BRITISH STANDARD

BS EN 1176-3:2008

Incorporating corrigendum September 2008

Playground equipment and surfacing —

Part 3: Additional specific safety requirements and test methods for slides

ICS 97.200.40

BSI British Standards

National foreword

This British Standard is the UK implementation of EN 1176-3:2008. It supersedes BS EN 1176-3:1998 which will be withdrawn on 31 May 2009.

The UK participation in its preparation was entrusted to Technical Committee SW/65, Children's playground equipment.

Operators and providers are advised that equipment conforming to EN 1176 require regular maintenance. Guidance on this and appropriate inspection, maintenance and operation schedules are contained within BS EN 1176-7:2008.

National standards have been published by BSI on children's playground equipment since BS 3178 was first issued in 1959, this standard concentrated on specifications for specific types of equipment. It was replaced in 1979 by BS 5696 which switched focus to a design and safety approach.

With the increasing introduction of overseas equipment BSI led the way by calling for a European Standard to address the conflicting safety advice and standards from other countries. This was published in 1999 as BS EN 1176 and further focused on the safety of playground equipment.

All standards published by BSI are regularly assessed and this revision is part of the process, it takes into account new design concepts and the operating experience available to the standards committees.

It is advised that the previous version of BS EN 1176 will not be withdrawn until 31 May 2009 to give manufacturers time to amend their product lines.

Playground equipment not complying with this revision should not automatically be considered as being unsafe or to require replacement. A risk assessment by competent persons should be used to determine what action, if any, is necessary. Manufacturers and Inspectors of the Register of Play Inspectors International (RPII) are amongst those that will be able to assist in this.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 July 2008

ISBN 978 0 580 64114 5

Amendments/corrigenda issued since publication

Date	Comments
30 September 2008	Correction to national foreword

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1176-3

May 2008

ICS 97.200.40

Supersedes EN 1176-3:1998

English Version

Playground equipment and surfacing - Part 3: Additional specific safety requirements and test methods for slides

Équipements et sols d'aires de jeux - Partie 3 : Exigences de sécurité et méthodes d'essai complémentaires spécifiques aux toboggans

Spielplatzgeräte und Spielplatzböden - Teil 3: Zusätzliche besondere sicherheitstechnische Anforderungen und Prüfverfahren für Rutschen

This European Standard was approved by CEN on 25 April 2008.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, 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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EUROPÄISCHES KOMITEE FÜR NORMUNG

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

Ref. No. EN 1176-3:2008: E

Contents

Page

Foreword

This document (EN 1176-3:2008) 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 November 2008, and conflicting national standards shall be withdrawn at the latest by May 2009.

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

This document supersedes EN 1176-3:1998.

This European Standard consists of a number of parts as follows:

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

EN 1176-2, *Playground equipment and surfacing — Part 2: Additional specific safety requirements and test methods for swings*

EN 1176-3, *Playground equipment and surfacing — Part 3: Additional specific safety requirements and test methods for slides*

EN 1176-4, *Playground equipment and surfacing — Part 4: Additional specific safety requirements and test methods for cableways*

EN 1176-5, *Playground equipment and surfacing — Part 5: Additional specific safety requirements and test methods for carousels*

EN 1176-6, *Playground equipment and surfacing — Part 6: Additional specific safety requirements and test methods for rocking equipment*

EN 1176-7, *Playground equipment and surfacing — Part 7: Guidance on installation, inspection, maintenance and operation*

EN 1176-10, *Playground equipment and surfacing — Part 10: Additional specific safety requirements and test methods for fully enclosed play equipment*

EN 1176-11, *Playground equipment and surfacing — Part 11: Additional specific safety requirements and test methods for spatial network*

This part of EN 1176 should not be used in isolation, but in conjunction with EN 1176-1, EN 1176-7 and EN 1177.

For inflatable play equipment see:

EN 14960, *Inflatable play equipment — Safety requirements and test methods*

The principal changes from the previous edition of this part of EN 1176 are as follows.

a) The inclusion of requirements for new products, e.g. slides with more tracks.

b) Revised requirements for access to and height of free-standing slides.

c) Revised requirements for the height of the free space for spiral slides.

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, 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 the United Kingdom.

1 Scope

This document specifies additional safety requirements for slides intended for permanent installation for use by children. The aim is to provide protection to the user against possible hazards during use. Where the main play function is not sliding, the relevant requirements in this part of EN 1176 may be used, as appropriate.

This document is not applicable to waterslides, rollerways or slide installations where auxiliary equipment such as mats or sledges are used. This document is not applicable for inclined surfaces which do not contain and guide the user, e.g. banister rails (inclined parallel bars).

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 1176-1:2008, *Playground equipment and surfacing — Part 1: General safety requirements and test methods*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1176-1:2008 and the following apply.

3.1
slide
structure with inclined surface(s) that contains and guides the user sliding in a defined track

NOTE Inclined planes, designed primarily for other purposes, such as roofs, do not constitute slides.

3.2
wave slide
slide with one or more variation(s) in the slope of its sliding section

3.3
embankment slide
slide in which the majority of the sliding section follows the contour of the land

NOTE Access to the starting section is usually direct from the mound or via an access ladder or stairs.

3.4
attachment slide
slide for which access to the starting section is possible only by passing via other equipment or parts of equipment

NOTE Such equipment includes climbing nets, bridges, platforms, inclined planes, other climbing devices.

3.5
helical slide
slide where the sliding section follows spirals (see Figure 4)

3.6
curved slide
slide where the sliding section follows curves (see Figure 4)

3.7
free-standing slide
slide which is separate from any other piece of equipment with its own means of access from the ground directly to the starting section

3.8
tunnel slide
slide where the sliding section has an enclosed cross section

3.9
mixed tunnel slide
slide for which only the upper section of the sliding section has an enclosed cross section

3.10
multi-track slide
slide with several defined tracks separated by dividers

3.11
starting section
section on which the user is enabled to get into sliding position

NOTE The starting section can be a platform or an extension of a platform of playground equipment.

3.12
sliding section
section on which the user is undergoing forced movement

3.13
run-out section
section on which the user's speed is reduced to enable a safe departure from the slide

3.14
guarding section
additional component of a slide, which serves the function of a barrier, to protect users from falls from the starting section

NOTE The guarding section can extend into the region of the sliding section.

3.15
lateral protection
side of the starting section or sliding section that retains and guides the user

4 Safety requirements

4.1 General

Slides shall conform to EN 1176-1 unless otherwise specified in this part of EN 1176.

NOTE This part of EN 1176 contains a number of requirements that will help limit the speed of the user whilst using slides. However, the coefficient of friction of sliding surfaces is highly dependant on the type of textile clothing worn by the user, material of the slide, weight of the user and weather conditions. It is therefore recommended that long slides are designed to ensure speed of the user is sufficiently controlled e.g. changes in direction of the sliding section.

4.2 Access

Access to the starting section shall be by means of an access ladder, stairs, climbing section or device.

NOTE 1 In the case of embankment slides, access to the starting section may be gained directly from the mound.

For free-standing slides, the maximum vertical height that the first stairs can reach without a change in direction or offset, by a minimum width of the means of access, shall be 2 500 mm.

Where the starting section of a slide is easily accessible the free height of fall (h) shall be 2 000 mm maximum unless guarding is provided (see 4.3.2 and Table 1).

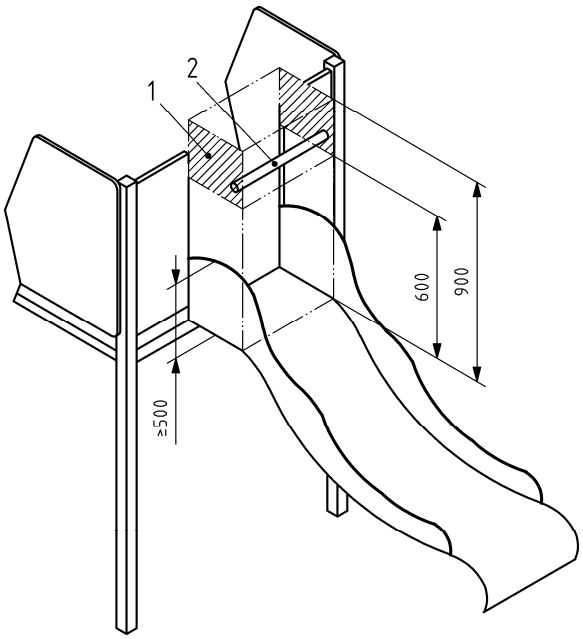
For all attachment slides with a fall height greater than 1 000 mm, a crossbar across the access opening shall be provided (see Figure 1a)). The crossbar shall be positioned between the platform guard rail or barrier and the start of the sliding section.

The height of the crossbar shall be between 600 mm and 900 mm above the starting section.

For attachment slides with a starting section or barrier beyond the edge of the platform, the area of the starting section between the crossbar and the platform shall comply with the same requirements as platforms.

NOTE 2 Such requirements include the height of guard rail or barrier.

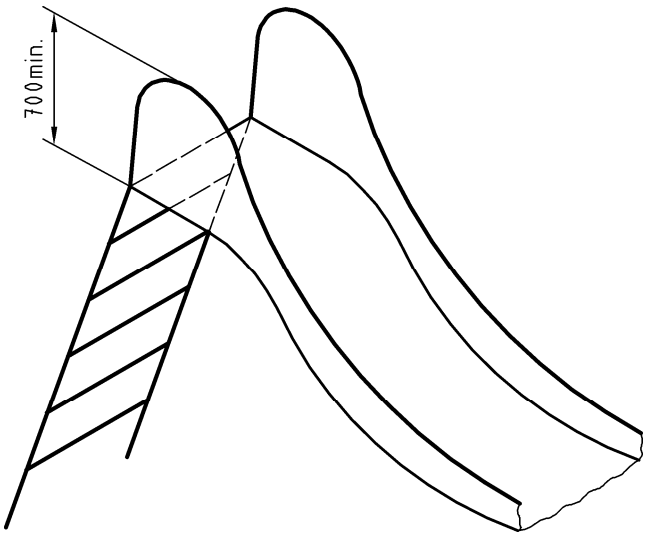
Dimensions in millimetres



Key
1 zone representing all the possible positions of a crossbar
2 crossbar

a) Example of lateral protection of a starting section for attachment slides over 1 000 mm and zone for the possible position of a crossbar

Dimensions in millimetres



b) Example of lateral protection of a starting section of a free-standing slide

Figure 1 — Examples of lateral protection

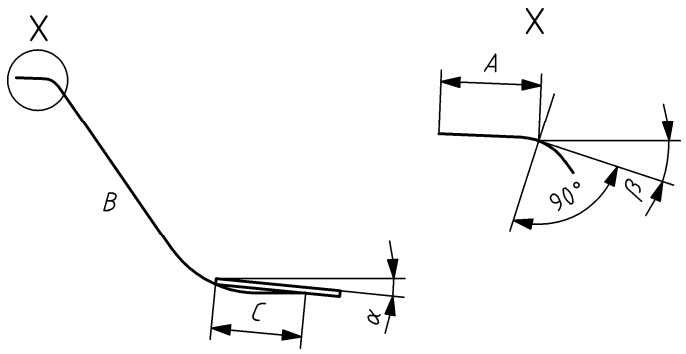
4.3 Starting section

NOTE The starting section and run-out section are illustrated in Figure 2.

4.3.1 Length and angle

Each slide shall have a starting section of at least 350 mm length. The starting section shall have a downward slope tolerance from 0° to 5° in the direction of the sliding section, the measurement being made at the centreline of the starting section.

NOTE For attachment slides the platform may be used as a starting section.



Key
A starting section measured along the surface of the slide
B sliding section measured along the surface of the slide
C run-out section measured along the surface of the slide
α maximum declination of the run-out section
β maximum declination of the starting section

Figure 2 — Illustration of the position of the sections of a slide

4.3.2 Guarding section

The starting section shall have a guarding section conforming to the barrier requirements of EN 1176-1 when one of the following applies:

— the length of the starting section is more than 400 mm;

— the starting section is easily accessible and has a free height of fall of more than 1 000 mm;

— the free height of fall of the starting section is more than 2 000 mm.

The guarding section shall either be a continuation of the lateral protection or be outside the plane of the lateral protection.

When the guarding section is separate from or outside the plane of the lateral protection, the maximum vertical or horizontal offset shall be less than 89 mm.

For attachment slides, the opening in the barrier shall be the same as the width of the starting section or guarding section.

For attachment slides where all or part of the starting section is beyond the platform edge, the guarding section shall have a height of at least 500 mm at some point (see Figure 1a)).

For attachment slides where the platform is used as the entire starting section, the requirements for protection against falling in EN 1176-1:2008, 4.2.4, apply.

For free-standing slides, the guarding section shall have a height of at least that required for platforms at one point (see Figure 1b)).

4.3.3 Width

The width of the starting section shall be equal to that of the sliding section. The starting section shall be designed so that it is aligned with the direction of the initial sliding movement. If the starting section is a platform or the extension of a platform the starting section can be greater in width than the sliding section.

4.3.4 Lateral protection (sides)

The lateral protection of the starting section shall be a continuous unbroken extension of the lateral protection of the sliding section.

NOTE The construction of the lateral protections may be from multiple components. Any joints should be free from entrapment and not present a hazard to users.

Any variations in the angle of declination of the top of the lateral protection in the sliding direction shall be made with a radius of at least 50 mm at some point.

4.4 Sliding section

4.4.1 Angle

The angle of declination to the horizontal of the sliding section shall not exceed 60° at any point and shall not exceed an average of 40°. The declination of the sliding section shall be measured from the centreline.

If the changes in angle of declination of slides are greater than 15°, other than for the transitional part between the starting section and the sliding section, the angle shall have a radius as follows:

a) for the initial 2 000 mm change in height, at least 450 mm; and

b) for the remainder of the slide, at least 1 000 mm.

NOTE This to help prevent the user from becoming involuntarily airborne.

4.4.2 Width

When measured as shown in Figure 3 and Figure 5b) (for flat bed slides) open and straight, non-tunnel slides with sliding sections exceeding 1 500 mm in length shall have a width (*W*) of the sliding section of either:

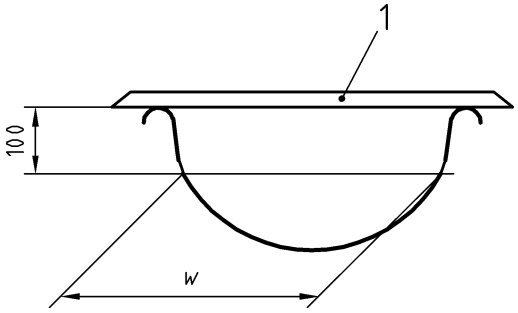
a) less than 700 mm; or

b) more than 950 mm.

Each track of a multi-track slide shall have a width of less than 700 mm.

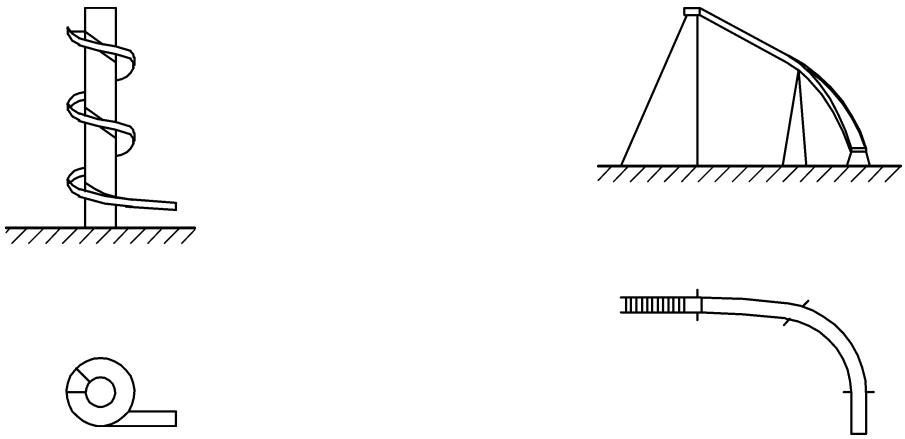
When measured as shown in Figure 3 helical or curved slides (see Figure 4 for examples) shall have a width (*W*) of the sliding section of less than 700 mm.

Dimensions in millimetres



Key
1 rule
w width of sliding section

Figure 3 — Measurement of width of sliding section



a) Helical slide **b) Curved slide**

Figure 4 — Typical examples of helical and curved slides

4.4.3 Sides and profile of the slide

The sliding section shall have solid lateral protection of heights (*p*) (see Figure 5a) and Figure 5b)) as given in Table 1, when measured perpendicular to the sliding section surface.

In the case of flat-sided slides, the sides shall not tip out from the vertical by more than 30° (see Figure 5b)).

In the case of curved profile sided slides, the profile of the sliding section shall be designed in such a way that the short arm of the template (see Figure 5c)) remains horizontal when placed with the long arm perpendicular to the sliding surface at the highest internal point of the inner face of the side (see Figures 5d)) and Figure 5e)).

Table 1 — Height of lateral protection

Dimensions in millimetres

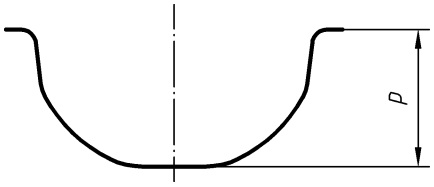
Free height of fall *h*	Height of lateral protection *p*
≤ 1 200	≥ 100
> 1 200 ≤ 2 500	≥ 150
> 2 500 height	≥ 500
Easily accessible (see EN 1176-1:2008, 3.24) >2 000	≥ 500

The sides shall be perpendicular to the sliding surface or curved or angled at an obtuse angle to the sliding surface.

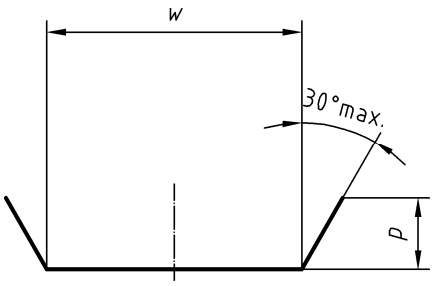
The edges of the sides shall be rounded with a radius of at least 3 mm or provided with a means for protection from injury to the user.

In the case of multi track slides, the track divider shall have a minimum height of 100 mm and shall be rounded with a radius of at least 3 mm. Track dividers shall be provided for the full length of the sliding section as a minimum.

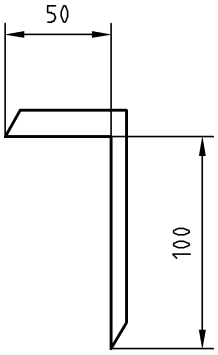
Dimensions in millimetres



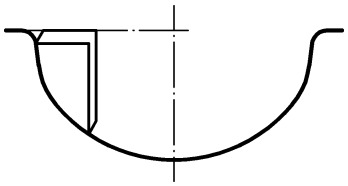
a) Measurement of height of sides of curved profile sliding section



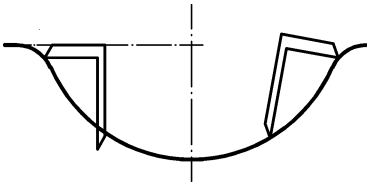
b) Measurement of width, height and inclination of sides of flat sided sliding section



c) Template for determining profile of curved profile sliding section



d) Application of template to curved profile sliding — Pass condition



e) Application of template to curved profile sliding section — Fail condition

Key
p height of lateral protection
w width

Figure 5 — Measuring of slide profile

4.5 Run-out section

All slides shall include a run-out section, either type 1, where the run-out section is short with a long impact area, or type 2, where the run-out section is long with a short impact area.

The declination of the run-out section shall be 10° maximum (for type 1) or 5° maximum (for type 2) (see Figure 2). The minimum length of the run-out section shall be as given in Table 2.

The height (*H*) of the end of the run-out section (see Figures 6 and 7) shall be as given in Table 2.

NOTE It may be dangerous if users stop on the sliding section. Slides should be designed to prevent the user stopping unintentionally before reaching the run-out section.

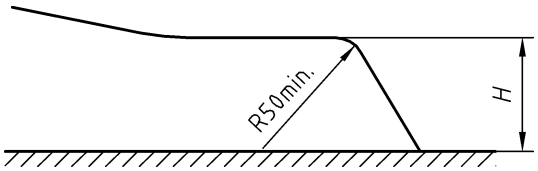
Table 2 — Length and height of run-out section

Dimensions in millimetres

<table>
<tr><th rowspan="2">Length of sliding section
B</th><th colspan="2">Minimum length of run-out section
C</th><th rowspan="2">Height of the end of run-out section
H</th></tr>
<tr><th>Type 1
α = 10° max</th><th>Type 2
α = 5° max</th></tr>
<tr><td>≤ 1500</td><td colspan="2">300</td><td>≤ 200</td></tr>
<tr><td>> 1 500
≤ 7 500</td><td>> 500
with end of slide in accordance with Figures 6 or 7</td><td rowspan="2">> 0,3 x length of sliding section, B</td><td rowspan="2">≤ 350</td></tr>
<tr><td>> 7 500</td><td>> 1 500
with end of slide in accordance with Figures 6 or 7</td></tr>
</table>

The end of type 1 slide run-outs shall turn down into the ground with a radius of at least 50 mm or reverse at an angle of at least 100° (see Figures 6 and 7).

Dimensions in millimetres

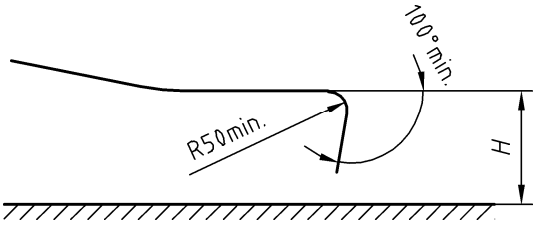


Key

H height of the end of slide run-out

Figure 6 — Example of continuation of the end of the slide to the ground

Dimensions in millimetres



Key

H height of the end of slide run-out

Figure 7 — Example of a slide ending above the ground

4.6 Surface of the slide

The design of slides and accessible structures around them shall be such that no part of clothes can become trapped (see EN 1176-1:2008, D.3).

NOTE 1 The surface of the slide length and of the lateral protection (sides) should be manufactured in such a way as to obviate any alterations likely to cause injury after exposure to weathering or other stresses arising during use.

NOTE 2 Should the slide surface be constructed from more than one piece of material it should be fabricated so as to eliminate gaps at the joints so that they inhibit the introduction of sharp objects such as razor blades and splinters. The preferred method of protecting against this problem is by manufacturing one piece slide surfaces.

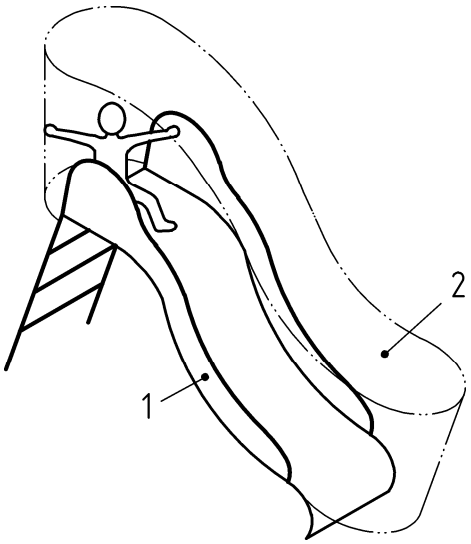
4.7 Free space

The free space starts at the beginning of the starting section and finishes at the end of the run-out section (see Figure 8). Certain slide features, e.g. crossbar, hoods or similar, may be present in the free space as they provide additional safety. If present, any such features shall conform to the relevant requirements EN 1176-1, e.g. entrapment.

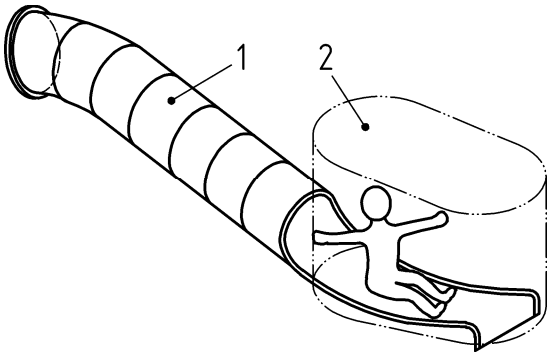
Central supporting posts on spiral slides may be used in the free space.

For open spiral slides, the height of the free space shall be 1 000 mm minimum (see EN 1176-1:2008, 4.2.8.2.3).

In the case of multi-track slides, the free spaces may overlap.



a) Non-tunnel slide



b) Tunnel slide

Key
1 space occupied by the equipment
2 free space

Figure 8 — Examples of the free space of slide

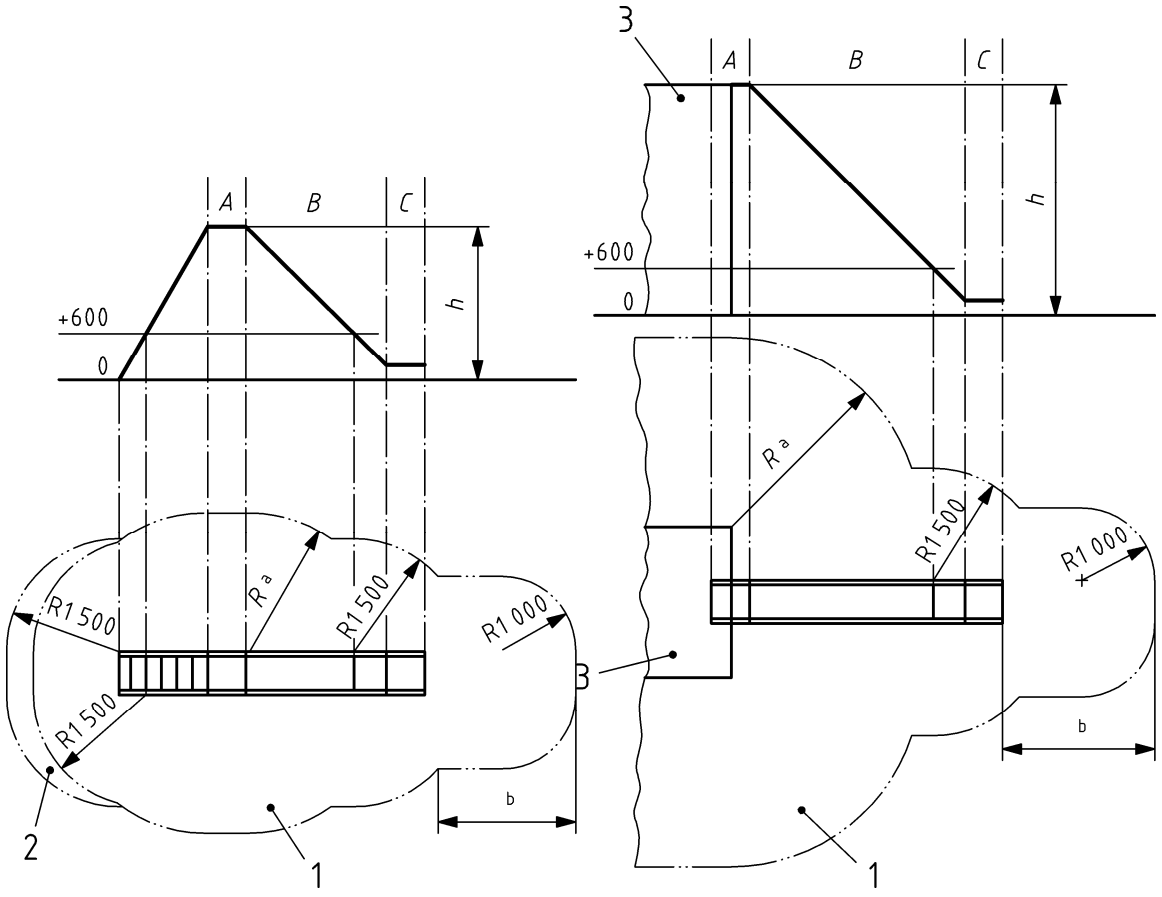
4.8 Impact area

In addition to the requirements given in EN 1176-1, the impact area shall be provided to a distance of at least 1 000 mm to the sides of the run-out section. The impact area shall be provided to a distance of at least 2 000 mm beyond the required run-out section for type 1 and 1 000 mm beyond the end of the required run-out section for type 2 (see Figure 9).

NOTE The required run-out section is as calculated in accordance with 4.5, Table 2.

The surface around the run-out section shall have critical fall height of at least 1 000 mm.

Dimensions in millimetres



a) Free-standing slide **b) Attachment slide**

Key

A starting section
B sliding section
C run-out section
1 impact area
2 impact area surface with no test requirement (see EN 1176-1:2008, 4.2.8.5.3)
3 play structure
h free height of fall
[a] depending on free height of fall
[b] depending on the type of run-out section

Figure 9 — Impact area of slides

4.9 Tunnel and mixed tunnel slides

4.9.1 Clearance

Enclosed sections of tunnel slides shall have a minimum internal height of 750 mm, when measured perpendicular to the sliding surface, and a minimum internal width of 750 mm.

4.9.2 Position

Tunnel sections shall start at least at the end of the starting section and shall not extend into the run-out section.

Tunnel sections shall be continuous over their whole length.

5 Test reports

Test reports shall be in accordance with EN 1176-1:2008, Clause 5, in addition to the following:

a) test report regarding compliance with EN 1176-3;

b) certification of conformity with the relevant requirements of EN 1176-1 and EN 1176-3;

c) the number and date of this European Standard, i.e. EN 1176-3:2008.

6 Marking

Slides shall be marked in accordance with EN 1176-1:2008, Clause 7.

Marking shall be positioned on the slide in a location that will be visible when erected on site.

Annex A
(informative)

A–deviations

A-deviation: National deviation due to regulations, the alteration of which is for the time being outside the competence of the CEN/CENELEC national member.

This European Standard does not fall under any Directive of the EU. In the relevant CEN/ CENELEC countries these A-deviations are valid instead of the provisions of the European Standard until they have been removed.

Deviation	
Country France	National Regulation Decree no. 94-699 of 10 August 1994 defining the safety requirements for community playgrounds
Sub-clause 4.2 The provisions of sub-clause 4.2 are completed in France as follows: For all slides, the entrance to the slide must be designed in such a way as to discourage any attempt to access it in an upright position.	Annex II, 3, a) This part of the decree indicates that “the entrance to the slide must be designed in such a way as to discourage any attempt to access it in an upright position".

Bibliography

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

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British Standards Institution (BSI)

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

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