
**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.

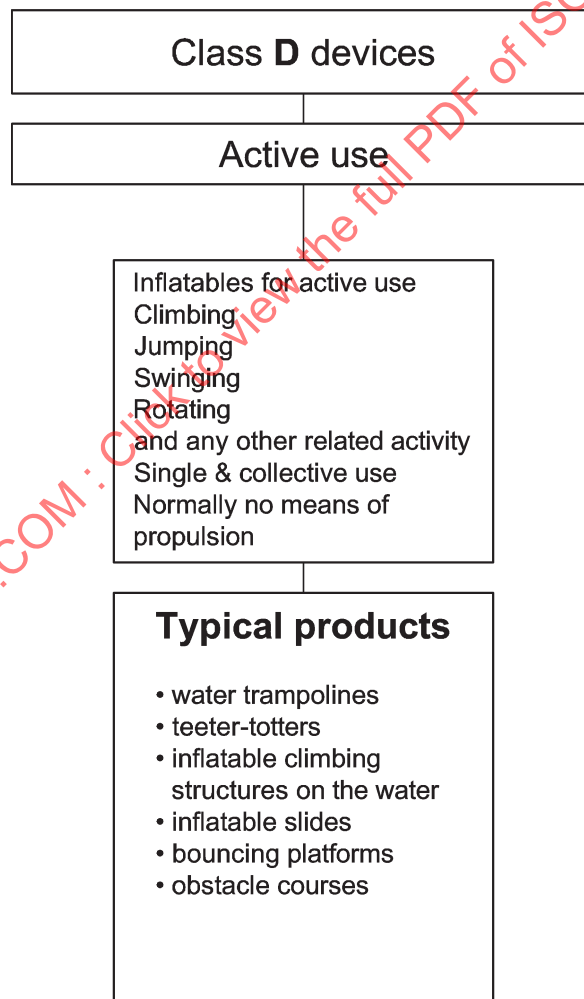
Introduction

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.

Interior Structure Class D



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)	DROWN-ING	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.

4.5.3.2 Testing

In compliance with the specified number of permissible users, test subject shall take position. Open all valves. The number of permissible users should stay afloat if any air chamber fails so that each permissible user can disembark to a safe position.

Verification by assessment panel.

4.5.4 Nominative buoyancy for floating leisure articles claiming floating stability when fully inflated

4.5.4.1 Requirement

The device shall keep a minimum buoyancy when the admissible number of users according to the manufacturer and to weight dimension as specified in ISO 25649-1:2017, Annex A, is on the floating leisure article.

4.5.4.2 Testing

The maximum number of test subjects according to manufacturer's declaration (adults, children) shall be displayed within the available area. Check whether the floating leisure article provides nominative buoyancy.

Assessment by assessment panel.

4.5.5 Carrying handles and climbing facilities

4.5.5.1 Carrying handles

Any carrying handle shall withstand a pulling force of 750 N when tested in accordance with [4.5.5.5](#).

4.5.5.2 Climbing handles, strength and safety distances

4.5.5.2.1 Requirements

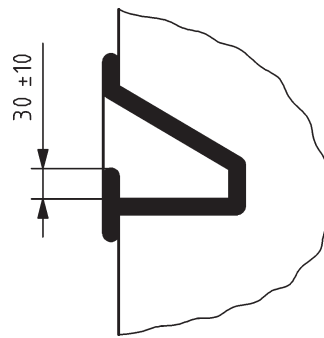
Climbing facilities in form of grab handles shall withstand a pulling force of 1 000 N when tested in accordance with [4.5.5.2.2](#).

The distance between the surface and the grab handle shall not exceed $30 \text{ mm} \pm 10 \text{ mm}$ if the handle is loaded with a force of 300 N vertically to the surrounding surface.

Cylindrically shaped grab handles shall have a diameter of not less than 20 mm and the protrusion above the surrounding surface shall not exceed $30 \text{ mm} \pm 10 \text{ mm}$ when loaded as specified above.

Climbing facilities in form of pocket handles shall provide an inner width of at least 100 mm and a grab barrier of $30 \text{ mm} \pm 10 \text{ mm}$ (see [Figure 1](#)).

Dimensions in millimetres

**Figure 1 — Climbing handle, pocket version**

If a climbing installation provides a distinct resting/sitting area above a height of 2 m, this area shall offer grab handles for each possible person sitting there.

4.5.5.2.2 Test methods

Check by visual inspection and measuring

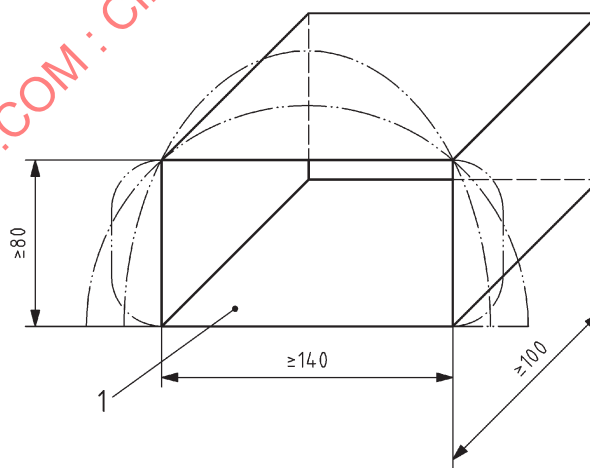
Apply test force of 1 000 N in the direction most likely to cause failure.

Apply test force of 300 N for measuring the safety distance. This force shall be applied in the middle of the handle by using a load application device (e.g. a strap) of 20 mm in width.

4.5.5.3 Foot holds for climbing

Foot holds shall be preferably designed in form of foot pockets. The interior minimum dimensions shall be as shown in [Figure 2](#).

Dimensions in millimetres



Key

1 foot/foot pocket

Figure 2 — Minimum interior dimensions for foot pockets

Footholds in form of facilities attached onto the surface of the floating leisure article shall provide a minimum step depth of 80 mm and an inner minimum width of 140 mm. The protrusion above the surrounding surface shall not exceed 90 mm.

4.5.5.4 Openings

Openings, normally created by tubes and pipes, shall be <8 mm or >25 mm.

4.5.5.5 Testing

Apply specified pulling forces in the direction most likely to cause failure. Dimensions of edges and corners shall be checked by measuring and visual inspection. Openings shall be tested with cylindrical test probes of 8 mm respectively 25 mm diameter.

For protruding as specified in ISO 25649-1:2017, 5.4.2 applies.

4.5.6 Re-embarkation from the water

4.5.6.1 Requirements

Floating leisure articles shall be so designed that a normal user (test subject) is able to re-embark on the device. Testing shall be done in accordance with [4.5.6.2](#). Any re-embarkation aids such as ladders or climbing handles, steps, platforms shall be able to withstand the weights and forces of its intended users.

These re-embarkation aids shall not be hazardous if one of the permissible users collides with it (falls on top of it).

4.5.6.2 Testing

All test subjects of the test panel shall show that it will be possible to climb back onto the floating leisure article. Assessment by assessment panel. Any re-embarkation aids used shall comply with torso entrapment in accordance with ISO 25649-1:2017, 5.3.

Adults may assist children to re-embark.

4.5.7 Anchorage

4.5.7.1 Requirements

All Class D devices shall be equipped with an anchoring attachment consisting either of an anchor plate, buckle or fixing that allows attaching an anchor rope. This device shall be capable to hold the floating device in place up to a wind force of 4 (Beaufort scale) with the admissible number of users on board or a horizontal pulling force of 1 000 N. Class D devices shall provide at least 2 anchoring points. Clear instructions and safety information symbols on various ways of anchoring shall be included in the instructions manual of the product.

4.5.7.2 Testing

Put the floating device in water with a depth of (200 ± 20) cm. Activate anchoring device according to suppliers instructions.

Pool/nature: apply a horizontal pulling force of 1 000 N on the attachment point connecting the anchoring device to the hull of the floating device. Check whether the inflatable stays in position. Visible check of wear and tear of the anchor device.

4.5.8 Water depth

4.5.8.1 Requirements

The necessary water depth $D_{\min}$ is calculated:

$$D_{\min} = \frac{H_D + H_P}{2} \quad (1)$$

where

H_D is the height of product in m;

H_P is the height of one person in m; average 1,80 m.

EXAMPLE $H_D = 5$ m

$H_P = 1,80$ m

$$D_{\min} = \frac{H_D + H_P}{2} = 3,40 \text{ m}$$

For trampolines calculate the water depth as below:

$$D_{\min} = \frac{H_D + H_{P;\text{test}} + b_{\max}}{2} \quad (2)$$

where

H_D is the height of product in m;

$H_{P;\text{test}}$ is the height of one test person in m; average of the test subjects;

$b_{\max}$ is the maximum bounce; average of the performance of the test subjects.

The minimum water depth shall be given by the manufacturer in the instructions manual.

To ensure safe diving, the manufacturer shall give information about the minimum water depths underneath the floating leisure article (see safety information symbol "Required minimum water depth underneath object" in accordance with ISO 25649-2).

4.5.8.2 Determination of bouncing height as parameter $b_{\max}$ in 4.5.8.1

- The trampoline shall be installed according to manufacturer's instructions and positioned on the water. For test purposes, a measuring device as shown in [Figure 3](#) shall be fitted to the trampoline.

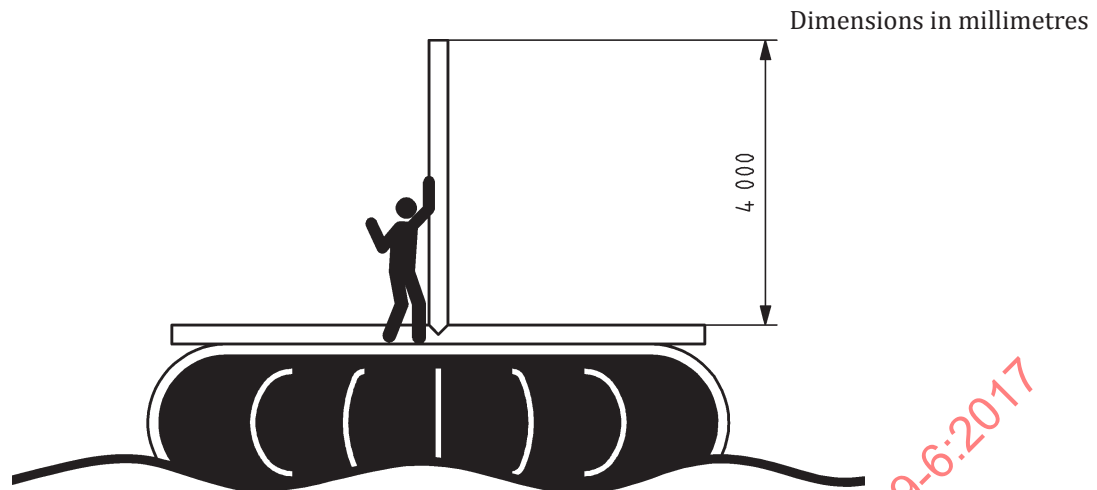


Figure 3 — Determination of bouncing height

- A test person representing the average body height and body weight (50th percentile) of the designated user group shall perform test jumps:
 - 1) Test person shall stand upright on the centre of the trampoline and mark a meter stick (see Figure 3) at the highest reachable point with his arm vertically lifted and index finger stretched out. During this procedure, the feet remain statically on the surface.
 - 2) Test person makes 10 jumps with his hand and index finger sliding along the meter stick and marking the reached bouncing heights
- The maximum bouncing height ($b_{\max}$) is the distance between the initial marking and the highest marking on the meter stick.

4.5.9 Horizontal safety distance with surrounding area

4.5.9.1 Requirement

The safety distance to any other solid object in proximity of the device shall not be less than 3 m.

4.5.9.2 Testing

Pull the device to the worst location and check by measurement.

4.5.10 Visibility

4.5.10.1 Requirements

When sliding or jumping down any object of Class D, the structure shall be of the kind that the landing area can easily be checked for clearance to avoid collision that causes injury.

If a surface $\geq 6 \text{ m}^2$ area is used for a product, then safety information symbol “Do not swim underneath the structure” and “Do not jump if water is not clear” (see ISO 25649-2) indicating “no diving or swimming underneath” shall be clearly visible on the product.

4.5.10.2 Testing

Practical, visual and assessment by the assessment panel.

4.5.11 Repair kit

4.5.11.1 Requirements

For Class D devices a repair kit and repair instructions shall be included with each product.

4.5.11.2 Testing

Visual examination.

4.5.12 Springs, protection against corrosion, durability

4.5.12.1 Requirements and protection against corrosion

Springs of devices shall be protected against corrosion (e.g. powder coating). After durability testing according to [4.5.12.2](#), there shall be no damage of the protection against corrosion when the spring is examined by naked eyes.

NOTE Not applicable for springs made from stainless steel.

4.5.12.2 Testing

Using an adequate test machine, springs (if applicable) will be expanded for 50 000 cycles about 25 % of their original length. Subsequently they will be inspected visually.

4.5.12.3 Durability and requirements

After testing according to [4.5.12.2](#) there shall be no break or any other visible damage that will foreseeable lead to break. Testing is applied to 5 springs out of the total quantity of springs used in the device.

4.5.13 Safety pad for trampolines and bouncy platforms

4.5.13.1 Requirements

If a trampoline/buoyancy platform, etc. is equipped with springs, then a safety pad covering the springs and frames shall be provided. This safety pad shall be at least twice the width of the springs and prevent the user from getting trapped between springs and metal frame. Safety pads shall remain in position while product is in use. The foam or other material used for the safety pad shall not absorb water. The foam or other material shall comply with EN 913:2008, 5.5. All metallic parts shall be covered by the safety pad. The safety pad shall be of a different colour than the jumping surface or main body of the product. A jumping mat shall have a centre point marking in a contrasting colour in the centre of the mat.

The safety pad shall be designed and positioned so that the inner and outer overlap of the springs is equal. The safety pad shall be affixed onto the structure (e.g. trampoline) to prevent lifting or displacement during use, which may allow entrapment.

If the jumping surface is attached directly to the product then a gap of no more than 3 cm shall be open. If the bouncy platforms are shown to be used also as a water trampoline then they shall conform to the same standards (i.e. safety information symbols, anchoring, etc.).

4.5.13.2 Testing

In accordance with EN 913 an overload test shall also be performed. Use test probe. Visual inspection of the centre point marking.

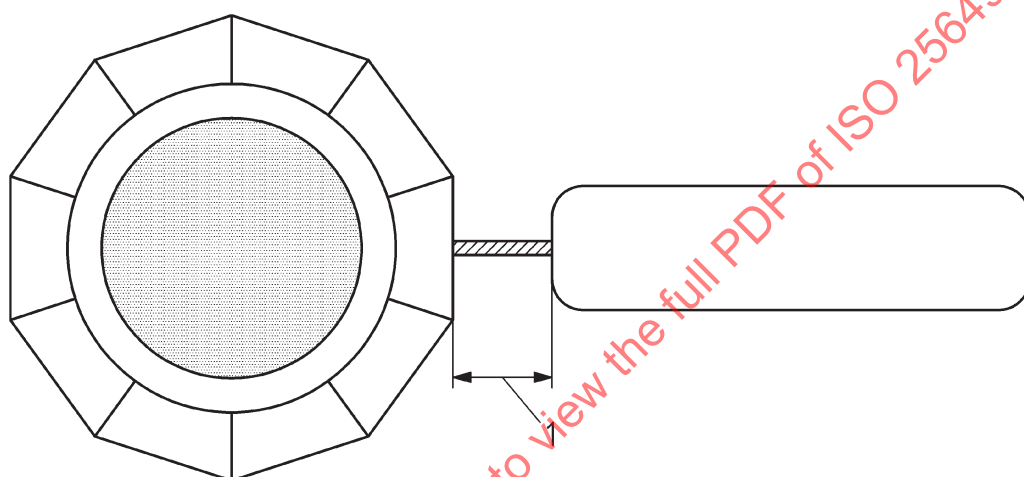
4.5.14 Connection of inflatable components

4.5.14.1 Requirements

If more than one Class D device is connected to another then there shall be no entrapment or squeezing hazard for hand, leg or body of a user between the connected parts. This requirement is deemed to be met if the distance of connected parts is not wider than 25 mm under a horizontal pulling force. For connected products where the function is in moving action then the space may be >25 mm. The connection needs to be free rotating and only have one connection and does not result in any entrapment. For connection of inflatable components, see [Figures 4](#) and [5](#).

4.5.14.2 Testing

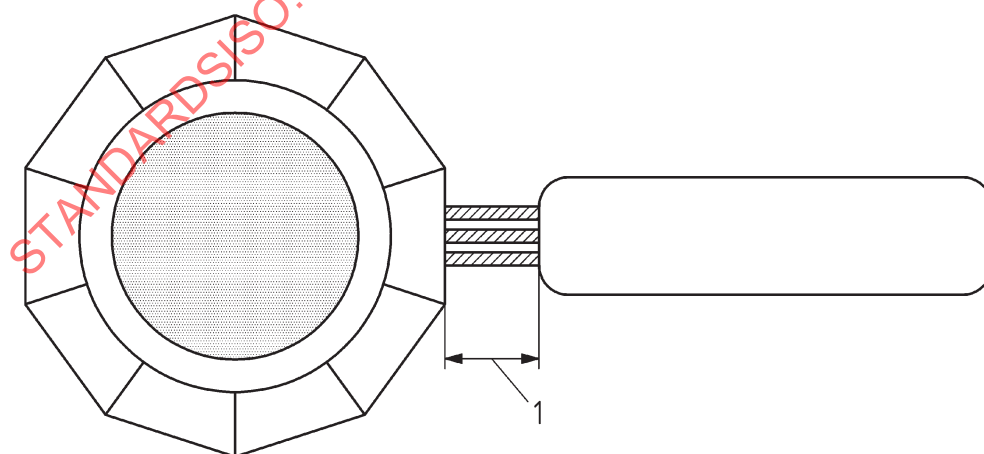
Apply a pulling force of 200 N and check distance via an appropriate test probe. Perform intended function of the action product and check for entrapment.



Key

1 gap

Figure 4 — One connection



Key

1 gap

Figure 5 — More than one connection

4.5.15 Swimming in close approximation under extra-large floating leisure articles

4.5.15.1 Floating structure

In addition to the prohibition to swim under extra-large floating objects (see safety information symbol “Do not swim underneath the structure” in ISO 25649-2) of a size $\geq 6 \text{ m}^2$ the adjacent under water area of such objects shall be smooth and shall not provide:

- a) openings, caverns or flexible slits etc. into which a child's or adult's body or parts of it might slip into and get trapped;
- b) any protrusion to which parts of the bathing dress, ribbons around a person's neck, etc. might get entangled;
- c) any meshes or nets underneath the structure.

4.5.15.2 Means of connection

Means of connection, e.g. a branched rope harness and/or the anchoring rope, connecting the floating structure to its ground fixation point shall not cause entrapment or entanglement. This is deemed to be met if an opening is big enough to allow the passage of a cylindrical test rod of 25 mm diameter (adult's finger) but small enough not to allow the passage of a cylindrical test rod of 42 mm (child's hand) or if the opening is smaller than 8 mm. If branched ropes form an opening this opening shall allow the passage of the adult torso probe as specified in ISO 25649-1:2017, 5.2.1.3. Means of connection in a distance deeper than 200 cm underneath the floating structure are exempted from these requirements.

4.5.16 Testing

It shall be tested by visual and tactile inspection of the product in its ready for use configuration with all means of fixation attached. The measurement and application of test probes shall be according to ISO 25649-1:2017, 5.2 to 5.5 if needed.

5 Instruction manual

In-water testing by human test subjects may replace the application by the torso probe. With regard to this torso/body entrapment the device or entire installation of combined devices is deemed to be safe if the biggest test subject according to ISO 25649-1:2017, 5.5.2 passes by swimming through all gaps and openings positioned in the underwater area and likely to cause failure.

For Class D devices there needs to be an instruction manual included with each product. This shall show clearly how to assemble and disassemble the products. Also included shall be the following warning instructions and safety information symbols as specified in ISO 25649-2.

- a) Swimmers only.
- b) Required minimum water depth of m
- c) Do not jump onto the Class D device from a different object (like jumping platform, etc.) or jump from the Class D device onto another object.
- d) Do not use in darkness.
- e) Do not use in shark infested water or in water that may contain other marine life dangers to humans.
- f) If used in an indoor pool make sure there is enough clearance space to the ceiling.
- g) Always inspect the area around and under the device before each use to ensure that the water is deep enough and free of all rocks, logs, sand bars, and underwater obstructions for at least 3 m in all directions.

- h) Ensure proper air pressure is maintained while the product is in use. Check pressure frequently especially on very hot/cold days. Give example of how air pressure can be checked.
- i) Allow not more than ... persons on the device at the same time (age: ...years and older).
- j) Always anchor the ... securely on all ... anchor points before it is used.
- k) Never use the device in rough surface water conditions, during high winds or when there is thunderstorm (e.g. lightning).
- l) Inspect the device before each use and replace any worn, defective or missing parts.
- m) The device is not designed to be used as a life saving device.
- n) Do not use in strong currents and secure against wind according to anchoring information (strong wind = Beaufort 5).
- o) The use of the device by children shall be under constant adult supervision.
- p) Diving and swimming underneath the device is forbidden.
- q) Take off watches, rings and other sharp objects before use.
- r) Cleaning, set up, inflation, deflation, maintenance and storage information needs to be included with each device.

6 Exclusion

The following sub classes/products dealt with in this specific part of ISO 25649 are exempted from the general requirements included in ISO 25649-1:

- no towing device (see ISO 25649-1:2017, 5.8);
- to avoid misuse, valves should not be easily reached by the user [see ISO 25649-1:2017, 5.9.1 a)];
- for jam points in accordance to ISO 25649-1:2017, 5.11.1, the requirements in [4.5.14](#) should be taken into consideration;
- no pressure tests for unsupported material (see ISO 25649-1:2017, 5.12.2.1);
- no heat tests for unsupported material (see ISO 25649-1:2017, 5.12.3);
- no air tightness for unsupported material (see ISO 25649-1:2017, 5.12.4);
- no tests pieces taken from the constituent materials (see ISO 25649-1:2017, 6.2.1): the test piece for Class D devices can also be from the same “run” of material which can be provided by the manufacturer;
- no mechanical requirements for unsupported material (see ISO 25649-1:2017, 6.4);
- pressure gauge according to ISO 25649-1:2017, 5.6.1 applies with the deviation that in the case where a device is designed for electrical air pump inflation, e.g. by an integrated air pump or pump interface, a pressure gauge (manometer) should be provided by the supplier. A pressure gauge should be also provided if the volume of the device exceeds the capacity of manual inflation and requires an electrical air pump;
- if various devices are intended for a combined installation the supplier shall provide only one pressure gauge (manometer) for the entire combined installation and not for each single device; (see ISO 25649-1:2017, 5.6.1).