INTERNATIONAL STANDARD

ISO 6185-1

First edition
2001-11-15

Inflatable boats —

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

Bateaux pneumatiques —

Partie 1: Bateaux équipés d'un moteur d'une puissance maximale de 4,5 kW

Reference number
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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.

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 6185 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 6185-1 was prepared by Technical Committee ISO/TC 188, *Small craft*.

ISO 6185-1, together with ISO 6185-2 and ISO 6185-3, cancel and replace ISO 6185:1982. They differ significantly from ISO 6185:1982 as they cover boats made from unsupported materials, whereas the latter only covered boats made from reinforced materials.

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*

Annexes A and B form a normative part of this part of ISO 6185. Annexes C, D and E are for information only.

Introduction

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

It excludes

— single-chambered boats,

— boats of buoyancy less than 1 800 N,

— boats made from unsupported materials of more than 12 kN inflated buoyancy and powered by motors exceeding 4,5 kW, and

— boats greater than 8 m in overall length.

It is not applicable to

— aquatic toys, and

— inflatable liferafts.

Part 1:

Type I	Boats propelled exclusively by manual means.
Type II	Powered boats not exceeding 4,5 kW.
Type III	Canoes and kayaks.
Type IV	Sail craft with a maximum sail area of 6 m^2.

Part 2:

Type V	Powered boats of 4,5 kW to 15 kW inclusive.
Type VI	Sail craft with sail area greater than 6 m^2.

Part 3:

Type VII	Powered boats of 15 kW and greater.
Type Vlll	Powered offshore boats of 75 kW and greater.

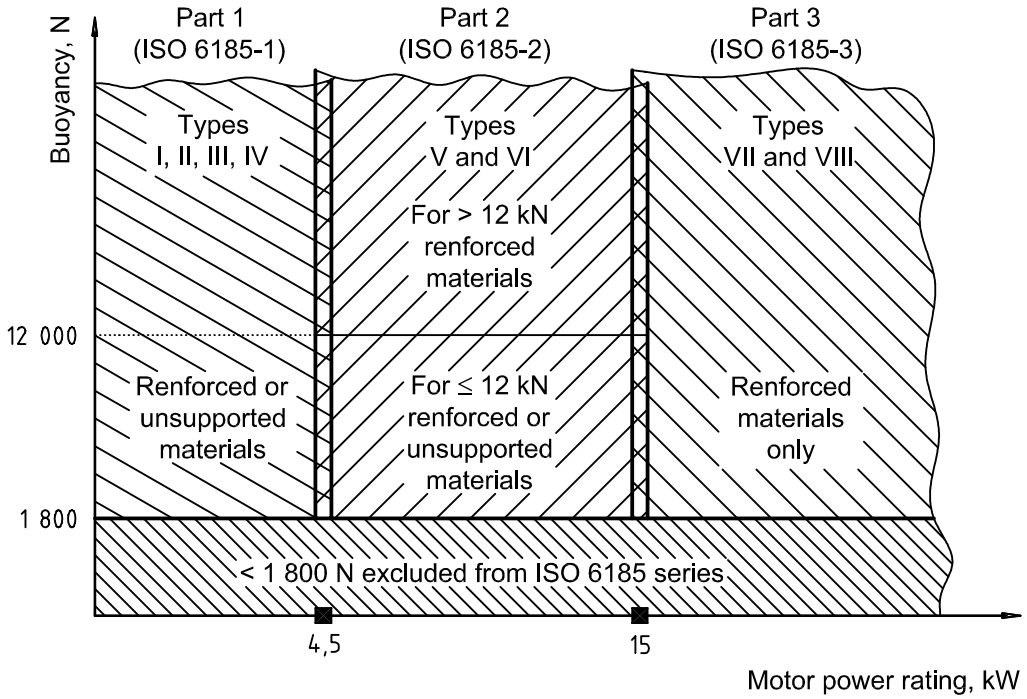


Figure 1 — Illustration of how the three parts of ISO 6185 are divided

Inflatable boats —

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

1 Scope

This part of ISO 6185 specifies the minimum safety characteristics required for the design, materials to use, manufacture and testing of inflatable boats (including rigid inflatable boats) less than 8 m in overall length with a minimum buoyancy of 1 800 N.

This part of ISO 6185 is applicable to the following types of inflatable boats intended for use within the operating temperatures of – 5 °C to + 60 °C:

— Type I: Inflatable boats propelled exclusively by manual means;

— Type II: Inflatable boats capable of taking a maximum motor power of 4,5 kW;

— Type III: Inflatable canoes and kayaks (see normative annex A);

— Type IV: Inflatable craft propelled by sail with a maximum sail area of 6 m^2 (see normative annex B).

NOTE 1 General arrangements of typical boats of Types I, II and III are given in annexes C, D and E, respectively.

NOTE 2 For boats with power ratings of 4,5 kW and greater, refer to ISO 6185-2 and ISO 6185-3.

This part of ISO 6185 excludes single-chambered boats and is not applicable to aquatic toys and inflatable liferafts.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 6185. 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 6185 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 1817:1999, *Rubber, vulcanized — Determination of the effect of liquids*

ISO 3011:1997, *Rubber- or plastics-coated fabrics — Determination of resistance to ozone cracking under static conditions*

ISO 4646:1989, *Rubber- or plastics-coated fabrics — Low-temperature impact test*

ISO 7000:1989, *Graphical symbols for use on equipment — Index and synopsis*

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

ISO 9775:1990, *Small craft — Remote steering systems for single outboard motors of 15 kW to 40 kW power*

ISO 11192: —[1)], *Small craft — Graphical symbols*

ISO 11591:2000, *Small craft, engine-driven — Field of vision from helm position*

ISO 12215-1:2000, *Small craft — Hull construction and scantlings — Part 1: Materials: Thermosetting resins, glass-fibre reinforcement, reference laminate*

ISO 15652: —[1)], *Small craft — Remote steering systems for inboard mini jet boats*

3 Terms and definitions

For the purposes of this part of ISO 6185, the following terms and definitions apply.

3.1
inflatable boat
buoyant structure (hull), achieving all or part of its intended shape and buoyancy by the medium of inflation and which is intended for the transportation of people and/or loads on the water, and where the design and shape of it gives it the capability of withstanding forces and movements arising from sea conditions

3.2
rigid inflatable boat
RIB
inflatable boat (3.1) with the lower part of the hull constructed as a rigid unit and the topsides (inflatable hull) achieving its intended shape and buoyancy (or part thereof) by the medium of inflation

3.3
buoyancy of the boat
volume of any chamber, which forms the inflatable hull, and any other chamber which is permanently fixed to it

3.4
buoyancy of a RIB
buoyancy comprising, for calculation purposes, in addition to the inflated buoyancy, the permanent inherent buoyancy or at least two compartments of permanent sealed buoyancy, fixed to the rigid hull, not exceeding 20 % of the total buoyancy

3.5
calculation of the buoyancy
determination of buoyancy by measuring or calculating the volume at the design working pressure recommended by the manufacturer and expression as a force, where required

NOTE The conversion factor is 9,81 kN/m^3 of the total buoyancy.

3.6
permanent inherent buoyancy
non-intercellular (closed-cell) foam or other materials which are less dense than fresh water and which have minimal water absorption over their intended life expectancy and which are in (a) sealed compartment(s) in the hull

3.7
permanent sealed buoyancy
sealed airtight compartment(s) filled with air

1) To be published.

3.8
reinforced materials
materials which have a coated base cloth

3.9
unsupported materials
materials which have no base cloth

3.10
inboard area
internal surface area defined by a vertical plane tangential to the innermost side of the buoyancy tube and perpendicular to the deck

3.11
inboard length
length of the cockpit, including the area below any spray cover, measured along the boat centreline between the innermost points of the bow and stern

3.12
inflatable canoe
craft having a length/width ratio of at least 3:1 and exclusively propelled by single paddles from either a kneeling or seated position and where the intended shape and buoyancy is achieved by inflation of air chambers

3.13
inflatable kayak
craft having a length/width ratio of at least 3:1 and exclusively propelled by double paddles from a seated position and where the intended shape and buoyancy is achieved by inflation of air chambers

3.14
type A canoe
type A kayak
craft intended for long distance cruising including travelling periods of several days

3.15
type B canoe
type B kayak
craft intended for beach use, short-time and short-distance cruising

4 Materials

4.1 General

All materials shall be selected by the manufacturer according to the stresses to which the craft is to be subjected (shape, dimensions, maximum load, installed power, etc.) and also according to the intended service conditions. Use under normal seagoing conditions shall not materially impair their performance and they shall meet the requirements specified in 4.2 to 4.5.

All materials of the inflatable boat shall be inherently rotproof.

4.2 Reinforced materials (excluding glass-fibre-reinforced plastics components) and/or unsupported materials making up the hull

4.2.1 Requirements

All materials contributing to the integrity of the boat shall meet the relevant requirements stipulated below and shall retain their full serviceability within the operating temperature range of –5 °C to + 60 °C.

4.2.2 Test methods

4.2.2.1 Sampling

Carry out the test with test pieces taken from the constituent materials prior to manufacturing the boat. If the boats are vulcanized during manufacture, the test pieces shall also be vulcanized.

4.2.2.2 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 but using ASTM oil No. 1.

In cases a) and b) shown in Table 1, 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 40 °C ± 1 °C.

Table 1 — Test liquids

Test liquid	Period of contact
a) Oil	22 h ± 0,25 h
b) Salt water [a]	336 h (minimum)
[a] Components of salt water: Distilled water + 30 g of sodium chloride per litre.	

4.2.2.3 Resistance to ozone

Carry out the test on the external side or the sides in contact with the ambient environment as specified in ISO 3011.

— Exposure time: 72 h

— Temperature of test: 30 °C ± 2 °C

— Concentration: 50 pphm[2)], that is to say, 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 the test samples are examined under a magnification of 10 ×.

4.2.2.4 Resistance to cold

All materials shall satisfy the requirements of ISO 4646 at a temperature of −5 °C.

4.3 Wood

4.3.1 General

The types of timber and plywood used shall be suitable for the application and the marine environment.

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

2) Parts of ozone per hundred million of air by volume.

4.3.2 Plywood

All plywood used shall incorporate hardwoods for both internal and external veneers and the bonding adhesive shall be waterproof and boil-proof. The 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.

Other timbers, e.g. Douglas Fir, may be used for the veneers provided that they are treated to give protection against rot, fungal decay and marine borers. Adjoining edges and/or surfaces, including any end-grain, shall be effectively sealed.

4.3.3 Constructional timbers

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

4.4 Metal and synthetic material parts

Materials used shall be of a type, strength and finish suitable for the intended purpose of the components and compatible with the marine environment.

4.5 Glass-fibre-reinforced plastics

Resins, reinforcements and laminates shall comply with the requirements of ISO 12215-1.

5 Functional components

5.1 Conditioning

All tests shall be performed at a temperature of 20 °C ± 3 °C.

5.2 Hull fittings

5.2.1 Requirement

The materials and method of construction used shall be compatible with that of the hull itself. Any load-bearing fitting attached to the boat (see 3.1 and 3.2) shall not, when loaded as described in 5.2.2, result in any impairment in airtightness or water integrity.

5.2.2 Test method

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

Gradually load the fittings in any direction up to breaking point but not exceeding 2 kN. If 2 kN is reached, maintain this load for 1 min.

5.3 Manual lifting and carrying devices

5.3.1 Requirement

The boat shall be equipped with a means for carrying it. There shall be no failure of the device when tested in accordance with 5.3.2.

5.3.2 Test method

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

Gradually load the device with a force as detailed below for 1 min in the appropriate directions.

Types I and III: 500 N

Types II and IV: 1 kN

Where lifting or carrying devices also function as safety ropes or grab handles, they shall also conform to the requirements of 6.7.1.

5.4 Valves

5.4.1 Inflation

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

The type and arrangement of the inflation valves fitted to an inflatable boat shall ensure that

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, lifelines or movable components of the boat construction or by normal movements of the passengers and load,

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

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

5.4.2 Deflation

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

Where separate devices are fitted then 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 5.4.1 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.

5.5 Rowlocks and oars

5.5.1 Requirements

The provision of rowlocks and oars is not mandatory. If they are provided as standard or optional equipment, they shall meet the requirements given in 5.5.2 to 5.5.5.

5.5.2 Abrasion damage

The bearing surfaces of the oars and rowlocks shall be free from any roughness likely to cause wear. All external surfaces of the rowlock shall be smooth and free from sharp edges and corners likely to cause damage when the craft is packed.

5.5.3 Prevention from loosening

Rowlocks shall be secured against unintended loosening. Means shall be provided for location of two oars or paddles when stowed away.

5.5.4 Strength of rowlocks

5.5.4.1 Requirement

There shall be no structural failure of the rowlock or associated fittings when tested as described in 5.5.4.2.

5.5.4.2 Test method

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

Load the rowing fitting, including the rowlock, with a force of 300 N for 1 min in any horizontal direction.

5.5.5 Use of the rowlocks and oars

When tested as described in 7.4, there shall be no structural failures or permanent deformation of any component during the test and it shall be clearly demonstrated that the rowlock system is rigid enough for efficient rowing.

A minimum unrestricted movement of the oars 60° ahead and 60° astern shall be required.

5.6 Transom (where applicable)

5.6.1 Requirement

The transom or motor mount and its attachment to the boat shall be designed to withstand, under normal use, the maximum stresses arising from

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

— the weight of such motor(s).

5.6.2 Test method

Visual inspection during and following in-water performance tests described in 7.2.

5.7 Hull drainage

If the boat is fitted with a transom, it shall be equipped with at least one drainplug or one bailing system.

For RIBs fitted with an integral closed hull/deck assembly which is not filled with closed-cell foam or equivalent, a facility shall be provided for draining the lower part of the hull.

5.8 Rudder steering system (where offered as standard or optional equipment)

5.8.1 Strength of the assembly

5.8.1.1 Requirement

No fracture or other damage shall occur following 500 movements of the rudder-blade over an angle of 60°.

5.8.1.2 Test method

Each movement (cycle) shall be carried out within 1 s and shall include the complete steering gear. The rudder-blade shall be submerged in its service position.

5.8.2 Rudder-blade

5.8.2.1 Requirement

The rudder-blade shall be capable of being hoisted to the level of the boat bottom and of being fixed in its working position without the use of tools.

5.8.2.2 Test method

Function test followed by visual inspection.

5.9 Remote steering system (Type II only where offered as standard or optional equipment)

Any remote steering system shall conform to the requirements of ISO 15652 and ISO 9775.

There shall be no damage or malfunction to either the system or to any related attachments to the boat when tested in accordance with clause 7.

5.10 Motor-securing line attachment (Type II only)

A means for attaching a motor-securing line shall be provided at an appropriate position.

5.11 Towing device (all types)

All craft shall have, at their bow, a towing device suitable for securing a towline. See 7.3 for strength test.

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

There shall be no damage or malfunction to either the seating or to any related attachment systems when tested in accordance with clause 7.

6 Safety requirements of the completed boat

6.1 Maximum permissible number of persons

The maximum permissible number of persons n carried shall be calculated for each boat type as follows:

Type I: $$n = \frac{A_{\mathrm{i}}}{0{,}3}$$

where A_{i} is the inboard area, in square metres.

Types II, IV: $n = \frac{l_i}{0,38} - 1$

where l_i is the inboard length, in metres.

Type III: See annex A.

Under no circumstances shall the value n, expressed in body mass, exceed the maximum load capacity (see 6.4).

The value n is reduced by one person if either the maximum motor power rating exceeds 3 kW (4 hp) or if a sailkit is mounted.

For Type I, II and IV boats, the value n shall always be rounded down to the nearest integer but, if the first decimal place is greater than 5, a child may be added or, if greater than 7, an adult may be added.

For calculations, the body mass of a child is defined as 37,5 kg and the body mass of an adult as 75 kg.

The data displayed on the builder's plate(s), see clause 8 e), shall include at least one adult and not more than one child.

6.2 Maximum motor power

This is applicable to Type II boats only.

— For boats without a transom: $P_{max} = 0,8F(d)$

— For boats with a transom: $P_{max} = 1,2F(d)$

where

P_{max} is the maximum motor power rating, in kilowatts, determined in accordance with ISO 8665;

$F(d)$ is the dimensional factor = $l \times b$

where

l is the overall length of the boat, in metres, from the bow to the extremity of the rear float (excluding handholds or other fittings);

b is the overall beam of the boat, in metres (excluding handholds or other fittings).

6.3 Static stability of the boat

6.3.1 Requirement

The boat equipped with the manufacturer's maximum rated motor(s) (see 6.2) shall not capsize when tested as described in 6.3.2.

6.3.2 Test methods

Carry out the test with the motor(s) fitted but without a fuel tank, battery or sailkit. Evenly distribute the test load over the test loading area of the boat as shown in Figure 2.

The total test load m_t, in kilograms, shall be calculated using the following formula:

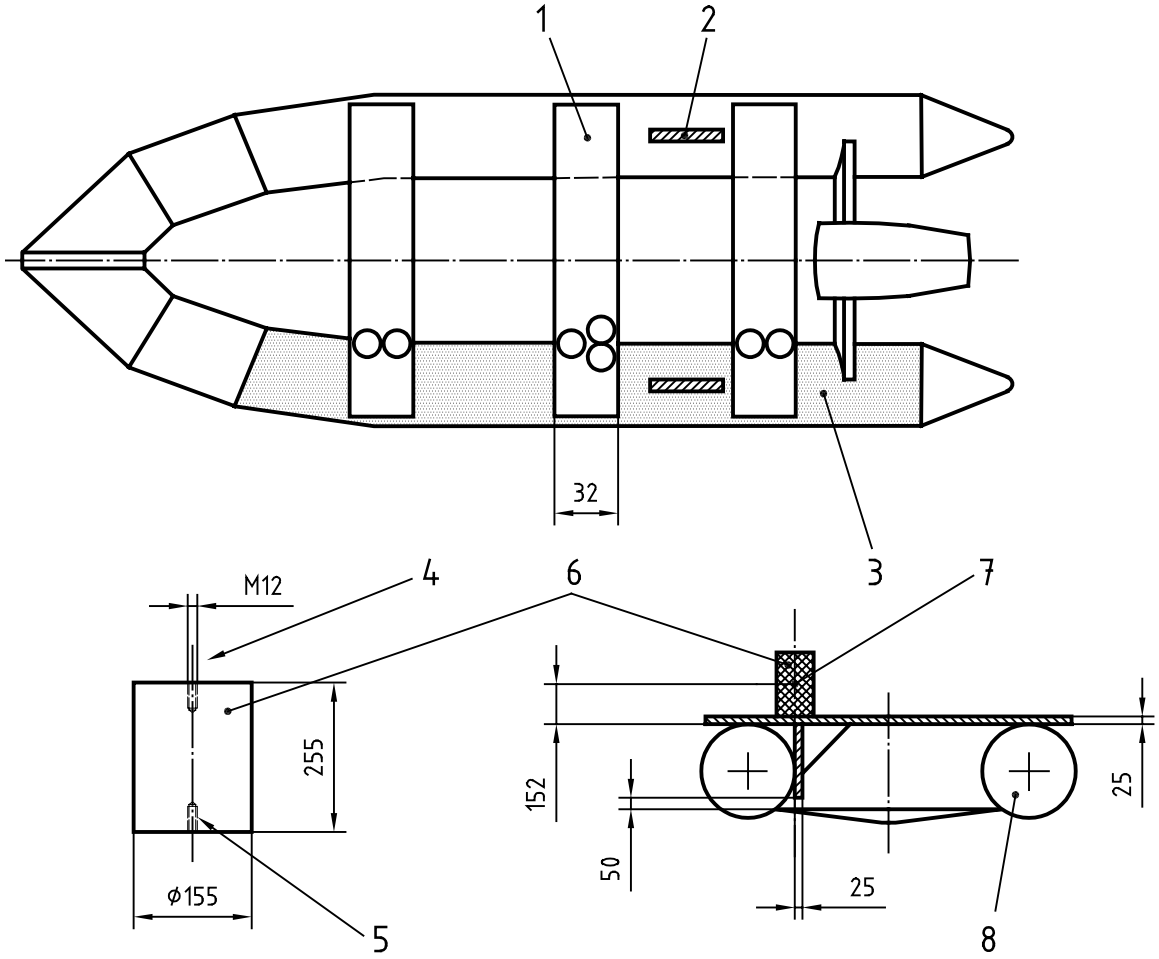
$m_t = (0,67 \times n \times 75) + (0,67 \times 37,5)$ for a child, if applicable

where

n is the maximum permissible number of adults determined by the manufacturer (see 6.1), i.e. 75 kg for each permissible adult and 37,5 kg for a child, if applicable.

NOTE The dimensions for a 37,5 kg steel test weight are given in Figure 2.

Dimensions in millimetres



Key

1	Typical load plate e.g. timber	5	For load-plate fastening bolt
2	Fitting or rowlock	6	Load weight, steel, 37,5 kg
3	Test-load weight area	7	Indicates centre of gravity of load weight
4	For eyebolt	8	Buoyancy tube

Figure 2 — Static stability test with three adults and a child

6.4 Maximum load capacity

6.4.1 Requirement

The maximum load which may be carried by the boat shall be calculated using the following formulae.

— For Types I and III: $m = (0{,}5 \times V \times 1\,000) - M$

— For Types II and IV: $m = (0{,}75 \times V \times 1\,000) - M$

where

m is the maximum load capacity, in kilograms (total mass on board including persons, equipment, outboard motor(s) and fuel);

V is the volume, in cubic metres, of the buoyancy of the boat;

M is the total mass, in kilograms, of the boat as supplied by the manufacturer (inclusive of all permanently installed equipment supplied with the boat: hull, fittings and similar items but without outboard motor(s) and fuel). Permanently installed engine(s) and drive systems shall also be included.

6.4.2 Test method

Calculate the maximum load capacity and compare with the manufacturer's rated value.

6.5 Design working pressures

The design working pressures shall be specified by the manufacturer for each compartment (including buoyancy chambers, keel, seats, awning, etc.) of the fully inflated boat. These pressures shall be indicated either on the appropriate compartment or in the operator's instruction booklet (or both) and, for the buoyancy chambers of the boat, on the builder's plate (see clause 8).

In order that the user may ascertain that the specified working pressure has been reached, the manufacturer shall provide appropriate equipment or a pressure gauge for this purpose. Alternatively, instructions shall be included in the operator's instruction booklet supplied (see clause 9) which will enable a sufficiently close estimate to be made.

The working pressure shall be consistently expressed in bars with psi (pounds per square inch) as an additional unit at the option of the manufacturer.

6.6 Strength of the hull

6.6.1 Requirement

The boat shall remain airtight (see 6.6.2.5) after each of the relevant tests, described in 6.6.2.

6.6.2 Test method

6.6.2.1 Test temperature

All tests shall be performed at a temperature of 20 °C ± 3 °C, unless specified otherwise.

6.6.2.2 Cycle test for boats manufactured from unsupported material (seam strength)

Assemble the boat in accordance with the manufacturer's instructions and fully inflate it to the design working pressure (see 6.5).

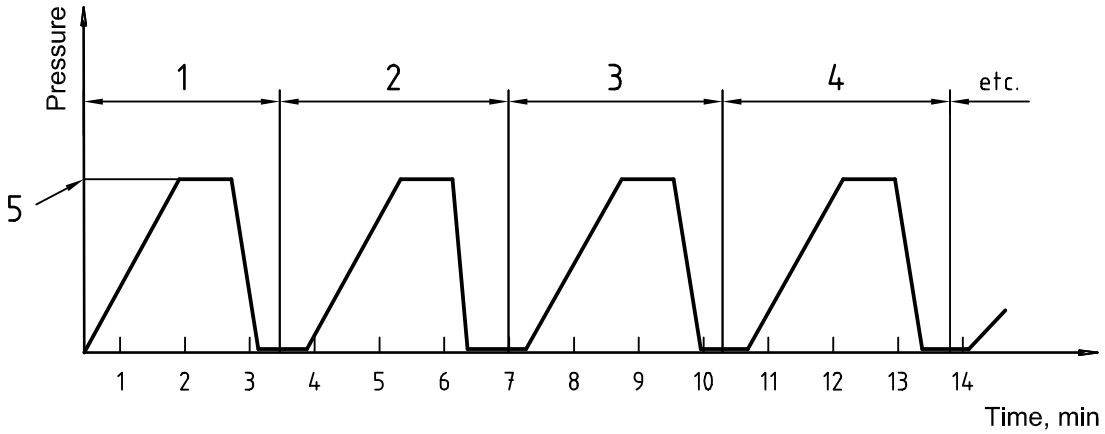
This test shall be in three stages:

a) This stage of the test procedure shall be applied alternately to at least two adjoining main buoyancy chambers in turn (see Figure 3). 50 cycles of inflation to a pressure of 1,1 times the design working pressure.

b) Inflate the boat completely to the design working pressure and leave it for 12 h.

c) 25 cycles of inflation as described in a).

Test the airtightness of each main buoyancy chamber in accordance with 6.6.2.5.2.



Key

1 Chamber 1
2 Chamber 2
3 Chamber 1
4 Chamber 2
5 Design working pressure

Figure 3 — Airtightness test for buoyancy chambers

Test durations for the inflation cycle shall be as follows:

— time to inflate to design working pressure: 2,0 min;

— maintain at design working pressure: 0,5 min;

— time to deflate to zero pressure: 0,5 min;

— maintain at zero pressure: 0,5 min.

Adjoining chambers shall **not** be tested simultaneously.

6.6.2.3 Heat test (all boat types)

Assemble the boat in accordance with the manufacturer's instructions and inflate it to a pressure of 1,1 times the design working pressure. When assembled, place the boat in a heat chamber, set at 60 °C, for a period of 6 h. On completion of the test period, remove the boat from the heat chamber and allow to cool down to ambient temperature. Test the airtightness of the boat in accordance with the relevant test specified in 6.6.2.5 (6.6.2.5.1 for boats manufactured from reinforced material or 6.6.2.5.2 for boats manufactured from unsupported material).

6.6.2.4 Overpressure test for boats manufactured from reinforced material

Inflate each compartment of the buoyancy tube to 1,5 times the manufacturer's design working 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 boat shall be tested for airtightness as described in 6.6.2.5.1.

6.6.2.5 Airtightness testing

6.6.2.5.1 Boats manufactured from reinforced material

Support or insulate the boat from the floor and do not expose it to any draught of air or direct sunlight. Inflate the boat (all compartments) for 30 min to a pressure, that is 20 % in excess of the manufacturer's design working pressure (see 6.5) in order to pre-stretch the boat. Then reset the pressures to the design working pressure for a further period of 30 min in order to stabilize conditions. Reset the pressures to the design working pressure and

record the ambient temperature and atmospheric pressure. Following a test period of 24 h, 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 in ambient temperature of 1 °C, an allowance of 0,004 bar may be respectively subtracted from, or added to, the recorded boat pressure.

6.6.2.5.2 Boats manufactured from unsupported material

The airtightness is measured indirectly as shrinkage of the material.

Test all buoyancy chambers individually with all adjacent chambers deflated.

Inflate the buoyancy chamber to be tested to a pressure of 1,1 times the design working pressure at ambient temperature. Immediately stick a strip of paper, approximately 100 mm long, at its ends onto the outer surface of the air chamber in a circumferential direction. Cut the strip in half horizontally. Following a test period of 2 h, there shall be no overlapping of the two cut ends.

6.7 Safety ropes and grab handles

6.7.1 Requirement

Boats of all types shall be equipped with adequate means of offering a firm hold to each of the permissible number of persons when occupying the seating positions provided or when outside in the water, even if the boat has capsized. All handholds shall designed to ensure, by their nature and arrangement, that the permissible number of persons can hold them, even for a long period, without risk of injury.

The handholds and assemblies shall conform to the requirements for hull fittings described in 5.2. Where safety ropes and grab handles also function as manual lifting or carrying devices, they shall also conform to the requirements of 5.3.

Boats of Type I shall have a safety rope around the whole boat.

Boats of Type II and IV shall have a safety rope and/or handles along the sides.

Boats of Type III shall be arranged in accordance with A.6 of annex A.

There shall be no failure of the handhold assemblies when tested as described in 6.7.2.

6.7.2 Test method

Visual inspection and assessment.

Load each handle and lifeline assembly with a force as detailed below for 1 min in any direction. For a practical assessment in the water, see 7.2.

Boats of Types I and III: 500 N

Boats of Types II and IV: 1 kN

6.8 Residual buoyancy

6.8.1 Requirement

After failure of the largest buoyancy chamber, the residual inflated buoyancy of the hull shall be at least 50 % of the manufacturer's rated maximum load capacity (see 6.4).

6.8.2 Test method

Calculate or measure the residual buoyancy.

6.9 Manoeuvrability

6.9.1 Requirement

An inflated boat loaded to the maximum load capacity shall be capable, upon sudden deflation of any one of its compartments, of being propelled by one of its intended means. Oars may be used as paddles.

6.9.2 Test method

Propel the boat in a generally straight line for at least 50 m in calm water.

6.10 Compartmentation

The inflated buoyancy shall be contained within a number of separate buoyancy chambers (compartments).

Ancillary inflatable compartments that are not permanently fixed to the hull (see 3.3) shall **not** be included in the volume calculation.

The minimum number of compartments is specified in Table 2.

Table 2 — Minimum number of compartments

Motor maximum power rating kW	Dimensional factor F(d)	Number of compartments
4,5	$\leqslant 8$	2
	> 8	3
NOTE The dimensional factor is defined in 6.2.		

6.11 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 Performance requirements and test methods

7.1 General

The boat shall have passed at least the tests in accordance with 5.8 (where applicable) and 6.6.

The boat shall be assembled in accordance with the manufacturer's instructions and inflated to the recommended working pressure.

Testing shall be performed in the order in 7.2 to 7.5.

Testing shall be performed in conditions with an observed significant average wave height of 300 mm.

7.2 In-water performance (Type II only)

7.2.1 Requirement

Closely examine the boat at the end of the test period.

There shall be no structural failures in the form of fractures, cracks, tears, separations, etc. on any part of the hull or boat component, such as the deck or thwarts, and including any boundary interface such as floor/hull, deck/transom, buoyancy tube/hull, etc.

There shall be no signs of abrasion that could result in subsequent structural damage or failure.

The boat shall not overturn.

The boat shall remain reasonably dry.

The coxswain shall maintain reasonable visibility at all times.

7.2.2 Test methods

7.2.2.1 General

Use the remote steering system if it is supplied as standard equipment. If it is offered as optional equipment, carry out the test using both tiller and remote steering systems consecutively.

7.2.2.2 Testing — Lightly loaded

Embark a coxswain only. The total period of test shall be not less than 45 min with the motor controls set to develop maximum forward thrust.

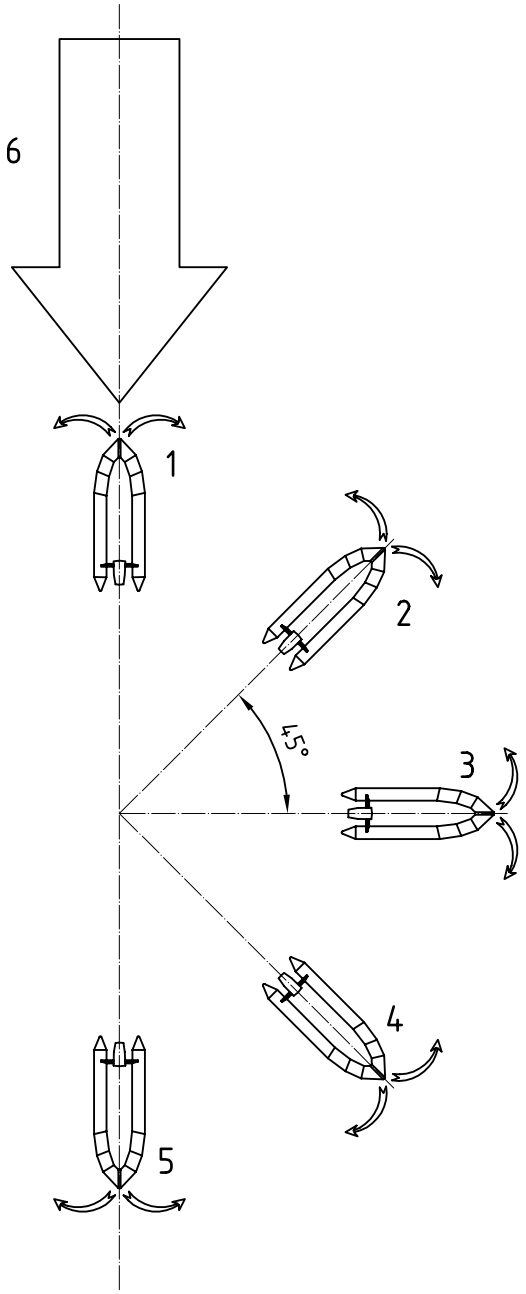
The boat shall be headed directly upwind and then successively downwind on courses of approximately 45° separation (see Figure 4). This will give a minimum of at least five separate courses encountering a head-on, bowquarter, beam, sternquarter and following sea condition. Turn the boat sharply to port and starboard towards the end of each course (see Figure 4).

7.2.2.3 Testing — Fully loaded

Repeat the test described in 7.2.2.2 but with the boat uniformly loaded with its maximum load capacity in persons (see 6.1 and 6.4).

All handholds shall be clearly seen to have satisfied the requirements of 6.7.1.

All seating and attachment systems shall be clearly seen to have satisfied the requirements of 5.12.



Key

1 Upwind course
2 Bowquarter course
3 Beam-wind course
4 Sternquarter course
5 Downwind course
6 True wind

Figure 4 — In-water performance test

7.3 Strength of the towing device (all types)

7.3.1 Requirement

When the boat is closely examined at the end of the test period, there shall be no structural failures on any part of the hull or boat component, such as the deck or thwarts, and including any boundary interface such as floor/hull.

During the test, there shall be no tendency for the bow to submerge or to lift in a manner likely to submerge the motor or overturn the boat.

7.3.2 Test method

Embark the maximum number of persons calculated in accordance with 6.1.

Tow the boat by its designated towing point (see 5.10) at a speed of not less than 4 kn with a towline of length equal to 3 × boat length (± 15 %).

Carry out towing manoeuvres for not less than 15 min.

7.4 **Rowing test** (where applicable, see 5.5)

The boat shall be rowed for a distance of not less than 300 m in both the lightly loaded condition (see 7.2.2.2) and the fully loaded condition (see 7.2.2.3).

Examine the rowlock system during and on completion of the test, and measure the unrestricted movement of the oars.

7.5 Watertightness test (not applicable to open floor, self-bailing craft)

7.5.1 Requirement

Closely examine the boat at the end of the test.

There shall be no evidence of water within the boat.

7.5.2 Test method

Ensure that there is no water within the boat. Load the boat to the maximum load capacity recommended by the manufacturer. The distribution of this load shall represent the boat fitted with motor(s) of the maximum power rating (as specified by the manufacturer) and passengers seated in their normal positions.

Allow the boat to remain static in the water for 20 min.

8 Builder’s plate(s)

The craft shall be equipped with one or two clearly and indelibly printed or engraved plates displaying all the relevant data listed below.

a) Number of this part of ISO 6185 and type(s) to which the craft conforms. Where compliance is required to the European Directive (94/25/EC), the boat design category shall be shown on the builder's plate.

b) Name of manufacturer or importer and country of origin.

c) Serial number and date of manufacture and type or model number. It is recommended to use the Hull Identification Number (HIN) coding system as detailed in ISO 10087.

d) Maximum motor power, in kilowatts (shown by symbol).

e) Maximum number of persons (shown by symbol).

f) Maximum load capacity (shown by symbol).

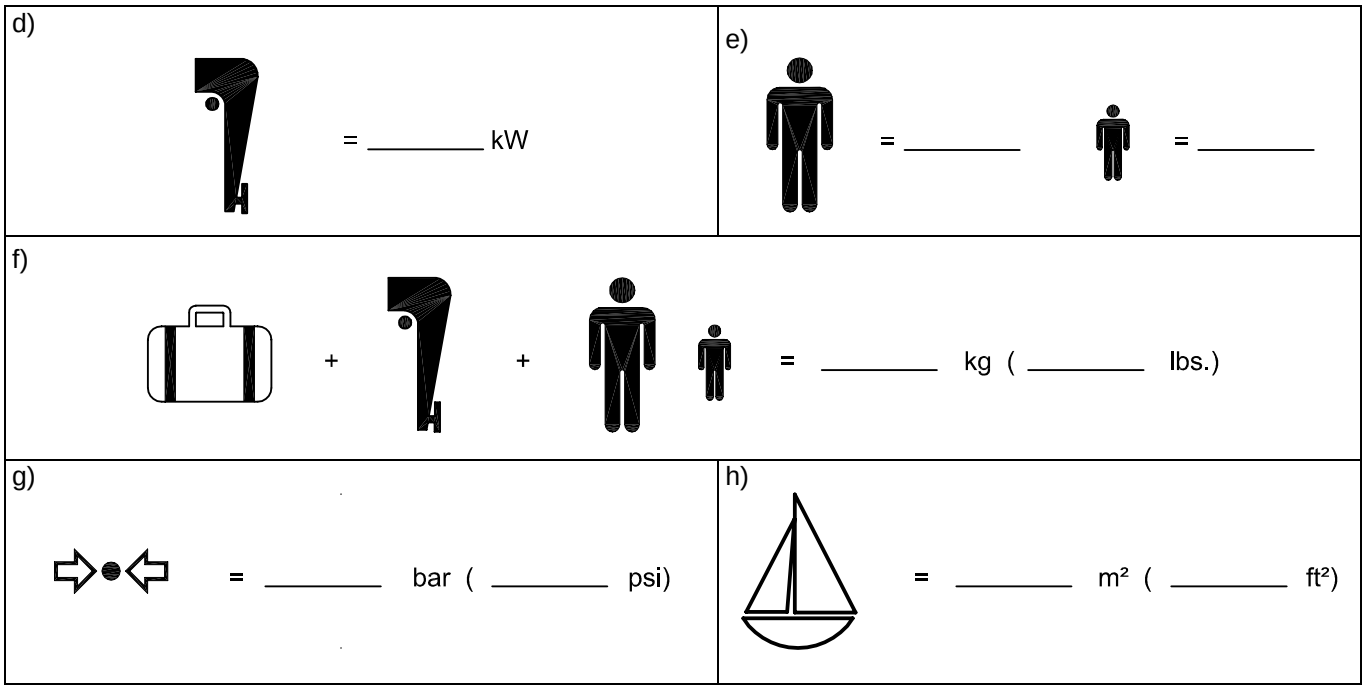
g) Recommended working pressure (shown by symbol).

h) Maximum sail area, if a sailkit is provided (shown by symbol).

Additional data may be supplied at the option of the manufacturer [maximum mass of motor(s)].

Where the HIN coding system is used, the data specified in c) need not be on the builder's plate.

For the data d) to h) inclusive, the symbols shown in Figure 5 shall be used. Refer to ISO 7000 and ISO 11192.



Additional units shown in brackets may be included at the option of the manufacturer.

Figure 5 — Symbols for the builder’s plate

9 Operator's instructions and warning notes

Operator's instructions shall be supplied in (a) suitable language(s) and in simple terms, sufficient to enable the operator to correctly assemble, inflate and prepare the boat for use afloat, including reference to the location/fixing of seats, steering system, battery and fuel tank (where applicable).

A warning shall be provided emphasizing the dangers of not following the operator's instructions, which may detail important inflation and assembly sequences.

Guidance shall also be given on drying, storage and servicing of the boat.

Warnings and advice, where applicable, shall be given regarding the potential harmful effects of liquids such as battery acid, oil, petrol.

A warning shall be included regarding the dangers associated with uneven distribution of persons or loads in the boat.

The instructions shall also warn against the possibilities of natural hazards and shall contain, in a conspicuous manner, the warning

"BEWARE OF OFFSHORE WINDS AND CURRENTS"

A warning shall be included emphasizing the danger of exceeding the data given on the capacity plate(s) (see clause 8).

It is recommended to refer to ISO 10240 for the inclusion of additional information.

10 Standard equipment

The following items of equipment shall be provided by the manufacturer with each boat:

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

— operator's instructions (see clause 9).

Where an inflation pump is not supplied as standard equipment, the manufacturer shall ensure that a compatible inflation pump is available.

Annex A
(normative)

Inflatable canoes and kayaks (Type III)

A.1 Applicable requirements

In addition to the requirements detailed in this annex, inflatable canoes and kayaks shall conform to all the requirements of the main text of this part of ISO 6185 except the following:

— 5.5 Rowlocks and oars

— 6.1 Maximum permissible number of persons

— 6.2 Maximum motor power

— 6.3 Static stability of the boat

— 7.2 In-water performance

— 7.4 Rowing test

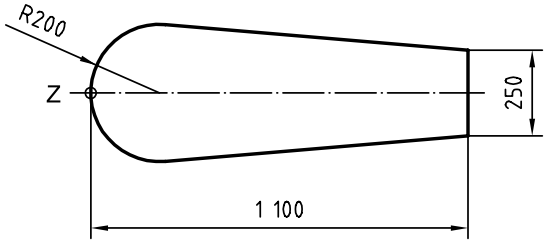
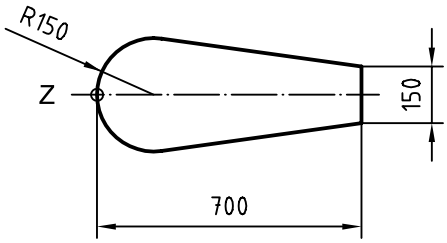
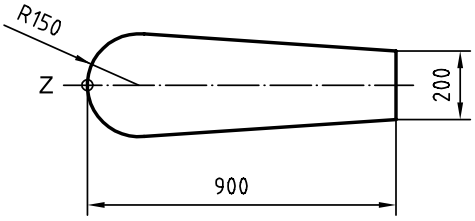
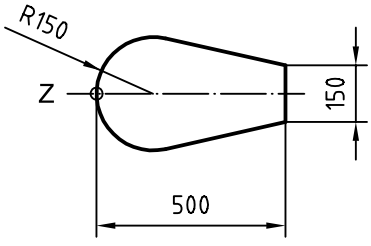
A.2 Maximum permissible number of persons

A.2.1 Kayaks

For each permissible person, the minimum seating area shown in Table A.1 shall be provided. The number of permissible persons n (adult or child) is equal to the number of seat patterns, which can be placed on the floor of the craft without overlapping. Point Z of the patterns shall be placed vertically in line with the lower forward edge of the backrest (see Table A.1).

Table A.1 — Seating area: patterns for testing kayaks

Dimensions in millimetres

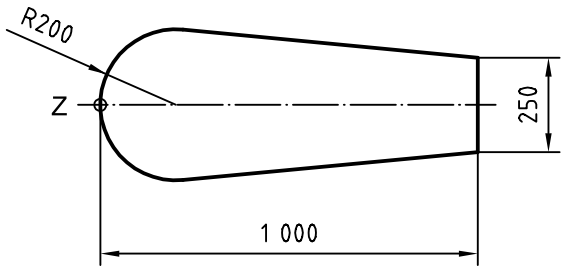
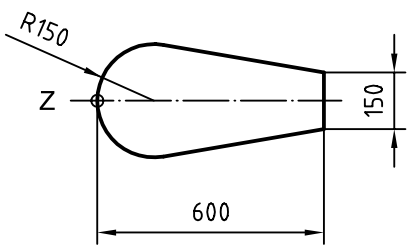
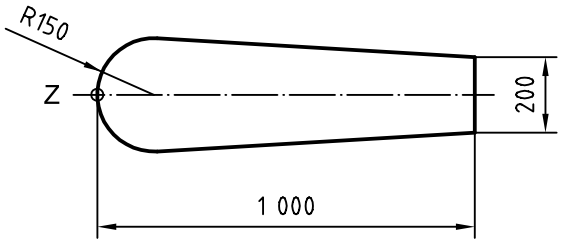
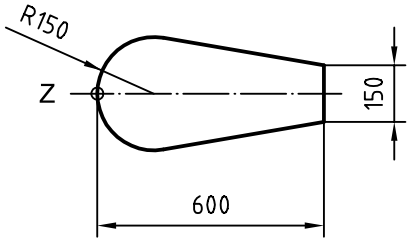
	Adult	Child
Type A		
Type B		

A.2.2 Canoes

For each permissible person, the minimum seating/kneeling area shown in Table A.2 shall be provided. The number of permissible persons n (adult or child) is equal to the number of patterns, which can be placed on the floor of the craft without overlapping.

Table A.2 — Seating/kneeling area: patterns for testing canoes

Dimensions in millimetres

	Adult	Child
Type A		
Type B		

The total mass of the number of persons determined by A.2.1 and/or A.2.2 shall not exceed the maximum load capacity (see 6.4).

Allow 75 kg for each adult and 37,5 kg for a child.

A.3 Load capacity, stowage volume

Craft of type A shall provide a minimum inboard stowage volume, outside the seating area, of 50 dm^3 per adult and 25 dm^3 per child.

A.4 Backrest and footrest for kayaks

Kayaks of type A and B shall be equipped with a backrest and a footrest for each admissible person. The footrest for kayaks of type A shall be adjustable from at least 700 mm to 1 100 mm (distance from backrest to footrest). The footrest shall not entangle the feet of the occupants in the event of a capsize.

A.5 Safety ropes

Safety ropes for all types of canoes and kayaks shall be fitted to both sides of the bow and stern areas only and shall not impede the normal operation of the craft.

A.6 Performance test for kayaks and canoes

Embark, without buckling the craft, the maximum and minimum number of permissible persons.

In a practical and visual test in water over a minimum of 100 m the craft shall be capable of

— propulsion by its intended means in a straight line without hindrance to the operator(s) when paddling or canoeing, and

— propulsion without the seats and backrest becoming detached and without undue ingress and retention of water in the craft.

There shall be no structural damage.

Craft equipped with a sailkit shall also conform to the requirements of annex B.

Annex B
(normative)

Inflatable craft propelled by sail (Type IV)

B.1 Applicable requirements

In addition to the requirements detailed in this annex, inflatable craft powered by sail shall conform to all the requirements of the main text of this part of ISO 6185 except the following:

— 5.9 Remote steering system (where applicable)

— 5.10 Motor-securing line attachment

— 5.12 Seating and attachment systems (where applicable)

— 6.2 Maximum motor power

— 7.2 In-water performance

These exceptions do not apply where the craft is also Type II.

B.2 Boards

B.2.1 Construction

Leeboards, daggerboards and centreboards shall be capable of being hoisted to the level of the craft bottom and of being fixed in their working position without the use of tools.

Daggerboards shall be secured against accidental loss.

B.2.2 Strength and function of boards

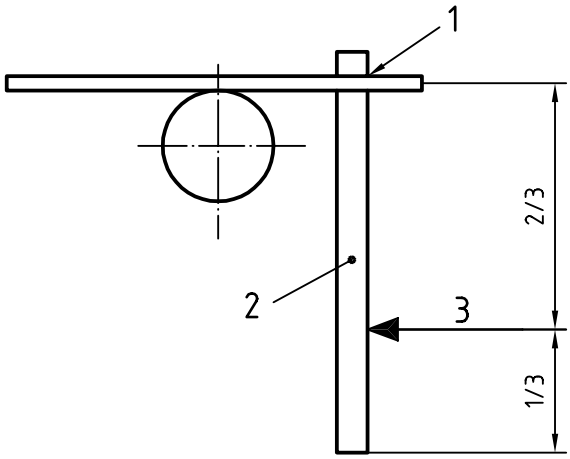
The attachment of any of the boards shall show no failure or permanent deformation when loaded with a lateral force of 80 N for each square metre of sail area.

For leeboards, the lateral force shall be applied on the vertical centreline 2/3 of its length down from the turning axis. See Figure B.1.

For centreboards and daggerboards, the lateral force shall be applied at the mid-point of their exposed length (l_X). See Figure B.2.

B.2.3 Test method

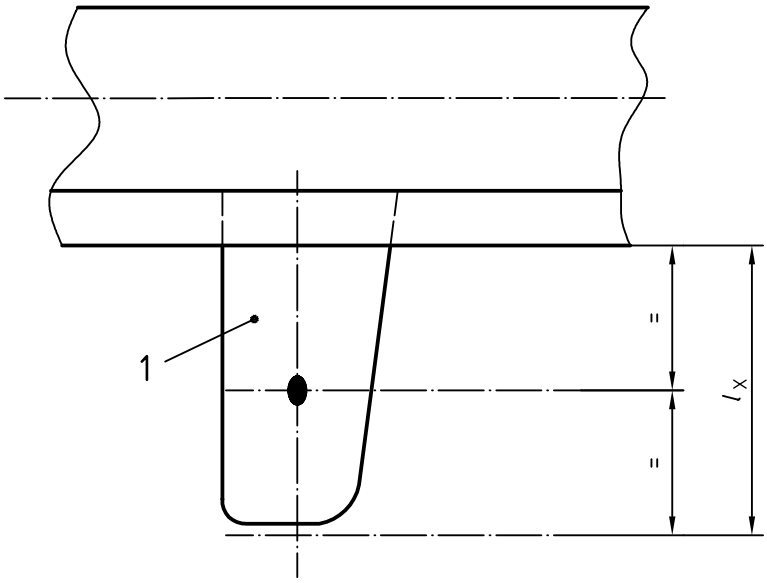
Boards shall be tested when fitted to the craft and in both directions. The load shall be applied once in each direction for 10 min.



Key

1 Turning axis
2 Leeboard
3 Lateral force

Figure B.1 — Leeboard strength test



Key

1 Centre/daggerboard

Figure B.2 — Centre/daggerboard strength test

B.3 Standing and running rigging

Detachable masts and booms shall be capable of being securely jointed.

The minimum diameter of sheets shall be 8 mm.

Jibs and mainsheets shall be capable of being cleated by the helmsman.

B.4 Sailing performance

B.4.1 Requirement

Craft of Type IV shall be capable of sailing the test course as described in Table B.1 and Figure B.3 with no damage or malfunction. The test course from A to B proves the ability of the craft to sail against a true wind under a true tack angle of at least 60°, i.e. buoy B shall be approached from its windward side without tacking.

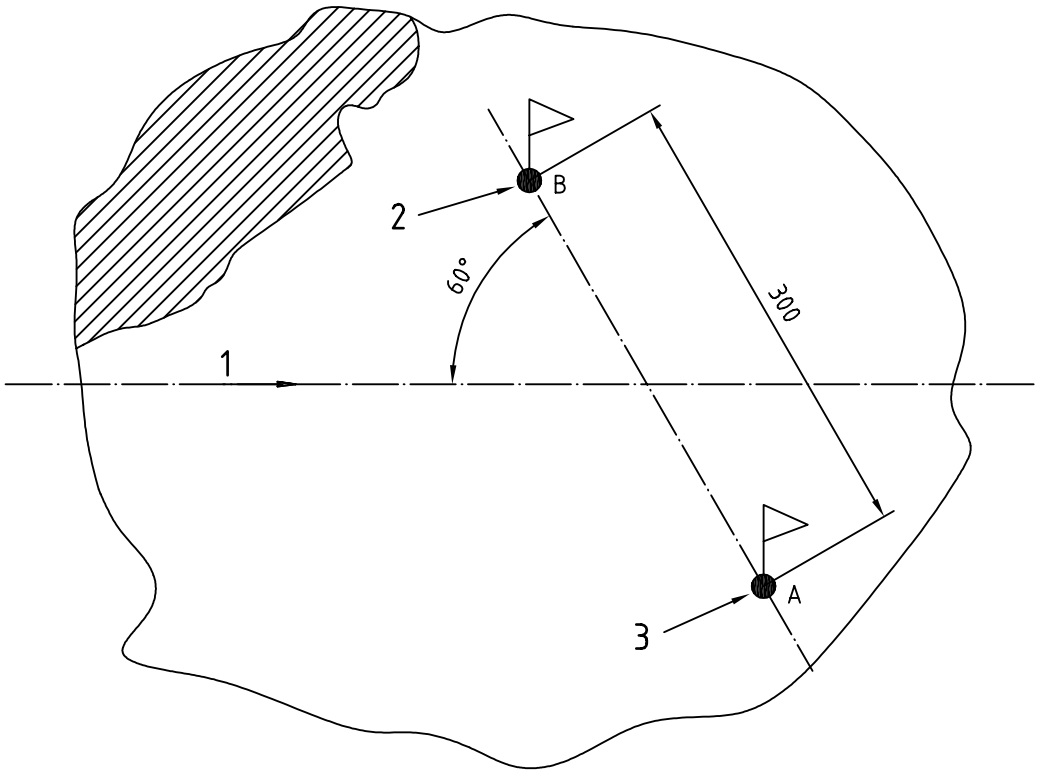
B.4.2 Test method

The test comprises two subtests [a) and b)] with different load conditions (see Table B.1).

Table B.1 — Sailing test course

Subtest	Wind force Beaufort	Sailing direction	Number of tests required	Load condition
a)	4	A to B	3	1 adult
b)	4	A to B	3	Maximum load

Dimensions in metres



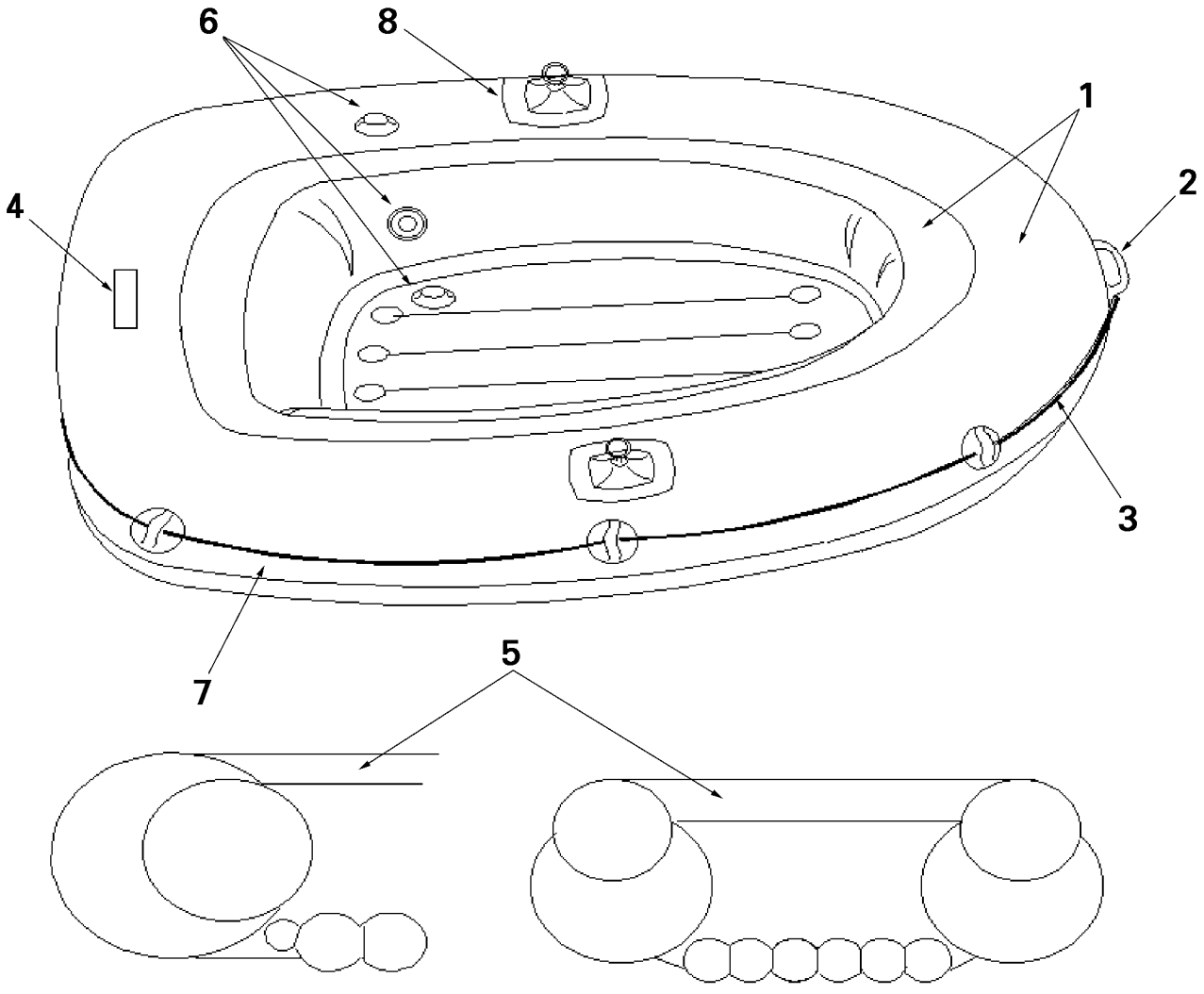
Key

1 True wind direction
2 Buoy B
3 Buoy A

Figure B.3 — Sailing test course

Annex C
(informative)

General arrangement of typical Type I boat



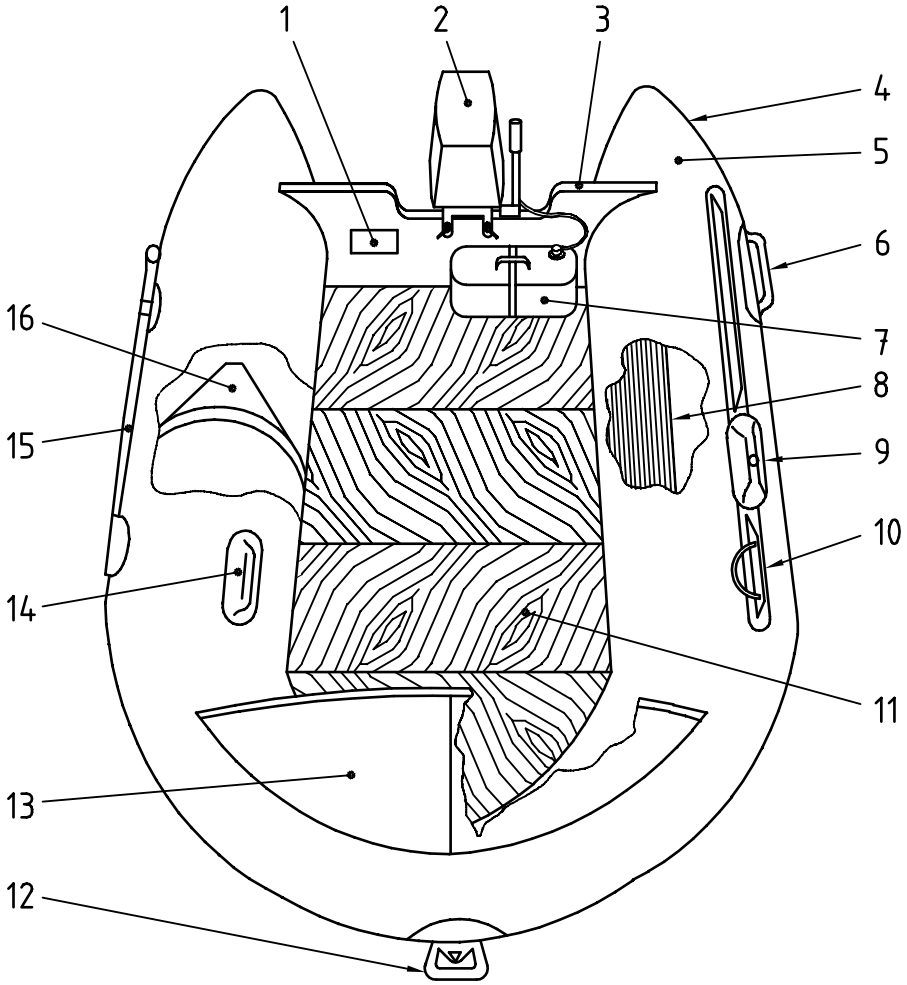
Key

1 Buoyancy tubes
2 Towing device
3 Safety rope or lifeline
4 Builder's plate
5 Example of a longitudinal partition
6 Inflation valve
7 Lifting/carrying device
8 Rowlock

Figure C.1 — Arrangement of a Type I boat

Annex D
(informative)

General arrangement of typical Type II boat



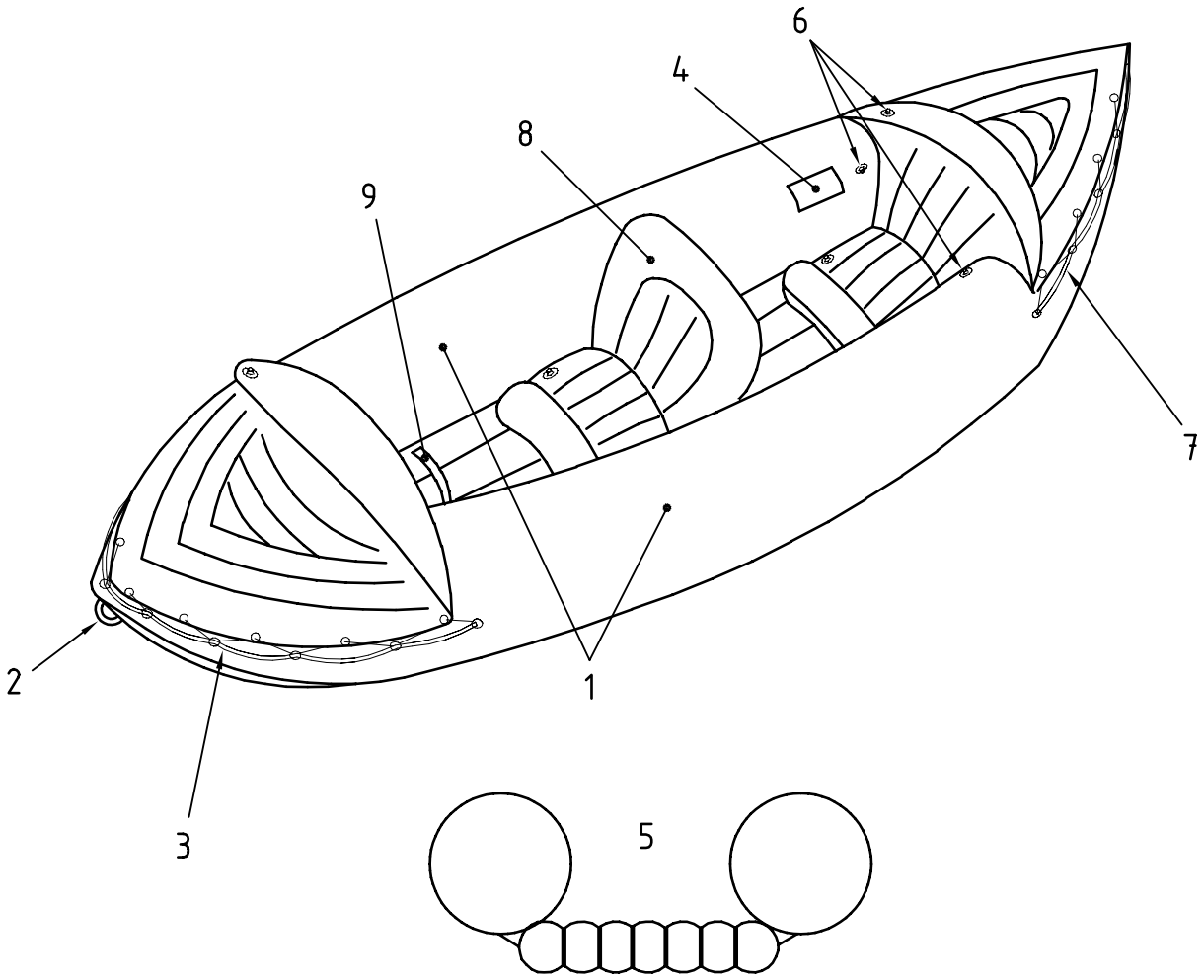
Key

1 Builder's plate
2 Motor
3 Transom
4 Inflation valve
5 Buoyancy tube comprising several buoyancy chambers and compartments
6 Lifting/carrying device
7 Fuel tank
8 Partition bulkhead — Example of a longitudinal partition
9 Rowlock
10 Safety rope or lifeline
11 Inboard area
12 Towing device
13 Spray cover
14 Grab handle
15 Paddle or oar
16 Partition bulkhead — Example of a transverse partition

Figure D.1 — Arrangement of a Type II boat

Annex E
(informative)

General arrangement of a typical Type III boat



Key

1	Buoyancy tubes	6	Inflation valve
2	Towing device	7	Lifting/carrying device
3	Safety rope or lifeline	8	Backrest
4	Builder's plate	9	Footrest
5	Example of longitudinal partition		

Figure E.1 — Arrangement of a Type III boat

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[1] ISO 62:1999, *Plastics — Determination of water absorption*

[2] ISO 10087:1995, *Small craft — Hull identification — Coding system*

[3] ISO 10240:1995, *Small craft — Owner's manual*

ICS 47.080

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