

MÄNGUVÄLJAKU SEADMED JA ALUSPINNAKATE. OSA 1:
ÜLDISED OHUTUSNÕUDED JA KATSEMEETODID

Playground equipment and surfacing - Part 1: General
safety requirements and test methods

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 1176-1:2017 sisaldab Euroopa standardi EN 1176-1:2017 ingliskeelset teksti.	This Estonian standard EVS-EN 1176-1:2017 consists of the English text of the European standard EN 1176-1:2017.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 18.10.2017.	Date of Availability of the European standard is 18.10.2017.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 97.200.40

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:

Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

EUROPEAN STANDARD

EN 1176-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2017

ICS 97.200.40

Supersedes EN 1176-1:2008

English Version

Playground equipment and surfacing - Part 1: General safety requirements and test methods

Équipements et sols d'aires de jeux - Partie 1:
Exigences de sécurité et méthodes d'essai générales

Spielplatzgeräte und Spielplatzböden - Teil 1:
Allgemeine sicherheitstechnische Anforderungen und
Prüfverfahren

This European Standard was approved by CEN on 8 June 2017.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents	Page
European foreword	4
Introduction	7
1 Scope	8
2 Normative references	8
3 Terms and definitions	9
4 Safety requirements	17
4.1 Materials	17
4.1.1 General	17
4.1.2 Flammability	17
4.1.3 Timber and associated products	18
4.1.4 Metals	18
4.1.5 Synthetics	18
4.1.6 Dangerous substances	18
4.2 Design and manufacture	19
4.2.1 General	19
4.2.2 Structural integrity	19
4.2.3 Accessibility for adults	20
4.2.4 Protection against falling	20
4.2.5 Finish of equipment	24
4.2.6 Moving parts	24
4.2.7 Protection against entrapment	24
4.2.8 Protection against injuries during movement and falling	29
4.2.9 Means of access	38
4.2.10 Connections	41
4.2.11 Consumable components	41
4.2.12 Ropes	41
4.2.13 Chains	43
4.2.14 Foundations	43
4.2.15 Heavy suspended rigid beams	44
4.2.16 Bouncing facilities	45
5 Verification of compliance and reports	47
5.1 General	47
5.2 Confirming the adequate level of impact attenuation after installation of impact attenuating surfacing	47
6 Information to be provided by the manufacturer/supplier	47
6.1 Information to be provided by the manufacturer/supplier of playground equipment	47
6.1.1 General product information	47
6.1.2 Pre-information	48
6.1.3 Installation information	48
6.1.4 Inspection and maintenance information	49
6.2 Information to be provided by the manufacturer or supplier of impact attenuating surfacing	50
6.2.1 Pre-information for impact attenuating surfacing	50
6.2.2 Installation information for impact attenuating surfacing	51

6.2.3	Inspection and maintenance information for impact attenuating surfacing.....	51
6.2.4	Identification of impact attenuating playground surfacing.....	52
7	Marking.....	52
7.1	Equipment identification.....	52
7.2	Basic level mark.....	52
	Annex A (normative) Loads.....	53
	Annex B (normative) Method of calculation of structural integrity.....	60
	Annex C (normative) Physical testing of structural integrity.....	72
	Annex D (normative) Test methods for entrapment.....	74
	Annex E (informative) Overview of possible entrapment situations.....	89
	Annex F (informative) Illustrations of calculation of free height of fall (FHF).....	91
	Annex G (informative) Illustration of sieve test.....	97
	Annex H (normative) Procedure for confirming the adequate level of impact attenuation after installation of impact attenuating surfacing.....	99
	Annex I (informative) A-deviations.....	100
	Bibliography.....	102

European foreword

This document (EN 1176-1:2017) has been prepared by Technical Committee CEN/TC 136 “Sports, playground and other recreational facilities and 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 April 2018, and conflicting national standards shall be withdrawn at the latest by October 2018.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1176-1:2008.

EN 1176 “Playground equipment and surfacing” consists of the following parts:

- Part 1: *General safety requirements and test methods*
- Part 2: *Additional specific safety requirements and test methods for swings*
- Part 3: *Additional specific safety requirements and test methods for slides*
- Part 4: *Additional specific safety requirements and test methods for cableways*
- Part 5: *Additional specific safety requirements and test methods for carousels*
- Part 6: *Additional specific safety requirements and test methods for rocking equipment*
- Part 7: *Guidance on installation, inspection, maintenance and operation*
- Part 10: *Additional specific safety requirements and test methods for fully enclosed play equipment*
- Part 11: *Additional specific safety requirements and test methods for spatial network*

This part of EN 1176 should be read in conjunction with:

- EN 1177, *Impact attenuating playground surfacing — Determination of critical fall height*;
- CEN/TR 16467:2013, *Playground equipment accessible for all children*;
- CEN/TR 16598:2014, *Collection of rationales for EN 1176*;
- CEN/TR 16396:2012, *Playground equipment for children, replies to requests for interpretation of EN 1176:2008 and its parts*;
- CEN/TR 16879:2016, *Siting of playground and other recreational facilities — Advice on methods for positioning and separation*.

For inflatable play equipment, see EN 14960, *Inflatable play equipment — Safety requirements and test methods*.

The main changes from the previous edition of this standard are as follows:

- a) Reference to CEN/TR 16467:2013, CEN/TR 16598:2014, CEN/TR 16396:2012, CEN/TR 16879:2016 added;
- b) Scope amended to include reference to 'permanently installed' also reference to electricity, water and UV added;
- c) Clause 3.25 definition of easily accessible improved;
- d) New definitions added for impact attenuating surfacing, adequate level of impact attenuation, forced movement, bouncing facilities, suspension bed, one post equipment, post installation inspection, fireman's pole and tunnel;
- e) Clause 4.2.4.1 amended to agree with Figure 8;
- f) Clause 4.2.4.3 and 4.2.4.4 detail of measurement of 500 mm opening added;
- g) Clause 4.2.7.1 new sentence adding reference to Clause 4.2.7.2;
- h) Figure 13 amended to show direction of travel;
- i) Clause 4.2.8.1 cross reference to Table 2 added;
- j) Table 2 amended to clarify distinctions for climbing and hanging fall heights;
- k) Figure 14 amended to include two types of net structure in fall height examples;
- l) Clause 4.2.8.2.5 clarification of overlapping falling spaces added;
- m) Clause 4.2.8.5.2 and Table 4 revised to align with changes to EN 1177;
- n) Clause 4.2.9.5 major rewrite to clarify requirements for easily accessible equipment;
- o) Clause 4.2.12.2 inclusion of reference to use of probe E;
- p) New Clause 4.2.16 giving requirements for bouncing facilities;
- q) Clauses 5.2 and Annex H relating to Impact Attenuating Surfacing added;
- r) Clauses 6.2 amended to give more information on Impact Attenuating Surfacing;
- s) A.2.2, notes 1 and 2 now included as part of requirements;
- t) D.4.2, last paragraph now includes additional test requirement for holes behind holes;
- u) New test (D.5) and Figure (D.13) for testing chain openings added;
- v) New Figure (D.12) showing application of finger probes in test situations;
- w) New test (D.6) for bouncing facilities;
- x) New Annex F showing illustrations of free height of fall;
- y) New Annex G showing illustration of sieve test results and sieve curve;

- z) New Annex H "Procedure for confirming the adequate level of impact attenuation after installation of impact attenuating surfacing" added;
- aa) Annex I "A-Deviations" updated.

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

Introduction

For the quality of reading and understanding this standard, the following wording is used:

- shall = requirement;
- should = recommendation;
- may = permission;
- can = possibility.

It is not the purpose of the requirements of this standard to lessen the contribution that playground equipment makes to the child's development and/or play, which is meaningful from an educational point of view.

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 skills and not age. Also, users other than the intended age range will almost certainly make use of the playground equipment.

Risk-taking is an essential feature of play provision and of all environments in which children legitimately spend time playing. Play provision aims to offer children the chance to encounter acceptable risks as part of a stimulating, challenging and controlled learning environment. Play provision should aim at managing the balance between the need to offer risk and the need to keep children safe from serious harm.

The principles of safety management are applicable both to workplaces in general as well as to play provision. However, the balance between safety and benefits is likely to be different in the two environments. In play provision, exposure to some degree of risk might be of benefit because it satisfies a basic human need and gives children the chance to learn about risk and consequences in a controlled environment.

Respecting the characteristics of children's play and the way children benefit from playing on the playground with regard to development, children need to learn to cope with risk and this can lead to bumps and bruises and even occasionally a broken limb. The aim of this standard is first and foremost to prevent accidents with a disabling or fatal consequence, and secondly to lessen serious consequences caused by the occasional mishap that inevitably will occur in children's pursuit of expanding their level of competence, be it socially, intellectually or physically.

Refusal of admittance and access as a safety precaution is problematic due to, for example, breach in supervision or help by peers. Requirements of significant importance, such as head and neck entrapment and protection against inadvertent falls, have been written with this in mind. It is also recognized that there is an increasing need for play provision to be accessible to users with disabilities. This of course requires play areas to provide a balance between safety and the offer of the required level of challenge and stimulation to all possible groups of users. However, for the purposes of protection against head and neck entrapment, this standard does not take into account children with an increased head size e.g. hydrocephalus or Down's syndrome or wearing helmets.

For further information about making play provision suitable for less able users a CEN Technical Report is available which discusses the challenges in provision and possible solutions that designers can consider. See the European foreword for details of this document.

In addition to the short-term risks that are associated with a playground, there is a risk that the playing child is overexposed to the ultraviolet radiation of the sun. Too much ultraviolet radiation and sunburns in childhood increase the risk of developing skin cancer later in life. Therefore, the playgrounds should be organized in a way that takes into account of the availability of shade options, and that a part of the playground equipment and recreational areas are placed entirely or partly in shade.

1 Scope

This part of EN 1176 specifies general safety requirements for permanently installed public playground equipment and surfacing. Additional safety requirements for specific pieces of playground equipment are specified in subsequent parts of this standard.

This part of EN 1176 covers playground equipment for all children. It has been prepared with full recognition of the need for supervision of young children and of less able or less competent children.

The purpose of this part of EN 1176 is to ensure a proper level of safety when playing in, on or around playground equipment, and at the same time to promote activities and features known to benefit children because they provide valuable experiences that will enable them to cope with situations outside the playground.

This part of EN 1176 is applicable to playground equipment intended for individual and collective use by children. It is also applicable to equipment and units installed as children's playground equipment although they are not manufactured as such, but exclude those items defined as toys in EN 71 and the Toys Safety Directive.

It is not applicable to adventure playgrounds with the exception of those items which have been commercially sourced.

NOTE Adventure playgrounds are fenced, secured playgrounds, run and staffed in accordance with the widely accepted principles that encourage children's development and often use self-built equipment.

This part of EN 1176 specifies the requirements that will protect the child from hazards that they might be unable to foresee when using the equipment as intended, or in a manner that can be reasonably anticipated.

The use of electricity in play equipment, either as a play activity or as a motive force, is outside the scope of this standard. The attention of users is drawn to European and local national standards and regulations which are to be complied with when using electricity.

Play equipment placed in water and where water can be seen as impact attenuating surfacing is not fully covered by this standard and additional risks are associated with wet environments.

The risk of exposure to excessive levels of UV radiation is not covered in this standard.

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.

EN 335, *Durability of wood and wood-based products — Use classes: definitions, application to solid wood and wood-based products*

EN 350:2016, *Durability of wood and wood-based products — Testing and classification of the durability to biological agents of wood and wood-based materials*

EN 351-1:2007, *Durability of wood and wood-based products — Preservative-treated solid wood — Part 1: Classification of preservative penetration and retention*

EN 636, *Plywood — Specifications*

EN 818-2:1996+A1:2008, *Short link chain for lifting purposes — Safety — Part 2: Medium tolerance chain for chain slings — Grade 8*

EN 818-3:1999+A1:2008, *Short link chain for lifting purposes — Safety — Part 3: Medium tolerance chain for chain slings — Grade 4*

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

EN 1991-1-2, *Eurocode 1: Actions on structures — Part 1-2: General actions — Actions on structures exposed to fire*

EN 1991-1-3, *Eurocode 1 — Actions on structures — Part 1-3: General actions — Snow loads*

EN 1991-1-4, *Eurocode 1: Actions on structures — Part 1-4: General actions — Wind actions*

EN 13411-3, *Terminations for steel wire ropes — Safety — Part 3: Ferrules and ferrule-securing*

EN 13411-5, *Terminations for steel wire ropes — Safety — Part 5: U-bolt wire rope grips*

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

EN ISO 4892-3, *Plastics — Methods of exposure to laboratory light sources — Part 3: Fluorescent UV lamps (ISO 4892-3)*

EN ISO 9554, *Fibre ropes — General specifications (ISO 9554)*

EN ISO 13934-1, *Textiles — Tensile properties of fabrics — Part 1: Determination of maximum force and elongation at maximum force using the strip method (ISO 13934-1)*

3 Terms and definitions

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

3.1

playground equipment

equipment and structure, including components and constructional elements with, or on which, children can play outdoors or indoors, either individually or in groups, according to their own rules or own reasons for playing which can change at any time

3.2

climbing equipment

playground equipment that only allows the user to move on it or in it by the use of a hand and foot/leg support and requires a minimum of three points of contact with the equipment, one of these being a hand

Note 1 to entry: During movement, it is possible to have only one or two points of contact but this is only during a transition from one rest position to the next.

3.3

impact area

area that can be hit by a user after falling through the falling space

3.4

impact attenuating surfacing

surfacing on impact areas intended to reduce the risk of injury when falling onto it