



**SLOVENSKI STANDARD**  
**SIST EN 14960:2007**

**01-marec-2007**

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**Napihljiva igralna oprema – Varnostne zahteve in preskusne metode**

Inflatable play equipment - Safety requirements and test methods

Aufblasbare Spielgeräte - Sicherheitstechnische Anforderungen und Prüfverfahren

Équipements de jeu gonflables - Exigences de sécurité et méthodes d'essai

**Ta slovenski standard je istoveten z: EN 14960:2006**

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**ICS:**

97.190	Otroška oprema	Equipment for children
97.200.50	Q!æ^	Toys

**SIST EN 14960:2007**

**en;fr;de**

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ICS 97.190; 97.200.50

English Version

## Inflatable play equipment - Safety requirements and test methods

Équipements de jeux gonflables - Exigences de sécurité et méthodes d'essai

Aufblasbare Spielgeräte - Sicherheitstechnische Anforderungen und Prüfverfahren

This European Standard was approved by CEN on 6 October 2006.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

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## Foreword

This document (EN 14960:2006) has been prepared by Technical Committee CEN/TC 136 “Sports, playground and other recreational equipment”, 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 May 2007, and conflicting national standards shall be withdrawn at the latest by May 2007.

It is not the purpose of the requirements of this Standard to affect a child's need to play nor to lessen the contribution that inflatable play equipment makes either to the child's development or meaningful play from an educational point of view.

Where inflatable play equipment is combined with other items of children's playground equipment, the relevant standards applying to the other items of equipment should also be consulted.

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

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## Introduction

Play is the means by which children discover and understand the world in which they live and is an essential element in a child's physical and mental growth.

It is important for children's rounded development that, through play, they arrive at an understanding of danger which provides a basis for assessing safety in a variety of situations. The balance between challenge and safety is an important consideration.

Inflatable play equipment referred to in this Standard can provide different levels of challenge and excitement. This European Standard aims to minimize the level of risk and the possibility of serious injury while allowing children to enjoy themselves when playing in or on inflatable equipment.

This standard acknowledges the difficulties of addressing safety issues by age criteria alone because the ability to handle risk is based on the individual users' level of skill and not age. Also users other than the intended age range will make use of the inflatable equipment, in which case, the provisions of this standard still apply.

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## 1 Scope

This standard is applicable to inflatable play equipment intended for use by children fourteen years and under both individually and collectively.

This standard specifies safety requirements for inflatable play equipment for which the primary activities are bouncing and sliding. It sets measures to address risks and also minimize accidents to users for those involved in the design, manufacture and supply of inflatable play equipment. It specifies information to be supplied with the equipment. The requirements have been laid down bearing in mind the risk factor based on available data.

This standard specifies the requirements that will protect a child from hazards that he or she may be unable to foresee when using the equipment as intended, or in a manner that can be reasonably anticipated.

This Standard is not applicable to inflatable water-borne play and leisure equipment, domestic inflatable toys, air-supported buildings, inflatables used solely for protection, inflatables used for rescue, or other types of inflatable toys where the primary activity is not bouncing or sliding.

## 2 Normative references

The following referenced documents are indispensable for the application 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 71-3, *Safety of toys - Part 3: Migration of certain elements*

EN 1177, *Impact absorbing playground surfacing — Safety requirements and test methods*

EN 60529, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)*

EN ISO 1421:1998, *Rubber- or plastics-coated fabrics - Determination of tensile strength and elongation at break (ISO 1421:1998)*

EN ISO 2307, *Fibre ropes - Determination of certain physical and mechanical properties (ISO 2307:2005)*

EN ISO 2411:2000, *Rubber- or plastics-coated fabrics — Determination of coating adhesion (ISO 2411:2000)*

EN ISO 9554, *Fibre ropes - General specifications (ISO 9554:2005)*

EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:2005)*

### 3 Terms and definitions

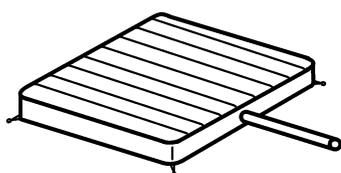
For the purposes of this European Standard, the following terms and definitions apply.

**NOTE** In order not to confine the application of this European Standard to those items of equipment currently in use and hence allow freedom of design for the manufacture of new equipment, only the fundamental forms of equipment and motion are listed.

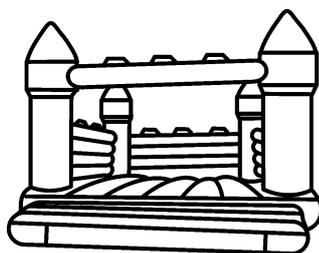
#### 3.1

##### **inflatable play equipment**

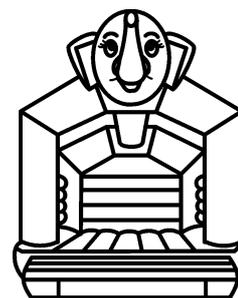
structure relying on a continuous supply of air to maintain its shape, on or in which users may play, bounce and/or slide. Also referred to as an/the inflatable



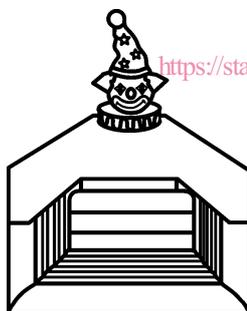
a) Flat-bed  
(4 open sides)



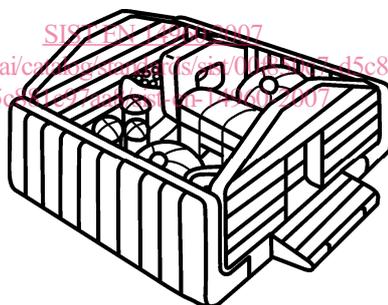
b) Castle (3 walled sides,  
1 open side)



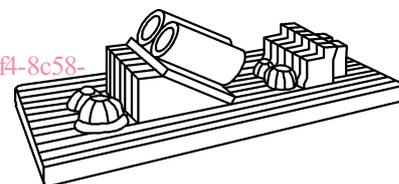
c) A-Frame inflatable  
(3 walled sides, 1 open side)



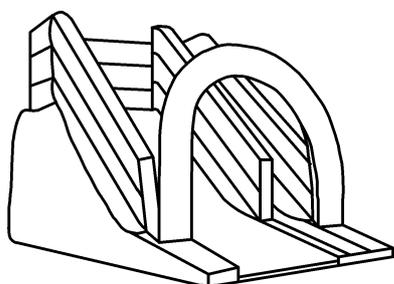
d) A-Frame inflatable with  
raincover



e) Multi-Play Centre



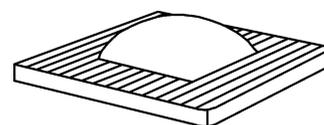
f) Obstacle course



g) Inflatable slide



h) Enclosed inflatable



i) Soft mountain

**Figure 1 — Examples of inflatable play equipment**

- 3.2 blower**  
powered machine used to continuously inflate the structure
- 3.3 connection tube**  
part of the inflatable structure to which the blower is connected
- 3.4 controller**  
person, company or hirer (those who hire to others), having responsibility for the overall control, inspection and maintenance of the equipment
- 3.5 operator**  
person appointed by a controller to be in charge of the operation of the equipment at any time when it is available for use by the public
- 3.6 attendant**  
person working under a control and direction of an operator to assist in the operation of the equipment
- 3.7 inspection body**  
organization, part of an organization or individual with the appropriate competence to carry out one or more of the following inspections:
- design review;
  - assessment of conformity to design;
  - initial testing;
  - annual main inspection
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- 3.8 free height of fall**  
greatest vertical distance from the clearly intended body support to an impact area below  
[EN 1176-1:1998]
- 3.9 critical fall height**  
upper limit of all free heights of fall, for which the surfacing provides an acceptable level of impact attenuation
- 3.10 open side**  
any external side of an inflatable with no containing wall
- 3.11 step**  
step to aid the access/egress of users into and out of the playing area of the inflatable, making the transition between the height of the playing area and the ground
- 3.12 ramp**  
ramp to aid the access/egress of users into and out of the playing area of the inflatable, making the transition between the height of the playing area and the ground
- 3.13 platform**  
any surface on which a user may stand

**3.14****squeeze**

play item which is often attached to and forms part of inflatable play equipment, the purpose of which is to squeeze the user whilst not entrapping them while allowing the user to pass through a gap with a degree of difficulty

**3.15****entrapment**

hazard in which a body, or part of a body, or clothing, can become trapped

**3.16****impact area**

area surrounding the open side(s) of an inflatable

**3.17****run-out**

intended deceleration zone at the bottom of a slide

**3.18****anchorage system**

method of fixing an inflatable to the ground using stakes

**3.19****ballast system**

method of fixing an inflatable to the ground using weights

**3.20****fan**

powered machine used to continuously inflate a structure

**3.21****user height**

maximum height of persons allowed to use the inflatable

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**4 Safety requirements****4.1 Materials****4.1.1 Fabrics**

Fabrics shall be flame retardant.

Fabrics, and joins in fabrics, shall be of adequate tear and tensile strength for the weight of the intended user and have sufficient air retention to enable the inflatable, when pressurized to the level specified in the operations manual, to resume its shape after distortion under load.

Fabrics of:

- a) minimum tear strength 350 N (test method Annex E);
- b) minimum tensile strength 1 850 N (EN ISO 1421);
- c) and minimum coating adhesion 100 N (EN ISO 2411);

shall be used in those structural parts of the inflatable where force or stress is applied by the user.

**4.1.2 Thread**

Threads shall be non-rotting yarn and at least 88 N tensile strength. Stitching shall be lock-stitch. The length of individual stitches shall be a minimum of 3 mm and a maximum of 8 mm.

4.1.3 Netting

Retention netting is commonly used to define the playing area, to contain the users and to retain items of mobile play equipment such as balls. Retention netting shall not significantly impair visibility. Retention netting shall be strong enough to contain the largest/heaviest user for whom the inflatable is designed.

In order to prevent users from climbing retention netting the mesh size, where the netting is more than 1 m vertical height and accessible to the user, shall be 30 mm or less to exclude users' feet.

Where netting is used for roofs and is accessible to the user, the mesh size shall be small enough to prevent the 8 mm finger rod from passing through (see Figure 2).

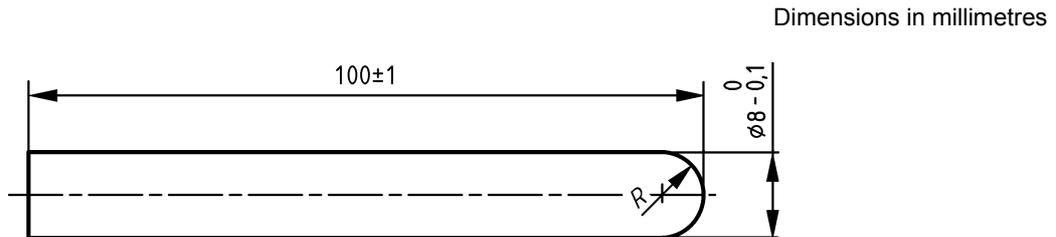


Figure 2 — 8 mm finger rod

Clamber netting (commonly laid on slopes to form foot and hand holds) shall be securely fixed to prevent lifting by the user. The rope from which it is made shall be at least 12 mm in diameter and shall be securely knotted. Strand ends shall be treated to prevent fraying. Care shall be taken when heat sealing so as not to form hard or sharp edges.

4.1.4 Ropes

Ropes shall be fixed at both ends and the total amplitude of swing shall not exceed 20 % of the distance between the fixing points.

NOTE This requirement is intended to remove the risk of strangulation.

The rope diameter shall be between 18 mm and 45 mm.

Fibre ropes (textile type) shall conform to EN ISO 9554 or EN ISO 2307. Alternatively, the manufacturer shall supply a works certificate stating the material used and the safe working load. Monofilament plastics ropes shall not be used.

4.1.5 Zips

Zips shall withstand air pressures and tension generated within the structure. Zips used for entrances and exits shall be reliable, easy to use, able to open from both sides and shall allow access and egress by adults. Zips used for deflation purposes shall have the puller hidden from view (e.g. by a flap or pocket).

#### 4.1.6 Dangerous substances and decorative finishes

Dangerous substances shall not be used for inflatable play equipment in such a way that they can cause adverse health effects to the user. Paints and other decorative finishes shall comply with EN 71-3.

NOTE Attention is drawn to the provisions of European Directive 76/769/EEC. Such materials include, for example, asbestos, lead, formaldehyde, coal tar oils, carbolineums and polychlorinated biphenyls (PCBs).

## 4.2 Design

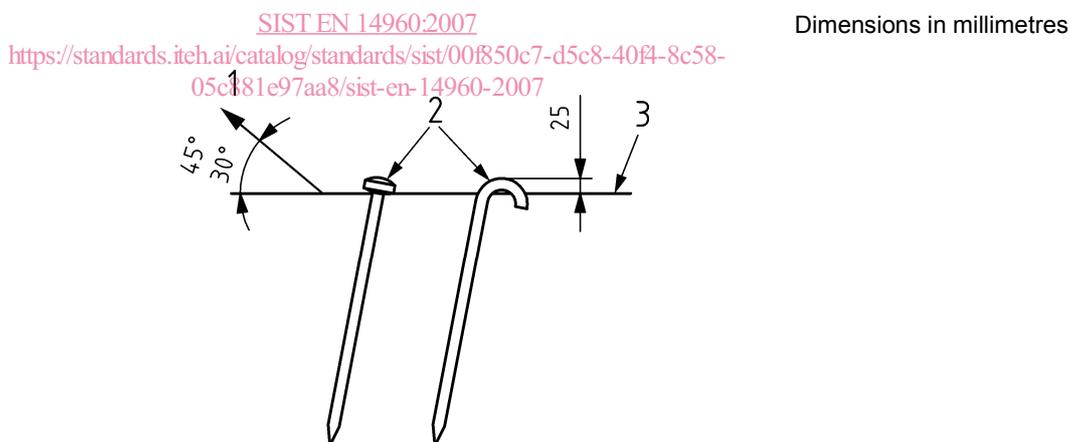
### 4.2.1 Anchorage

The inflatable shall be provided with an anchorage and/or ballast system and any necessary accessories enabling the inflatable to be securely fixed to the ground. Each inflatable shall have at least six anchorage points.

The number of anchorage points shall be calculated in accordance with Annex A. They shall be distributed around the perimeter of the inflatable (see also 4.2.3). The maximum wind-speed in which inflatables shall be used outdoors is 38 km/h (Force 5 on the Beaufort Scale), see Annex B.

When used outdoors, the inflatable shall be secured to the ground, preferably with ground stakes where the ground is suitable. Each anchorage point on the inflatable and all of the components of the anchorage and/or ballast system e.g. ropes, webbings, metal attachments, stakes, weights, shall withstand a force of 1 600 N. The direction of the exerted force shall be at an angle to the ground of 30 ° to 45 °. Ground stakes shall incline away from the direction of the exerted force. The tops of ground stakes shall be rounded. The system shall expose no more than 25 mm of the stake above ground level (see Figure 3).

NOTE When the inflatable is used indoors, the anchorage and/or ballast system should be used, when necessary, to maintain stability.



#### Key

- 1 Direction of force
- 2 Rounded tops
- 3 Ground level

**Figure 3 — Examples of ground stakes**

On hard standing where ground stakes cannot be used, the inflatable shall be secured to the ground by equally effective method e.g. attaching each of the anchorage points to fittings already in the ground, or to sandbags or other weights, if these are capable of supporting the 1 600 N load. If the inflatable is secured to a vehicle or other movable machinery, such vehicles or machinery shall be immobilized and be under the control of an operator.