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Floating leisure articles for use on and in the water —

Part 6: Additional specific safety requirements and test methods for Class D devices

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

Partie 6: Exigences de sécurité et méthodes d'essai complémentaires propres aux dispositifs de Classe D

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Foreword

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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 25649-6:2017), which has been technically revised.

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The main changes are as follows:

— update of the scope;

— update of Clause 2;

— update of Clause 3;

— in 4.2.1, update of the requirements regarding the force to apply for the test method;

— in 4.5.3.1, addition of requirements on the residual buoyancy for structure > 1,5 m height;

— creation of 4.5.5.6 on products with climbing functions;

— creation of 4.5.8.1 on water depth information;

— creation of 4.5.8.2 on water depth calculation for specific products;

— in 4.5.11.1 addition of requirements on the repair kit;

— update of Clause 5;

— update of Annex A,

— creation of Annex B on specific information for devices exceeding 5 m height;

— creation of Annex C and specific requirement for pool use of water parc modules.

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

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Introduction

The products described in this document are characterized by their enormous size and intended collective use. Therefore, most safety requirements concentrate on floating stability under full and single sided load, collision of users, entrapment and entanglement issues as well as safety distances and sufficient water depth in relation to jumping and potential falling heights provided by the various “action modules”. Another issue is the assembly of these stand-alone modules to large and complex activity courses. The assembly creates entrapment risks at the interfaces and needs to be assessed under the aspect of closing those interfaces.

Consumer information related to safe use is an important supplement.

Class D devices are applicable to persons older than 36 months who are able to swim. Class D devices are intended to be anchored in position or free floating. They are designed for active use on the water surface. Class D devices are especially designed for active use, including jumping, playing, climbing and any other related activity on the inflatable.

See Annex A for examples of typical products forming Class D. See Figure 1 for interior structure of Class D devices.

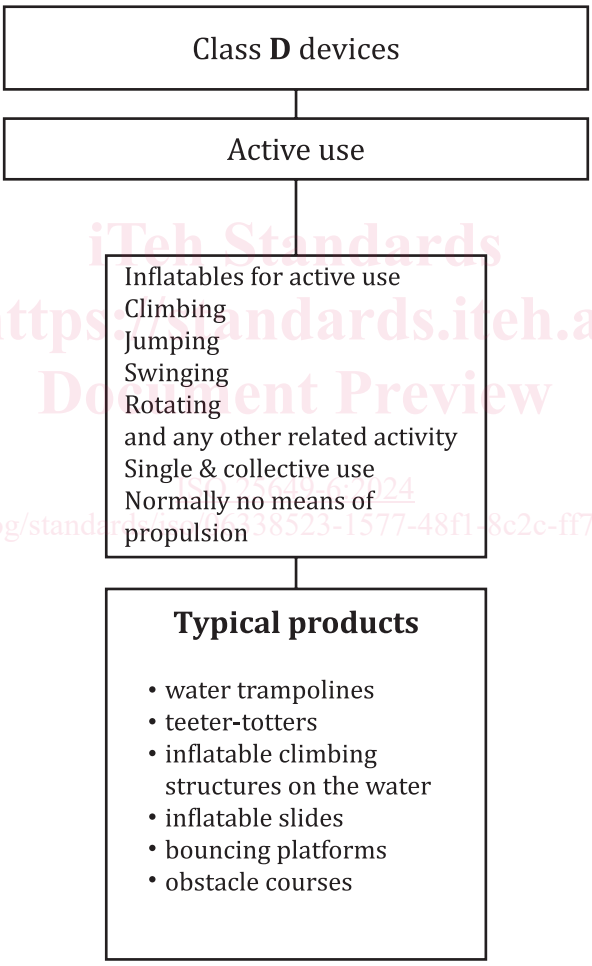

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Figure 1 — Interior structure of Class D devices

The risk assessment for this document is shown in Table 1.

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Table 1 — Introductory risk analysis

Class	Typical products	Place of usage	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
Trampoline D (D1, D2) climbing/ jumping structures	Trampolines on the water of various sizes	Sea shore or close to shore; lakes; smoothly running rivers; big pools; amusement parks	Jumping on devices/in the water, dual use: resting, use as platform all age groups, swimmers	Static use on a determined place, device moored may also be free floating; users jumping; all sorts of movements	Considerable elevation depending on the size of the device and jumping height; entrapment through swimming underneath the structure	Use by non-swimmers; overcrowding; insufficient water depth; impact in water, collision; entrapment through swimming underneath device, lack of supervision (small children)	Collision of persons; collision with objects (anchoring); insufficient water depth; safety distances; dangerous proximity to other objects; shallow water; re-embarking (grab handles)	DROWNING	Age limits; swimmers only; no protruding parts; no entrapment; cushioning; warnings; supervision of small children
	Large floatable structures for action and fun, mainly climbing jumping, rollicking; bouncing castles on water	Sea shore/ close to shore; lakes; rivers; big pools; amusement parks	All age groups, swimmers	Devices static (drifting or moored); users are jumping; climbing; sliding; bouncing; (see also trampolines)	Depending on the size of the device; height up to 4 m are likely; jumps and falls are part of the game	Depending on the size of the device; heights up to 4 m are likely; jumps and falls are part of the game	As above		Supervision; no rules are known for on the water equipment; safety transfers are likely from land-bound toy structures

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Floating leisure articles for use on and in the water —

Part 6:
Additional specific safety requirements and test methods for Class D devices

1 Scope

This document specifies safety requirements and test methods related to materials, safety, performance and consumer information for classified floating leisure articles for use on and in the water according to ISO 25649-1:2024.

This document is applicable to Class D floating leisure articles for use on and in water according to ISO 25649-1:2024 regardless whether the buoyancy is achieved by inflation or inherent buoyant material.

NOTE 1 Typical products forming Class D (see Figure A.1 and Figure A.2):

— inflatable climbing structures on the water;

— bouncing platforms;

— inflatable slides;

— water trampolines;

— teeter totters;

— obstacle courses.

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NOTE 2 Typical places for application:

— pools;

— lakes, ponds;

— open sea;

— 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.

EN 913:2018, *Gymnastic equipment — General safety requirements and test methods*

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*

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*

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ISO 25649-3:2024, *Floating leisure articles for use on and in the water — Part 3: Additional specific safety requirements and test methods for Class A devices*

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 any buoyancy chamber

3.2
re-embarkation aids
design feature that facilitates getting back on the floating leisure article from an in-water position, regardless whether the buoyant structure is fully inflated or any chamber is deflated

3.3
safety pad
trampoline cover for springs, metal frame and fringe zone of the jumping surface

3.4
available area
area on or inside a floating article that can be unrestrictedly used for user accommodation when taking the intended posture(s)

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3.5
load capacity
value stated by the manufacturer representing the maximum load on a buoyant structure under which a safe floating position is assured

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3.6
unsupported material
materials that have no reinforcing textiles

3.7
module
functional element of floating leisure articles that can be used as a stand-alone device or integrated with other functional elements into a complex *modular arrangement* (3.8) of any optional shape

Note 1 to entry: The two major types of modules are flat connection modules and action modules.

3.8
modular arrangements
individually and variable combination of single floating leisure article *modules* (3.7), flat connection and action modules in a way that a multi-functional water park is created and can be modified by exchanging an optional number of modules when needed

Note 1 to entry: Action modules include climbing module, water slide module, trampoline module, swing module, etc.

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4 Safety requirements and test methods

4.1 General

Construction of a floating leisure article Class D device shall be such that it corresponds in terms of design, dimensions, safety, strength and durability to its intended use. The requirements set out in this document were chosen to ensure compliance with these considerations. When floating leisure articles provide buoyancy in several components, these requirements shall apply to all components. Inflatables shall provide residual buoyancy if one air chamber fails. This residual buoyancy maintains the safety of the device even if its function might be lost. The safety requirements in this document are therefore related to:

— design;

— sizing;

— materials;

— strength;

— performance;

— information.

General and common material related requirements and test method as specified in ISO 25649-1:2024 and ISO 25649-2:2024 shall apply for Class D devices (inflatable or inherent buoyant).

In individual cases, due to the unpredictability of existing and future products, a corresponding choice shall be made by the test house.

With regard to those risks resulting from extreme height, devices exceeding 5 m height shall be submitted to further risks analysis (as stated in Annex B).

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4.2 Design of buckles and other fixings

4.2.1 Requirements

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If buckles or other detachable fastening devices are used as components of Class D devices in order to attach or connect functional parts or other components, they shall require at least two simultaneous actions for their release or opening in order to prevent an unintended opening. When one of the two sequences of buckle opening relies on pressure, it shall be necessary to apply a force of at least 50 N on this release mechanism.

4.2.2 Test method

Verification shall be executed by the test panel. In case of a locking system based on pressure, the testing shall be done in accordance with EN 13138-3:2021, Annex E.

4.3 Sizing and admissible number of users, maximum load capacity

4.3.1 Product sizing

The device shall not exceed a maximum accessible platform height of 5 m.

See Annex B for specific recommendations related to devices exceeding 5 m maximum height.

4.3.2 User sizing

If a specific size/body weight correlation between user and device is relevant, the marking shall be in accordance with the range of body weights. The size/body weights of the user shall be indicated on the product by completing the relevant boxes of the appropriate safety information symbols “Number of users, adult/children” (Figure 22) and/or “Maximum load capacity” (Figure 27) as specified in ISO 25649-2:2024.

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Devices shall be marked according to their size and/or number of permitted users and maximum load capacity as specified in ISO 25649-1:2024 and ISO 25649-2:2024.

Devices including dual or multiple use (e.g. jumping on a trampoline or lying rest) shall include markings in accordance with ISO 25649-2:2024 for all intended functions.

4.3.3 Space per person per trampoline

4.3.3.1 Requirements

Class D products shall be labelled with the intended posture of the user(s) [lying/sitting/standing and relaxing or jumping (for multiple use bounce platforms or trampolines)] and the maximum permissible number of users recommended by the manufacturer.

The minimum space for a user in lying posture shall correspond to a flexible template (adult/child) the dimensions of which are specified in ISO 25649 1:2024, A.1.1. The minimum space for a sitting user shall correspond to the template (adult/child) as specified in ISO 25649 1:2024, A.1.2. In cases of combined use (sitting and lying), the template for a lying person shall be applied to determine the available area.

For multiple use bounce platforms or trampolines, the maximum number of jumpers shall correlate with the space available for each jumper. A 1,5 m jumping surface diameter is required per jumper. Each increase of jumping surface by 1,5 m shall allow for an increase of one more jumper. The total number of jumpers shall however not exceed three persons. The minimum space for a user in relaxing position should correspond to a flexible template (adult/child), the dimensions of which are specified in ISO 25649-1:2024, A.1. The minimum space for a sitting or lying user shall correspond to the template (adult/child) as specified in ISO 25649-1:2024, A.1. The maximum permissible number of users shall be recommended by the manufacturer.

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In deviation to other specifications related to land-based trampolines, a 1,5 m jumping circle diameter per person can be accepted considering experience over a period of 10 years without accidents related to this space per person and the fact that the trampolines in question shall meet a high level of fall protection requirements (covering of rigid objects on the surface according to 4.5.13).

The total number of users determined by the template shall not exceed the load capacity and floating stability of the device.

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4.3.3.2 Test method

Testing shall be done by applying the relevant lying/sitting templates as specified in ISO 25649-1:2024, A.1. Templates shall be stretched out over the area available to the user without overlapping. Templates may be arrayed to optimize the number of users without exceeding the load capacity of the device. Check for appropriate labelling in accordance with safety information symbols “Number of users, adult/children” (Figure 22) and/or “Maximum load capacity” (Figure 27) as specified in ISO 25649-2:2024.

4.4 Components

4.4.1 Valves and stoppers (special requirements for Class D)

All Class D floating leisure articles shall be fitted with non-return valves. Valves should meet the relevant requirements in ISO 25649-1:2024, 5.9.

In deviation to ISO 25649-1:2024, the protrusion of the valve and stopper shall not exceed 20 mm above the surrounding surface when the device has been inflated. When accessible during intended use, protruding parts of valves shall be rounded and not create entanglement or entrapment (see ISO 25649-1:2024, 5.4).

When tested in accordance with 4.2.2, the inflatable device shall not collapse due to a sudden loss of air pressure.

The valves shall be located in a safe place that does not obstruct the use of the products and shall be positioned such that it cannot easily be opened by an individual. If placement shall be in visible view

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