BRITISH STANDARD

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Floating leisure articles for use on and in the water

Part 7: Additional specific safety requirements and test methods for class E devices

ICS 97.200.50; 97.220.40

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British Standards

National foreword

This British Standard is the UK implementation of EN 15649-7:2009.

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A list of organizations represented on this committee can be obtained on request to its secretary.

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Schwimmende Freizeitartikel zum Gebrauch auf und im Wasser - Teil 7: Zusätzliche besondere sicherheitstechnische Anforderungen und Prüfverfahren für Artikel der Klasse E

This European Standard was approved by CEN on 11 September 2009.

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Foreword

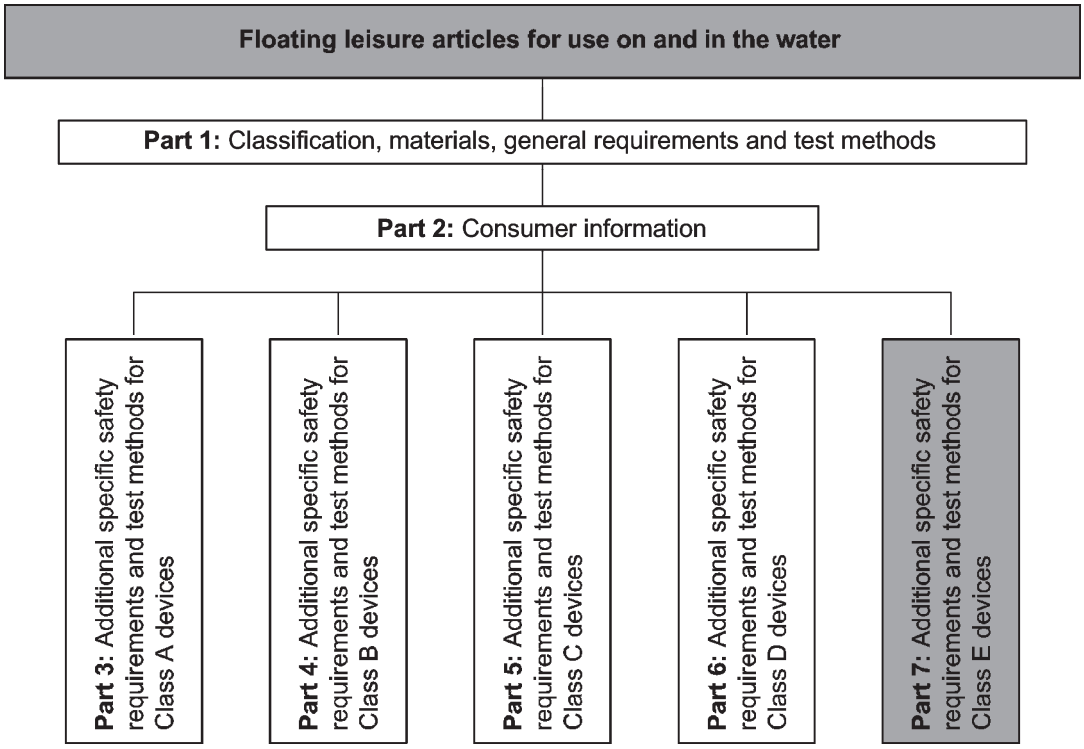
This document (EN 15649-7:2009) has been prepared by Technical Committee CEN/TC 136 “Sports, playground and other recreational facilities and equipment”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2010, and conflicting national standards shall be withdrawn at the latest by May 2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

This European Standard is one of a series consisting of seven standards dealing with floating leisure articles for use on and in the water.



Compliance of a product to this standard requires that the requirements of the relevant specific part and, additionally, the requirements of EN 15649-1 and EN 15649-2 have to be met. If a product includes multiple use related to several classes it has to meet the requirements of all these classes.

Annex A and Annex B are normative.

Annex C to Annex F are informative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

This part of the standard covers boats of customary construction and design with an overall length from 1,2 m (uninflated, flat) up to 1 800 N buoyancy. Such boats are mostly intended for recreational water activities and for the use by children. However, smaller tender boats such as those used on yachts also fall within this size range and small boats for specific applications (e.g. fishing boats) may also be included. Therefore, irrespective of the main group of users, powered craft and sail craft have also been taken into consideration.

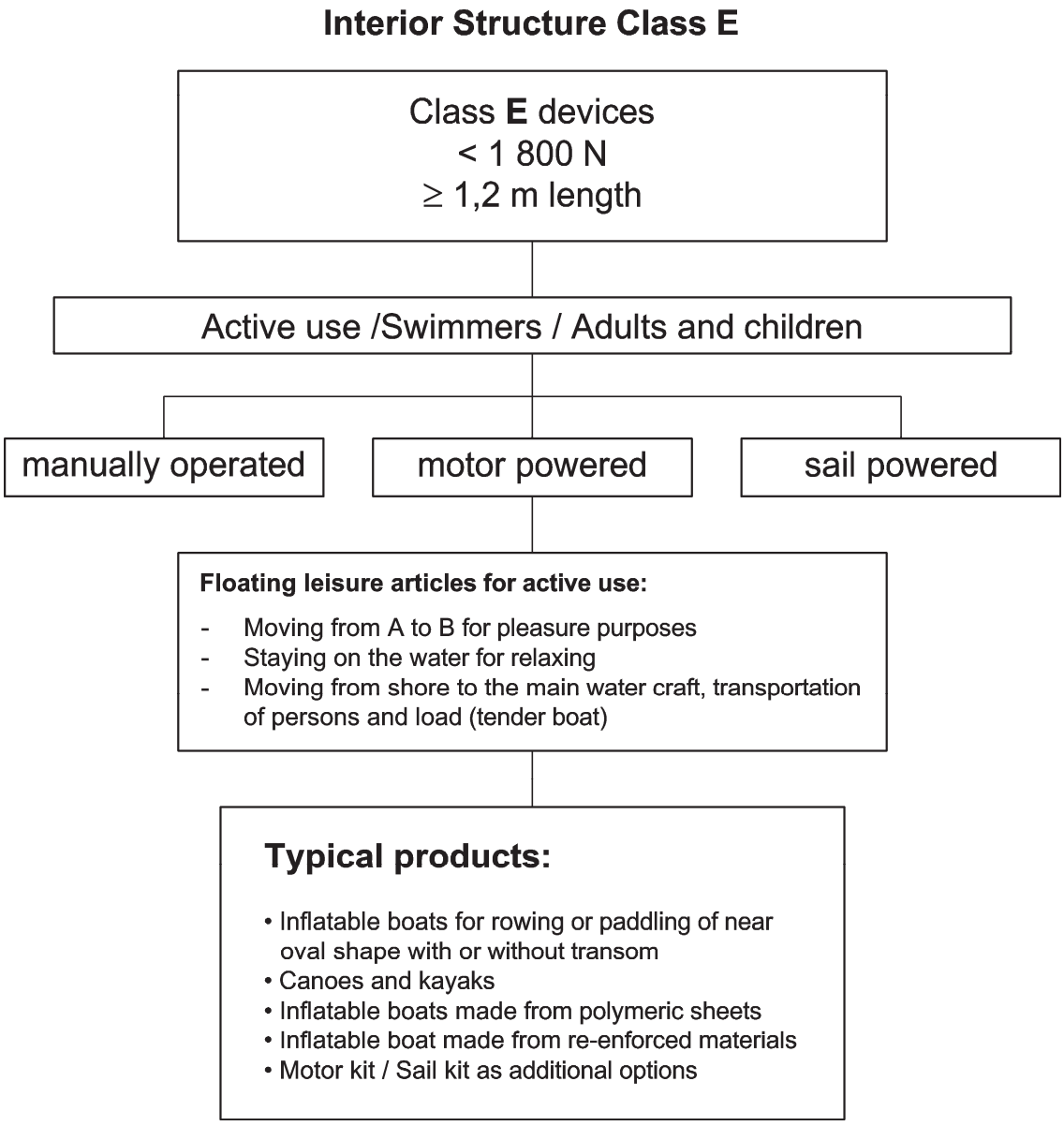


Table 1 — Introductory risk analysis

No.	Typical products	Place of usage	Function; range of usage; target/age group	Type of move-ment/propulsion	Position of user in regard to the equipment, elevation above water	Predictable misuse	Partial risk related to water environment	Final risk	Protection aims standard/ regulation
E **in work programme**	Adults and children's boats rowing boats of near oval shape with or without transom canoes, kay-aks, tender boats to yachts	Pools; sea, shore/ close to shore; rivers; lakes	Children, adults	Paddling, rowing, sail, engine passive and active use by hand, drifting; third party (towing) ...	Inside the craft	Overload; use by non-swimmers; wave riding	Drifting away; capsizing; en-trapment; lack of supervision in case of child use ...	**D R O W N I N G**	This EN stan-dard closes the gap between EN ISO 6185 and EN 71)

1 Scope

This European Standard is applicable for CLASS E floating leisure articles for use on and in water according to EN 15649-1 regardless whether the buoyancy is achieved by inflation or inherent buoyant material.

This document (EN 15649-7) is applicable with EN 15649-1 and EN 15649-2.

Class E devices are intended for use in bathing areas or in protected and safe shore zones.

NOTE 1 Typical products forming class E:

— inflatable boats for rowing or paddling of near oval shape with or without transom;

— canoes and kayaks;

— inflatable boats made from plastic sheets or from reinforced materials;

— motor kit/sail kit as additional option.

NOTE 2 Typical places for application of Class E devices:

— moving from A to B for pleasure purposes;

— staying on the water for relaxing;

— moving from shore to the main water craft, transportation of persons and load (tender boat).

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.

EN 15649-1:2009, *Floating leisure articles for use on and in the water — Part 1: Classification, materials, general requirements and test methods*

EN 15649-2, *Floating leisure articles for use on and in the water — Part 2: Consumer information*

EN ISO 8665, *Small craft — Marine propulsion reciprocating internal combustion engines — Power measurements and declarations (ISO 8665:2006)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 15649-1:2009 and the following apply.

3.1
residual buoyancy
provision of remaining buoyancy in case of a defect of any buoyancy chamber

3.2
inflatable boat
buoyant structure (hull), achieving all or part of its intended shape and buoyancy by the medium of inflation and intended for the transportation of persons on the water; its design and shape give it the capability to withstand forces and movements arising from various sea conditions

NOTE An inflatable boat is considered as an aquatic toy (toy in form of a boat) according to EN 71-1, when:

a) it is intended for use without any propelling means (oars, paddles, motor, sail) and these are also not to be fitted subsequently; and

b) its overall length is < 120 cm and the boat is additionally marked with the following warning note "Caution, to be used only in shallow water and under supervision".

3.3
tender
sport boats serve as an auxiliary means in working around a bigger water craft but mainly to commute from the craft to shore or other places nearby

NOTE In this respect the transport crew and load. Tenders are propelled by oars, frequently they are equipped with an outboard engine, partly they can be fitted with sails. For stowage reasons tenders are often small in size but robust in material and construction.

3.4
leisure boat
serve as a recreational craft strolling around on the water, relaxing, extended bathing, etc.

NOTE They do not have the purpose of a working boat.

3.5
inherent buoyant material
non-crosslinked (closed-cell) foam or other materials enclosed in (a) sealed compartment(s) in the hull which less than fresh water

NOTE Boat made from inherent buoyant material is a buoyant structure (hull) achieving all or parts of its intended shape and buoyancy from soft foam, hard foam or sealed chambers filled with air, gas or granules.

3.6
inboard area
internal surface area defined by a vertical plane tangential to the innermost side of the buoyancy tube and perpendicular to the deck

3.7
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

3.8
usable seating area
inboard area, including the area below any spray cover, available for the users to sit on

3.9
permissible rated load
maximum loading of the boat by persons, propelling means and other items

3.10
integrated transom
rear part of the boat's cockpit normally made by a flat wooden board inseparably integrated in the boats hull on which the motor is clamped by clamp screws

3.11
motor mount transom
small board attached to the rear part of the boat via a tube frame and hull fittings by means of separable fixations for the purpose to clamp the motor to it

3.12
kayak
boat which is propelled by means of double paddle(s) and user(s) sitting in line in a mid boat position

NOTE The width/length–ratio of kayaks is above 1:3. Kayaks can be equipped with sail and motor.

3.13
canoe
boat which is propelled by means of a single paddle(s) and user(s) are kneeling or sitting at bow and rear of the boat

NOTE The width/length–ratio of canoes is above 1:3. Canoes can be equipped with sail and motor.

4 Materials

Boats conforming to this standard shall meet the requirements set out in Clause 6 of EN 15649-1:2009.

All materials shall be selected by the manufacturer according to the requirements for shape, dimensions, maximum load, etc. to which the boat is to be subjected and which are resulting from the intended service conditions.

5 Construction and functional components of boats

5.1 Conditioning

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

5.2 Hull integrity

5.2.1 Requirements

The materials and the method of construction used in the construction of a boat shall be compatible with that of the hull itself. Any load-bearing fittings attached to the boat shall not result in any impairment in air tightness or water integrity, when loaded as described in 5.2.2.

5.2.2 Test method

Load-bearing fittings shall be loaded in any direction up to breaking point, but not exceeding 1 kN for leisure boats and 2 kN for tender boats (see 3.3). If maximum load is reached, this load shall be maintained for 1 min.

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

5.3 Manual lifting and carrying devices

5.3.1 Requirements

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

Where lifting or carrying devices also function as safety ropes or grab handles, they shall also comply with the requirements of 6.6.1.

5.3.2 Test method

The carrying device shall be gradually loaded with a force of 500 N for 1 min in the appropriate directions.

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

5.4 Rowlocks and oars

5.4.1 Requirements

5.4.1.1 General

The provision of paddles, rowlocks and oars is not mandatory. The assembly system oar/rowlock shall comply with the requirements given in 5.4.1.2 to 5.4.1.5.

5.4.1.2 Abrasion damage

The bearing surfaces of the oars and rowlocks shall be free from any roughness likely to cause excessive wear. All external surfaces of the rowlocks shall be smooth and free from sharp edges and corners.

5.4.1.3 Securing against loss

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

5.4.1.4 Strength of rowlocks

There shall be no structural failure of the rowlocks and/or associated fittings when tested in accordance with 5.4.2.2.

5.4.1.5 Strength and performance of rowlocks and oars

When tested in accordance with 7.4, there shall be no structural failure or permanent deformation of any component during the test and it shall be clearly demonstrated that the rowlock system is sufficiently rigid for efficient rowing. A minimum unrestricted movement of the oars 60° ahead and 60° astern shall be enabled.

5.4.2 Test methods

5.4.2.1 Abrasion damage and prevention of loosening

Visual inspection and performance testing.

5.4.2.2 Strength of rowlocks

The rowing system, including the rowlocks, shall be loaded with a force of 300 N for 1 min in the horizontal direction that is most likely to cause failure.

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

5.5 Hull drainage

If the boat is fitted with a transom integrated in the body of the boat, it shall be equipped with at least one drain-plug or one bailing system.

5.6 Towing device

All watercraft shall have, at their bow, a towing device suitable for securing a towline. See 7.2 for strength test.

5.7 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 and test methods

6.1 Minimum area and maximum permissible number of persons

6.1.1 Requirement

The calculated seating area for each adult shall be at least 0,45 m² and for each child it shall be 0,23 m². The load rated for an adult shall be 75 kg, for a child 37,5 kg. Two children up to 10 years of age are considered as an adult. The inboard area of boats (inboard length x inboard width) intended for use by only one person shall be so designed, independent of the calculated seating area, that the appropriate seat pattern shown in EN 15649-1:2009, Annex A can be placed inboard without over crowding.

For boats where the inboard area is restricted by equipment parts of the motor or sail kit, the usable inboard area for each person shall be verified by placing the seat patterns for adults and/or children on the usable area without overlapping. The patterns shall be distributed so that the persons sitting in their predetermined positions are not impeded and/or endangered by any equipment parts protruding/swinging into or installed inboard the boat.

6.1.2 Testing

The dimensions for calculating the usable inboard area (m²) shall be determined vertically between the in-board walls with the hull inflated to working pressure. Where the inboard area has an irregular shape, the measurements of length and width shall be multiplied. Areas below the spray cover are considered as usable areas.

The permissible number of persons (adults/children) for boats designed for several persons is obtained by division of the total inboard area by 0,45 m² for adults or 0,23 m² for children. Boats shall not be labelled for more than two children. The resulting value shall be rounded down to the nearest integer or 0,5 m². For boats designed for one person only, the seat patterns are used as measuring aid or test criterion.

6.2 Static stability of the boat

6.2.1 Requirement

The boat equipped with the manufacturer's maximum rated motor (see B.2.4) shall not capsize when tested in accordance with 7.4.2.

6.2.2 Test method

The test shall be carried out with the motor fitted but without a fuel tank, battery or sail kit. The test load shall be evenly distributed over the test loading area of the boat, as shown in Figure 1.

The total test load shall be

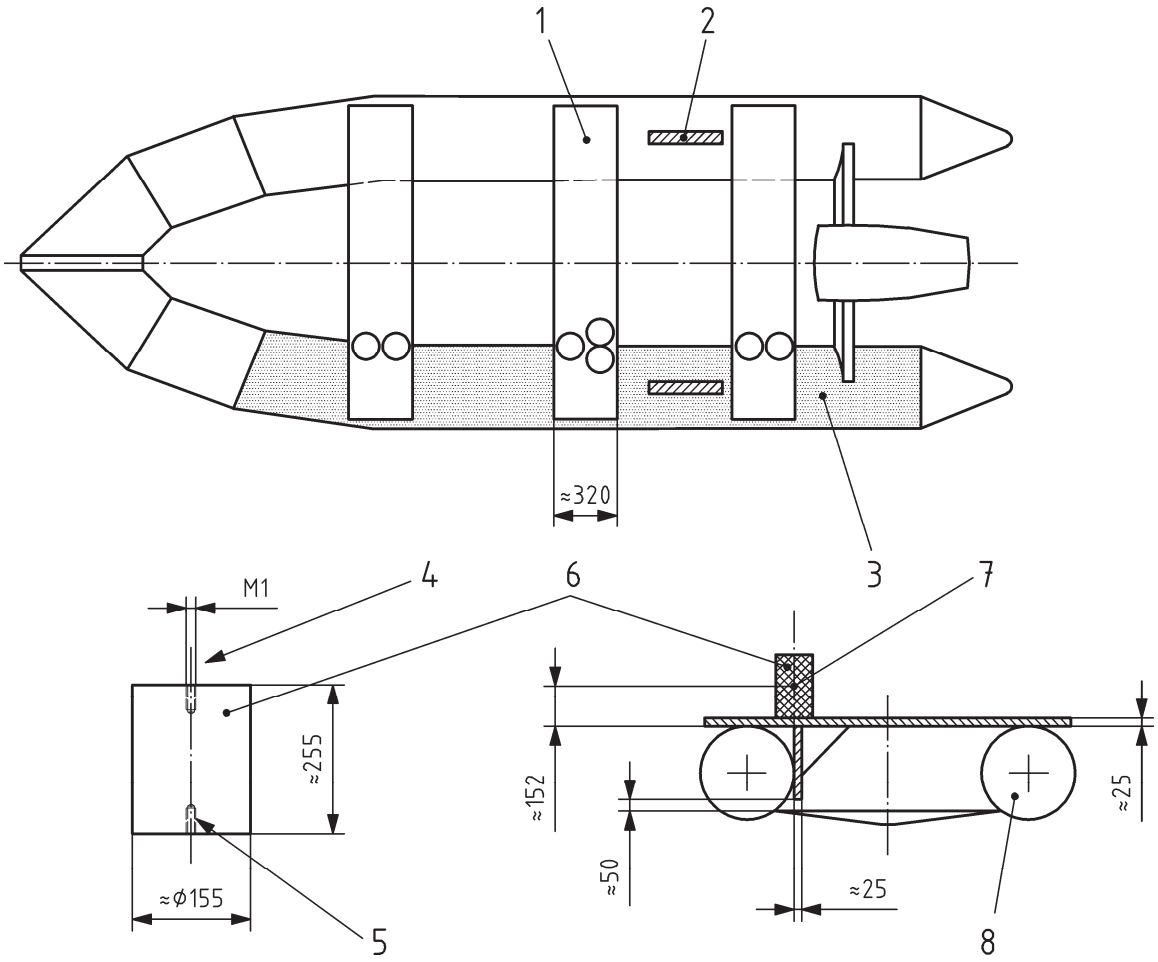
m_t = (0,67 × n × 75 kg) + (0,67 × 37,5 kg) for a child, if applicable.

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 1.

Dimensions in millimetres



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

Figure 1 — Static stability test with three adults and a child

6.3 Dimensional stability when getting on and off the boat

6.3.1 Requirement

The inflated boat, ready-for-use, shall not buckle nor capsize when a person carrying luggage (100 kg) is getting into or out of the boat at any accessible point of the floor of the inboard area, while the load capacity (evenly distributed over the usable inboard floor area) is fully utilized.

The boat shall be checked for its stability in shape when the boat is embarked by the first test person. The boat may deform up to a degree where function and safety is still maintained.

6.3.2 Testing

The water craft shall be loaded with a mass of 75 kg (adult) or 37,5 kg (child) at any accessible point of the inboard floor area. The loading area shall be a circle with a diameter of 200 mm.

6.4 Maximum load capacity

6.4.1 Requirement

The maximum load capacity of the watercraft shall be calculated using the following equation:

$$m = (0{,}5 \times V \times 1000 \frac{kg}{m^3}) - M$$

where

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

V is the volume of the buoyancy chambers in m³;

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

6.4.2 Testing

Proof of maximum load capacity m by calculation. The volume V shall be determined either by calculation or experimentally. For determination of the data (dimensions for calculation, gauging of volume by litres) the boat shall be inflated to the working pressure.

For determination of the volume, the uncertainty of measurement shall not exceed 3 %. The arithmetic mean of three measurements shall be taken.

For determination of the mass, an appropriate balance shall be used.

The determined volume and the mass of the boat shall be indicated in the test report.

6.5 Safety ropes and grab handles

6.5.1 Requirement

All boats shall be equipped with adequate means 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 be 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 their 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.

All boats shall have a properly affixed safety rope.

There shall be no failure/fracture of the handhold assemblies when tested as specified in 5.2.2.

6.5.2 Test method

Visual inspection and assessment.

Each handle and lifeline assembly fitting shall be loaded with a force of 500 N for 1 min in the direction most likely to cause failure. For practical assessment in the water, see 7.2.

6.6 Residual buoyancy specific for boats

6.6.1 Requirement

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

6.6.2 Test method

The residual buoyancy shall be calculated or measured.

6.7 Manoeuvrability

6.7.1 Requirement

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

6.7.2 Test method

The craft shall be propelled, with its main air chamber deflated, in a generally straight line over at least 50 m in calm water.

7 Performance requirements and test methods for boats

7.1 General

The water craft shall have passed at least the test in accordance with EN 15649-1:2009, Clause 6. The boat shall be assembled in accordance with the manufacturer's instructions and inflated to the defined working pressure.

Testing shall be carried out in the order of 7.2 to 7.4 in conditions with an average wave height of 300 mm.

The coxswain and other crew members, if any, shall perform the tests by taking the seating positions offered as standard or optional equipment.

7.2 Strength and performance of the towing device for boats

7.2.1 Requirement

When examining the craft closely at the end of the test period, there shall be no structural failures on any part of the hull or craft components, 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.

7.2.2 Test method

The maximum permissible number of persons calculated in accordance with 6.1 shall be embarked.

The watercraft shall be towed for at least 15 min by its towing device (see 5.6) to be designated by the manufacturer at a speed of not less than 4 knots with a towline of length equal to 3 times the boat length (± 15 %).

7.3 Rowing test (where applicable, see 5.4)

The watercraft shall be rowed for a distance of not less than 300 m in both the minimum loaded condition and the fully loaded condition according to manufacturer's declaration.

The rowlock system shall be examined during and on completion of the test, and the unrestricted movement of the oars shall be measured.

7.4 Water tightness test for boats

7.4.1 Requirement

The craft shall be closely examined at the end of the test. There shall be no evidence of water within the craft.

This test does not apply to craft equipped with a self-draining system.

7.4.2 Test method

It shall be ensured that there is no water within the craft. The craft shall be loaded to the maximum load capacity recommended by the manufacturer. The distribution of this load shall represent the craft fitted with a motor of the maximum power rating as specified by the manufacturer and passengers seated in their normal positions.

For testing, the watercraft shall be allowed to remain static in the water for 20 min.

8 Standard equipment and accessories for boats

8.1 Requirement

Where a pressure gauge is provided by the manufacturer to ensure the specified maximum working pressure, it should at least conform to class 2,5 (see EN 837-1).

8.2 Testing

Visual inspection.

9 Marking

Inflatable watercraft shall be marked in accordance with EN 15649-2 as far as applicable. All information shall be placed together in a position where they are well visible when the boat is in use. Information shall be grouped in consistent contents.

Additionally, given pictorial representation of the useable boat with significant contour lines and main dimensions shall be on the packaging.

10 Instructions for use for boats

See also relevant additional requirements in EN 15649-2.

Each inflatable watercraft shall be supplied with instructions for use, easy to understand, sufficient to enable even an unskilled operator to correctly assembly and disassemble, operate, handle, maintain and store the boat. The texts describing difficult and complicated handlings shall be supplemented by explanatory drawings/ pictures. The instructions for use shall be subdivided into groups as given below and shall contain at least the following information, with explanations where possible:

a) General information about the boat and it's use:

1) Descriptions of the craft, accessories and options of use (propelling by oars or paddles).

2) Explanations of the terms "permissible number of persons" and "maximum working pressure".

3) Warning, not to perform any structural changes to the craft that could affect the safety.

4) The minimum safety and performance requirements specified in this standard does not release the user of an inflatable boat from his obligation to acquire the knowledge and skills required for navigating in water and to observe the respective regulations, since safety on the water is also a result of the interaction between coxswain, boat and water conditions.

b) Instruction for assembling and disassembling the boat:

Descriptions, including drawings/pictures, of assembly and disassembly with information on:

1) Preparation of the craft and its accessories for assembling;

2) Mounting of floor and bracing parts;

3) Mounting of devices for rowing;

4) Inflation of the boat and maximum working pressures;

5) Handling of inflation valves;

6) Handling of pressure gauge or device for pressure assessment, see also EN 15649-1:2009, 5.7;

7) Positioning and fixing of the seats;

8) Mounting and handling of protective devices, where available;

9) Attachment of belaying lines fixtures.

c) Instruction for care and storage of the boat:

1) Thorough cleaning and drying of all parts of the craft, particularly after it has been used in salt water and after soiling by oil, indicating the permitted cleaning and preservative agents;

2) Inspection of the hull and all its parts for detection of any damages due to mechanical strain, wear and ageing;

3) Repair of smaller damages by the means provided on board (repair kit);

4) Advice, when to bring the water craft or any essential equipment part into a professional repair shop for appropriate repair or replacement (e.g. large tears/cracks);

5) Instruction for correct storage of the craft, its equipment and other accessories.

d) Instruction for operation afloat, including the necessary warning notes and required supervision of children:

Advices and/or rules of behaviour with respect to:

1) Correct use of the craft's equipment and accessories;

2) Provision of oars or paddles;

3) Load distribution, secure stowing of items, taking and keeping the seating positions inboard (falling overboard);

4) Taking along of sharp and/or pointed items;

5) Stony shore, jetties, shallows (e.g. sandbanks, coral reefs, rock);

6) Provision of lifesaving means (e.g. life jackets, distress signals, spare parts);

7) Towing, being towed;

8) Failure of an air chamber;

9) Re-rightening of the boat;

10) Hazards arising from currents and winds;

11) Caution of offshore winds and currents (parental supervision of children).

11 Exclusions

See Table 2.

Table 2 — Exclusions

No	Propelling means	Not applicable specifications depending on the propelling means	
1	Propelled by manual means	5.2; B.2; B.1 (sailing test)	To be applied analogously for combinations of propelling means
2	Propelled by motor power	Annex B (sailing test)	
3	Propelled by sail	5.2; B.2	

Annex A
(normative)

Inflatable canoes, kayaks and sit-on-top kayaks

A.1 Applicable requirements

In addition to the requirements detailed in this annex, inflatable canoes, kayaks and sit-on-tops shall conform to all the requirements of the main text of this part of the standard, excluding the following clauses:

— 5.4 Rowlocks and oars;

— 6.1 Minimum area and maximum permissible number of persons;

— B.2 Applicable requirements for motorised boats;

— 6.2 Static stability of the boat;

— 7.3 Rowing test.

NOTE Sit-on-tops should be tested as far as requirements below are applicable.

A.2 Maximum permissible number of persons

A.2.1 Kayaks

For each permissible person, the minimum seating area shown in EN 15649-1:2009, Annex A 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 boat without overlapping. Point Z of the patterns shall be placed vertically in line with the lower forward edge of the backrest (see EN 15649-1:2009, Annex A).

A.2.2 Canoes

For each permissible person, the minimum seating/kneeling area shown in EN 15649-1:2009, Annex A, 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 boat without overlapping.

A.3 Load capacity, stowage volume

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

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

Canoes and kayaks shall provide a minimum inboard stowage volume, outside the seating area, of 25 dm^3 per adult and 13 dm^3 per child.

A.4 Backrest and footrest for kayaks

Kayaks shall be equipped with a backrest and a footrest for each permissible person. The footrest shall not entangle/entrap 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

The manoeuvre ability of the boat under given loading conditions shall allow a goal orientated straight forward course according to manufacturer's declarations.

Testing shall be performed by a practical test in water. The test course for propulsion straight forward shall be 100 m.

Test criteria:

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

— purposeful 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 of the watercraft.

Annex B
(normative)

Inflatable boat propelled by sail or motor

B.1 Applicable requirements for sailed boats

B.1.1 General

In addition to the requirements detailed in this Annex, inflatable crafts propelled by sail shall conform to all the requirements of the main text of this part of the standard except the requirements in B.2.

B.1.2 Boards

B.1.2.1 Construction

Leeboards, centreboards and dagger boards 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 or devices.

Dagger boards shall be secured against accidental loss.

B.1.2.2 Strength and function of boards

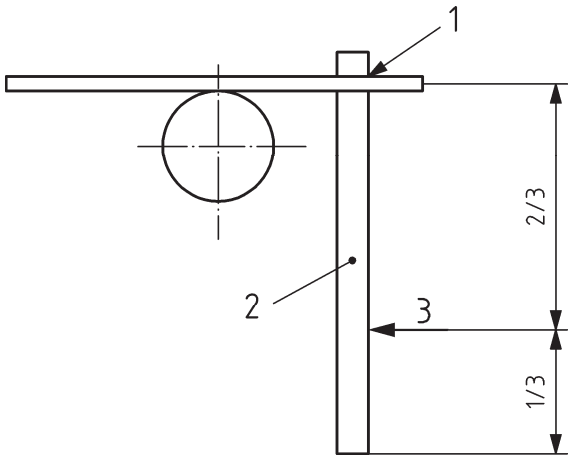
The attachment of any of the boards shall show no failure or permanent deformation when loaded with a lateral force of 80 N/m^2 of sail area.

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 dagger boards, the lateral force shall be applied at the mid-point of their exposed length underneath the boat bottom (l_x). See Figure B.2.

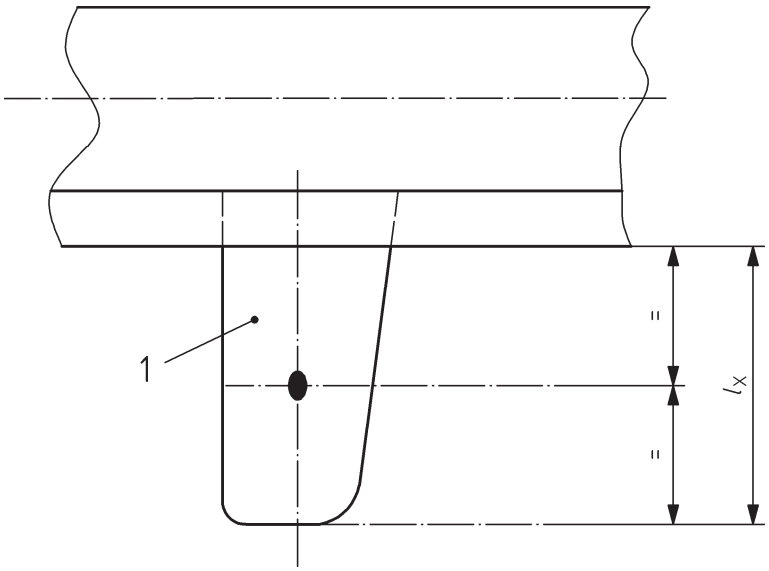
B.1.2.3 Test method

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/daggerborad
l_x Length underneath the boat bottom

Figure B.2 — Centre/daggerboard strength test

B.1.3 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 cleat by the helmsman in his seating position.

B.1.4 Sailing performance

B.1.4.1 Requirement

Watercrafts propelled by sail 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 boat 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.

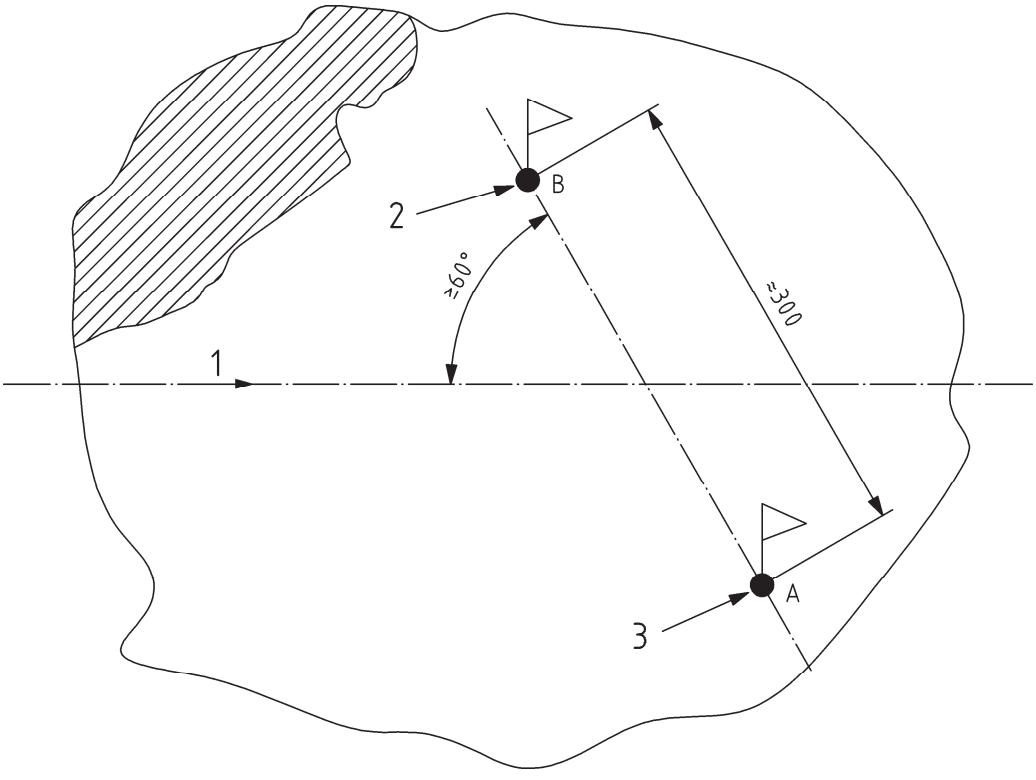
B.1.4.2 Test method

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 courses 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

B.2 Applicable requirements for motorised boats

B.2.1 General

In addition to the requirements detailed in this Annex, inflatable crafts propelled by motor shall conform to all the requirements of the main text of this part of the standard:

B.2.2 Transom (where applicable)

B.2.2.1 Requirement

The transom or motor mount and its attachment to the boat shall be designed to withstand, under normal use, the output power and torque of the motor specified by the manufacturer and the weight of such a motor.

B.2.2.2 Test method

Visual inspection during and after in-water performance tests as described in B.2.5.

B.2.3 Motor-securing line attachment (only powered boats)

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

B.2.4 Maximum motor power

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

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

where

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

$F_{(d)}$ is the dimensional factor = $l \times b$

where

l is the overall length of the boat in m, from the bow to the extremity of the rear float (excluding hand-holds or other fittings);

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

B.2.5 In-water performance, if the boat is equipped with mechanical means of propulsion

B.2.5.1 Requirements

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

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

The boat shall not overturn and shall remain reasonably dry.

B.2.5.2 Test method

B.2.5.2.1 General

The boat shall be closely examined at the end of the test period.

The remote steering system shall be used, if it is supplied as standard equipment. If it is offered as optional equipment, the test shall be carried out using both tiller and remote steering system consecutively.

B.2.5.2.2 Testing with minimum load

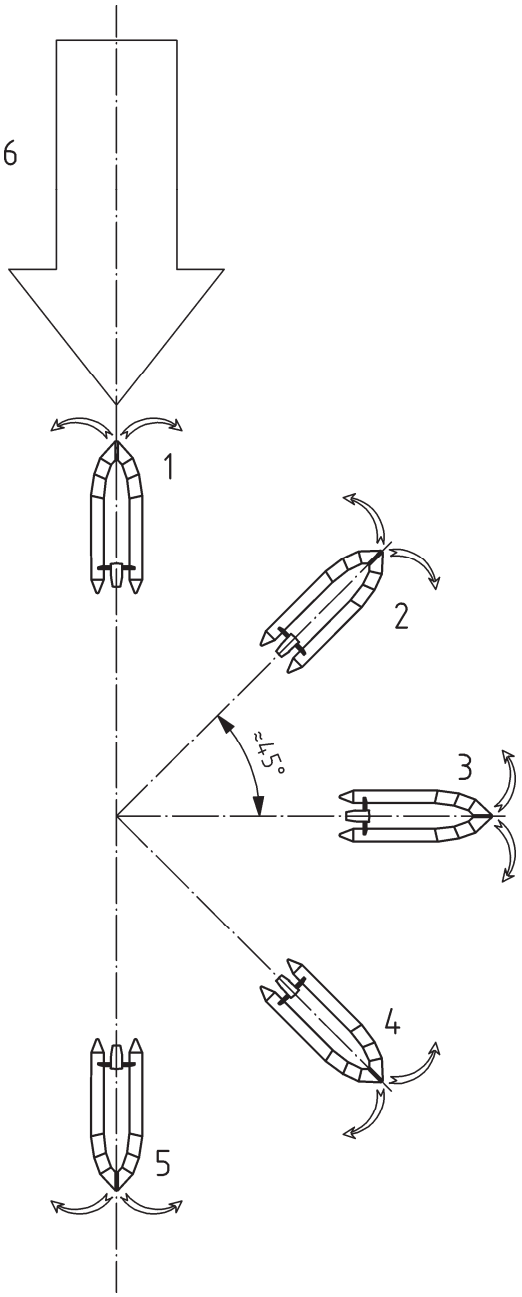
Only a coxswain shall be embarked. The total period of testing shall not be less than 45 min. With powered boats, the motor controls shall be set to develop maximum forward thrust.

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

B.2.5.2.3 Testing with maximum load

The test described in B.2.5.2.2 shall be repeated, but with the boat uniformly loaded with its maximum load capacity including the maximum permissible number of persons (see 6.1 and 6.4).

All handholds shall be clearly seen to have satisfied the requirements of 6.5.1 and all seating and attachment systems to have satisfied the requirements of 5.7.

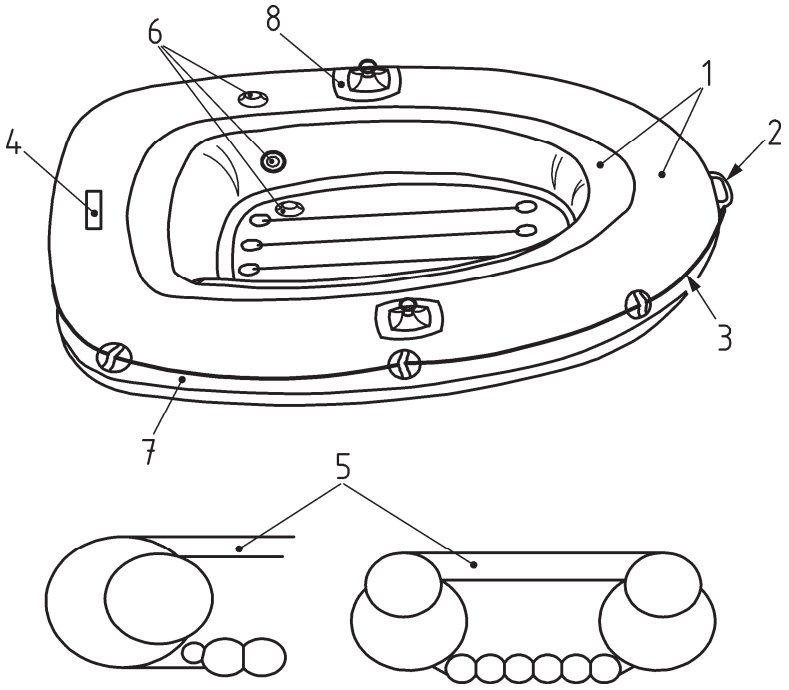


Key
1 Upwind course
2 Bowquarter course
3 Beam-wind course
4 Sternquarter course
5 Downwind course
6 True wind direction

Figure B.4 — In-water performance test

Annex C
(informative)

General arrangement of a typical boat with the hull made of non-reinforced material

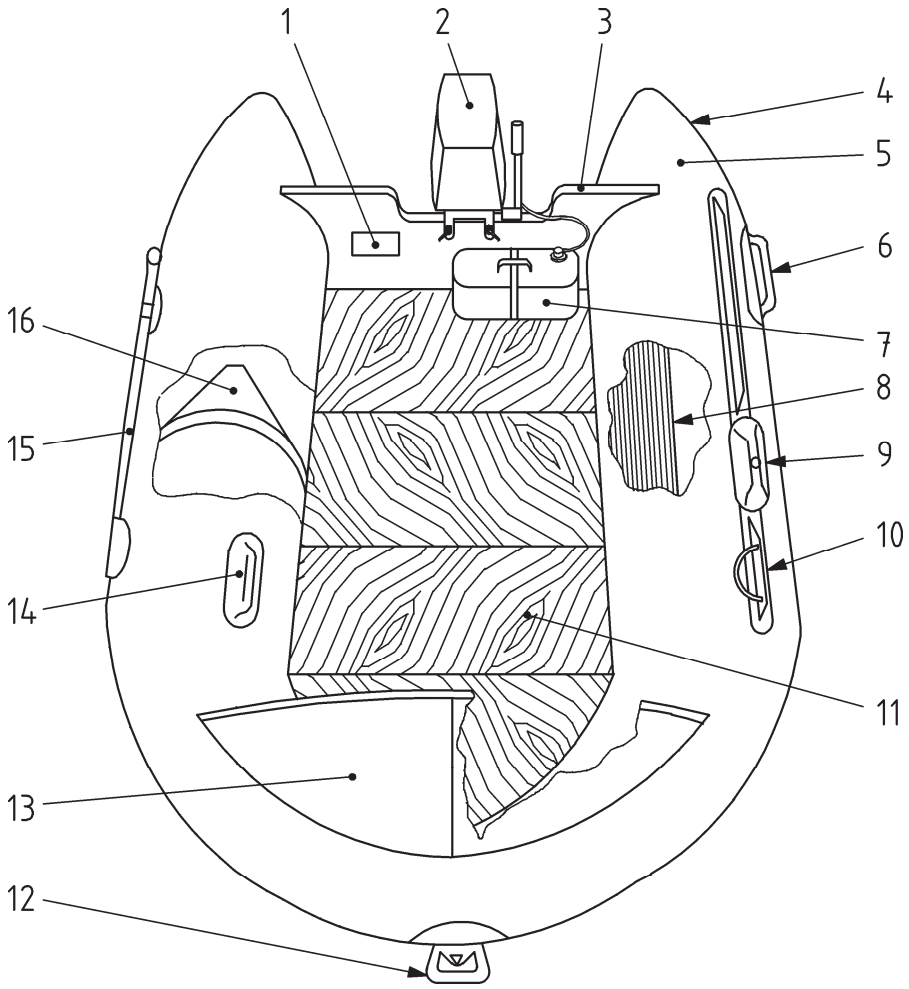


Key
1 Buoyancy tubes
2 Towing device
3 Safety rope or lifeline
4 Type plate
5 Example of a longitudinal partition
6 Inflation valve
7 Lifting/carrying device
8 Oarlock

Figure C.1 — Arrangement of a boat made of non-reinforced material

Annex D
(informative)

General arrangement of a typical boat with the hull made of reinforced material

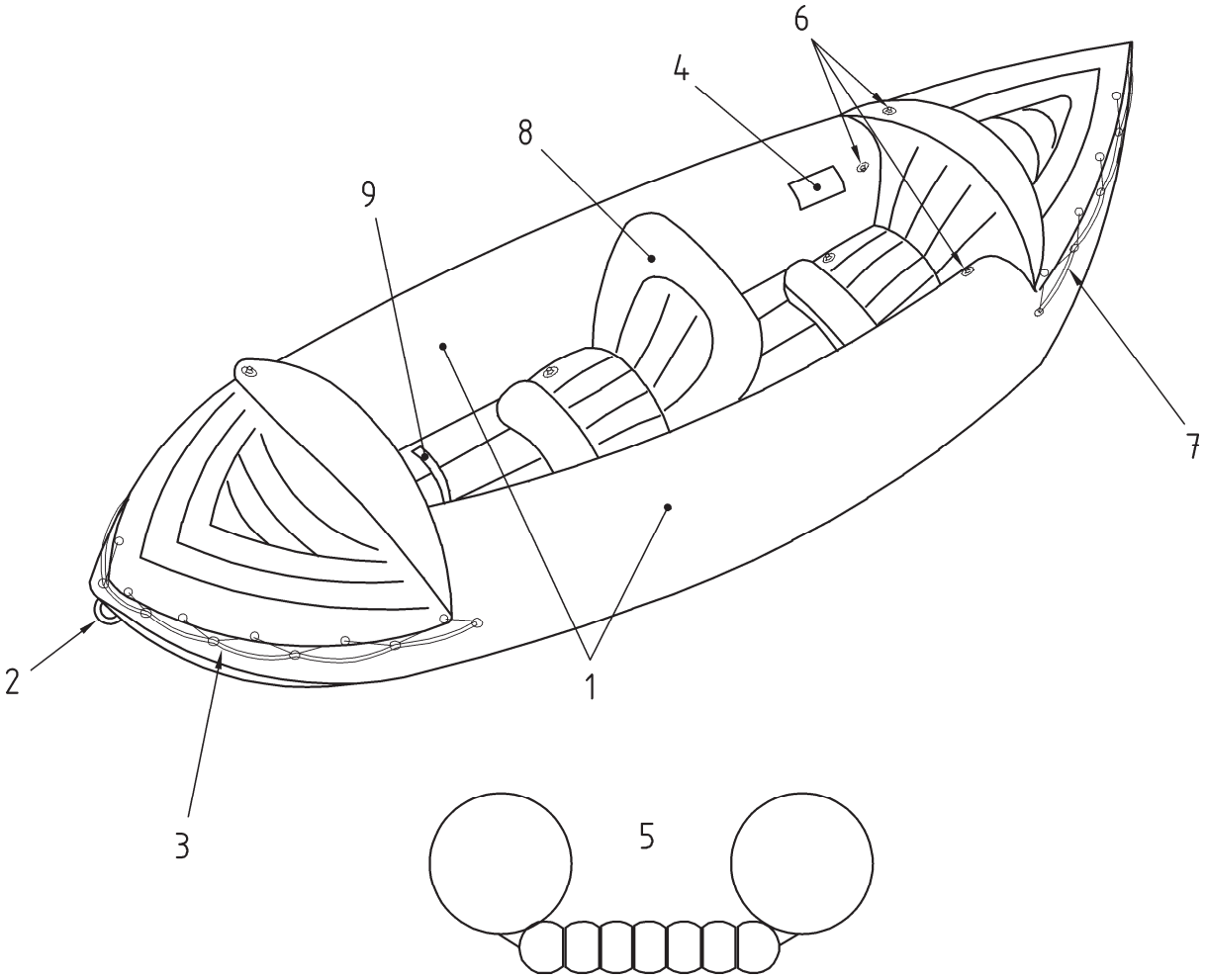


Key
1 Type plate
2 Motor
3 Transom
4 Inflation valve
5 Buoyancy tube comprising several buoyancy chambers
6 Lifting/carrying device
7 Fuel tank
8 Partition bulkhead – Example of a longitudinal partition
9 Oarlock
10 Safety rope or lifeline
11 Inboard area
12 Towing device
13 Spray cover
14 Grab handle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

Figure D.1 — Arrangement of a boat made of reinforced material

Annex E
(informative)

General arrangement of a typical paddle boat/kayak



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

Figure E.1 — Arrangement of a paddle boat/kayak

Annex F
(informative)

Examples of typical products forming Class E

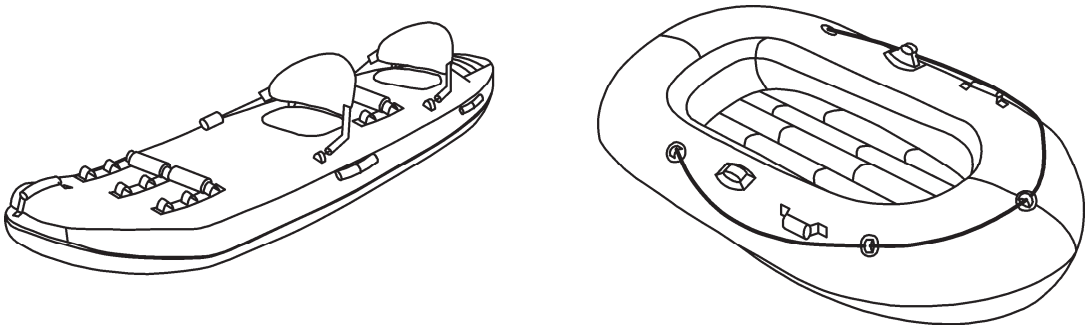


Figure F.1 — Examples of typical products forming Class E

Bibliography

[1] EN 71-1, Safety of toys — Part 1: Mechanical and physical properties

[2] EN ISO 13857, Safety of machinery — Safety distance to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)

[3] EN 837-1, Pressure gauges — Part 1: Bourdon tube pressure gauges — Dimensions, metrology, requirements and testing

[4] EN 837-3, Pressure gauges — Part 3: Diaphragm and capsule pressure gauges — Dimensions, metrology, requirements and testing

[5] EN 13138-1, Buoyant aids for swimming instruction — Part 1: Safety requirements and test methods for buoyant aids to be worn

[6] EN 13138-2, Buoyant aids for swimming instruction — Part 2: Safety requirements and test methods for buoyant aids to be held

[7] EN 13138-3, Buoyant aids for swimming instruction — Part 3: Safety requirements and test methods for swim seats to be worn

[8] EN ISO 179-1, Plastics — Determination of Charpy impact properties — Part 1: Non-instrumented impact test (ISO 179-1:2000)

[9] EN ISO 4892-2, Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps (ISO 4892-2:2006)

[10] EN ISO 6185-1, Inflatable boats — Part 1: Boats with a maximum motor power rating of 4,5 kW (ISO 6185-1:2001)

[11] EN ISO 6185-2, Inflatable boats — Part 2: Boats with a maximum motor power rating of 4,5 kW to 15 kW inclusive (ISO 6185-2:2001)

[12] EN ISO 6185-3, Inflatable boats — Part 3: Boats with a maximum motor power rating of 15 kW and greater (ISO 6185-3:2001)

[13] ISO 1431-1:2004, Rubber, vulcanized or thermoplastic — Resistance to ozone cracking - Part 1: Static and dynamic strain testing

[14] ISO 1817, Rubber, vulcanized — Determination of the effects of liquids

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

[16] ISO 4646, Rubber- or plastics-coated fabrics — Low temperature impact test

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