

2. EN 1176-3:2017 Playground equipment and surfacing Part 3: Additional specific safety requirements and test methods for slides

Scope:

1. This European Standard 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.
2. 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 to inclined surfaces that do not contain and guide the user, e.g. banister rails (inclined parallel bars).

Sample size/weight:	Weight: 205kg (Claimed by Client)	Total number of users:	2-3
Age range:	3-14 YEARS	Number of tested samples:	1

Clause	Test Method & Test Requirement	Rating
2	Normative references	
3	Terms and definitions	
4	Safety requirements	
4.1	General Slides shall conform to EN 1176-1 unless otherwise specified in this part of EN 1176.	P
4.2	Access Access to the starting section shall be by means of an access ladder, stairs, climbing section or device. 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 1 000 mm maximum unless guarding is provided (see 4.3.2). For all attachment slides with a fall height greater than 1 000 mm, a rail or crossbar across the access opening shall be provided (see Figure 1a)). The rail or crossbar shall be positioned between the platform guard rail or barrier and the start of the sliding section. The height of the rail or crossbar shall be between 600 mm and 900 mm above the starting section.	P



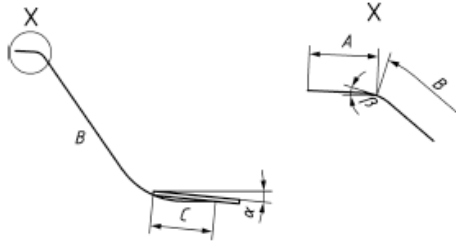
Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <https://www.sgs.com/any/terms-and-conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing/inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

Building 30 and Building 18, Heimudan Science Park, Tianning District, Changzhou, Jiangsu, China 213017 t (86-519) 8558 7753 www.sgs.com.cn
 中国·江苏·常州市天宁区黑牡丹科技园30幢、18幢 邮编: 213017 t (86-519) 8558 7753 sgs.china@sgs.com

Clause	Test Method & Test Requirement	Rating
	<p>For attachment slides with a starting section or barrier beyond the edge of the platform, the area of the starting section between the rail or crossbar and the platform shall comply with the same requirements as platforms in EN 1176-1. NOTE Such requirements include the height of guard rail or barrier.</p> <p style="text-align: center;">Dimensions in millimetres</p> <p>Key 1 zone representing all the possible positions of a rail or crossbar 2 crossbar</p> <p>a) Example of lateral protection of a starting section for attachment slides over 1 000 mm and zone for the possible position of a rail or crossbar</p> <p>b) Example of lateral protection of a starting section of a free-standing slide</p> <p style="text-align: center;">Figure 1 — Examples of lateral protection</p>	
4.3	Starting section	P
4.3.1	<p>Length and angle</p> <p>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.</p> <p>For attachment slides the platform may be used as a starting section.</p>	P



Clause	Test Method & Test Requirement	Rating
	 <p>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</p> <p>Figure 2 — Illustration of the position of the sections of a slide</p>	
4.3.2	<p>Guarding section</p> <p>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.</p> <p>The guarding section shall either be a continuation of the lateral protection or be outside the plane of the lateral protection.</p> <p>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.</p> <p>For attachment slides, the opening in the barrier shall be the same as the width of the starting section or guarding section.</p> <p>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)).</p> <p>For attachment slides where the platform is used as the entire starting section, the requirements for protection against falling in EN 1176-1:2017, 4.2.4, apply.</p> <p>For free-standing slides, the guarding section shall have a height of at least that required for platforms at one point (see Figure 1b)).</p>	P
4.3.3	<p>Width</p> <p>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 may be greater in width than the sliding section.</p>	P
4.3.4	<p>Lateral protection (sides)</p>	



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <https://www.sgs.com/eng/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

SGS-CSTC (常州) 技术服务有限公司
 Inspection & Testing Services
 Building 30 and Building 18, Heimudan Science Park, Tianning District, Changzhou, Jiangsu, China 213017 t (86-519) 8558 7753 www.sgs.com.cn
 中国·江苏·常州市天宁区黑牡丹科技园30幢、18幢 邮编: 213017 t (86-519) 8558 7753 sgs.china@sgs.com

Clause	Test Method & Test Requirement	Rating
	The lateral protection of the starting section shall be a continuous unbroken extension of the lateral protection of the sliding section. The construction of the lateral protection 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	P
4.4.1	Length and angle The length of the initial straight sliding section shall not exceed 7 000 mm. The length of the second and subsequent straight sliding sections after a bend shall not exceed 5 000 mm. NOTE 1 Background information and rationale regarding limiting straight sliding sections are given in informative Annex B. 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 2 This to help prevent the user from becoming involuntarily airborne.	P
4.4.2	Width When measured in accordance with 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 in accordance with 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.	P



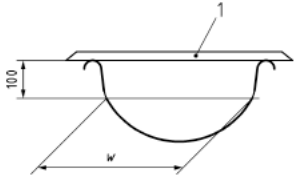
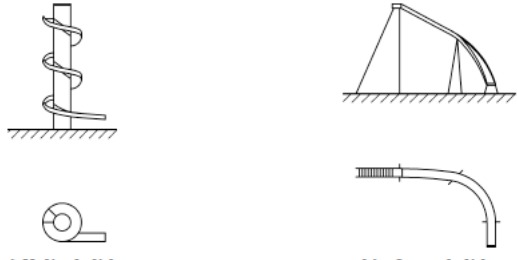
Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <https://www.sgs.com/en/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

SGS-CSTC Suzhou Technical Services (Changzhou) Co., Ltd.
Hardlines

Building 30 and Building 18, Heimudan Science Park, Tianning District, Changzhou, Jiangsu, China 213017
中国·江苏·常州市天宁区黑牡丹科技园30幢、18幢 邮编: 213017

t (86-519) 8558 7753 www.sgs.com.cn
t (86-519) 8558 7753 sgs.china@sgs.com

Clause	Test Method & Test Requirement	Rating										
	<p style="text-align: right;">Dimensions in millimetres</p>  <p>Key 1 rule w width of sliding section</p> <p style="text-align: center;">Figure 3 — Measurement of width of sliding section</p>  <p style="text-align: center;">Figure 4 — Typical examples of helical and curved slides</p>											
4.4.3	<p>Sides and profile of the slide</p> <p>The sliding section shall have solid lateral protection of heights (p) (see Figure 5a) and Figure 5b)) in accordance with 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)).</p> <p style="text-align: center;">Table 1 — Height of lateral protection</p> <p style="text-align: right;">Dimensions in millimetres</p> <table border="1" data-bbox="303 1523 1045 1736"> <thead> <tr> <th>Free height of fall <i>h</i></th> <th>Height of lateral protection <i>p</i></th> </tr> </thead> <tbody> <tr> <td>≤ 1 200</td> <td>≥ 100</td> </tr> <tr> <td>> 1 200 ≤ 2 500</td> <td>≥ 150</td> </tr> <tr> <td>> 2 500 height</td> <td>≥ 500</td> </tr> <tr> <td>Easily accessible (see EN 1176-1:2017, 3.24) > 2 000</td> <td>≥ 500</td> </tr> </tbody> </table> <p>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.</p>	Free height of fall <i>h</i>	Height of lateral protection <i>p</i>	≤ 1 200	≥ 100	> 1 200 ≤ 2 500	≥ 150	> 2 500 height	≥ 500	Easily accessible (see EN 1176-1:2017, 3.24) > 2 000	≥ 500	P
Free height of fall <i>h</i>	Height of lateral protection <i>p</i>											
≤ 1 200	≥ 100											
> 1 200 ≤ 2 500	≥ 150											
> 2 500 height	≥ 500											
Easily accessible (see EN 1176-1:2017, 3.24) > 2 000	≥ 500											



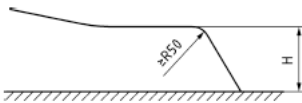
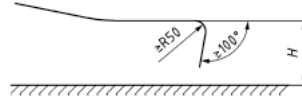
Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <https://www.sgs.com/en/terms-and-conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

Building 30 and Building 18, Heimudan Science Park, Tianning District, Changzhou, Jiangsu, China 213017 t (86-519) 8558 7753 www.sgs.com.cn
 中国·江苏·常州市天宁区黑牡丹科技园30幢、18幢 邮编: 213017 t (86-519) 8558 7753 sgs.china@sgs.com

Clause	Test Method & Test Requirement	Rating
	<p>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.</p> <p>a) Measurement of height of sides of curved profile sliding section</p> <p>b) Measurement of width, height and inclination of sides of flat sided sliding section</p> <p>Dimensions in millimetre</p> <p>c) Template for determining profile of curved profile sliding section</p> <p>d) Application of template to curved profile sliding — Pass condition</p> <p>e) Application of template to curved profile sliding section — Fail condition</p> <p>Key p height of lateral protection w width</p> <p>Figure 5 — Measuring of slide profile</p>	
4.5	<p>Run-out section</p> <p>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.</p> <p>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 in accordance with Table 2.</p> <p>The height (H) of the end of the run-out section (see Figures 6 and 7) above the ground shall be as given in Table 2.</p> <p>It can 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.</p>	P



Clause	Test Method & Test Requirement	Rating																		
	<p>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° in accordance with Figures 6 and 7.</p> <p style="text-align: center;">Table 2 — Length and height of run-out section</p> <p style="text-align: right; font-size: small;">Dimensions in millimetres</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Length of sliding section <i>B</i></th> <th colspan="2" style="width: 50%;">Minimum length of run-out section <i>C</i></th> <th style="width: 25%;">Height of the end of run-out section <i>H</i></th> </tr> <tr> <td style="text-align: center;">—</td> <td style="text-align: center;">Type 1 $\alpha = 10^\circ$ max</td> <td style="text-align: center;">Type 2 $\alpha = 5^\circ$ max</td> <td style="text-align: center;">—</td> </tr> </thead> <tbody> <tr> <td style="text-align: center;">$\leq 1\,500$</td> <td colspan="2" style="text-align: center;">300</td> <td style="text-align: center;">≤ 200</td> </tr> <tr> <td style="text-align: center;">$> 1\,500$ $\leq 7\,500$</td> <td style="text-align: center;">> 500 with end of slide in accordance with Figures 6 or 7</td> <td rowspan="2" style="text-align: center;">$> 0,3 \times$ length of sliding section, <i>B</i></td> <td rowspan="2" style="text-align: center;">≤ 350</td> </tr> <tr> <td style="text-align: center;">$> 7\,500$</td> <td style="text-align: center;">$> 1\,500$ With end of slide in accordance with Figures 6 or 7</td> </tr> </tbody> </table> <p>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° in accordance with Figures 6 and 7.</p> <p style="text-align: right; font-size: small;">Dimensions in millimetres</p>  <p>Key <i>H</i> height of the end of slide run-out</p> <p style="text-align: center;">Figure 6 — Example of continuation of the end of the slide to the ground</p> <p style="text-align: right; font-size: small;">Dimensions in millimetres</p>  <p>Key <i>H</i> height of the end of slide run-out</p> <p style="text-align: center;">Figure 7 — Example of a slide ending above the ground</p>	Length of sliding section <i>B</i>	Minimum length of run-out section <i>C</i>		Height of the end of run-out section <i>H</i>	—	Type 1 $\alpha = 10^\circ$ max	Type 2 $\alpha = 5^\circ$ max	—	$\leq 1\,500$	300		≤ 200	$> 1\,500$ $\leq 7\,500$	> 500 with end of slide in accordance with Figures 6 or 7	$> 0,3 \times$ length of sliding section, <i>B</i>	≤ 350	$> 7\,500$	$> 1\,500$ With end of slide in accordance with Figures 6 or 7	
Length of sliding section <i>B</i>	Minimum length of run-out section <i>C</i>		Height of the end of run-out section <i>H</i>																	
—	Type 1 $\alpha = 10^\circ$ max	Type 2 $\alpha = 5^\circ$ max	—																	
$\leq 1\,500$	300		≤ 200																	
$> 1\,500$ $\leq 7\,500$	> 500 with end of slide in accordance with Figures 6 or 7	$> 0,3 \times$ length of sliding section, <i>B</i>	≤ 350																	
$> 7\,500$	$> 1\,500$ With end of slide in accordance with Figures 6 or 7																			
4.6	<p>Surface of the slide</p> <p>The design of slides and accessible structures around them shall be such that no part of clothes can become trapped (see EN 1176-1:2017, D.3). 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. If the slide surface is 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.</p>	P																		
4.7	<p>Free space</p> <p>The free space starts at the end of the starting section and finishes at the end of the run-out section (see Figure 8). Certain slide features, e.g. rail or</p>																			



Clause	Test Method & Test Requirement	Rating
	<p>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 in EN 1176-1, e.g. entrapment.</p> <p>Central supporting posts on spiral slides may be used in the free space.</p> <p>For open spiral slides, the height of the free space shall be 1 000 mm minimum (see EN 1176-1:2017, 4.2.8.2.3).</p> <p>In the case of multi-track slides, the free spaces may overlap.</p> <p>a) Non-tunnel slide</p> <p>b) Tunnel slide</p> <p>Key 1 space occupied by the equipment 2 free space</p> <p>Figure 8 — Examples of the free space of slide</p>	
4.8	<p>Impact area</p> <p>Different to the requirements given in EN 1176-1, the impact area shall be provided to a distance of at least 1 000 mm from the outer edge of the run-out section of the slide. End corners can be rounded off with a radius of maximum 1 000 mm (see Figure 9).</p> <p>The impact area for type 1 and a sliding section less than 1 500 mm shall be provided to a distance of at least 1 500 mm beyond the required run-out section. If the slide section is more than 1 500 mm, the impact area shall be provided to a distance of at least 2 000 mm beyond the required run-out section and 1 000 mm beyond the end of the required run-out section for type 2 (see Figure 9).</p> <p>The surface of the impact area around the run-out section shall have an adequate level of impact attenuation at least equivalent to a free height of fall of 1 000 mm.</p> <p>The impact area shall be provided to a distance of at least 1 000 mm around the run-out section.</p>	NC



Clause	Test Method & Test Requirement	Rating
	<p>Dimensions in millimetres</p> <p>a) Free-standing slide b) Attachment slide</p> <p>Key A starting section B sliding section C run-out section 1 impact area 2 impact area surface with no test requirement (see EN 1176-1:2017, 4.2.8.5.3) 3 play structure h free height of fall R_a extent of the falling space depending on free height of fall b depending on the type of run-out section/length sliding section</p> <p>Figure 9 — Impact area of slides</p>	
4.9	Tunnel and mixed tunnel slides	NA
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.	NA
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.	NA
5	Test reports	
6	Marking Slides shall be marked in accordance with EN 1176-1:2017, Clause 7. Marking shall be positioned on the slide in a location that will be visible when erected on site.	NC
Annex A-B	Details see EN 1176-3:2017	



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <https://www.sgs.com/en/Terms-and-Conditions>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

SGS-CSTC Inspection & Testing Services (常州) Co., Ltd. | Building 30 and Building 18, Heimudan Science Park, Tianjing District, Changzhou, Jiangsu, China 213017 | t (86-519) 8558 7753 | www.sgs.com.cn
中国·江苏·常州市天宁区黑牡丹科技园30幢、18幢 邮编: 213017 | t (86-519) 8558 7753 | sgs.china@sgs.com