INTERNATIONAL STANDARD

ISO 20187-1

First edition
2022-11

Inflatable play equipment —

Part 1: Safety requirements and test methods

Reference number
ISO 20187-1:2022(E)

© ISO 2022



COPYRIGHT PROTECTED DOCUMENT

© ISO 2022

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

© ISO 2022 – All rights reserved

Contents

Page

Foreword ..... **v**
Introduction ..... **vi**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **1**
4 Safety requirements **4**
4.1 Materials 4
4.1.1 Fabrics 4
4.1.2 Thread 5
4.1.3 Netting 5
4.1.4 Ropes 5
4.1.5 Zips 6
4.1.6 Dangerous substances and decorative finishes 6
4.2 Design 6
4.2.1 Anchorage 6
4.2.2 Structural integrity 7
4.2.3 Access/egress 8
4.2.4 Blowers 11
4.2.5 Entrapment 11
4.2.6 Hard objects, sharp angles and edges 16
4.2.7 Electrical installations 16
4.2.8 Siting 16
4.2.9 Containment 18
4.2.10 Wall heights on slopes 19
4.2.11 Run-out 20
4.2.12 Ventilation 20
4.3 Number of users 20
4.4 Supervision 21
5 Test methods and reports **21**
6 Information to be provided by the supplier/manufacturer **21**
6.1 General product information 21
6.2 Pre-information 22
6.3 Installation information 22
6.4 Operating information 22
6.5 Inspection and maintenance information 23
7 Inspection, maintenance and alteration **23**
7.1 Inspection 23
7.1.1 General 23
7.1.2 Routine Inspection 23
7.1.3 Annual inspection 24
7.2 Maintenance 24
7.2.1 General 24
7.2.2 Routine maintenance 24
7.2.3 Corrective maintenance 24
7.3 Alteration 25
8 Marking **25**
9 Documentation **25**
Annex A (normative) **Calculation of number of anchor-points** **26**
Annex B (informative) **The Beaufort Scale of wind force** **27**

© ISO 2022 – All rights reserved

Annex C (normative) **Test method for grounding** **28**
Annex D (normative) **Test methods for entrapment** **29**
Annex E (normative) **Test method for tear strength** **40**
Bibliography **45**

© ISO 2022 – All rights reserved

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 14960-1:2019) 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;

— minor editorial amendments.

This first edition of ISO 20187-1, together with ISO 20187-2 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.

© ISO 2022 – All rights reserved

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 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 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 standard still apply.

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.

© ISO 2022 – All rights reserved

Inflatable play equipment —

Part 1:
Safety requirements and test methods

1 Scope

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

This document 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 document 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 document 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 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.

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

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

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

ISO 9554, *Fibre ropes — General specifications*

ISO/IEC 17025:2017, *General requirements for the competence of testing and calibration laboratories*

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

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

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

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 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.

© ISO 2022 – All rights reserved

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

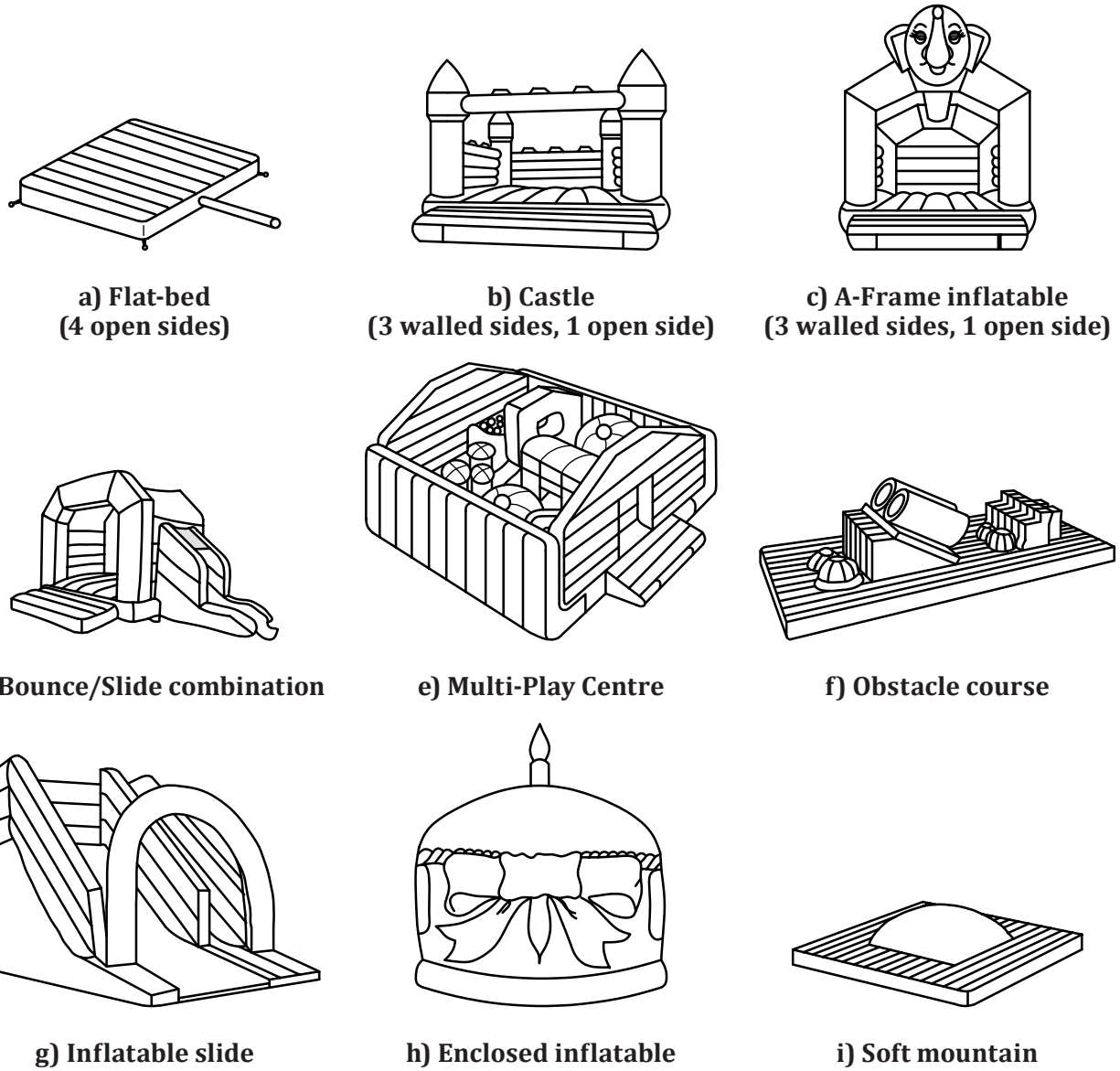
— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
inflatable 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.

Note 2 to entry: See Figure 1.



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

© ISO 2022 – All rights reserved

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 the control and direction of an operator to assist in the operation of the equipment

3.7
inspection body
organisation, part of an organisation 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 below

[SOURCE: EN 1176-1:2008, 3.6]

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 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

© ISO 2022 – All rights reserved

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
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.

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.

© ISO 2022 – All rights reserved