

**3. EN 1176-10:2023 Playground equipment and surfacing Part 10: Additional specific safety requirements and test methods for fully enclosed play equipment**

Scope:

1. This document is applicable to fully enclosed play equipment intended for installation inside and outside buildings, for children up to 14 years old, see 3.1.
2. The purpose of this document is to provide additional safety requirements covering particulars of these structures.

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

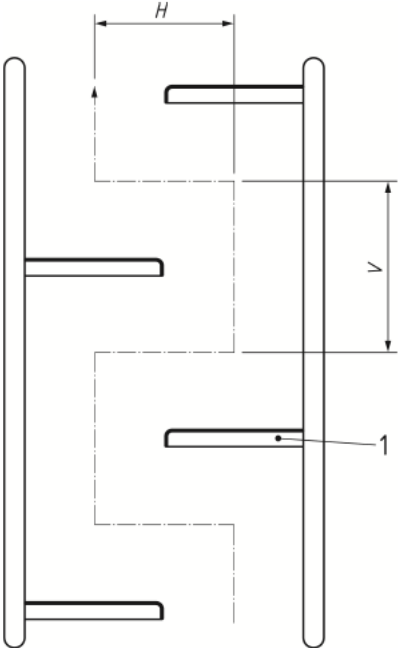
Clause	Test Method & Test Requirement	Rating
2	Normative references	
3	Terms and definitions	
4	Safety requirements	P
4.1	General  Fully enclosed play equipment shall conform to EN 1176-1 unless otherwise specified in this part of EN 1176	P
4.2	Emergency procedures and fire safety management	NC
4.2.1	Flammability of materials  Materials, components and composite parts used in the construction of enclosed play equipment shall be flame retardant. They shall be tested where practical to EN ISO 11925-2 or EN 1021-1 and EN 1021-2 or to an equivalent suitable test.	NC
4.2.2	Evacuation	P
4.2.2.1	Adult access route  Adult access routes shall conform to Table 1.  An adult access route shall have a height of at least 1300 mm and a width of at least 700 mm. Play equipment may be placed inside the adult access route only if it meets the following requirements: a) Play equipment that is placed along the vertical or horizontal surfaces of the adult access route shall not impede exit. b) Moving play equipment hanging in the evacuation route, for example punching bags, shall allow easy passage through when using a manual pushing action. c) Play equipment in the evacuation route shall not reduce the route to a	P



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	width of less than 700 mm or a height of less than 1 300 mm. d) Surface mounted Items of play equipment placed inside the adult access route shall have a depth and height of no more than 400 mm and there shall be a distance of at least 1 000 mm between any pieces of such play equipment which reduce the dimensions of the adult access route.	
4.2.2.2	Distance to the exit	P
	<p>The distance from any point in the equipment to the nearest exit shall be no greater than 18 m. There are some special cases for calculation of this distance:</p> <p>a) for a slide, the distance is half the length of the sliding surface; b) for a climbing tower, add vertical and horizontal distances between the geometric centres of the openings (see Figure 2).</p>  <p><b>Key</b> 1 platform H horizontal distance V vertical distance</p> <p><b>Figure 2 — Measuring distances within a climbing tower</b></p>	P
4.2.2.3	Access and egress	P
	<p>The number of access and egress points shall conform to Table 1.</p> <p>Access/egress points shall be located so as to distribute evacuation through different zones of the play equipment (see Table 1 and Formula (1)).</p>	P



Clause	Test Method & Test Requirement	Rating																																																												
	<p align="center"><b>Table 1 — Adult access routes, access and egress points</b></p> <table border="1"> <thead> <tr> <th>Capacity<sup>a</sup></th> <th>Highest platform</th> <th>Minimum number of access and/or egress points</th> <th>Maximum distance from any point to an adult access route<sup>b</sup></th> </tr> </thead> <tbody> <tr> <td rowspan="4">1 to 20</td> <td>0 m ≤ 2 m</td> <td>2</td> <td>10 m</td> </tr> <tr> <td>&gt; 2 m ≤ 4 m</td> <td>2</td> <td>10 m</td> </tr> <tr> <td>&gt; 4 m ≤ 6 m</td> <td>2</td> <td>10 m</td> </tr> <tr> <td>&gt; 6 m</td> <td>2</td> <td>10 m</td> </tr> <tr> <td rowspan="4">21 to 50</td> <td>0 m ≤ 2 m</td> <td>2</td> <td>10 m</td> </tr> <tr> <td>&gt; 2 m ≤ 4 m</td> <td>2</td> <td>10 m</td> </tr> <tr> <td>&gt; 4 m ≤ 6 m</td> <td>3</td> <td>10 m</td> </tr> <tr> <td>&gt; 6 m</td> <td>3</td> <td>10 m</td> </tr> <tr> <td rowspan="4">51 to 100</td> <td>0 m ≤ 2 m</td> <td>2</td> <td>10 m</td> </tr> <tr> <td>&gt; 2 m ≤ 4 m</td> <td>2</td> <td>10 m</td> </tr> <tr> <td>&gt; 4 m ≤ 6 m</td> <td>3</td> <td>5 m</td> </tr> <tr> <td>&gt; 6 m</td> <td>4</td> <td>5 m</td> </tr> <tr> <td rowspan="4">101 to 200</td> <td>0 m ≤ 2 m</td> <td>3</td> <td>5 m</td> </tr> <tr> <td>&gt; 2 m ≤ 4 m</td> <td>3</td> <td>5 m</td> </tr> <tr> <td>&gt; 4 m ≤ 6 m</td> <td>4</td> <td>5 m</td> </tr> <tr> <td>&gt; 6 m</td> <td>4</td> <td>5 m</td> </tr> <tr> <td>≥ 201</td> <td>—</td> <td>In accordance with Formula (1)</td> <td>5 m</td> </tr> </tbody> </table> <p><sup>a</sup> Number of users, calculated according to 4.2.2.4  <sup>b</sup> If the maximum distance is sufficient to reach the exit, an adult access route is not necessary inside the equipment.</p> $n_{min} = \left( \frac{c_1}{50} \right) + 1 \quad (1)$ <p>where  <math>n_{min}</math> is the minimum number of access and/or egress points;  <math>c_1</math> is the capacity.</p>	Capacity <sup>a</sup>	Highest platform	Minimum number of access and/or egress points	Maximum distance from any point to an adult access route <sup>b</sup>	1 to 20	0 m ≤ 2 m	2	10 m	> 2 m ≤ 4 m	2	10 m	> 4 m ≤ 6 m	2	10 m	> 6 m	2	10 m	21 to 50	0 m ≤ 2 m	2	10 m	> 2 m ≤ 4 m	2	10 m	> 4 m ≤ 6 m	3	10 m	> 6 m	3	10 m	51 to 100	0 m ≤ 2 m	2	10 m	> 2 m ≤ 4 m	2	10 m	> 4 m ≤ 6 m	3	5 m	> 6 m	4	5 m	101 to 200	0 m ≤ 2 m	3	5 m	> 2 m ≤ 4 m	3	5 m	> 4 m ≤ 6 m	4	5 m	> 6 m	4	5 m	≥ 201	—	In accordance with Formula (1)	5 m	
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4.2.2.4	Capacity	P																																																												
	<p>The capacity, <math>c_1</math>, shall be calculated by the manufacturer, taking into account:</p> <p>a) the strength of the structure in accordance with EN 1176-1;  b) practical use based upon Formula (2).</p>	P																																																												





Clause	Test Method & Test Requirement	Rating
	Fully enclosed play equipment has a number of unique features that make a different hazard approach to EN 1176-1 necessary. Requirements are given in 4.3.4.2 and 4.3.4.3 for specific features.	
4.3.4.2	<p>Falling space and impact areas</p> <p>Where a foam wall less than 600 mm high has been installed to offer containment, the falling space/impact area may be reduced to 1 000 mm, see Figure 3a.</p> <p>a) less than 600 mm high, 1000 mm plus space b) more than 600 mm high, 1500 mm plus space</p> <p>Figure 3 — Falling space</p> <p>For all other areas where there is a free height of fall greater than 600 mm but less than or equal to 1 500 mm (see Figure 3b), the extent of the falling space and impact area as given in EN 1176-1:2017, 4.2.8.2.5, may be reduced around the accessible parts of the equipment if protection against impact is provided to the surrounding vertical surfaces or reduced further in the case of spinning poles.</p>	NC
4.3.4.3	<p>Proximity to hard or projecting surfaces</p> <p>Where a structure is installed in close proximity to external hard or projecting surfaces the enclosure shall be a minimum distance of 200 mm away from the surface or projecting parts unless suitably protected.</p>	NA
4.3.5	<p>Connections and platform</p> <p>Connections shall be inspected in accordance with 5.1. Connections and platforms shall be secured such that they cannot come loose of their own accord unless specifically designed to do so. Connections shall be safeguarded so that they cannot be undone without tools.</p>	P
4.3.6	<p>All rope features shall be securely knotted and strand ends treated to prevent fraying. Care shall be taken when heat sealing nylon rope to avoid hard edges.</p> <p>Where users are undergoing forced movement or passing quickly underneath rope nets and crossings, these shall be designed to prevent limbs falling/passing through the standing surface where there is a risk of causing injuries to the user and other users passing underneath. In these situations, a mesh with openings up to 50 mm can be added to prevent limbs</p>	NA



Clause	Test Method & Test Requirement	Rating
	from passing through. Where rope features go over a rigid bar they should be secured against movement.	
4.3.7	Foam play features  Where foam play features are included in areas that are intended for running/walking and are provided adjacent to a flexible material (e.g. nets), the gap between the materials needs to be secured by suitable means (e.g. eyeletted strip) to close the gap. This requirement does not apply to surfaces inclined at more than 38 degrees from the horizontal or features less than 300 mm high.	NA
4.3.8	Lighting  Light fittings should be appropriately protected and be inaccessible to children.	NA
4.3.9	Signage  Adequate and clear signage shall be displayed, to include at least: a) age group(s) or height(s) of children; b) capacity; c) emergency signs; d) rules of play.	NA
4.4	Specific equipment	P
4.4.1	Slides  Slides installed in a fully enclosed playground equipment are excluded from the maximum length requirements listed in EN 1176-3:2017, 4.4.1. All other parts of this clause shall still be applicable.	P
4.4.2	Drop slides	NA
4.4.2.1	General  Drop slides shall conform to EN 1176-3 unless otherwise specified in this document. NOTE It is important for drop slides to be supervised when they are in use.	NA
4.4.2.2	Access  The starting section shall be secured against access when no trained staff is available to monitor safe use.	NA
4.4.2.3	Starting section  Each slide shall have a horizontal starting section at least 1 000 mm long.	NA



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Clause	Test Method & Test Requirement	Rating
	The starting section shall be separated from travelling routes.	
4.4.2.4	<p>Sitting position</p> <p>The radius in the sitting position between the starting and sliding sections shall be at least 100 mm to avoid bumping the back of the head.</p>	NA
4.4.2.5	<p>Lateral protection (sides)</p> <p>Lateral protection shall be provided on each side of a drop slide. The top edge of the lateral protection shall be continuous from the starting section to the sliding section and the run-out section.</p> <p>Where the slide starts at or below 2 000 mm, lateral protection shall be provided to a height of at least 500 mm, measured at 90° from the surface of the slide.</p> <p>Where the slide starts above 2 000 mm, lateral protection shall be provided to a height of at least 750 mm, measured at 90° from the surface of the slide.</p> <p>NOTE Lateral protection can be made up of the slide walls plus any extension that provides containment.</p>	NA
4.4.2.6	<p>Sliding section</p> <p>Angles of declination may exceed those given in EN 1176-3 to an angle of at least 15° from the vertical.</p>	NA
4.4.2.7	<p>Run-out section</p> <p>At the run-out section a velocity of 5 m/s shall not be exceeded, assuming a coefficient of friction of <math>\mu = 0,3</math>. The length of the run-out section shall be calculated according to the velocity.</p> <p>NOTE Calculation for the length of a horizontal run-out section until the stop point can be carried out by Formula (3).</p> $l = \frac{v^2}{2 \cdot g \cdot \mu}$ <p>where</p> <ul style="list-style-type: none"> <li><math>l</math> is the length of the horizontal run-out section, in metre;</li> <li><math>v</math> is the velocity, in metre per second;</li> <li><math>g</math> is the acceleration due to gravity, in metre per square second;</li> <li><math>\mu</math> is the coefficient of friction.</li> </ul>	NA
4.4.2.8	<p>Impact area</p> <p>Where the slider stops before the end of the run-out section, the clearance distance beyond the end may be reduced to 1 000 mm for drop slides.</p>	NA
4.4.3	Overhead track rides (rigid)	NA



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Clause	Test Method & Test Requirement	Rating
	<p>4.4.3.1 The traveller shall be fixed into position within the overhead track with movement restricted by the provision of end stops.</p> <p>4.4.3.2 There shall be only one traveller on each overhead track.</p> <p>4.4.3.3 The traveller shall be protected to prevent the possibility of the users trapping their fingers in the overhead track as the traveller moves along. The means of protection shall be integrated into the design of the traveller or by a covering device.</p> <p>4.4.3.4 The end stop at the starting point or terminus shall be of suitable energy absorbing material and shall be located a minimum of 1 200 mm from the back enclosure or a distance of 75 % of the total length of the linkage element.</p> <p>4.4.3.5 For overhead track rides arranged in parallel, segregation shall be provided between the two units. NOTE This is typically constructed from materials that present no risk of entrapment or impact injury.</p> <p>4.4.3.6 Linkage elements shall be designed to facilitate grip and, where ropes are used, they shall be between 16 mm and 45 mm in diameter. The grip shall not be enclosed (e.g. a loop).</p> <p>4.4.3.7 Seats shall be designed so that the user can get off the seat at any time. Seats shall be made of, or covered by, suitable impact attenuating material. The underside of the seat shall have a minimum ground clearance of 250 mm, as shown in Figure 4, a) and b). NOTE Seats comprising hoops or straps are unsuitable.</p> <p>4.4.3.8 Clearance shall be provided to a distance of at least 1 200 mm to each side of the overhead track unless a form of enclosure is provided to prevent accidental impact between users.</p> <p>4.4.3.9 Impact attenuating surfacing shall have a level of impact attenuation at least equivalent to a free height of fall of 1 000 mm in the impact area.</p>	



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	<p style="text-align: right;">Dimensions in millimetres</p> <p style="text-align: center;"><b>Figure 4 — Overhead track ride in fully enclosed playground equipment</b></p>	
<p>4.4.4</p>	<p><b>Spinning poles</b></p> <p>The impact area around the spinning pole shall have critical fall height of at least 600 mm.</p> <p>The axis of support of the spinning platform shall not be inclined at an angle of more than 5° from the vertical.</p> <p>The ground clearance shall be between 60 mm and 110 mm, maintained for the whole of the underside of the spinning platform and it shall be smooth.</p> <p>The diameter of the spinning platform shall not exceed 600 mm.</p> <p>If installed within a thoroughfare, the maximum overall width of the thoroughfare shall be 1 200 mm (see Figure 5a).</p> <p>If installed within a contained area and not in a thoroughfare, the maximum dimension from the outer edge of the spinning platform and the edge of the area shall be 1 000 mm (see Figure 5b).</p> <p>Spinning poles are exempt from the requirements for forced movement.</p> <p>Spinning poles may be installed in a cluster where the distance between items is less than or equal to 500 mm. On sides where the user is not</p>	<p>NA</p>



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	<p>enclosed a 1,5 m falling space and impact area is required as per the requirements of EN 1176-1:2017, 4.2.8.2.4 and 4.2.8.2.5.</p> <p>a) spinning pole installed in a thoroughfare      b) spinning pole installed in an enclosed area</p> <p>Key 1 enclosure 2 spinning pole</p> <p>Figure 5 — Spinning pole</p>	
4.4.5	<p>Ball pool</p> <p>4.4.5.1 Any ball pool shall be designed to minimize ball spillage during normal play.</p> <p>4.4.5.2 The floor surface of the ball pool shall conform to the requirements for a critical fall height of at least 600 mm.</p> <p>4.4.5.3 Sides that are easily cleaned shall be provided.</p> <p>4.4.5.4 The base shall be continuous-level floor surfacing designed to prevent objects that might present a hazard from being lodged in gaps.</p> <p>4.4.5.5 To minimize the dangers of concealment of children in a ball pool, the maximum depth shall not exceed 600 mm in a ball pool intended for use by children over 36 months, and 450 mm in a ball pool intended for use by children up to 36 months.</p> <p>4.4.5.6 Balls shall be a minimum of 60 mm in diameter to prevent choking.</p> <p>4.4.5.7 Any point of entry into a ball pool or any accessible platform within a ball pool shall not exceed a height of 1 000 mm from the base of the ball pool.</p> <p>4.4.5.8 A ball pool shall only be part of a slide run-off area if it is:</p> <p>a) separated from ball pool areas used for general play;</p> <p>b) visible from viewing and supervision areas;</p> <p>c) limited to 400 mm maximum depth of balls.</p> <p>The length of such a ball pool shall be at least 2 000 mm, measured from the end of the slide runoff. Such a ball pool shall be clear of obstructions.</p>	NA
4.4.6	Cannons	NA



Clause	Test Method & Test Requirement	Rating
	Balls shall be a minimum size of 60 mm in diameter.	
4.4.7	<p>Bouncing elements in indoor play structures</p> <p>Bouncing facilities shall conform to EN 1176-1 unless otherwise specified in this document.</p> <p>The bouncing element bed surface shall be made from a smooth, uniform continuous surface secured by suitable means.</p> <p>Bouncing elements shall not be located adjacent to each other without a dividing net that fully encloses the individual bays.</p> <p>Bouncing Element surround and roof netting shall be fitted with anti-climb material with openings less than 8 mm.</p> <p>Signage shall be provided in a prominent position, indicating that only one user should be on a bouncing element at one time.</p> <p>Entrances to bouncing elements shall have a device fitted to prevent accidental escape from bed into other areas and collisions with other users. Examples of access restriction might include but are not limited to:</p> <ul style="list-style-type: none"> <li>— A bar, fixed at a height of 600 mm to 850 mm from the lower edge of the opening., with the area above the bar fitted with anti-climb material with openings less than 8 mm;</li> <li>— A net enclosure with a reinforced opening slit;</li> <li>— Other solutions may also be appropriate.</li> </ul> <p>Entrances into the bouncing element are to be directly from outside the play structure or from an open area of the play structure with clear visibility.</p> <p>Subject to risk assessment, the height of the roof net should be a minimum of 2,0 m above the bouncing element bed surface for a small bouncing element.</p> <p>Where a large bouncing element is provided, the clearance should be calculated as 1,5 times the total area of the bed surface. Once 3,5 m of clearance is achieved using this calculation, there is no need to provide any additional clearance. In addition to these requirements, a minimum clearance of 300 mm above the net shall be provided, free from projections or hard surfaces. Where the minimum height requirements for roof netting and additional clearances are already provided, a hard-flat surface may be allowed in place of the netting.</p> <p>Where springs are used to secure the bed, they shall not be easily accessed by users and shall be covered with a suitable protective cover which overlaps onto the bouncing element bed and provides sufficient coverage when loaded with a static weight of 69,5 kg applied to the middle of the suspension bed. Where other measures are used to secure the bouncing element bed, the securing elements shall be fully covered in order to prevent limbs slipping through.</p>	NA
4.4.8	<p>Electrically powered equipment</p> <p>4.4.8.1 Electrical appliances incorporated into fully enclosed play equipment should meet the specific standards for that equipment and should be installed according to manufacturer's instructions, national regulations can also apply.</p> <p>4.4.8.2 The electrical supply cords shall not be accessible to users.</p>	NA



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Clause	Test Method & Test Requirement	Rating
5	Inspection and maintenance information to be provided by the manufacturer or supplier	NC
5.1	The manufacturer or supplier shall provide instructions for maintenance marked with the number of this part of EN 1176 (see also 5.4), which shall include a statement that the frequency of inspection will vary with the type of equipment or materials used and other factors, for example heavy use, levels of vandalism, air pollution, age of equipment. Drawings and diagrams necessary for maintenance, inspection and checking of correct operation and, when appropriate, repair of the equipment shall also be provided.	NC
5.2	The instructions shall specify the frequency with which the equipment or its components should be inspected or maintained.	NC
5.3	The instructions shall also specify at least the following:  a) where necessary, the servicing points and methods of servicing, for example lubrication, tightening of bolts, re-tensioning of ropes and nets; b) replacement parts shall comply with the manufacturer's specifications; c) whether special disposal treatment is required for some equipment or parts; d) identification of spare parts; e) any additional measures to be taken during the run-in period, for example tightening of fastenings, tensioning of ropes and nets; f) all damaged balls shall be removed from ball pools as they are found. Balls shall be maintained to an even depth throughout the ball pool; g) safety surfacing shall be maintained.	NC
5.4	The instructions for maintenance shall include advice or statements on the following: a) that installations or equipment of the fully enclosed play equipment shall be maintained in accordance with regional, national and local standards and/or regulations: 1) electrical; 2) gas; 3) lifting; 4) fire detection; 5) firefighting; 6) ventilation. b) a routine inspection document which is tailored to the specific needs of the facility and includes advice, is obtainable from the supplier, the document shall be completed daily by the owner/operator (subject to risk assessment); c) that fully enclosed play areas shall be efficiently maintained and cleaned at all times; d) that points of access shall be positioned throughout the play frame to facilitate passage for cleaning and maintenance personnel and equipment; e) that all cleaning and maintenance access points shall be capable of being secured against	NC



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Clause	Test Method & Test Requirement	Rating
	unauthorised access when not in use.	
5.5	Safety measures and procedures shall be installed.  The operator of a playground should periodically, at least once a year, systematically assess the effectiveness of all safety measures used (including the recommendations given in this document and any published amendments) and alter them if it is found necessary on the basis of experience, or if circumstances have changed. Defects that occur during operation and which put safety at risk should be corrected without delay. If this is not possible, the equipment should be secured against use, for example by immobilization or removal. There should be written operational procedures covering the measures to be taken in emergencies.	NC
6	Test reports	
7	Marking	NC
	Fully enclosed play equipment shall be marked in accordance with EN 1176-1:2017, Clause 7. Marking shall be positioned on the equipment in a location that will be visible when erected on site.	NC

**4. Refer to EN 1069-1-2017+A1-2019 Water slides - Part 1: Safety requirements and test methods (only test clause 7.2 & 8.3)**

Scope:

This European Standard is applicable to all water slides installed in swimming pools of public use.

This Standard specifies general safety requirements for water slides in swimming pools of public use and specific requirements for defined types of water slides. These specific safety requirements are also applicable to undefined types as far as possible.

These requirements concern safety and the technical rules for design, calculation and testing.

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
7	<b>Safety requirements for water slides</b>	
7.2	<b>Entrapment</b> To prevent risk of entrapment the requirements of EN 13451-1:2011+A1:2016, 4.7 and EN ISO 13857:2008, 4.2.2 and 4.2.3 shall be complied with for the complete installation.	Pass



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