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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

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, Sièges flottants

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13.340.70	Rešilni jopiči, vzgonska pomagala in plavajoči pripomočki	Lifejackets, buoyancy aids and floating devices
97.220.40	Oprema za športe na prostem in vodne športe	Outdoor and water sports equipment

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NORME EUROPÉENNE  
EUROPÄISCHE NORM

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**prEN 13138-3**

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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, Sièges flottants

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 162.

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COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

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## prEN 13138-3:2018 (E)

### European foreword

This document (prEN 13138-3:2018) 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 document is currently submitted to the CEN Enquiry.

This document will supersede EN 13138-3:2014.

Annex L 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 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
- Part 4: In-water performance testing of buoyant aids to be worn

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## Introduction

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

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

Buoyant aids for swimming instructions (in brief: swimming device(s)) are intended to assist users (in particular children) to learn to swim. The design and purpose of the 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 devices will by itself eliminate the risk of drowning as this depends also on the behaviour of the user and any supervision.

Although this European Standard sets performance requirements to ensure that swimming devices perform appropriately, it is essential that the 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 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 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 do not apply to this European Standard.

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

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 devices that are intended to allow the user to become familiar with water (passive user), devices that are worn (active user) and those devices that are held by the user to improve swimming strokes.

Part 1 of this European Standard is only for devices that are securely attached to the body (class B devices = for an active user). They are intended to introduce the user to the range of swimming strokes. This part 1 of prEN 13138 is applicable only in connection with part 4 of prEN 13138.

Part 2 of this European Standard is for devices that are held either in the hands or by the body (class C 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 European Standard deals only with 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).

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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 standard provide a stable, floating position for a child sitting in the swim seat and avoids entrapment in case of capsizing. Children in swim seats do however require very close parental supervision. Overload beyond specified body weight, 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.

Buoyant swimming aids should be only a class A or a class B or a class C device.

Part 4 of this European Standard deals with in-water performance testing for class B devices and provides objective methods of measuring the lifting and turning capacity of a swimming device by applying test manikins of various sizes. It is applicable only in connection with part 1.

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## 1 Scope

This part 3 of EN 13138 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 standard is not applicable to products covered by EN 13138-1 and -2.

This part 3 of EN 13138 applies only to 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 devices intended to introduce the user to the water environment. These devices are only intended for children aged up to 36 months with a body mass less than or equal to 18 kg. It does not apply to class B or class C devices, to pull buoys, lifebuoys, buoyancy aids, lifejackets or aquatic toys.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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, *Safety of toys — Part 1: Mechanical and physical properties*

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

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, *Textiles — Tests for colour fastness — Part E04: Colour fastness to perspiration (ISO 105-E04)*

EN ISO 105-X12, *Textiles — Tests for colour fastness — Part X12: Colour fastness to rubbing (ISO 105-X12)*

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

EN ISO 12402-7:2006, *Personal flotation devices — Part 7: Materials and components — Safety requirements and test methods (ISO 12402-7:2006)*

EN ISO 12402-9:2006, *Personal flotation devices — Part 9: Test methods (ISO 12402-9:2006)*

## 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 <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://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

**prEN 13138-3:2018 (E)****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 (in brief "swimming device")**

garment or 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

**3.4****minimum buoyancy**

least buoyancy required by the standard

**3.5****original buoyancy**

buoyancy provided by the complete device when first tested

**3.6****class A device**

buoyant device 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.

Note 1 to entry: This device is intended to allow the user to become familiar with the water environment.

**3.7****class B device**

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

**3.8****class C device**

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****device to be worn**

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 removed and so as to provide the user with buoyancy

**3.10****device to be held**

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

**3.11****conditioning**

process to which the complete device shall be 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 device is likely to be subjected in normal use and storage

**3.12****component**

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

**3.13****swim seat**

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

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.

**3.14****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 an emergency capsizing

**3.15****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

**3.16****assessment panel**

group of three people who are appointed by a test house, all of whom are experienced in assessing buoyant swimming devices

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**3.17****kick board**

buoyant device designed to be held in the hands or by the arms in order to support the body in the water to assist the user to improve swimming strokes

**3.18****turning-lifting-capacity (TLC)**

Turning Lifting Capacity of a swimming device is its capability to turn the user's body into a specified floating angle and to lift him to a level where the body floats at least just on equal level with the water surface or above

Note 1 to entry: It is expressed as angle  $x$  between calibrated sinking angle and floating angle achieved by the device.

**3.19****sinking angle**

angle to which a test manikin is intentionally calibrated when hung on its centre of gravity and completely immersed under water

**4 Classification****4.1 General**

Buoyant swimming devices shall be classified according to Table 1:

**Table 1 — Classification of buoyant devices**

Class	Description
A	Device in which the child is positioned inside the buoyant structure and is in contact with the water. This device is intended to allow the user to become familiar with the water environment and movement through it. The device will keep the passive user in a stable floating position so that the base of the chin is at or above the surface of the water.
B	Buoyant swimming device intended to be worn, to be securely attached to the body and to introduce the user to the range of swimming strokes.
C	Device intended to be held in the hands or by the body to assist with swimming 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 2 — Values for manikins**

Age years	Mass	Manikin
≤ 1	≤ 11 kg	I
> 1 to 2	> 11 kg to 15 kg	II
> 2 to 3	> 15 kg to 18 kg	III

## 5 Safety requirements

### 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, 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 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 panel shall agree, by at least a 2:1 majority or by unanimity, that the 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

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

### 5.2.2 Innocuousness

Class A devices shall be of a design and construction such that they cannot cause harm to the user.

### 5.2.3 Edges, corners and points

Buoyant swimming devices shall be of a design such that they cannot cause harm to the user. 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 Annex F.

### 5.2.4 Buckles, zippers and other fixings

If buckles, zippers or other detachable fastening devices are used as parts of the entire device in order to attach the 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.

### 5.2.5 Small parts

Attached small parts shall withstand a pull of  $(90 \pm 2)$  N in the direction most likely to cause failure without becoming detached from the device. Parts, not including foam fragments, which can become detached shall not fit wholly into the small parts cylinder, testing of which shall be in accordance with EN 71-1.

### 5.2.6 Valves and stoppers

Inflatable class A devices shall be fitted with valves guarantying sealing even when the stopper is entirely removed. Stoppers shall be connected to the body of the valve.

The valve shall ensure that, with an opened stopper, inflatable devices when tested in accordance with Annex D shall after a period of 2 min retain at least 75 % of their original buoyancy.

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Testing shall be by inspection and measurement in accordance with the procedures in 5.5.9 of EN ISO 12402-9:2006.

**5.2.7 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 M.

**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 device shall be indicated on the product (see Clause 7) and by marking the relevant box(es) according to Figure 1 by ticking in a (√)

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

Adjustment 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 a lift of seat height:

— Size I and II: 50 mm;

— Size III: 55 mm.

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The adjustment shall be either stepwise (SMALL, MEDIUM, LARGE), sliding or otherwise adjustable and shall not become loose or detached during use. The adjustment mechanism shall enable the supervising person to control and recognise the degree of adjustment. To prevent the supervising person from setting higher sitting positions than intended by the manufacturer technical means shall avoid over-adjustment if the highest intended sitting level is reached. Appropriate information should be provided in the manufactures instructions. In addition graphical symbol No. 14 shall be applied.

Seat depth adjustment shall not compromise the leg-hole dimensions according to Annex I.

Testing and measuring shall be done by applying the relevant test template in accordance with Annex J.

NOTE 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****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. Fibres shall not leave an ash when burned but should melt or burn to leave a black pellet like residue.

### 5.4.2 Resistance to puncturing

Where buoyant swimming devices incorporate 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

When tested in accordance with the procedures given in 5.5.5 of EN ISO 12402-9:2006, the material sample shall lose no more than 10 % of its original buoyancy.

The materials shall be tested using three new and conditioned sample of the inherent buoyant material conditioned in accordance with 6.1 for a period of 24 h.

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

When tested in accordance with 4.8 of EN ISO 12402-7:2006, class A devices manufactured from foam or other inherently buoyant materials shall 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, 3 new, pre-conditioned samples of the buoyant material not used in other tests shall not lose more than 10 % of its buoyancy for each sample.

### 5.4.5 Resistance to chlorinated salt water

After conditioning according to the procedures in 6.1, the entire deflated device shall be tested for change in colour and damage. The change in colour shall be tested according to EN 20105-A02 and shall be step 3 on the grey scale or better. Inflatable devices, after being dried, shall be orally inflated to their maximum volume and inspected for air leakage. All devices shall be inspected to ensure markings remain legible.

### 5.4.6 Material used for markings

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#### 5.4.6.1 General

<https://standards.iteh.ai/catalog/standards/sist/f0bb274b-fa7c-45a8-bf44-d4981f94c15a/osist-pren-13138-3-2018>

The tests described in 5.4.6.2 to 5.4.8 shall not apply where the markings are debossed onto or moulded into the device as illustrated in Figure 1.

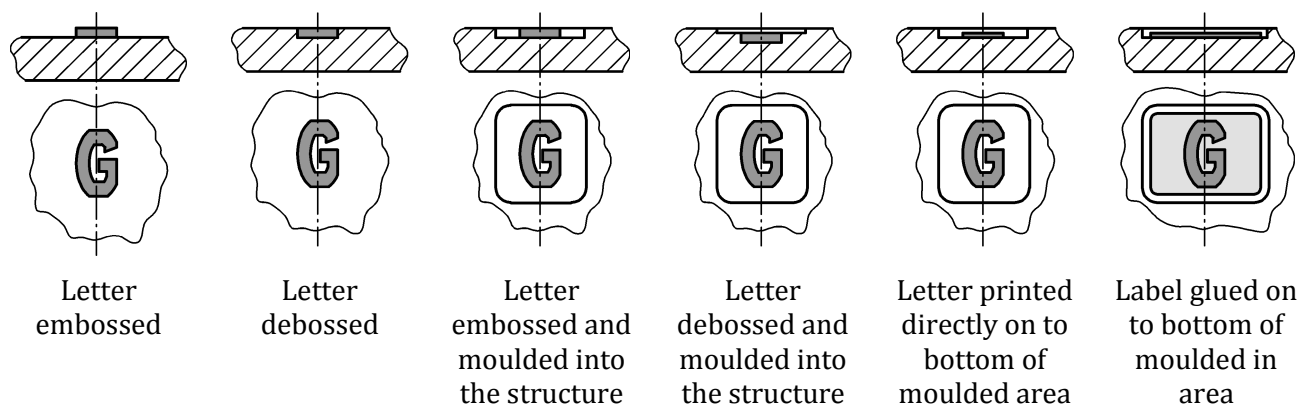


Figure 1 — Illustration of marking techniques on and in foam structures

#### 5.4.6.2 Resistance of the markings to saliva

When tested in accordance with the procedures in Annex C, the change in colour of the markings on the grey scale shall be 3 or better when assessed according to EN 20105-A02.