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# Plavajoči pripomočki za učenje plavanja - 3. del: Varnostne zahteve in preskusne metode za plavajoče sedeže, v katere je uporabnik nameščen

Buoyant aids for swimming instruction - Part 3: Safety requirements and test methods for swim seats into which a user is positioned

Auftriebshilfen für das Schwimmenlernen Teil 3: Sicherheitstechnische Anforderungen und Prüfverfahren für Schwimmsitze, die am Körper getragen werden (standards.iten.ai)

Aides à la flottabilité pour l'apprentissage de la natation - Partie 3 : Exigences de sécurité et méthodes d'essai relatives aux dispositifs dans lesquels l'enfant est placé

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#### SIST EN 13138-3:2021

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## Buoyant aids for swimming instruction - Part 3: Safety requirements and test methods for swim seats into which a user is positioned

Aides à la flottabilité pour l'apprentissage de la natation - Partie 3 : Exigences de sécurité et méthodes d'essai relatives aux dispositifs dans lesquels l'enfant est placé Auftriebshilfen für das Schwimmenlernen - Teil 3: Sicherheitstechnische Anforderungen und Prüfverfahren für Schwimmsitze, die am Körper getragen werden

This European Standard was approved by CEN on 4 July 2021.

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## **European foreword**

This document (EN 13138-3:2021) has been prepared by Technical Committee CEN/TC 162 "Protective clothing including hand and arm protection and lifejackets", 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of an identical text or by endorsement, at the latest by April 2022 and conflicting national standards shall be withdrawn at the latest by April 2022.

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

This document supersedes EN 13138-3:2014.

Annex M provides details of significant technical changes between this European Standard and the previous edition EN 13138-3:2014.

EN 13138, *Buoyant aids for swimming instruction* consists of the following parts dealing with buoyant swimming devices for swimming instructions for the various stages of the learning process:

- Part 1: Safety requirements and test methods for buoyant aids to be worn
- Part 2: Safety requirements and test methods for buoyant aids to be held
- Part 3: Safety requirements and test methods for swim seats into which a user is positioned

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

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

Kingdom.

### Introduction

The entire process of learning to swim is considered to include two stages:

- getting familiar with the water environment and movements in it, and
- acquiring skills in standard swimming strokes.

Buoyant aids for swimming instruction (in brief: swimming device(s)) are intended to assist users (in particular children) to learn to swim. The design and purpose of the swimming devices are related to the above stages.

Swimming devices are intended to give the user positive buoyancy in the water while maintaining the correct body position for swimming. However, it should not be assumed that standard conformity of the swimming devices will by itself eliminate the risk of drowning as this depends also on the behaviour of the user and any supervision.

Although this document sets performance requirements to ensure that swimming devices perform appropriately, it is essential that the swimming devices are used correctly and under constant and close supervision. It is important to ensure that they are securely fitted to the appropriate size of user and that when correctly fitted, they cannot become displaced. Swim seats however should allow immediate escape in case of capsizing. Therefore, the use of these swimming devices is recommended to be restricted to water out of standing depth of the user.

The highest degree of protection against drowning can only be achieved by using lifejackets. It is essential that there is a clear distinction between swimming devices intended to preserve life and those which are intended only to assist buoyancy for the user when learning to swim. As swimming devices are not life preservers, they should only be used in swimming pools and other situations free from current, tides and waves.

The bulk storage of some types of swimming devices could, under certain conditions, result in a potential fire hazard. The perceived risk of such a hazard was evaluated against the actual risk to the user from materials treated with certain known toxic fire-retardant chemicals. However, the fire hazard is less of a problem to the user than the risk associated with the swimming devices being put in the mouth, especially by children. For this reason, flammability requirements are not included in this document.

For the above reasons and to differentiate these swimming devices from aquatic toys, advisory safety measures, including marking, warning notices and user instructions are included in this document.

The range both of the design and function of buoyant aids for swimming instruction varies considerably and for this reason, the standard for swimming devices has been prepared in three parts, namely swimming devices that are intended to allow the user to become familiar with water (passive user), swimming devices that are worn (active user) and those swimming devices that are held by the user to improve swimming strokes.

- Part 1 of this series is only for products that are securely attached to the body (Class B swimming devices = for an active user). They are intended to introduce the user to the range of swimming strokes.
- Part 2 of this series is for products that are held either in the hands or by the body (class C swimming devices = for an active user) and are intended to assist with improving specific elements of the swimming stroke. For adult beginners or more advanced users they can also be used for further stages of the process to learn to swim.
- Part 3 of this series deals only with products (swim seats) to assist children up to 36 months in their first attempts to learn to swim (i.e. to get familiar with the —in-water-environment) and moving through it. The child is positioned inside the buoyant structure, which provides buoyancy and lateral support to the body, thereby keeping the child's head above water level (class A devices = for a passive user).

Swim seats allow young children to experience the water environment and being moved through it. Movements of lower limbs and arms are possible. The use of swim seats does however not replicate any form of a correct swimming stroke.

Swim seats complying with this document provide a stable, floating position for a child sitting in the swim seat and avoid entrapment in case of capsizing. Children in swim seats do however require very close parental supervision. Overload beyond specified body mass, breaking waves and violent external forces are remaining risks that can cause capsizing. Use of these devices in water that is of the child's standing depth will increase the risk of capsizing and will hinder or block the escape from the seat in case of emergency.

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### 1 Scope

This document specifies safety requirements for design, sizing, materials, strength and in-water performance as well as provisions for marking and the information supplied by the manufacturer for swim seats. It also specifies the relevant test methods. This document is not applicable to products covered by EN 13138-1 and EN 13138-2.

This document applies only to swimming devices into which the user is placed and which have either inherent buoyancy or can be inflated or a combination of both. It only applies to class A swimming devices intended to introduce the user to the water environment. These swimming devices are only intended for children aged up to 36 months with a body mass less than or equal to 19 kg. It does not apply to class B or class C swimming devices, to pull buoys, lifebuoys, buoyancy aids, lifejackets or aquatic toys.

#### 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 71-1:2014+A1:2018, Safety of toys — Part 1: Mechanical and physical properties

EN 20105-A02:1994, Textiles — Tests for colour fastness — Part A02: Grey scale for assessing change in colour (ISO 105-A02:1993)

EN ISO 105-E03:2010, Textiles — Tests for colour fastness — Part E03: Colour fastness to chlorinated water (swimming-pool water) (ISO 105-E03:2010)

EN ISO 105-E04:2013, Textiles — Tests for colour fastness — Part E04: Colour fastness to perspiration (ISO 105-E04:2013) <u>SIST EN 13138-3:2021</u> https://standards.iteh.ai/catalog/standards/sist/f0bb274b-fa7c-45a8-bf44-

EN ISO 105-X12:2016, Textiles —<sup>14</sup>Tests<sup>4</sup> for colour<sup>3</sup> fastness<sup>2</sup> – Part X12: Colour fastness to rubbing (ISO 105-X12:2016)

EN ISO 3696:1995, Water for analytical laboratory use — Specification and test methods (ISO 3696:1987)

EN ISO 12402-7:2020, Personal flotation devices — Part 7: Materials and components — Safety requirements and test methods (ISO 12402-7:2020)

ISO 3864-1, Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

#### 3.1

#### buoyancy

resultant upthrust of a swimming device when totally submerged in fresh water with its uppermost part just below the water surface

#### 3.2

#### 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

#### 3.3

#### buoyant aid for swimming instruction

garment or swimming device which when worn or held correctly will provide the buoyancy required to become familiar with movement through the water, assist with learning to swim or to improve swimming strokes

Note 1 to entry: In brief: swimming device.

#### 3.4

#### minimum buoyancy

least buoyancy required by the standard

#### 3.5

#### original buoyancy

buoyancy provided by the complete swimming device when first tested

#### 3.6

#### class A swimming device

swimming device for children up to 36 months of age in which the child is in contact with the water positioned inside the buoyant structure so that it will keep the passive user in a stable floating position where the base of the chin is at or above the surface of the water **a** 

Note 1 to entry: This swimming device is intended <u>Eto 1 allow3:the1</u> user to become familiar with the water environment. https://standards.iteh.ai/catalog/standards/sist/f0bb274b-fa7c-45a8-bf44-

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Note 2 to entry: For swimming devices class A for children above 36 months, see EN ISO 25649-4.

#### 3.7

#### class B swimming device

swimming device intended to be worn, to be securely attached to the body and to introduce the active user to the range of swimming strokes

#### 3.8

#### class C swimming device

swimming device intended to be held either in the hands or by the body and to assist with swimming strokes and/or improving specific elements of the strokes

#### 3.9

#### conditioning

process to which the complete swimming device is submitted that includes immersion in chlorinated swimming pool water and storage in cold and hot conditions and comprising a number of cycles, to simulate the conditions to which the swimming device is likely to be subjected in normal use and storage

#### 3.10

#### component

sub-group of the entire swimming device which contributes to either buoyancy, function or safety

#### 3.11

#### swim seat

buoyant swimming device intended to introduce the user to the aquatic environment and to build water confidence as a pre-requisite to learning to swim

Note 1 to entry: Swim seats provide safety for the user but do not guarantee protection against drowning.

Note 2 to entry: Swim seats are learning aids and should not be mistaken with aquatic toys as defined in EN 71-1:2014+A1:2018.

#### 3.12

#### swim seat system

all integrated components (parts) of a swim seat which contribute to stable floating conditions and to safety during normal use or after a capsizing emergency

#### 3.13

#### escape

complete separation between the test dummy and the swim seat in case of a deliberate capsizing of the swim seat or swim seat system

#### 3.14

#### assessment panel

group of three people, all of whom are experienced in assessing buoyant swimming devices appointed to witness and assess the swimming device DARD PREVIEW

#### 3.15

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angle to which a test manikin is intentionally calibrated when hung on its centre of gravity and completely immersed under waters://standards.iteh.ai/catalog/standards/sist/f0bb274b-fa7c-45a8-bf44-

d4981f94c15a/sist-en-13138-3-2021

#### 3.16

#### passive user

sinking angle

user who does not need to make conscious efforts to keep their airway above water level since this is achieved by the swimming device

#### 3.17

#### active user

user who needs to make conscious efforts to keep their airway above water level since this is not achieved by the swimming device

#### 3.18

#### swimming device intended to be worn

swimming device having either inherent buoyancy or may be inflated to provide buoyancy and which is securely attached to the body in such a way that it cannot be accidentally be removed and so as to provide the user with buoyancy

#### 3.19

#### swimming device intended to be held

device held either in the hands or by the body and which provides buoyancy whilst it is being held by the user

### 4 Classification

#### 4.1 General

Buoyant swimming devices shall be classified according to Table 1.

#### Table 1 — Classification of buoyant aids for swimming instruction

| Class | Description  |
|-------|--|
| А     | Buoyant swimming device in which the child is in contact with the water positioned<br>inside the buoyant structure. This swimming device is intended to allow the user to<br>become familiar with the water environment and movements through it. The swimming<br>device will keep the passive user in a stable floating position so that the base of the chin<br>is at or above the surface of the water. |
| В     | Buoyant swimming device intended to be worn, to be securely attached to the body and to introduce the active user to the range of swimming strokes.  |
| С     | Swimming device intended to be held either in the hands or by the body and to assist with swimming strokes and/or improving specific elements of the strokes.  |

#### 4.2 Manikin characteristics

The characteristics given in Table 2 were chosen to ensure compliance between swim seat sizes and manikin in all relevant test procedures.

## Table 21-H Values for manikins

| Age years           | SIST Mass 138-3:2021                | Manikin                      |
|---------------------|-------------------------------------|------------------------------|
| shtps://standards.i | teh.ai/catalog/standards/sist/f0bb/ | 274b-fa7c-45a8-bf44-<br>2021 |
| > 1 to 2            | > 11 kg to 15 kg                    | II                           |
| > 2 to 3            | > 15 kg to 19 kg                    | III                          |

#### 5 Safety requirements concerning design and material

#### 5.1 General

Construction of a buoyant swimming device shall be such that it corresponds in terms of design, dimensions, safety, strength and durability for its intended use. The requirements set out were chosen to ensure compliance with these considerations. Where buoyant swimming devices are provided in several components, the requirements apply to each of the components as specified in the relevant paragraphs below.

Buoyancy may be provided by inherent buoyancy materials, by inflatable chambers or by both. Where buoyancy is not inherent, swimming devices shall have a minimum of two independent chambers safeguarding function and to allow the user to maintain the airway above water level at all times if one chamber fails. A swimming device shall be only class A or class B or class C.

These products shall be manufactured in bright colours that are in contrast to the water surface so as to be visible at all times and at any angle when in use. Wholly transparent or materials in any shade of undecorated blue in the visible areas when in use are not acceptable.

For safety reasons and to assist in supervising children when used in the water, the visible areas of these products when being used shall be clearly visible from the water's edge or the poolside when the water is crowded, moving or may not be clear. Where criteria cannot be objectively assessed, they shall be subject to evaluation by the assessment panel.

The assessment may make use of the specifications with regard to conspicuity led down in EN 13138-1:2021. 5.2.

The assessment panel shall agree, by at least a 2 : 1 majority or by unanimity, that the swimming device is visible when used in the water.

#### 5.2 Design

#### 5.2.1 Avoidance of similarities to aquatic toys

#### 5.2.1.1 Shape

Design and appearance of swim seats shall not evoke the impression of being an aquatic toy.

Inflatable buoyancy chambers or buoyancy chambers filled by air or inherently buoyant material shall be limited in number and volume to the functional needs of providing sufficient buoyancy and safety. There shall be no toy elements or above water level structures like, e.g. animal imitations, car or boat structures or other elements evoking the character of an aquatic toy and no wind catching structures, e.g. canopy or sunshade.

#### 5.2.1.2 Special features íTeh STANDARD PREVIEW

Special features or equipment, like handles etc., shall not impair the safety of the swimming device. Requirements given in 5.6, in water behaviour, shall be met with and without detachable equipment.

#### 5.2.2 Health and comfort

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5.2.2.1 Innocuousness d4981f94c15a/sist-en-13138-3-2021

Class A swimming devices shall not adversely affect the health or hygiene of the user. The materials shall not, in the foreseeable conditions of normal use, release substances general know to be toxic, carcinogenic, mutagenic, allergenic, toxic to reproduction or otherwise harmful.

Testing shall be carried out verifying:

- Materials specifications;
- Safety data sheets relating to the materials;
- Information relating to the suitability of the materials for use with food, in medical swimming devices, or other relevant applications;
- Information relating to toxicological, allergenic, carcinogenic, toxic to reproduction or mutagenic investigations on the materials;
- Information relating to ecotoxicological and other environmental investigations on the materials.

#### 5.2.2.2 Edges, corners and points

Edges and corners of hard and rigid materials shall be chamfered or rounded. Round edges or corners shall have a minimum radius of 1 mm and where a chamfer is part of the design, it shall be of  $(45 \pm 5)^{\circ}$ and at least 1 mm in width. There shall be no barbs or other sharp points or features.

Testing shall be by measurement and tactile assessment in accordance with Table F.1.

#### 5.2.2.3 Buckles, zippers and other fixings

If buckles, zippers or other detachable fastening devices are used as parts of the entire swimming device in order to attach the swimming device to the body or in order to connect functional parts or components they shall require at least two simultaneous or sequential actions for their release or opening in order to prevent unintended opening. Where one single action can be applied and relies on pressure for release, it shall be necessary to apply a force of at least 50 N. Testing shall be in accordance with Annex F.

Buckles for seat depth adjustment are exempted from this requirement.

Verification shall be agreed by the assessment panel according to Annex F in the context of the relevant opening/closing system.

#### 5.2.2.4 Attached small parts

Attached small parts on the swimming device shall withstand a pull of  $(90 \pm 2)$  N in the direction most likely to cause failure without becoming detached from the swimming device. Parts which are detached, including those that may accidentally come away or be torn off the swimming device, shall not fit wholly into the small parts cylinder, the specifications for which shall be in accordance with EN 71-1:2014+A1:2018, 8.2.

#### **5.2.2.5 Valves and stoppers**

Inflatable class A swimming devices shall be fitted with valves ensuring sealing even when the stopper is entirely removed. Stoppers shall be connected to the body of the valve. All valves shall ensure that, with any opened stopper, inflatable swimming devices, when tested in accordance with Annex D, shall after a period of 2 min retain at least 80 % of their original buoyancy.

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#### **5.2.2.6 Protruding parts**

The protrusion of the valve/stopper or of any other protruding part shall not catch a test rope when tested in accordance with Annex Edards.iteh.ai/catalog/standards/sist/f0bb274b-fa7c-45a8-bf44d4981f94c15a/sist-en-13138-3-2021

#### 5.3 Sizing

Sizing of swim seats with regard to body weight of the user shall be in accordance with the range of body weights and age groups as specified in Table 2.

The size of the swimming device shall be indicated on the product (see Clause 7) and by ticking ( $\checkmark$ ) the relevant box(es) according to Figure 2, Example 1.

The size of the leg holes, when tested in accordance with Annex I, shall not allow the probe to pass through.

Adjustment swimming devices for the body holding system (seat pant) shall be provided if the smallest user (5 %, female of the designated user group) cannot:

a) Look over the front edge when sitting vertically in the fully intact swim seat;

or

b) Keep her airways above water level if the air chamber most likely to cause failure is deflated.

In order to avoid excessive lifting of the user it is recommended that the means of adjustment should allow an increase of the sitting height:

— Size I and II: 50 mm;

— Size III: 55 mm.

The swimming device shall be adjustable either stepwise (SMALL, MEDIUM, LARGE), sliding or otherwise and shall not become loose or detached during use. The adjustment mechanism shall enable the supervising person to control and recognize the degree of adjustment. To prevent the supervising person from setting higher sitting positions than intended by the manufacturer technical means shall avoid overadjustment if the highest intended sitting level is reached. Appropriate information should be provided in the manufacturer's instructions. In addition the graphical symbol according to Figure K.15 shall be applied.

- Seat depth adjustment shall not compromise the leg-hole dimensions according to Annex I. In case of an all- or two-in-one design the smallest probe according to Annex I must not pass through the biggest leg hole. Testing shall be done with the smallest and the largest manikin of the range.
- Testing and measuring shall be done by applying the relevant test template in accordance with Annex J.

With the recommended lifting heights, the centre of gravity of the various user sizes within a designated user group can be brought to an equal level (see J.3).

#### 5.4 Materials — Mechanical properties

#### 5.4.1 Thread

To sew load bearing components, only threads manufactured from synthetic materials whose properties correspond to polyester or polyamide fibres shall be used.

Thread shall be tested using a simple burn test. When tested by a flame, fibres shall not leave an ash but should melt or burn to leave a black pellet like residue.

#### 5.4.2 Resistance to puncturing

SIST EN 13138-3:2021 Where buoyant swimming devices have air filled buoyancy chambers, the chambers shall remain airtight when tested in accordance with the procedures given in Annex H.

#### 5.4.3 Resistance of foam and other inherent buoyant material to water absorption

After 24 h water immersion a sample of foam or other inherent buoyant material taken from the swimming device shall lose no more than 10 % of its original buoyancy. Due to the small dimensions and the shape of learn to swim devices the sample may consist of a complete component or shall provide sample dimensions as near as possible to  $10 \text{ cm} \times 10 \text{ cm}$ .

#### 5.4.4 Resistance of foam and other inherent buoyant materials to compression

Class A swimming devices manufactured from foam or other inherently buoyant materials shall, when tested according to EN ISO 12402-7:2020, 4.8.2.4 with the pre-conditioning according to 6.1 of this standard, be capable of withstanding compression and other movements in normal use without sustaining permanent loss of buoyancy. When tested following conditioning in accordance with 6.1, three new, pre-conditioned samples of the buoyant material not used in other tests shall lose no more than 10 % of its buoyancy for each sample. Testing shall be done as specified in EN ISO 12402-7:2020, 4.8.2.4

#### 5.4.5 Testing

The foam or other inherently buoyant sample shall be tested after conditioning according to 6.1.

Test procedure:

- a) the sample is put into a net of appropriate size just to hold it;
- b) the net with the sample inside is loaded with an amount of ballast weight so that it sinks to about 30 cm below the water surface;