ratio (quickest) steering system offered on the boat model. Mount the engine manufacturer's recommended propeller providing maximum speed. Standard permanently installed fuel tanks shall be no more than half full.

The vertical position for mounting the outboard engine shall be determined. The test shall be conducted in that position and in accordance with the recommended outboard mounting information.

Boat bottom, engine and propeller shall be clean and in like-new condition.

The use of the following special equipment shall be considered because of the potential for exceeding the capabilities of the boat while performing this test:

a) approved lifejacket or personal flotation device (PFD), depending on local regulations;

b) emergency lanyard stop switch;

c) additional appropriate safety gear, e.g. helmet.

7.3.2.2 Test conditions

Testing shall be conducted on calm water with the wind speed below 18 km/h (10 knots) and maximum wave height of less than 0,2 m.

The test shall be conducted with no load other than a driver, who shall weigh no more than 90 kg (200 lb).

The propulsion unit trim angle, or other hull trim devices, if installed, shall be adjusted to provide maximum full-throttle speed, short of excessive porpoising or propeller ventilation, so that there is no loss of directional control.

The maximum full-throttle boat speed shall be verified by no fewer than two passes over a measured distance in both directions, or by any other suitable and accepted means of boat speed measurement accurate within 1,8 km/h (1 knot) of true boat speed.

7.3.3 Quick turn test

7.3.3.1 General

Determine the maximal manoeuvring speed of the boat, which is the highest speed at which the boat successfully completes the test defined in 7.3.3.2.

7.3.3.2 Test procedure

The driver operates the boat straight ahead at any given low-throttle setting.

Turn the wheel 180° or to the limit of rotation, whichever is less, in one direction, in 0,5 s or less; hold at that position without changing the throttle or trim settings during or after the wheel change. The boat completes the manoeuvre successfully if it is capable of completing a 90° turn without the driver's loss of confidence in maintaining control of the boat. Repeat in the other direction of turn.

If the boat successfully completes the test, increase the boat's turn entry speed incrementally until the boat does not complete the test, or successfully completes it at maximum throttle.

Operator skill and familiarity with a particular boat and engine combination will affect the test results. Therefore, the operator should make a number of practice runs at any throttle setting.

7.3.4 Avoidance line test

7.3.4.1 General

Determine the maximal manoeuvring speed of the boat by completing the test defined in 7.3.4.2 using the avoidance line test course shown in Figure 2 with the operator experiencing no loss of directional control or stability and no difficulty maintaining position at the helm.

For boats capable of speeds up to and including 48 km/h (26 knots), the distance, D, from the avoidance line at which turns are initiated shall be $6 \times L_H$.

For boats capable of speeds more than 48 km/h (26 knots), the distance, D, from the avoidance line at which turns are initiated shall be $6 \times L_H$ plus 2 m for each knot above 48 km/h (26 knots).

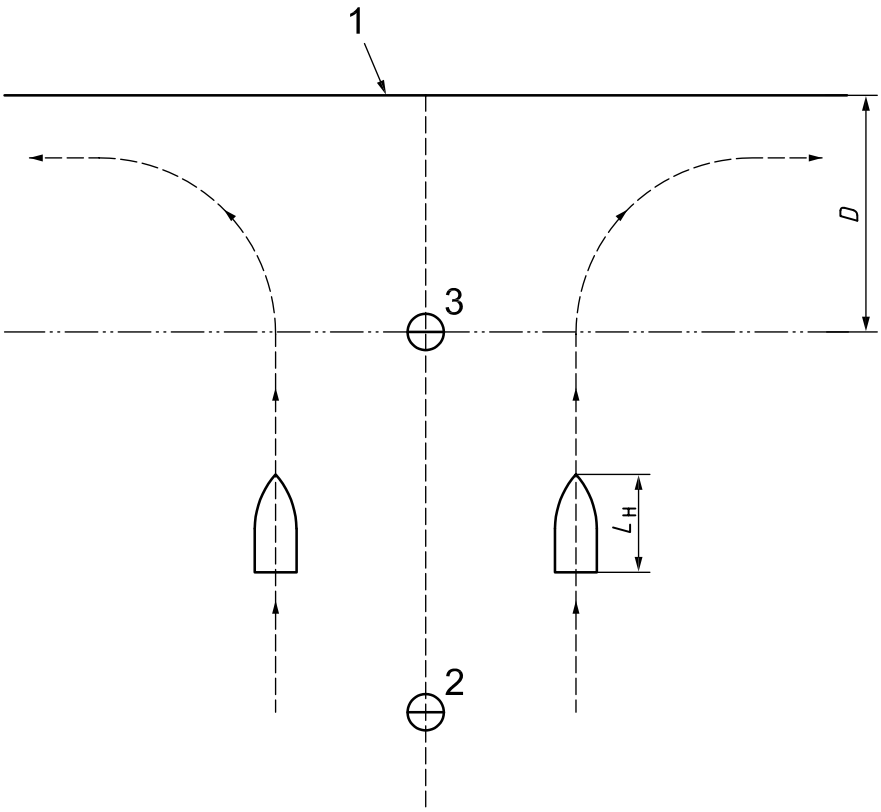
7.3.4.2 Test procedure

Operate the boat in one run at any throttle setting, straight ahead on a course parallel to and within 5 m of a line between marker A and marker B, as shown in Figure 2.

Execute a turn to port when the bow of the boat reaches a point opposite marker B, as shown in Figure 2, without reducing the throttle setting and without crossing the avoidance line, and assume a course parallel to the avoidance line. Repeat the test by operating the boat in another run, this time turning to starboard when reaching marker B.

If the boat successfully completes the test, incrementally increase the speed on subsequent runs until the operator cannot maintain position at the helm or experiences loss of directional control or stability or successfully completes it at maximum throttle.

Operator skill and familiarity with a particular boat and engine combination will affect the test results. Therefore, the operator may make a number of practice runs at any throttle setting.



Key

1 avoidance line
2 marker A
3 marker B

Figure 2 — Avoidance line test course

7.4 Static stability of the boat

The static stability shall comply with the subclauses of ISO 12217-1:—, as specified in Table 3.

Table 3 — Static stability and freeboard compliances

Parameter	Boat type	
	Type IX	Type X
Possible design category	C and D	B
Offset load	6.2	6.2
Resistance to waves and wind	Not applicable	6.3.2 and 6.3.3
Heel due to wind action	6.4[a]	Not applicable

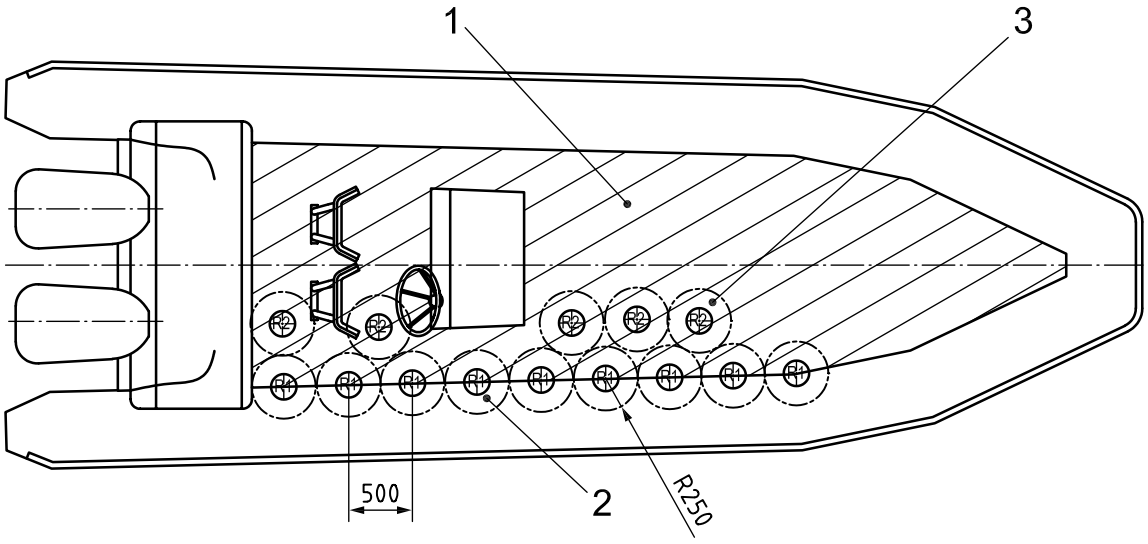
[a] The application of 6.4 is only required for boats where $A_{LV} \geqslant 0{,}5 L_H B_H$.

Alternatively, the static stability, buoyancy and freeboard may be assessed using option 1, 2 or 3 of ISO 12217-1. Where this alternative is employed, the requirements of 7.6 do not apply.

The offset-load test shall be conducted with the centre-of-gravity of the crew (up to the crew limit) positioned above the vertical tangent to the inboard face of the buoyancy tube as shown in Figure 3, except where there are insufficient seating places for all persons to be accommodated sitting on one side tube (with 500 mm spacing), in which case the remainder shall stand on the cockpit sole as far outboard as practicable.

Because the boat cannot sink if it complies with 7.5, the offset-load test does not have to be limited by the freeboard margin to water flooding over the buoyancy tube or transom into the interior of the boat.

Dimensions in millimetres



Key

1 working deck/bottom

2 outboard row of persons centred over inboard tangent of buoyancy tube, minimum spacing 500 mm in any direction

3 inboard row of persons (example)

Figure 3 — Position of crew limit

7.5 Maximum load capacity

The maximum load capacity shall be determined according to ISO 14946 except that stability and buoyancy calculations shall be done according to 7.4 and 7.6, respectively.

7.6 Buoyancy requirements

7.6.1 Total buoyant volume

The total buoyant volume of the RIB comprises

— the buoyancy of tubes (3.2 or 3.3),

— the permanent inherent buoyancy (3.5),

— the permanent sealed buoyancy (3.6), and

— the inherent buoyancy of the rigid parts of the boat (3.7).

NOTE Where the rigid hull is manufactured in aluminium or glass-reinforced plastic, the inherent buoyancy of the rigid parts of the boat can conservatively be taken as the mass of structural materials, in kilograms, divided by 2 700.

The total buoyant volume of the RIB (V), in cubic metres, shall be as follows:

$$V > \frac{1{,}33 \times m_{\mathrm{LDC}}}{1\ 000}.$$

As defined by 3.1, the volume of the buoyancy tube may not comprise less than 50 % of the required total buoyant volume of the boat.

7.6.2 Buoyancy determination

Total buoyant volume shall be determined by measuring or calculating the volume of the closed-cell foam buoyancy tubes, the volumes of the inflatable buoyancy tubes at the nominal pressure, permanent inherent buoyancy (3.5), permanent sealed buoyancy (3.6) and inherent buoyancy of the rigid parts of the boat (3.7).

7.6.3 Level flotation when swamped

When the boat in the fully loaded condition is filled to overflowing with water, it shall float with not more than 10° trim from the unswamped fully loaded waterline and with more than two thirds of the length of the top of the buoyancy tubes and transom above the water.

All compartments not comprising

— buoyancy tubes (as defined in 3.3),

— permanent inherent buoyancy (as defined in 3.5), or

— permanent sealed buoyancy (as defined in 3.6)

shall be filled with water during this test.

For this purpose, the mass of the engine or engines shall correspond to the maximum engine power recommended by the builder for outboard engines, as given in ISO 12217-1:—, Tables E.1 and E.2.

This requirement may be demonstrated either by physical test or by calculation.

If using the physical test, the following apply.

a) Vulnerable items, such as engines, may be replaced with an appropriate mass at the appropriate location.

b) For outboard engines, ISO 12217-1:—, Tables E.1 and E.2, columns 2 and 4 give the appropriate replacement mass to be used with respect to engine power for petrol engines. A heavier mass may be used if it is recorded in the owner's manual. A mass of 86 % of the engine dry mass shall be used for diesel, jet-propulsor or electric outboard engines, if these are supplied as the standard outfit. Boats equipped for use both with and without an outboard engine shall be tested in both conditions.

c) For inboard engines, the replacement mass shall be lead, steel or iron of a mass equal to 75 % of the installed mass of the engine and stern-drive.

d) Replacement masses shall, as far as practicable, have the same position of centre of gravity as the actual engine.

7.7 Compartmentation (inflatable buoyancy tubes)

The buoyancy of the inflatable buoyancy tube shall be contained within a number of separate buoyancy chambers (compartments). The minimum number of compartments, N, is five and the length of each compartment shall not exceed 4 m.

Ancillary inflatable compartments not permanently fixed to the hull (see 3.3) shall not be included in the calculation below.

The volume of each compartment (V_c), with internal partition bulkheads in the neutral position, shall be within ±20 % of the mean compartment volume expressed as the total volume of the buoyancy tube using the ratio V/N.

Compartments in addition to the minimum required number may have a lower volume than required by the above paragraph.

7.8 Nominal pressures (inflatable buoyancy tubes)

The nominal pressures shall be specified for each compartment of the fully inflated buoyancy tube. These pressures shall be indicated in the owner's manual (see Clause 9) and on the builder's plate (see Clause 8).

In order for the operator to ascertain that the nominal pressure has been reached, the manufacturer shall provide appropriate equipment or a pressure gauge for this purpose. Alternatively, instructions shall be included in the owner's manual which will enable a sufficiently close pressure estimate to be made.

The nominal pressure shall be consistently expressed in pascals, with bars and pounds per square inch as additional optional units.

As an additional safety measure, the nominal pressures should be indicated on each compartment.

7.9 Strength of the inflatable buoyancy tube

7.9.1 General

The inflatable buoyancy tube shall remain airtight after each of the tests in 7.9.2.

7.9.2 Test method

7.9.2.1 Test temperature

All tests shall be performed at an ambient temperature of (20 ± 3) °C unless otherwise specified.

7.9.2.2 Heat test (inflatable buoyancy tube)

The heat test may be carried out on a sample piece of the buoyancy tube to facilitate testing in a heat chamber. The sample shall be made using exactly the same method, using the same materials, valves and adhesives and shall be of the same diameter as the production buoyancy tube. The sample piece shall be a minimum of 1,45 m in length.

NOTE The buoyancy tube or sample will be called “element to be tested” in the remainder of 7.9.2.2.

Inflate the element to be tested to a pressure of 1,2 times the design working pressure. Place the element to be tested in a heat chamber, set at 60 °C, for a period of 6 h. On completion of the test period, remove the element to be tested from the heat chamber and allow it to cool down to ambient temperature. Test the airtightness of the element to be tested in accordance with the test specified in 7.9.2.4.

7.9.2.3 Overpressure test

Inflate each compartment of the inflatable buoyancy tube to 1,5 times the nominal pressure for 30 min. When separate compartments have common envelope parts (for example, internal partition bulkheads), these compartments shall be individually tested with adjacent compartments deflated. No damage or rupture shall occur and the buoyancy tube shall be tested for airtightness as specified in 7.9.2.4.

7.9.2.4 Airtightness test

Support or insulate the buoyancy tube from the floor and do not expose to any draught of air or direct sunlight. Inflate the buoyancy tube (all compartments) for 30 min to a pressure 1,2 times the nominal pressure (see 7.8) in order to pre-stretch the buoyancy tube. Then, reset the pressures to the nominal pressure for a further 30 min period in order to stabilize conditions. Check and adjust, if needed, the pressures to the nominal pressure and record the ambient temperature and atmospheric pressure. Leave the buoyancy tube inflated for 24 h, after which the pressure drop shall not be greater than 20 % in any compartment. Record the final ambient temperature and atmospheric pressure.

The temperature difference between the start of the test and the test readings shall not exceed ±3 °C.

The atmospheric pressure difference between the start of the test and the test readings shall not exceed ±1 %.

For each rise or fall of 1 °C in ambient temperature, an allowance of 400 Pa may be subtracted from or added to the recorded boat pressure, respectively.

7.10 Man overboard prevention and recovery

All boats shall be in accordance with ISO 15085:2003, Clauses 7, 9, 15 and 16.

7.11 Field of vision from the helm position

The field of vision from the main helm position shall conform to the requirements of ISO 11591.

7.12 Provision for a liferaft or liferafts

Provision shall be made for stowage of a liferaft or liferafts that can carry the crew limit. If the liferaft is a rigid canister type, it shall be mounted on the cockpit, ready for use. If the liferaft is contained in a soft bag, it may be stowed in a compartment but shall be readily available for use.

7.13 Self-bailing

7.13.1 General

The boat shall be capable of self-bailing within 5 min when tested as in 7.13.3 or by calculation as in 7.13.4.

7.13.2 Self-bailing test requirement

Closely examine the boat at the end of the test described in 7.13.3.

The cockpit areas shall self-drain in less than 5 min and shall have no more than 100 mm height of residual water.

7.13.3 Test method

Ensure that there is no water within the boat. Load the boat to the manufacturer's recommended maximum load capacity. The distribution of this load shall represent the boat fitted with motor(s) of the maximum power rating (as specified by the manufacturer) and crew limit seated in their normal positions. Close any cockpit drains and scuppers while filling. Fill the cockpit areas with water until it starts to flow out overboard. Let the water drain from the flooded cockpit areas by opening the cockpit drains and scuppers, and, if necessary, by other means without using loose equipment or an electric bilge pump.

7.13.4 Self-bailing calculation requirement

Calculate the draining time in accordance with ISO 11812.

7.14 Buoyancy tube attachment strength test (type test only)

7.14.1 General

The strength of the buoyancy tube attachment is paramount to safe operation of a RIB and shall be sufficiently strong for its intended use. The purpose of this testing is to simulate loads in a closed environment that can be experienced in normal use to show if the attachment system is of sufficient strength.

7.14.2 Requirement

The attachment system of the buoyancy tube to the rigid structure shall be tested in accordance with either 7.14.3 or 7.14.4.

Closely examine the buoyancy tube attachment system and its surrounding area at the end of the test. There shall be no visible damage or tearing.

7.14.3 Test method A

Attach a sample section of the buoyancy tube (minimum length 0,5 m) to a sample section of the rigid structure (minimum length 0,5 m), both manufactured to the same design and process of the assessed boat and joined together exactly as in the assessed boat.

The objective of the test is to generate a force on the join between rigid structure and buoyancy tube, simulating what can be experienced by the boat when it is subjected to a 3 m drop test at a 0° heel and 0° trim in its fully loaded ready-for-use condition as defined in ISO 8666. This is followed immediately by the same test at a 0° heel and −45° trim (representing a bow-down position) followed immediately afterwards by the same test at a 0° heel and +45° trim (representing a stern-down position).

The simulation can be achieved using the equipment and material listed as follows:

— a fork-lift truck with tines capable of lifting the test weight(s) and supporting the jerk weight of the test weight(s) when dropped from a height of 3 m;

— test weight(s) and 4 m length(s) of wire rope attached to the sample rigid structure section that can withstand the forces of stopping the test weight after a free fall drop of 3 m. The wire rope(s) shall be configured with a quick release device fitted to allow a 3 m drop of the weight (see Figure 3);

— a sample section of the buoyancy tube with a minimum length of 0,5 m that can be inflated to the nominal pressure or is filled with closed-cell foam that is used in the assessed craft;

— a sample section of the boat rigid structure or cockpit, at least as long as the sample section of the buoyancy tube where the buoyancy tube is normally joined;

NOTE A rigid component representing the rigid structure or cockpit of the assessed craft may also be used.

— a cradle or frame that can be fitted to the tines of the fork-lift truck and support the sample buoyancy tube section at 45°.

Determine the mass of the test weight(s) that needs to be used for the test for the sample buoyancy tube section [length to be determined by the manufacturer (the minimum length of sample buoyancy tube is 0,5 m)] using the following formula:

$$m_{\mathrm{t}} = \frac{L_{\mathrm{STS}} \times m_{\mathrm{LDC}} \times 0{,}75}{L_{\mathrm{T}}}$$

EXAMPLE A 10 m boat with a mass of 10 000 kg in its fully loaded ready-to-use condition that has a total buoyancy tube length of 20 m would require a 375 kg test weight if the length of the sample buoyancy tube section was 1 m.

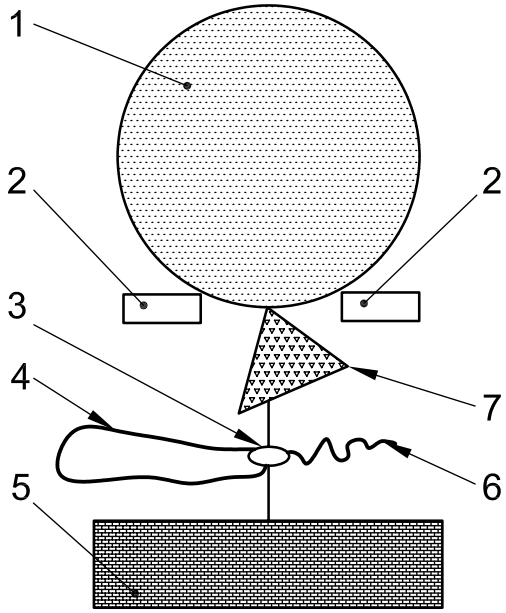
Connect the test weight(s) to the sample section of the rigid structure using the wire rope configured as in Figure 4 (if multiple weights are used, they shall be placed evenly along the length of the section far enough apart that they do not touch each other when the section is angled at 45°).

Place the sample buoyancy tube section lengthwise between the tines of the fork-lift truck, allowing the join between rigid structure and buoyancy tube to be positioned between the tines.

Elevate the tines to a height that will allow the test weight(s) to drop 3 m without hitting the ground.

Pull on the release lanyard of the release device and allow the test weight(s) to drop 3 m.

Repeat the test twice with the sample buoyancy tube section secured at –45° trim and +45° trim.



Key

1 buoyancy tube section
2 tines of fork lift
3 release device
4 3 m of looped wire rope
5 test weight
6 release lanyard of release device
7 rigid structure section

Figure 4 — Connection of test weights

7.14.4 Test method B

Provide two pieces of material: one made of the material of the buoyancy tube and one made of the material of the rigid structure/cockpit. Join the two pieces together in the same manner as used in the assessed boat construction (method, material, dimensions) to form a 500 mm wide test piece. Gradually load this assembly with a horizontal sliding force up to breaking point. If the buoyancy tube material or the rigid structure material fails before the attachment, the test is passed. There shall be no slipping or other failure at any part of the attachment.

7.15 Strength of the rigid structure (type test only)

The strength of the rigid structure shall

— be in conformity with ISO 12215-5, and

— pass the performance tests as defined in ISO 6185-3:2001, 8.3 (in observed significant wave height of 1 200 mm) and 8.5.

7.16 Strength of principal factory-fitted accessories

7.16.1 General

The strength of principal accessories is paramount to safety and shall be sufficient for its intended use. The purpose of this test is to simulate loads that can be experienced in normal use and indicate if the accessory itself and its attachment system are of sufficient strength.

7.16.2 Requirement

The attachment systems of accessories such as seats and steering consoles shall be tested in accordance with either of the tests in 7.16.3 or 7.16.4.

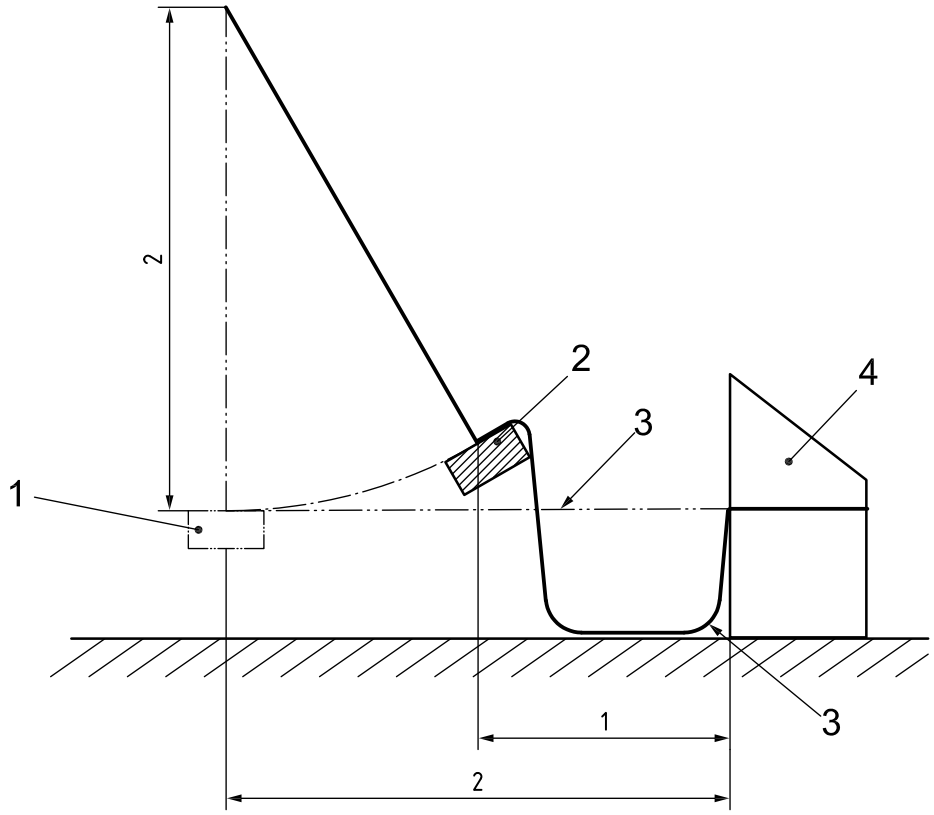
At the end of the test, closely examine the attachment systems and all surrounding surfaces. There shall be no evident damage.

7.16.3 Test method A

Prepare the accessory to be tested by fitting it in the boat or on a sample piece of the cockpit using exactly the same method as the assessed boat.

Suspend a 225 kg test weight vertically by a 2 m wire so that it is positioned at a horizontal distance of at least 2 m away from the test accessory. Attach a 2 m retainer wire from the test weight to the test accessory at the level where the steering helm is positioned. Pull the test weight in the desired direction at least 1 m towards the test accessory then immediately release it, allowing it to swing freely away from the test accessory for at least 1 m before the retainer wire brings it to a stop (see Figure 5). The test shall be carried out in the fore and aft directions as well as the transversal port and starboard directions.

Dimensions in metres



Key

1 test weight
2 test weight pulled within 1 m of the test accessory
3 2 m retainer wire (free hanging and under tension)
4 test accessory (steering console is depicted)

Figure 5 — Testing the strength of factory-fitted accessories

7.16.4 Test method B

Any cordage used for test purposes shall have a diameter of 8 mm.

Prepare the accessory to be tested by fitting it in the boat or a sample piece of the cockpit using exactly the same method as the production.

Gradually load the accessory up to 2 kN in the upward and downward vertical directions, the horizontal fore and aft directions as well as the transversal port and starboard directions, maintaining this load for 1 min each time.

8 Builder's plate(s)

The boat shall be equipped with printed or engraved plates in accordance with ISO 14945.

Additional data may be supplied as long as it does not contradict ISO 14945.

The craft identification number shall be shown in accordance with ISO 10087 and be mounted separately from the builder's plate.

Although ISO 14945 excludes inflatable boats, its requirements for the uniform display of information to be exhibited on the builder's plate are applicable to Type IX and Type X boats.

9 Owner's manual

An owner's manual shall be supplied in a suitable language or languages for the intended market(s) and in simple terms, sufficient to enable the operator to correctly assemble, inflate and prepare the boat for use afloat, including reference to lifting devices, the location/fixing of seating, steering system, battery and fuel tank(s) (where applicable).

Guidance shall also be given in the owner's manual on drying, storage and servicing of the boat.

A warning notice such as the following shall be given concerning the final assembly of the boat prior to delivery.

WARNING — Attention is drawn to the completion process whereby structural items, for example steering consoles, seats and superstructures, are installed by parties other than the manufacturer of the boat. These items should be installed to comply with the relevant clauses of ISO 6185-4 so it can be ensured that any such installations do not invalidate the original assessment.

Warnings shall be given in the owner's manual regarding the following:

a) the dangers of not following the owner's manual, which can detail important inflation and assembly sequences;

b) the advisability of carrying safety equipment as required by national safety regulations, as well as the wearing of lifejackets and/or buoyancy aids;

c) the purpose and importance of the “kill cord” in preventing accidents;

d) where applicable, the potential harmful effects of liquids such as battery acid, oil and petrol, together with the risks of fire;

e) the dangers associated with uneven distribution of persons or loads in the boat;

f) the possibilities of natural hazards, containing the conspicuous warning “BEWARE OF OFFSHORE WINDS AND CURRENTS”;

g) the danger of exceeding the data given on the builder's plate(s) (see Clause 8) and associated risks of flooding;

h) the importance of ensuring that the subsequent fitting of consoles or other structures not supplied with the boat when new are installed in accordance with guidance provided by the boat manufacturer.

The unladen weight of the craft shall be specified.

Details of the handling characteristics for the most powerful engine shall be given.

Refer to ISO 10240 for the inclusion of additional information.

10 Standard equipment

The following standard equipment shall be provided with each boat:

— repair outfit, suitable for repairing small punctures of limited extent and including instructions for use;

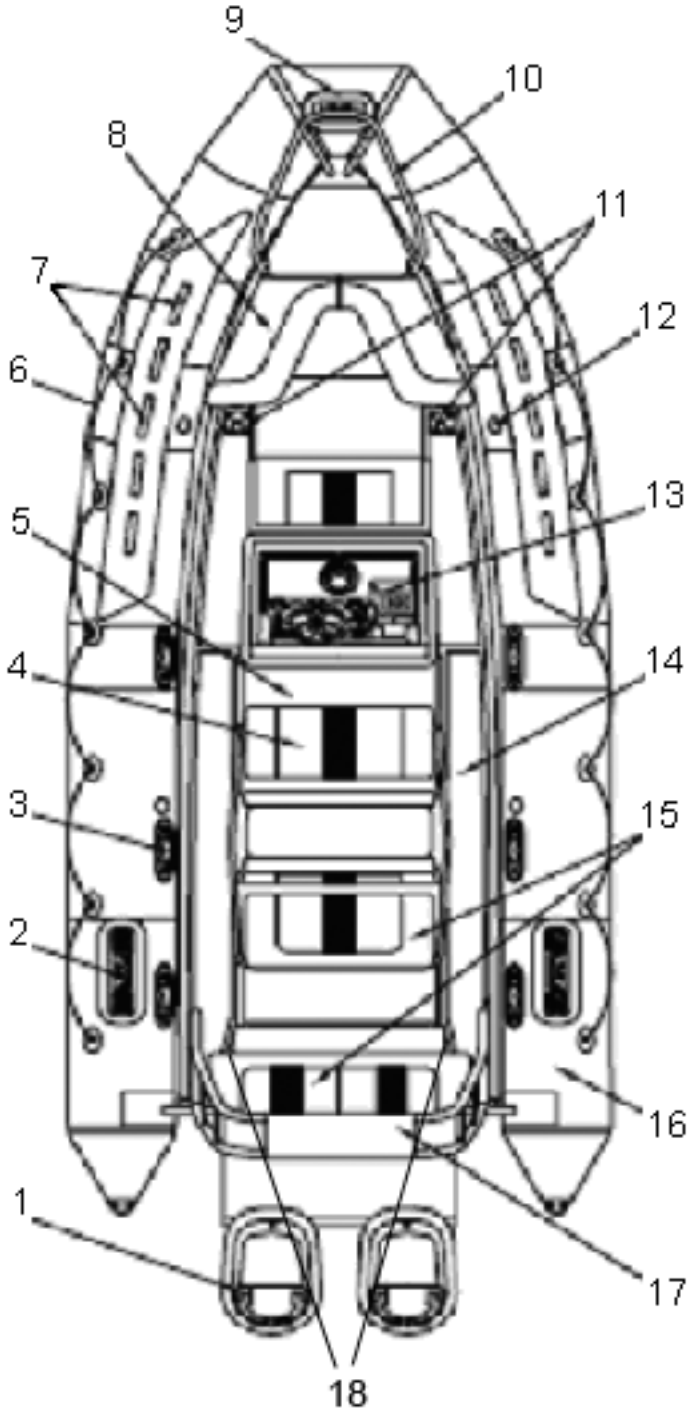
— pump for maintaining the pressure in inflated components;

— bow rope (painter) permanently attached to the towing point with a length of not less than L_H, and having a minimum strength, in newtons, not less than $10 \times m_{LDC}$.

Annex A
(informative)

Typical Type IX powered boat

Figure A.1 depicts a dual-outboard open RIB with a centre steering console and crew seating positioned centrally as well as fore and aft. It is a guide for the user to identify the components that typically make up a Type IX boat.



Key

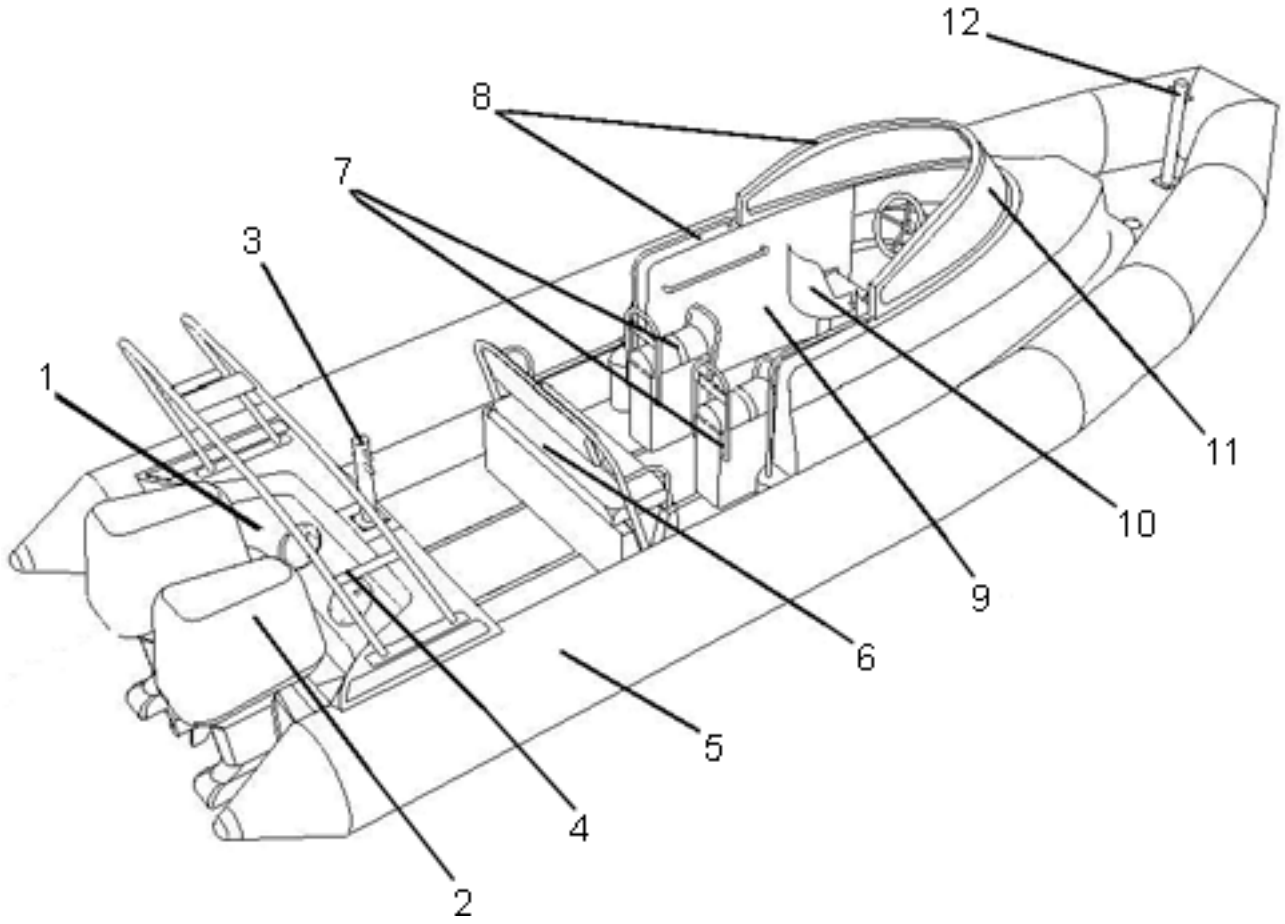
1 dual outboard engines on outboard bracket extension
2 aft mooring cleat
3 passenger grab handle
4 driver and passenger seat
5 fuel tank (under cockpit)
6 safety ropes
7 passenger handles
8 bow seats
9 bow mooring cleat
10 bow rail
11 forward lifting points
12 inflation valve
13 steering console with instrumentation
14 non-skid cockpit on rigid hull
15 passenger bench/seat
16 inflatable buoyancy tube
17 stern arch
18 aft lifting points

Figure A.1 — General arrangement of a typical Type IX powered boat

Annex B
(informative)

Typical Type X powered boat

Figure B.1 depicts a dual-outboard RIB with a cabin superstructure and various seating arrangements. It is a guide for the user to identify the components that typically make up a Type X boat.



Key

1 dual outboard engines
2 self-draining outboard well
3 aft mooring/towing post
4 stern arch suitable for mounting navigation lights and antennae
5 buoyancy tube, either inflatable or foam-filled
6 passenger bench seat with passenger grab handles
7 passenger jockey seats with passenger grab handles
8 passenger grab rails
9 cabin superstructure
10 helm seat
11 windshield
12 bow mooring/towing post

Figure B.1 — General arrangement of a typical Type X powered boat

Bibliography

[1] ISO 9650 (all parts), *Small craft — Inflatable liferafts*

[2] ISO 12217-3:—[3], *Small craft — Stability and buoyancy assessment and categorization — Part 3: Boats of hull length less than 6 m*

3) To be published. (Revision of ISO 12217-3:2002)

ICS 47.080

Price based on 29 pages