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# Inflatable play equipment — Safety requirements and test methods

*Équipements de jeux gonflables — Exigences de sécurité et méthodes d'essai*

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# Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 83, *Sports and other recreational facilities and equipment*.

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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.

The inflatable play equipment referred to in this International Standard can provide different levels of challenge and recreation. This International 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 International Standard acknowledges the difficulties of addressing safety issues by age criteria alone because the ability to handle risk is based on the individual user's level of skill and not age. Moreover, users other than the intended age range will make use of the inflatable equipment, in which case, the provisions of this International Standard still apply.

It is not the purpose of the requirements of this International 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 is to also be consulted.


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# Inflatable play equipment — Safety requirements and test methods

## 1 Scope

This International Standard is applicable to inflatable play equipment intended for use by children up to 14 years of age individually and as a group activity.

This International 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 to 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 International 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 International 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 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.

ISO 2307, *Fibre ropes — Determination of certain physical and mechanical properties*

ISO 8124-3, *Safety of toys — Part 3: Migration of certain elements*

ISO 9554, *Fibre ropes — General specifications*

ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

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

EN 1177, *Impact attenuating playground surfacing — Determination of critical fall height*

## 3 Terms and definitions

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

NOTE In order not to confine the application of this International 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

Note 1 to entry: Also referred to as an/the inflatable.

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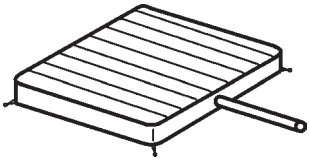
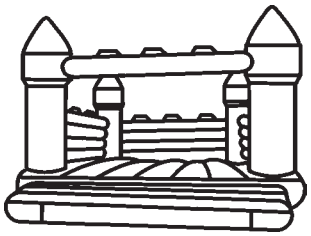
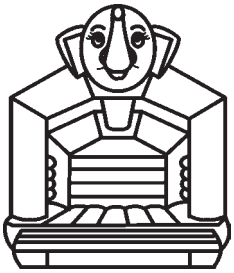


a) Flat-bed
(4 open sides)



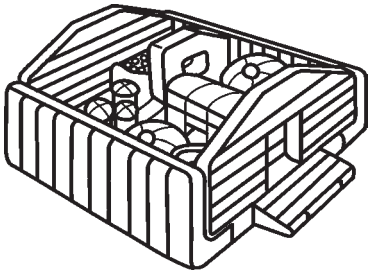
b) Castle (3 walled sides,
1 open side)



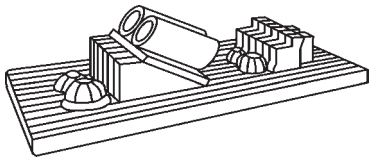
c) A-frame inflatable
(3 walled sides, 1 open side)



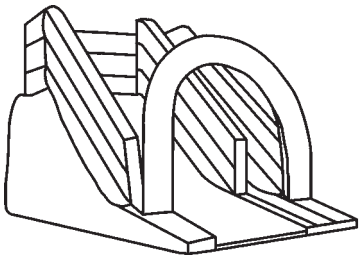
d) Bounce/Slide combination



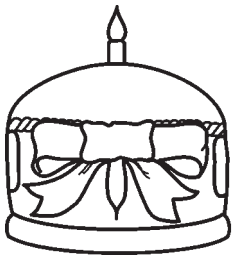
e) Multi-play centre



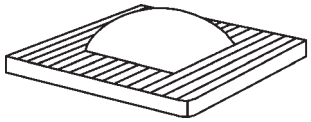
f) Obstacle course



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* (3.2) 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* (3.4) 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 the control and direction of an *operator* (3.5) to assist in the operation of the equipment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**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

**3.8**
**free height of fall**
greatest vertical distance from the clearly intended body support to the *impact area* (3.16) below

[SOURCE: ISO 8124-4:2014, 3.8, modified]

**3.9**
**critical fall height**
maximum free heights of fall for which a surface will provide 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* (3.22) 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* (3.22) of the inflatable making the transition between the height of the playing area and the ground

**3.13**
**platform**
surface on which a user may stand

**3.14**
**squeeze**
play item which is often attached to and forms part of *inflatable play equipment* (3.1), 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)* (3.10) 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

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**3.19**
**ballast system**
method of fixing an inflatable to the ground using weights

**3.20**
**user height**
maximum height of persons allowed to use the inflatable

**3.21**
**free space**
space in, on, or around the inflatable that can be occupied by a user undergoing a movement forced by the equipment (for example, sliding, bouncing)

**3.22**
**playing area**
space in or on the inflatable intended for play

**3.23**
**falling space**
space in or around the inflatable that can be passed through by a user falling from an elevated part of the equipment

Note 1 to entry: The falling space commences at the *free height of fall* (3.8).

# 4 Safety requirements

## 4.1 Materials

### 4.1.1 Fabrics

Fabrics shall be flame retardant.

Fabrics and joints 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.

The following fabrics shall be used in those structural parts of the inflatable where force or stress is applied by the user:

a) minimum tear strength 350 N (see test method Annex E);

b) minimum tensile strength 1 850 N (see ISO 1421);

c) minimum coating adhesion 100 N (see ISO 2411).

### 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.


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