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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 des 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

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 documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

ISO 25649-6 was prepared by the European Committee Standardization (CEN) Technical Committee CEN/TC 136, *Sports, playground and other recreational facilities and equipment*, in collaboration with ISO Technical Committee TC 83, *Sports and other recreational facilities and equipment*, in accordance with the agreement on technical cooperation between ISO and CEN (Vienna Agreement).

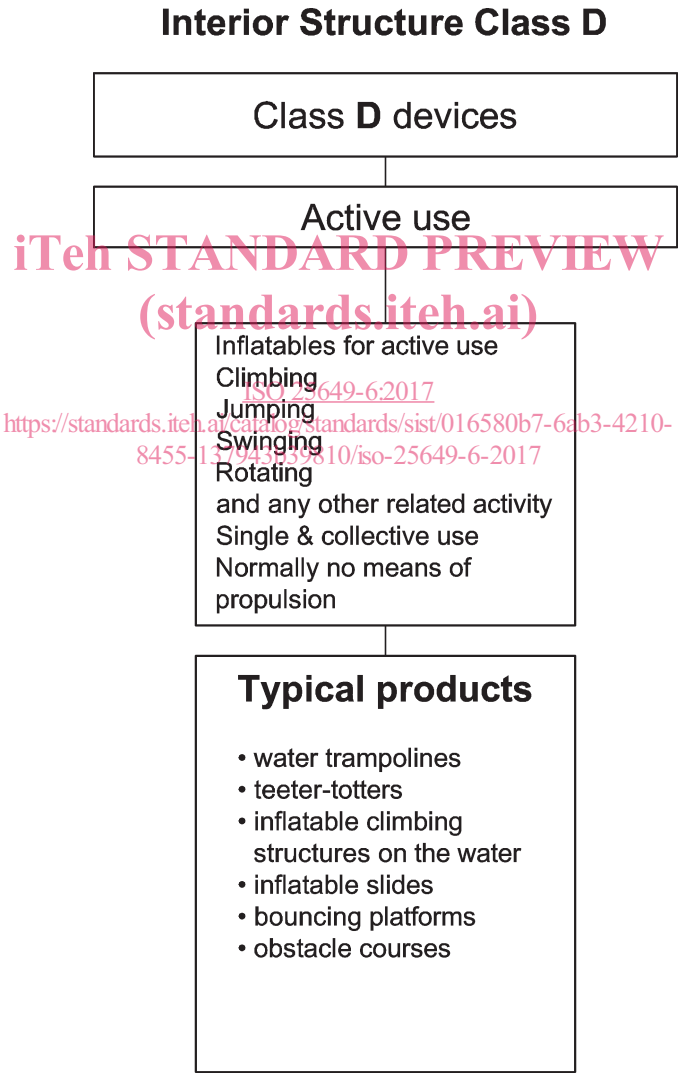
A list of all the parts in the ISO 25649-series can be found on the ISO website.

Introduction

The overriding property of Part-6-products is their enormous size and intended collective use. Therefore, the majority of 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 and regulated 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 with the restriction of the capability 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. Characteristics for Class D devices are especially the active use. Jumping, playing, climbing and any other related activity on the inflatable are part of the use.



Risk assessment for entire part 6 is shown in Table 1.

Table 1 — Introductory risk analysis

No.	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/ close to shore; lakes; smoothly running rivers; big pools; fun 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; fun 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

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

This document is to be applied with ISO 25649-1 and ISO 25649-2.

NOTE 1 Typical products forming Class D (see Annex A):

— inflatable climbing structures on the water;

— bouncing platforms;

— inflatable slides;

— water trampolines;

— teeter totters;

— obstacle courses.

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.

ISO 25649-1:2017, *Floating leisure articles for use on and in the water — Part 1: Classification, materials, general requirements and test methods*

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

ISO 25649-3:2017, *Floating leisure articles for use on and in the water — Part 3: Additional specific safety requirements and test methods for Class A devices*

EN 913:2008, *Gymnastic equipment — General safety requirements and test methods*

EN 13138-3:2014, *Buoyant aids for swimming instruction — Part 3: Safety requirements and test methods for swim seats to be worn*

3 Terms and definitions

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

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

— ISO Online browsing platform: available at http://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
inherent buoyancy
upthrust provided by material which is less dense than water or by sealed chambers that are not inflatable and are filled with air or gas

[SOURCE: EN 13138-1:2014, 3.2]

3.2
residual buoyancy
provision of remaining buoyancy in case of a defect of any buoyancy chamber

3.3
means to assist re-embarkation
means which helps the user to climb back on board of the floatable device from an in-water position regardless whether the buoyant structure is fully inflated or any air chamber is deflated

3.4
safety pad
trampoline cover for springs, metal frame and fringe zone of the jumping surface

3.5
available area
area on or inside a floating article which can be unrestrictedly used for user accommodation when taking the intended posture(s)

3.6
multiple use products
any products that are intended to be used for more than one purpose (jumping, resting, climbing, etc.)

3.7
permanent air flow articles
floating leisure articles that use a power source to continuously inflate a product maintaining its shape

3.8
inherent buoyant material
non-crosslinked (closed-cell) foam or other materials enclosed in (a) sealed compartment(s) in the hull which has a specific weight less than fresh water

Note 1 to entry: Inflatable 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.

3.9
unsupported materials
materials which have no reinforcing textiles

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 for 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 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 following safety requirements are therefore related to

— design,

— sizing,

— materials,

— strength,

— performance, and

— information.

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

ISO 25649-1 and ISO 25649-2 are applicable as general parts. In individual cases, due to the unpredictability, valency and indeterminability of existing and future concrete products, a corresponding choice shall be made by the test house.

4.2 Design of buckles and other fixings

4.2.1 Requirements

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 100 N on this release mechanism.

4.2.2 Testing

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 13138-3:2014, Annex E.

4.3 Sizing and admissible number of users, maximum load capacity

4.3.1 General

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 “Number of users, adult/children” and/or “Maximum load capacity” as specified in ISO 25649-2.

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

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

4.3.2 Space per person per trampoline

4.3.2.1 Requirements

Class D products shall be labelled with regard to the intended posture — lying/sitting/standing and relaxing or jumping (for multi-use bounce platforms or trampolines) of the user(s) 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 pattern (adult/child) the dimensions of which are specified in ISO 25649-1:2017, A.1 and specified in ISO 25649-3:2017, 4.2.3.1. The minimum space for a sitting user shall correspond to the template (adult/child) in accordance with ISO 25649-1:2017, A.1.

For multi-use bounce platforms or trampolines, the maximum number of jumpers shall correlate to 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 pattern (adult/child) the dimensions of which are specified in ISO 25649-1:2017, A.1. The minimum space for a sitting or lying user shall correspond to the template (adult/child) as specified in ISO 25649-1:2017, A.1. The maximum permissible number of users shall be recommended by the manufacturer.

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). In addition to this, ISO 25649-6 deals with trampolines positioned on the water and thus allow jumps and falls into it without those risks accompanied with land based devices.

The total amount of users determined by the template shall not contradict to the load capacity and floating stability of the device.

4.3.2.2 Testing

Testing shall be done by applying the relevant lying/sitting templates as specified in ISO 25649-1:2017, A.1. Templates shall be stretched out over the area available to the user without overlapping. Patterns may be arrayed to optimize the amount of users without contradicting to the load capacity of the device. Check for appropriate labelling in accordance with “Number of users, adult/children” and/or “Maximum load capacity” as specified in ISO 25649-2.

4.4 Components

4.4.1 Valves and stoppers (special requirements for Class D)

Floating leisure articles Class D shall be fitted with non-return valves. Valves should meet the relevant requirements set out in ISO 25649-1:2017, 5.9.

In deviation to ISO 25649-1, 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 25649-1:2017, 5.4).

When tested in accordance with 4.4.2 the inflatable device shall not suddenly collapse due to a loss of sudden air pressure. Testing shall be in accordance with 4.4.2.

The valves shall be located in a safe place that does not obstruct the use of the products and so positioned that it cannot easily be opened by any individual. If placement shall be in visible view and located where it is easily reachable then a locking system for the valve or a valve apron (permanent covering) shall be used.

The valves should have no hazardous parts that result in entrapment (such as loose strings, etc.).

4.4.2 Testing

Visual inspection and assessment by assessment panel.

4.5 In water performance

4.5.1 Class D devices, floating stability

4.5.1.1 Requirements

All floating leisure articles of Class D shall provide sufficient buoyancy and buoyancy distribution to bear the weight of the intended number of users and meet the intended functions. Devices shall float stable with all admitted passengers represented by the test subjects, as specified in ISO 25649-1:2017, 5.5, placed on those positions on the device and taking the posture representing the most uneven load distribution (multiple postures if applicable) on the device. Test in accordance with 4.5.1.2.

The capability of stable floating performance shall be marked on the product via the appropriate safety information symbol “Device provides floating stability” and “Device requires balancing” as specified in ISO 25649-2.

4.5.1.2 Testing

The maximum number of test subjects according to manufacturer’s declaration (adults, children) shall be placed within the available area in a way most likely to cause failure but without stretching (see ISO 25649-1:2017, 5.5.4 and 5.5.5, posture 1.1 and adjust). The test procedure, i.e. loading and body posture, shall cover all intended functions of a device.

4.5.2 Floating devices not claiming to provide floating stability

4.5.2.1 Requirements

a) Provide a residual buoyancy which is sufficient to keep all permissible users afloat when holding on to it.

b) The achievable floating position shall enable the users to keep their airways above water without using swimming strokes or any other active movements to keep them afloat except holding to the device.

c) These means shall be available and reachable for each permissible user after immersion.

4.5.2.2 Testing

Testing shall be done in accordance with ISO 25649-1:2017, 5.5.3.

4.5.3 Buoyancy and amount of residual buoyancy

4.5.3.1 Requirement

The amount of buoyancy shall be sufficient to keep the number of permissible users safely afloat even if one air chamber fails to allow the user(s) enough time to reach safety. When tested in accordance with the test method given in 4.5.3.2 the device shall provide stable floating position.