



SLOVENSKI STANDARD
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Buoyant aids for swimming instruction - Part 3: Safety requirements and test methods for swim seats to be worn

Auftriebshilfen für das Schwimmenlernen - Teil 3: Sicherheitstechnische Anforderungen und Prüfverfahren für Schwimmsitze, die am Körper getragen werden

Aides a 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, sieges flottants

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## Buoyant aids for swimming instruction - Part 3: Safety requirements and test methods for swim seats to be worn

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

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 26 June 2003.

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## EN 13138-3:2003 (E)

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## Foreword

This document (EN 13138-3:2003) has been prepared by Technical Committee CEN/TC 162 “Protective clothing including hand and arm protection and life jackets”, 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of an identical text or by endorsement, at the latest by February 2004, and conflicting national standards shall be withdrawn at the latest by February 2004.

The Annexes A, B, C, D, E, F, G and H are normative.

This European Standard is one of a series consisting of three standards dealing with buoyant devices for swimming instructions for the various stages of the learning process.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

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**EN 13138-3:2003 (E)****Introduction**

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

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

Buoyant devices for swimming instructions (in brief: swimming device(s)) are intended to assist persons (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 whilst 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 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 wearer and that when correctly fitted, they cannot become displaced. Swim seats however shall allow immediate escape in case of capsizing. The use of these devices shall be restricted to water out of standing depth of the wearer.

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 sorts 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 the 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 swimming devices 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 wearer to become familiar with water (passive wearer), devices that are worn (active wearer) and those devices that are held by the user for special training purposes.

Part 1 of the Standard is for devices that are worn or carried on the body (class B devices = for an active user). They are intended to introduce the user to the range of swimming strokes.

Part 2 of the Standard is for devices that are held either in the hands, by the body or between the legs (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.

This Part 3 of the Standard deals with swim seats to assist children up to 36 month in their first attempts to learn to swim i.e. to get familiar with the "in-water-environment" and moving through it. The child sits inside the swim seat, the seat 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 improve the in-water stability and minimise the entrapment risk in case of capsizing. Children in swim seats do however require very close parental supervision. Overload, breaking waves and violent external forces are remaining risks which can cause capsizing. Shallow water is likely to hinder or block the escape from the seat in case of emergency.

## 1 Scope

This European Standard 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 to be worn. It also specifies the relevant test methods.

This European Standard covers class A buoyancy devices in which children are seated. These devices are only intended for children aged up to 36 months with a body mass less than or equal to 18 kg.

## 2 Normative references

This standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 71-1:1998, *Safety of toys — Part 1: Mechanical and physical properties.*

EN 71-3, *Safety of toys — Part 3: Migration of certain elements.*

EN 393:1993 *Lifejackets and personal buoyancy aids – Buoyancy aids 50 N.*

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

EN ISO 105-E03:1996, *Textiles — Tests for colour fastness — Part E03: Colour fastness to chlorinated water (swimming pool water)(ISO 105-E03:1994)*

EN ISO 105-E04, *Textiles — Tests for colour fastness — Part E04: Colour fastness to perspiration (ISO 105-E04:1994)*

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EN ISO 105-X12, *Textiles — Tests for colour fastness — Part X12: Colour fastness to rubbing (ISO 105-X12:2001)*

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

## 3 Terms and definitions

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

### 3.1

#### **swim seat**

buoyant device intended to introduce the wearer to the aquatic environment and to build water confidence as a pre-requisite to learning to swim. Swim seats provide minimum safety for the wearer but no protection against drowning. They are learning aids and should not be mistaken with aquatic toys as defined in EN 71-1

### 3.2

#### **buoyancy**

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

### 3.3

#### **inherent buoyancy**

upthrust provided by material which is less dense than water or by sealed chambers filled with air or gas

### 3.4

#### **buoyant 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

**EN 13138-3:2003 (E)****3.5****class A device**

device intended to provide sufficient buoyancy to allow the wearer to become familiar with the water environment. It is not intended to specifically facilitate learning swimming strokes. It will keep a passive wearer in such a position that the base of the chin is at or above the water surface

**3.6****class B device**

device intended to be worn and to provide the wearer with buoyancy appropriate to the needs of the swimming stroke that is being taught. The buoyancy will be sufficient to allow the body to adopt a near normal position in the water appropriate to the stroke or part of the stroke

**3.7****class C device**

device intended to be held in the hands, by the body or between the legs and to assist with improving specific elements of a swimming stroke

**3.8****device to be worn**

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

**3.9****device to be held**

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

**3.10****conditioning**

process to which the complete device shall be submitted and comprising a number of cycles, to simulate the conditions to which the device is likely to be subjected in normal use and storage. The conditioning process will include immersion in chlorinated swimming pool water and storage in cold and hot conditions

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**3.11****component**

sub group of the entire device which is permanently attached and which contributes to buoyancy, function and safety

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**3.12****swim seat system**

all permanently attached components (parts) of a swim seat which contribute to stable floating conditions and safety after an emergency capsizing constitute a swim seat system

**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 from an accredited and notified test house, all of whom are experienced in assessing buoyant swimming devices



## 4 Classification

### 4.1 General

Buoyant swimming devices shall be classified by design according to Table 1:

**Table 1 — Classification of buoyant devices**

Class	Description
A	Buoyant device in which the child is seated. 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 wearer in such a position that the base of the chin is at or above the surface of the water.
B	Buoyant swimming device intended to be worn and to introduce the active wearer to the range of swimming strokes.
C	Buoyant device intended to be held and to assist with improving specific elements of a swimming stroke.

### 4.2 Categorisation

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

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**Table 2 — Values for categorisation**  
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Age years	Mass (equivalent to age) <sup>a</sup>	Minimum buoyancy N	Manikin
≤ 1	≤ 11 kg	100	I
> 1 to 2	> 11 to 15 kg	120	II
> 2 to 3	> 15 to 18 kg	140	III

<sup>a</sup> for categorisation, marking and use priority shall be given to the values representing the body mass, age groups have been added for rough orientation

**EN 13138-3:2003 (E)****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 all components. These components shall be permanently attached to the swim seat or form an integral, functional part of it in the same way that the entire swim seat can not be used without all components. Where buoyancy is not inherent, devices shall have a minimum of two separate chambers safeguarding function and safety if one chamber fails.

**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 sun-shade.

**5.2.1.2 Colour/Decorations**

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The colour of swim seats shall be in compliance with a colour range from yellow to red-orange. There shall be no colourful printed decorations. Warnings etc. (see 7.2) shall be printed in contrasting colours.

**5.2.1.3 Special features**

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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 Edges, corners and points**

Buoyant swimming devices shall be of a design such that they cannot cause harm to the wearer. Edges and corners of hard and rigid materials shall be chamfered or rounded.

Round edges or corners shall have a minimum radius of 2 mm and where a chamfer is part of the design, it shall be of 45° +/- 5° and at least 2 mm in length. There shall be no barbs or other sharp points or features. Testing shall be by measurement and tactile assessment in accordance with annex F.

**5.2.3 Buckles and other fixings**

If buckles or other detachable fastening devices are used as parts of the entire swim seat system in order to attach or connect functional parts or components shall require at least two simultaneous actions for their release or opening in order to prevent unintended opening. Verification shall be executed by the assessment panel according to annex F in the context of the relevant opening/closing system. Where fastenings rely on pressure for release, it shall be necessary to apply a force of at least 50 N on the release mechanism for the buckles in order for the buckle to be opened. In that case testing shall be in accordance with annex E.

**5.2.4 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 which can become detached shall not fit wholly into the small parts cylinder, testing of which shall be in accordance with 8.2 of EN 71-1:1998.

### 5.2.5 Valves and stoppers

Inflatable swimming devices (swim seats) shall be fitted with non-return valves. Stoppers shall be connected to the buoyant swimming device. The protrusion of the valve and stopper shall not exceed 5 mm above the surrounding surface when the device has been inflated.

The non-return 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. Testing shall be by inspection and t measurement in accordance with the procedures in annex B of EN 393:1993.

### 5.3 Sizing

Sizing of swim seats shall be in accordance with the range of body weights and age groups as specified in 4.2. 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 [√].

### 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.

#### 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 annex C of EN 393:1993, the material samples shall lose no more than 10 % of its original buoyancy. The materials shall be tested using a new and conditioned sample of the inherent buoyant material.

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

Buoyant swimming 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 in accordance with annex H of EN 393:1993, a new and conditioned sample of the buoyant material not used in other tests shall not lose more than 10 % of its buoyancy.

#### 5.4.5 Migration of certain elements

Swimming devices shall conform to the requirements given in EN 71-3. A new and unconditioned complete device shall be tested.

#### 5.4.6 Resistance to chlorinated salt water

After the complete conditioning according to the procedures in 6.1, the samples shall be tested for change in colour according to EN ISO 105-E03. The change in colour according to EN 20105-A02 on the grey scale shall be 3 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 for damage or deterioration.

#### 5.4.7 Material used for markings

##### 5.4.7.1 General

The tests described in 5.4.7.2 to 5.4.7.4 shall not apply where the markings are embossed onto or moulded into the device.

**EN 13138-3:2003 (E)****5.4.7.2 Resistance of the markings to saliva**

Markings shall be tested in accordance with the procedures set out in annex C. The assessment shall be carried out in accordance with EN 20105-A02.

**5.4.7.3 Resistance of the markings to perspiration**

When tested in accordance with EN ISO 105-E04 the change of colour on the grey scale shall be 3 or better. The assessment shall be carried out in accordance with EN 20105-A02.

**5.4.7.4 Adhesion of markings**

When tested in accordance with the procedures in EN ISO 105-X12 (wet and dry, 100 cycles) the markings shall not be damaged and shall remain legible in all details when assessed by the assessment panel.

**5.5 Strength****5.5.1 Strength of entire seat**

When tested in accordance with B. 5 no part or component of the seat e.g. straps, trousers or its attachment to the buoyant structure (welding seams) shall break or show any deficiency compromising safety.

**5.5.2 Seam strength and durability of inflatable devices**

The device shall remain airtight after being submitted to a cyclic pressure test according to the procedures given in annex G.

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**5.6 In-water performance****5.6.1 Buoyancy characteristics of the complete device**

Buoyancy components shall be permanently attached or be a functional part of the system without which the device will not meet the requirements of the standard. When tested in accordance with the test method given in annex B of EN 393:1993, swim seats shall meet the buoyancy minimum requirements according to their category according to Table 2 Inflatable devices shall be inflated to the device's maximum volume and to a maximum pressure of  $(3,5 \pm 0,2)$  kPa.

**5.6.2 Residual buoyancy**

Where buoyancy is not provided by inherently buoyant material the swim seat shall have a minimum of two separate chambers. If the swim seat is made up by several components this requirement applies for each of them.

Swim seats providing buoyancy by inflation or by filling materials such as granules, air sacs or similar shall provide, when tested in accordance with annex B of EN 393:1993 a residual buoyancy of at least 50 % of the required minimum buoyancy (see Table 2) after complete deflation or removal of the filling material from a buoyancy chamber most likely to cause failure. If the buoyancy is provided in different separate components (parts) each component shall have a residual buoyancy of  $(50 \pm 10)$  % of its original buoyancy before deflation or removal of filling material.

**5.6.3 Fit and positioning**

When tested in accordance with B.1, inspection by the assessment panel, there shall be clear evidence that the swim seat provides support to hold the child's body in a reasonable upright position without fixing it or being too loose. The child's body shall be represented by the appropriate manikin I to III in accordance with the relevant swim seat category as specified in Table 2.

**5.6.4 In-water behaviour, static stability**

With the appropriate manikin in position as specified in annex B, the swim seat shall not capsize when submitted to the test in calm water (see B.2). The airways — marked by green head area — shall always remain above water level.