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Inflatable play equipment—

Part 2:

**Additional safety requirements for
inflatable bouncing pillows intended
for permanent installation**

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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 (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 of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by the European Committee for Standardization (CEN), Technical Committee CEN/TC 136, *Sports, playground and other recreational equipment* (as EN 14960-2:2019) and drafted in accordance with its editorial rules. It was assigned to Technical Committee ISO/TC 83, *Sports and other recreational facilities and equipment* and adopted, without modification other than those given below, under the "fast-track procedure":

- references to EN documents were replaced with their equivalent ISO standards.

This first edition of ISO 20187-2, together with ISO 20187-1 and ISO 20187-3, cancels and replaces ISO 20187:2016, which has been technically revised.

The main changes are as follows:

- changes with regard to inflatables sited on hard standing;
- minor editing to improve the content accuracy of the document.

A list of all parts in the ISO 20187 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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 document can provide different levels of challenge and excitement. This document 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 document 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 might make use of the inflatable equipment, in which case, the provisions of this standard still apply.

It is not the purpose of the requirements of this document 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.

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Inflatable play equipment —

Part 2: Additional safety requirements for inflatable bouncing pillows intended for permanent installation

1 Scope

This part of ISO 20187 specifies additional safety requirements for inflatable bouncing pillows intended for permanent installation.

This part of ISO 20187 is applicable to inflatable play equipment intended for use by children fourteen years and under, both individually and collectively.

This part of ISO 20187 specifies safety requirements for inflatable play equipment for which the primary activity is bouncing. 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 part of ISO 20187 specifies the requirements that will protect a child from hazards that he or she might be unable to foresee when using the equipment as intended, or in a manner that can be reasonably anticipated.

This part of ISO 20187 is not applicable to inflatables dealt with in ISO 20187-1:2022, 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 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 71-3, *Safety of toys — Part 3: Migration of certain elements*

EN 1176-1:2017, *Playground equipment and surfacing — Part 1: General safety requirements and test methods*

ISO 1421, *Rubber- or plastics-coated fabrics — Determination of tensile strength and elongation at break*

ISO 2411, *Rubber- or plastics-coated fabrics — Determination of coating adhesion*

ISO 20187-1:2022, *Inflatable play equipment — Part 1: Safety requirements and test methods*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 20187-1:2022 and the following apply.

Note 1 to entry In order not to confine the application of this document to those items of equipment currently in use and to allow freedom of design for the manufacture of new equipment, only the fundamental forms of equipment and motion are defined.

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

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

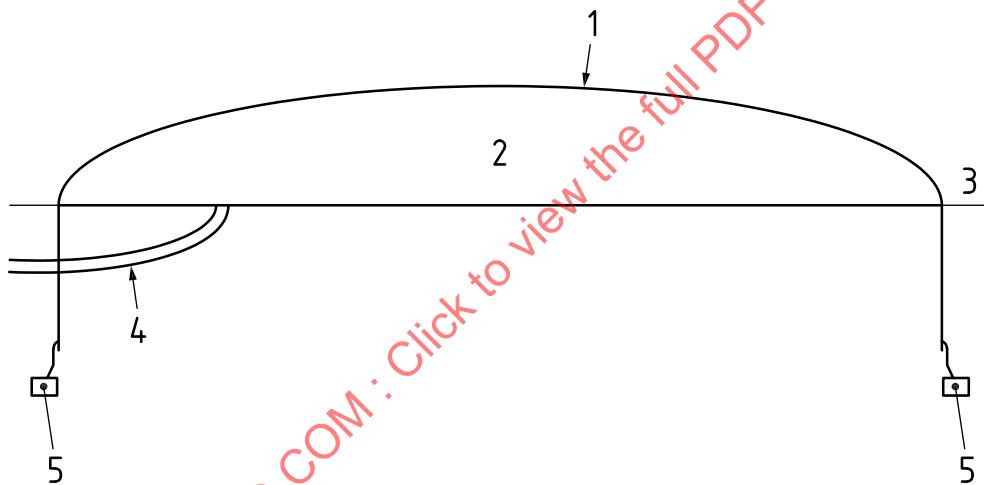
3.1

inflatable bouncing pillow

structure made of a single thickness sheet with edges permanently installed in the ground, relying on a continuous supply of air to form a pressurized void on which users can play and bounce

Note 1 to entry: This type of structure has no walls and enables access and egress on all sides.

Note 2 to entry: See [Figure 1](#).



Key

1	sheet
2	pressurized void
3	ground level
4	air supply tube
5	foundation

Figure 1 — Inflatable bouncing pillow

3.2

blower

powered machine used to inflate the structure continuously

3.3

air supply tube

tube running underground, connected to the blower and discharging into the void

3.4**free height of fall**

greatest vertical distance from the clearly intended body support to the impact area below

3.5**critical fall height**

maximum free height of fall, for which a surface provides an acceptable level of impact attenuation

3.6**platform**

any surface on which a user can stand

3.7**entrapment**

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

3.8**impact area**

area surrounding the open sides of the bouncing pillow

3.9**user height**

maximum height of persons allowed to use the inflatable

3.10**free space**

space in, on or around the inflatable that can be occupied by a user undergoing a movement forced by the equipment

3.11**playing area**

space on the inflatable, clear of any hazard, intended for play

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 resume its shape after distortion under load.

Fabrics of:

- a) minimum tear strength 500 N (see the test method in ISO 20187-1:2022, Annex E),
- b) minimum tensile strength 3 500 N (in accordance with ISO 1421), and
- c) minimum coating adhesion 100 N (in accordance with ISO 2411)

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

4.1.2 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 conform to EN 71-3.

NOTE Attention is drawn to the provisions of European Regulation (EC) No. 1907/2006.^[1] Such materials include, for example, asbestos, lead, formaldehyde, coal tar oils, carbofineums and polychlorinated biphenyls (PCBs).

4.2 Construction

4.2.1 Foundation

Foundations shall be designed in such a way that they do not present a hazard (e.g. tripping, impact etc.). The fabric shall be securely fastened to an underground foundation, e.g. concrete, timber, metal etc., and shall be a minimum of 400 mm deep.

4.2.2 Structural integrity

Pressure inside the inflatable shall not exceed 0,7 kPa (70 mm water gauge) and shall be sufficient for the unit to meet the grounding test requirements.

The grounding test shall be carried out in accordance to [Annex A](#).

The gradient formed by the fabric shall not exceed an average angle of more than 20° with the ground.

The inflatable shall support the weight of the largest and/or heaviest intended user.

4.2.3 Blowers - Safety requirements

Blowers shall be placed in a secure container, to prevent access by the public.

Blowers shall be protected to a minimum of IP23B as defined in EN 60529, except that the 8 mm finger rod, as illustrated in ISO 20187-1:2022, Figure 2, shall be used instead of the jointed 12 mm test finger.

The 8 mm finger rod may pass through the guard mesh but shall not, in any position, come into contact with any moving part, hot surface or exposed electrical connections.

The blower shall be positioned at least 2,5 m away from the inflatable or sited behind a fence at least 2 m distance away.

The blower, including cabling, shall not be readily accessible to the public. See also [4.2.5](#).

Activation of the blower shall only be controlled manually or by a timer.

4.2.4 Hard objects, sharp angles and edges

Users shall not be able to come into contact with any hard or sharp objects inside, underneath or adjacent to the playing area of the inflatable while it is in use or during accidental deflation.

4.2.5 Electrical installations

For electrical installations, national standards/regulations apply.

Controls of electrical installations shall not be readily accessible to the public.

Electrical cables shall be secured away from users and the public.

4.2.6 Siting

4.2.6.1 The inflatable shall be sited so that there is, at least, 3,5 m of free space above the playing area measured from its highest point.

A clear area, of at least 2 m, free of any obstacle which could cause injury shall be maintained around the inflatable.

The inflatable shall not be built on a site with more than a 5 % slope in any direction.

Prior to installation the site shall be cleared of debris and/or sharp objects on, or embedded in, the surface.

4.2.6.2 If a perimeter fence is used, it shall be sited at least 2 m away from the edge of the inflatable. A fence shall be at least 0,9 m high, strong enough to withstand onlookers leaning on it and shall not significantly impede visibility.

A fence shall fulfil the requirements of EN 1176-1:2017, 4.2.7, and there shall be at least two access/egress points of at least 1 m wide.

4.3 Impact area

An impact area, of at least 2 m width, measured from the edge of the inflatable, shall surround the entire inflatable structure.

The impact attenuating surface provided shall be of a critical fall height at least equal to the height measured 1 m in from the outer edge of the inflatable.

4.4 Signage

Signs shall be placed on or in the immediate vicinity of the inflatable providing at least the following information:

- a) optimum number of users;
- b) the inflatable shall not be used during inflation/deflation;
- c) no somersault, cartwheels or rough play;
- d) no shoes allowed;
- e) no hard and sharp objects allowed;
- f) no food or drinks allowed;
- g) children may be accompanied by an adult;
- h) the surface of the inflatable might be slippery.

The maximum number of users is determined by dividing the surface area in square metres by 5.

4.5 Supervision

Constant supervision of permanently installed inflatable bouncing pillows is not required.

5 Test methods and reports

Unless otherwise specified, the requirements of this part of ISO 20187 shall be verified by measurement, visual examination and/or practical tests.

Before testing, the equipment shall be assembled and installed in accordance with the manufacturer's instructions.

Test reports shall include the following:

- a) the number and date of this document, i.e. ISO 20187-2:2022;
- b) details of the equipment tested, including the unique identifying number;
- c) details and condition of the equipment including any defects observed;
- d) test results.

6 Information to be provided by the manufacturer/supplier

6.1 General product information

The supplier/manufacturer shall provide information in the appropriate language(s) of the country in which the equipment is to be installed and used. The information shall:

- a) be printed legibly and in a simple form;
- b) be conveyed using illustrations wherever possible; and
- c) include, at least, details of installation, operation, inspection and maintenance.

6.2 Pre-information

The manufacturer/supplier shall provide information concerning the safety of the equipment prior to accepting an order. This information shall include, at least, the following:

- a) height and space required to operate the equipment safely;
- b) surfacing requirements;
- c) attestation of conformity with this standard;
- d) frequency of inspections;
- e) intended age range and optimum number of users.

6.3 Installation information

The manufacturer/supplier shall provide installation information which shall include, at least, the following:

- a) list of equipment;
- b) siting, height and space requirements to include impact area and fencing requirements;
- c) maximum allowed slope of the site;
- d) blower and air feed requirements.

6.4 Operating information

The manufacturer/supplier shall provide operating information which shall include, at least, the following:

- a) optimum number of users;

- b) users to remove their footwear;
- c) users to remove hard, sharp or dangerous objects from their person;
- d) prohibit somersaults, cartwheels and rough play;
- e) remove glasses when practicable;
- f) action to be taken in the event of an emergency or accident.

6.5 Inspection and maintenance information

The supplier/manufacturer shall provide information on the inspection and maintenance of the equipment. The information shall specify the type and frequency of the inspections.

7 Inspection, maintenance and alteration

7.1 Inspection

7.1.1 General

The equipment and installation shall be inspected at suitable intervals to ensure that deterioration is detected and remedied in good time.

7.1.2 Routine inspection

The controller shall carry out, or appoint a person to carry out, routine inspections.

Routine inspections should be carried out before each time the equipment is made available for use. The checks shall include the following:

- a) visual inspection of the impact area and fencing;
- b) for significant holes or rips in the fabric or seams;
- c) the internal air pressure is maintained in accordance with [4.2.2](#);
- d) there are no exposed electrical parts;
- e) plugs, sockets, switches, etc. are not damaged.

The equipment shall not be used by the public until any defect found in the routine inspection has been rectified.

7.1.3 Annual inspection

The controller shall ensure that the annual inspection is carried out by a competent person.

The main inspection shall at least include inspection of the following:

- a) previous inspection reports and certificates where appropriate;
- b) identification of the inflatable and blower (e.g. serial numbers);
- c) condition of the inflatable fabric for wear and/or rips;
- d) condition of seams and joints;
- e) the internal air pressure is maintained between minimum and maximum levels (see [4.2.2](#));
- f) condition of the blower and its enclosure;

- g) condition of electrical wiring;
- h) condition of the enclosure including the fencing and access/egress points;
- i) condition of the impact attenuating surface;
- jj) gradients of the fabric and structure;
- k) signage.

The above list is not exhaustive.

7.2 Maintenance

7.2.1 General

Repairs shall not be carried out while the equipment is in use.

7.2.2 Routine maintenance

Preventative measures to maintain levels of safety and performance shall include the following:

- a) cleaning the inflatable;
- b) removal of debris and contaminants;
- c) maintenance of impact attenuating materials;
- d) rust control on the blower;
- e) cleaning the blower, e.g. mesh and impeller.

The above list is not exhaustive.

7.2.3 Corrective maintenance

Measures to correct defects or to re-establish the necessary levels of safety shall include the following:

- a) replacement of worn or defective parts;
- b) repairs of splits or delaminated seams;
- c) repair of holes and cuts;
- d) repair or replacement of defective structural components.

7.3 Alteration

Alteration to any part of the equipment that could affect its essential safety shall only be carried out after consultation with the supplier/manufacturer or a competent person. The equipment shall only be put into use again when alterations have been inspected and passed by a competent person.

8 Marking

The markings for inflatable bouncing pillows permanently installed shall be positioned on, or in the immediate vicinity of, the bouncing pillow.

At least the following shall be included:

- a) type and size of blower;