



International
Standard

ISO 25649-4

**Floating leisure articles for use on
and in the water —**

**Part 4:
Additional specific safety
requirements and test methods for
Class B devices**

Articles de loisirs flottants à utiliser sur ou dans l'eau —

*Partie 4: Exigences de sécurité et méthodes d'essai
complémentaires propres aux dispositifs de Classe B*

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Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Safety requirements and test methods	2
4.1 General	2
4.2 Sizing	3
4.2.1 Sizing of B1 devices, fit to user's body and test probes	3
4.2.2 Sizing of B2.1 (being-in type) devices, loose fit to body	4
4.2.3 Sizing of B2.2 (sitting-on type) devices, loose fit to the body	5
4.3 Strength of entire device Class B1	5
4.3.1 Requirement	5
4.3.2 Strength of entire device Class B1, test method	7
4.4 In-water performance of Class B1 devices	8
4.4.1 In-water behaviour, static floating stability of Class B1 devices for children of 4 years old to 8 years old	8
4.4.2 In-water behaviour, static floating stability of Class B1 devices for children above 8 years of age (test panel of human test subjects, device fully inflated)	10
4.4.3 In-water behaviour, dynamic stability for Class B1 devices intended for children of 4 years to 7 years of age (30 kg)	11
4.4.4 Residual buoyancy and retention of function of Class B1 devices (children up to 7 years, 30 kg)	11
4.4.5 Escape from the Class B1 device (body entrapment, leg or foot entanglement)	11
4.5 In-water performance of Class B2 devices	12
4.5.1 In/water behaviour, static floating stability of Class B2 devices for children up to 7 years	12
4.5.2 In-water behaviour, static floating stability of Class B2 devices for children above 7 years of age (30 kg)	15
4.5.3 Residual buoyancy and retention of function of Class B2 devices for children of 3 years (36 months) to 8 years (96 months) of age	15
4.5.4 Escape from the Class B2 device (body entrapment, leg or foot entanglement)	15
5 Consumer information	16
5.1 General	16
5.2 Consumer information on the packaging (point of sale information)	16
5.3 Consumer information on the product (information related to safe use)	16
5.4 Consumer information by instructions for use (separate written information)	16
5.4.1 General	16
5.4.2 Safety and product information	16
5.4.3 Assembly	16
5.4.4 Maintenance and repair	16
6 Exclusions	17
Annex A (informative) Optional manikin testing for swim seats as one possible embodiment of Class B1 devices, requirements	18
Annex B (informative) Examples of products forming Class B	23
Bibliography	25

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 83, *Sports and other recreational facilities and equipment*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 136, *Sports, playground and other recreational facilities and equipment*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 25649-4:2017), which has been technically revised.

The main changes are as follows:

- update of the introduction;
- update of [Clause 2](#);
- in [Table 3](#), modifications of smallest interior dimensions for xx-large devices;

A list of all parts in the ISO 25649 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

0.1 General

Class B devices are marketed and used for activities in the water. Typically, they are characterized by a partly immersed position of the user inside the device, distinguishing them from other floating devices. The development of new products in this area is progressing. Beyond the classical swim seat rafts for more dynamic action on and in the water, different body postures and extended user groups have been developed. ISO 25649-4 aims at increased safety with regard to all foreseeable uses of Class B floating leisure articles.

This document does not apply to only one technically clearly determined product, but to a diverse group of products including two major design principles, B1 and B2, as laid down in the classification of Class B floating leisure articles (see [Clause 4](#)).

[Figure 1](#) shows the distinction between Classes B1 and B2 products.

Class B1 includes products, e.g. swim seats for children older than 36 months, with an interior body holding system. In the case of very young users (non-swimmers 4-years-old and older) the body position can be such that the body is kept afloat and laterally supported by a surrounding inflatable structure. This structure provides a relatively tight fit between user and buoyant structure, creating a risk of entrapment in case of capsizing.

Class B1 products for children younger than 36 months are dealt with in EN 13138-3:2021.

Class B2 products do not provide this kind of support for the body of the user. Although they have a circumferential buoyant structure in common with Class B1 products – and thus a risk of entrapment if this fit becomes too tight – flotation of the user depends on his ability to hold himself by hands or body inside the very loosely surrounding buoyant structure.

Both classes of products include also adult use. Activities range from passive floating to actions such as wave surfing, tubing, balancing, swinging, etc. (See [Figure 1](#)). The devices are associated with the identified risks given in [Table 1](#).

Since Class B products support the user's body in a partly and permanently immersed position, they do not need requirements for re-embarkation (unlike ISO 25649-3 devices). The degree of immersion can vary. In the case of a big floating ring, e.g. B1.1 and B2.2, the user can be immersed up to the chest or only the buttocks can be immersed. In the case of B1-products (e.g. swim seat), the human body is permanently immersed to a large degree.

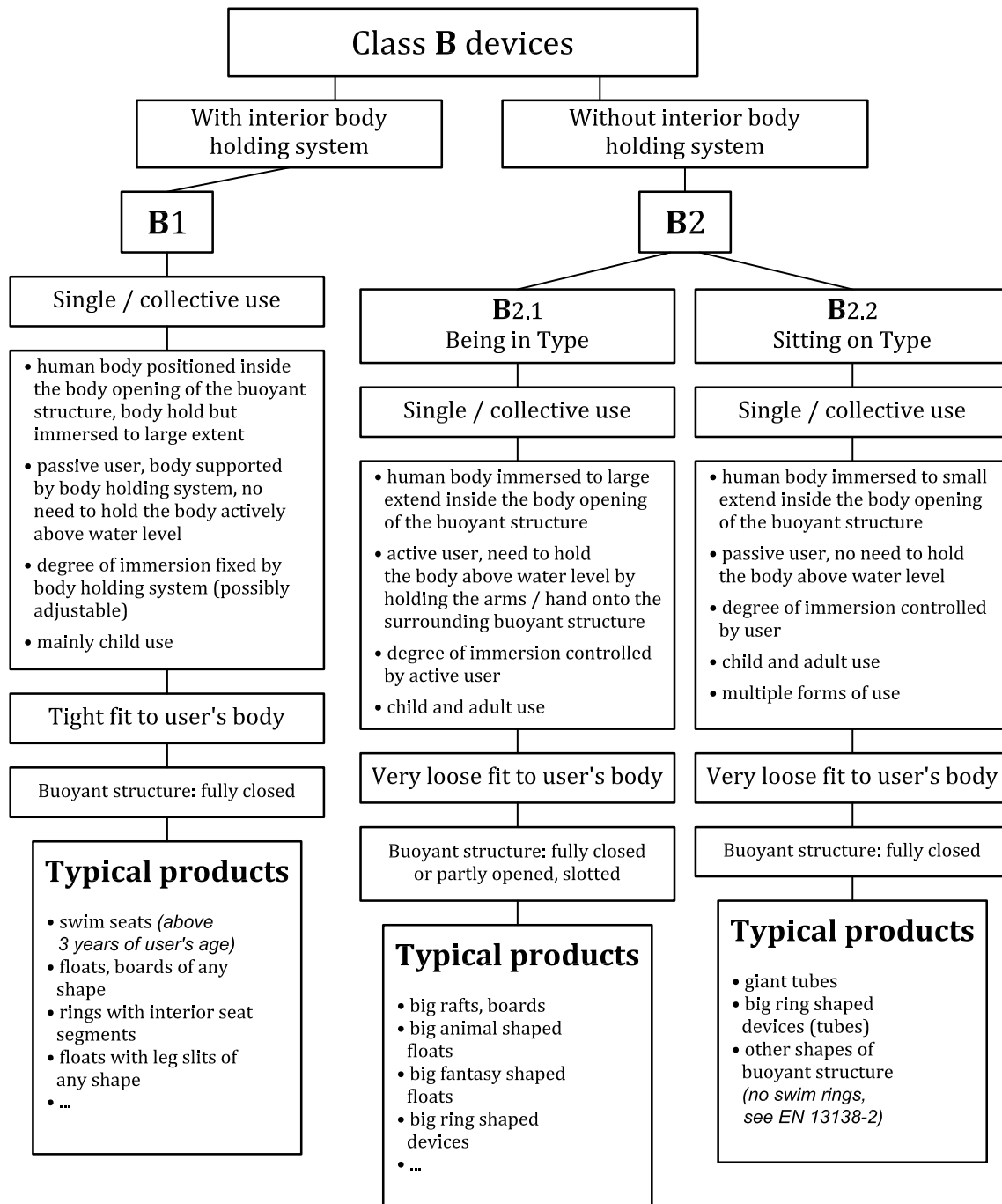
Dealing with a partly intentionally immersed human body leads to the question of loads to be applied for appropriate testing. For the purpose of this document, load resulting from the body weight is set with 75 % of the body weight of the heaviest foreseeable or specified user, even when in certain circumstances this immersed body weight may be reduced to roughly 10 %. In the case of devices on top of which the user can sit (e.g. big rings) the maximum body weight out of the stipulated user group is assessed as adequate.

0.2 Child testing

See [Annex A](#) and ISO 25649-1:2024, Clause 4, as alternatives. Class B products can be used by children from the age of 4 years. Some essential requirements ensuring safety in use and in dangerous situations which can occur – e.g. capsizing – cannot be simulated and verified via the application of forces or other instrumental procedures, but only by practical testing involving human test subjects or test manikins that sufficiently represent the envisaged user groups. Children testing increases the nearness to real-life situation but can lead to subjective results. An increased number of test cycles is an appropriate means to get an average result that makes the subjective test more objective. The use of test manikins reduces the nearness to real life situation but increases reproducibility of testing. The worst alternative is to eliminate certain requirements if they cannot be verified for the lack of either test manikins or human test subjects.

This document refers amongst others to children as test subjects. The anthropometric requirements related to these test subjects are based on children 5 years of age and 9 years of age with a body height of 126 cm and 149 cm and a body weight of 25 kg and 38 kg, respectively. Children of 14 years of age and above can be represented by the smallest adult female person representing the 5th percentile of the anthropometric range.

In order to provide in all cases an alternative to child testing, the anthropometric data of relevant manikins are specified for optional application in [Annex A](#).



NOTE Rings and ring shaped tubes dealt with in this document are in no case swim rings as means to learn to swim (see EN 13138-2) but water leisure articles for hanging in or sitting on.

Figure 1 — Interior structure Class B devices

Table 1 — Introductory risk analysis

Class	Typical products	Place of use	Function; range of usage; target/age group	Type of movement/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
B (B1, B2)	Floating structures with circumferential buoyancy chambers around user's body, body opening with (B1) or without (B2) interior body holding system, various body postures	Depending on age group and capability to swim: pool, close to shore, lake, pond	Children; adolescents; large variety with regard to age and use (max. 16 years to 18 years); no infants	Mainly drifting; propulsion only by swimming strokes; third party acting, moving by hand paddling, action in waves for adolescents	In-water position: main parts of body are below the water surface; no elevation above water level; sitting kneeling, standing, laying	Dangerous distance from bank/ shore; use in currents and/or dangerous off-shore winds; use by non-swimmers (B2); capsizing (B1); wrong size allocation (user wedged-in device); lack of supervision	Capsizing, entrapment, entanglement; capsizing in combination with entrapment can lead to fatal accidents; drifting away through current or wind	DROWNING	Avoidance of entrapment or entanglement; floating stability; residual buoyancy; warning notes; easy escape in the case of capsizing; adult supervision; suitable sizing system

Floating leisure articles for use on and in the water —

Part 4:

Additional specific safety requirements and test methods for Class B devices

1 Scope

This document specifies additional specific safety requirements and test methods for Class B floating leisure articles for use on and in the water regardless whether the buoyancy is achieved by inflation or inherent buoyant material.

This document is applicable for Class B floating leisure articles as specified in ISO 25649-1:2024, Table 1.

Class B devices provide a buoyant structure with one or more body openings into which the user is positioned partly immersed.

NOTE 1 Typical products in Class B (see [Annex B](#)):

- floating rafts with interior body holding system (“swim seats”) mostly in circular or square shape, fantasy shape for playing purposes;
- floating fantasy shaped structures with one or more openings to host a child’s body, with or without body holding system;
- floating with slits or openings to put legs through any shape;
- floating rings with interior seat segments inside the circular body opening.

NOTE 2 Typical places for application:

- pools;
- protected areas of lakes, ponds;
- protected areas of sea shore (no offshore winds, no currents).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 25649-1:2024, *Floating leisure articles for use on and in the water — Part 1: Classification, materials, general requirements and test methods*

ISO 25649-2:2024, *Floating leisure articles for use on or in the water — Part 2: Consumer information*

EN 13138-3:2021, *Buoyant aids for swimming instruction — Part 3: Safety requirements and test methods for swim seats into which a user is positioned*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 25649-1:2024 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1 residual buoyancy

provision of remaining buoyancy in case of a defect of a buoyancy chamber

3.2 floating stability

capability of a non-moving buoyant structure to withstand internal and external forces that tend to capsize it and to maintain a stable floating position

Note 1 to entry: Internal forces leading to capsizing can result from uneven load distribution, external forces leading to capsizing can result from wind or waves.

3.3 device to be balanced by the user

product of which the upright floating depends on user's skill and sense to balance it

3.4 escape

easy and complete separation between the user and the device in case of capsizing of the device or system without hindrance through a part or feature of the floating device

3.5 swim seat

buoyant device intended to introduce the user to the aquatic environment and to build water confidence as a pre-requisite to learning to swim, which provides safety for the user but no guaranteed protection against drowning

Note 1 to entry: Swim seats are learning aids and shall not be mistaken with aquatic toys as defined in EN 71-1.

[SOURCE: EN 13138-3:2021, 3.11]

3.6 body holding system

system that is constituted by any means inside the circumferential buoyant structure that supports the user's body

Note 1 to entry: Body holding systems enable users to stay in the partly immersed position without needing to hold themselves to not slip through the opening into the water. The body holding system can be designed to allow a sitting, kneeling, standing or lying posture. It can be integrated into the interior opening of the buoyant structure or added as a separable component.

3.7 inherent buoyant material

non-crosslinked (closed-cell) foam or other materials enclosed in (a) sealed compartment(s) in the hull that have a specific weight lower than 1 kg/dm³

Note 1 to entry: Floating leisure articles made from inherent buoyant material are considered buoyant structures (hull) achieving all or parts of their intended shape and buoyancy through soft foam, hard foam or sealed chambers filled with air, gas or granules.

4 Safety requirements and test methods

4.1 General

Construction of Class B devices shall be such that it corresponds, in terms of design, dimensions, safety, strength and durability to its intended use.

Where Class B devices are provided in several components, the requirements set out in ISO 25649-1:2024 shall be applied to all components. These components shall be permanently attached if they contribute indispensably to safety and performance.

With regard to general material and design requirements, Class B devices shall meet the requirements specified in ISO 25649-1:2024.

In individual cases, due to the unpredictability of future products, a corresponding choice shall be made.

Class B products shall be marked with the safety information markings, as specified in ISO 25649-2:2024, Clause 4.

4.2 Sizing

4.2.1 Sizing of B1 devices, fit to user's body and test probes

4.2.1.1 Requirements

The child's torso and thighs shall be represented by test probes representing the anthropometrically relevant 95th percentile, male body dimensions of the labelled age/weight group. The torso and thigh probes shall slip easily through the body or leg openings respectively (see [Figure 2](#)).

Sizing of Class B1 devices shall be in accordance with the range of body weights and age groups as specified in [Table 2](#) (for sizing safety information symbols see ISO 25649-2:2024).

Table 2 — Minimum dimensions for interior body openings

Body weight	Age range	Torso probe dimensions <i>A^a × B^a × C^a</i>	Thigh probe diameter <i>D^a</i>
kg	years	mm	mm
22 to 25	4 to 5	260 × 210 × 400	168 ^a (140 ^b)
28 to 34	6 to 8	310 × 240 × 450	192 ^a (160 ^b)
38 to 48	9 to 11	330 × 250 × 500	222 ^a (185 ^b)
54 to 61	12 to 13	350 × 260 × 550	264 ^a (220 ^b)
69 and above	14 and above	The 14 year-old child user may be represented by the human adult test subject 4 as specified in ISO 25649-1:2024, Table 2. ISO 25649-1:2024, Table 2 can be consulted for test subjects above 14 years of age (test persons 3 and 4).	
^a Anthropometric data, + 20 % safety margin (applicable test value).			
^b 95 th percentile, male, oldest child of age range.			