

HAGS®

Time to inspect your playground

**A guide to safety
requirements of European
standard EN 1176**

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A brief guide to safety requirements of European standard, EN 1176

In public areas, there are many pieces of equipment available for use. For example, there could be roller sports areas, parkour, benches, play, gym and fitness equipment etc.

Different equipment categories refer to different published Standards. Specifically for Playground equipment the standard is EN 1176, which should be referenced along with national laws and local regulations. Regardless of when equipment is provided, it must always be safe.

The Product Safety Act, within the EU, requires that products supplied in a public environment should be safe. Under this Act, the primary route suggested is by ensuring the equipment is in accordance with a published valid standard. This requirement applies regardless of where the equipment is provided or when the equipment was installed. In some countries, there are also national laws referring to the standard for play equipment.

In this document, we refer to the standard of playground equipment EN 1176 with the aim of increasing the understanding of the standard.



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 need to keep children safe from serious harm.

The principles of safety management are applicable both to workplaces in general, as well as 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 may 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 may 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 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, for example, head and neck entrapment and protection against inadvertent falls, have been written with this in mind. It is also recognised 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 increased size of head or wearing helmets.

Those responsible for safety inspection of play equipment must have an in-depth understanding of the standards to ensure compliance is fully considered. This leaflet covers the most critical areas of the EN 1176 standard. Although for full detailed information, it is recommended that actual standard publications are referenced.



Inspection - Maintenance and Operation

Service, maintenance and inspection

- It is essential that play equipment has been installed correctly and is serviced, maintained and inspected regularly to ensure user safety and proper operation.
- Equipment must be installed by qualified professionals and in accordance with manufacturer's specification.
- Equipment must be serviced, maintained and inspected by qualified professionals with the expertise and experience for the job and in compliance with manufacturer's specification.
- Procedures related to design procurement, operation, installation, maintenance and inspection shall be established and performed according to manufacturer's instruction or more frequently.
- As required, consideration shall also be given to the local environment, including extreme weather conditions such as heat, cold, rain, location, wind or high user areas, local use factors or where vandalism is commonplace.
- The owners or the person responsible for operation of the play equipment must ensure that appropriate service, maintenance and inspection schedules and procedures are in place. A separate document is available from HAGS, which gives general and product specific guidance on service, maintenance and operational inspection.

Children's Safety - A question worth asking?

It is unlikely that we will ever be able to eliminate risks altogether. After all, risks don't only include physical hazards, but factors that can curb the development of children too. Our ambition must always be to create interesting, stimulating environments for children to play in, with risks that children can understand and overcome. It is here that we can use our knowledge of how children play and demonstrate just how much we care.

Fact 1 - Children have the right to play (UN's Convention on the Rights of the Child).

Fact 2 - Responsibility for maintaining and managing playgrounds to minimize the risk of accidents is governed by statutory law.

Fact 3 - The European safety standard EN 1176 provides guidance on hazard assessment, and control.

Fact 4 - The landowner/playground owner/operator is responsible for safety (This will be covered in different ways according National laws).

Fact 5 - The product safety act covers playground equipment and states that those who manufacture, supply and operate the products are equally responsible for product safety.

Safety Aspects

This concerns all adults who come into daily contact with children. Parents, teachers, pre-school staff, park staff, property maintenance employees and many others. The check list on the following pages provides information from EN 1176 that will help with safety judgments relating to Playground equipment, however it is not intended to be a replacement of the full published standard.

Checklist - for easy access/inclusive play areas

The UN child convention states that children's right to play should be respected and supported. Information and advice about how this can be managed in public areas are published in the technical report CEN/TR16467:2013 - 'Playground equipment accessible to all children'. The guidelines in this report state that not all places i.e. playgrounds, could fit every child. There might be obstacles i.e. budget or limited area. However, it is hoped that, by adopting the information provided, all play areas in some way can become more inclusive. There is a moral and legal duty upon us all to ensure that, whatever their ability, each child has a chance to reach their full potential. This will not come from focusing on the lowest common denominator of ability, but by offering each and every child a level of challenge that they can learn to manage and thus develop their skills and move on to further challenges. If we don't plan and adapt public areas, the alternative is exclusion and this might affect children with disabilities and their families. This will also effect other children since they tend to "assign status" on each other during play - and the ones who contribute during play are expected to contribute during life. This perception is established during childhood and is very difficult to alter as a youth or adult. The consequences of some children being excluded from public playgrounds has the effect of excluding them from the world of other children, which sets the stage for how we interact as adults in society.

(More information can be found in the Technical Report, which can be ordered from HAGS Aneby AB).

Unacceptable Gaps and Openings

- Fingers: 8-25mm for equipment with forced motion e.g. slides, fireman's pole etc at heights in excess of 1.0m above ground level. Tested in compliance with EN 1176-1.
- Feet: Gaps more than 30mm on walking surfaces inclined at $<45^\circ$ and which do not yield to pressure.
- Openings 89-230mm. The size of the opening is tested regardless of whether the play equipment is easily accessible or not. EN 1176-1 probes C or E and D. A set of probes can be purchased from HAGS.
- Openings should not include sections which form V-shaped openings at an angle of less than 60° and at a height of 0.6m or more above the ground level.

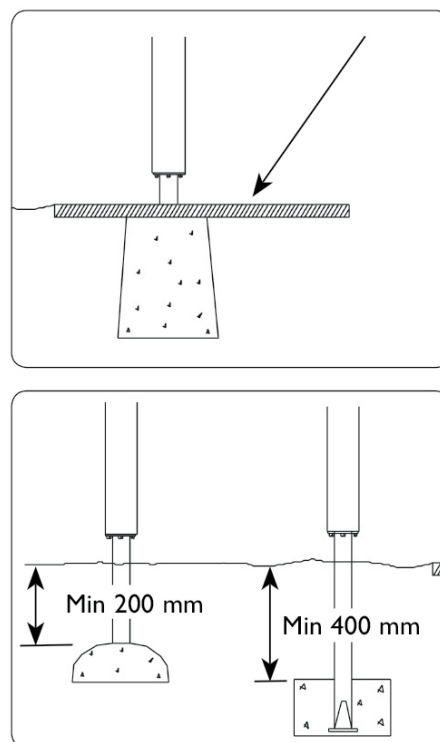
Moving parts

- Make sure there is no risk of entrapment between moving parts and fixed parts (>12 mm). See table - This where hazards can occur.

Anchoring

- Play equipment and other equipment must be firmly anchored. See Fig 1.
- Check for stability and risk of tipping. This is particularly important for structures that rely on one post for their stability.

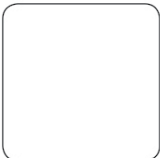
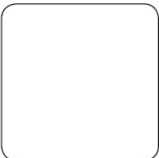
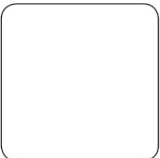
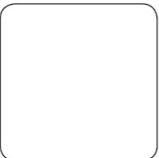
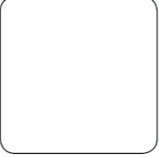
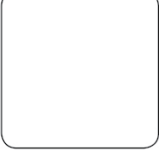
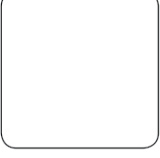
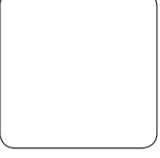
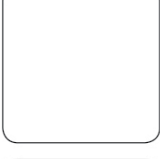
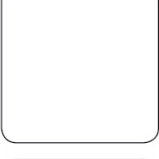
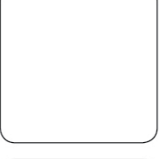
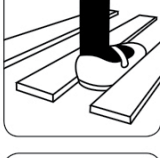
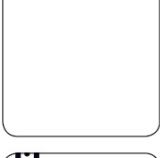
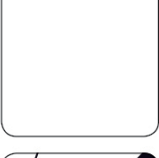
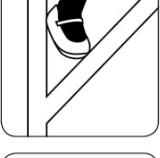
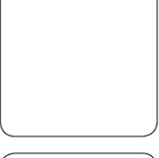
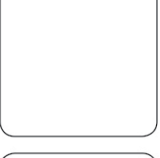
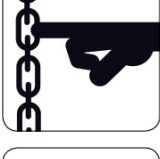
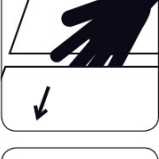
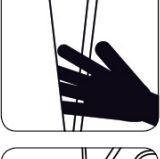
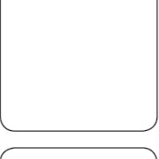
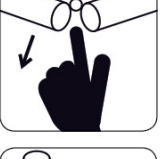
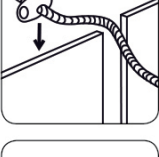
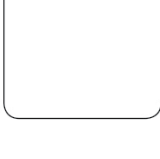
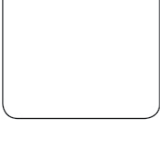
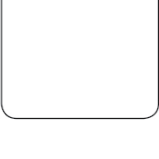
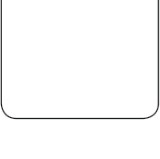
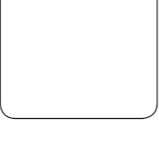
Fall Protection - Fig 1



Spare parts

- Always use original spare parts and those that have been tested for safety.

This is where hazards can occur

	Completely bounded openings		Partially bounded openings	V-shaped openings	Projecting parts	Moving parts
	Rigid	Non-rigid				
Whole body						
Head/neck head first						
Head/neck feet first						
Arm and hand						
Leg and foot						
Finger						
Clothing						
Hair						

Surfaces - Impact surface

- The maximum free fall height is 3.0m. See special requirements for climbing frames, swings, slides, roundabouts etc.
- Impact-attenuating surface in accordance with EN 1176 and where necessary tested to EN 1177.
- Surface areas should be free draining.

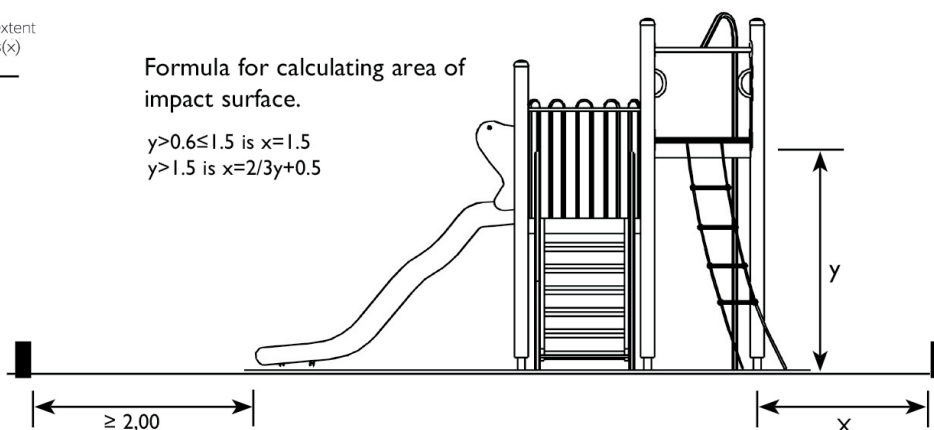
Impact-attenuating surfacing must extend at least 1.5m beyond the play equipment that has forced movement or a fall height greater than 0.6m. For fall heights over 1.5m see table C. (Special requirements apply to surfacing around swings, slides, cableway and roundabouts).

Table C*	
Fall height metres (y)	Area extent metres(x)
0,6-1,5	1,50
1,6	1,57
1,7	1,63
1,8	1,70
1,9	1,77
2,0	1,83
2,1	1,90
2,2	1,97
2,3	2,03
2,4	2,10
2,5	2,17
2,6	2,23
2,7	2,30
2,8	2,37
2,9	2,43
3,0	2,50

Formula for calculating area of impact surface.

$y > 0.6 \leq 1.5$ is $x = 1.5$

$y > 1.5$ is $x = 2/3y + 0.5$



Rubber:

- Prefabricated tiles are placed on an even, drained base.
- Pored in place mixture is placed on an even, drained base.

Other synthetic material:

- See manufacturer instruction.

Loose fill material i.e. sand, gravel, bark and wood chips:

For sand and gravel HAGS recommend a particle size between 0.5-5mm which is as uniform in size as possible.

Recommended fill thickness for loose fill material:

Thickness for loose material	Fall Height up to
200mm + 100mm	2.00m
300mm + 100mm	3.00m

The values above take account on the fact that loose fill material is displaced during frequent play. Other thickness's are possible where a specific material has been confirmed by a laboratory test.

Other types of loose fill material:

Impact-attenuating materials of a type not mentioned in EN1176 must be tested and verified by an EU accredited testing facility to the procedure in EN 1177. When using sand and gravel additional checks can also be carried out in accordance with EN 933.

Checklist - play equipment

Beams and crossbars

- No projecting or protruding components are allowed in the head and feet area. (Unobstructed area) See Fig. 2.

Floors and decking

- For equipment not easily accessible: Platforms higher than 1.0m must incorporate protection against falls in the form of a guard rail with a height of 600-850mm at the top edge. Platforms higher than 2.0m must incorporate a protective barrier that is at least 700mm high. See Fig. 3.
- For easily accessible equipment: Platforms higher than 600mm above the play area must have a protective barrier at least 700mm high. See Fig. 4.
- Barriers must not incorporate intermediate horizontal bars which encourage climbing.

Swings

- Use short-link chain or equivalent materials.
 - Maximum of 2 swing seats per swing bay.
 - Unobstructed space between ground and underside of swing seat must be more than 350mm. The gap must be more than 400mm for tyre swing seats.
 - Distance between swing seats: see table A.
 - Unobstructed space and extent of impact absorbent material in front of swing. See table B.
- L_1 = tested loose fill surface.
 L_2 = tested, flush synthetic, plus 0.5m unobstructed space.

Suspension bridges

- Openings for suspension bridges must be >230mm (stressed or unstressed). See Fig. 5.
- In compliance with EN 1176-1.

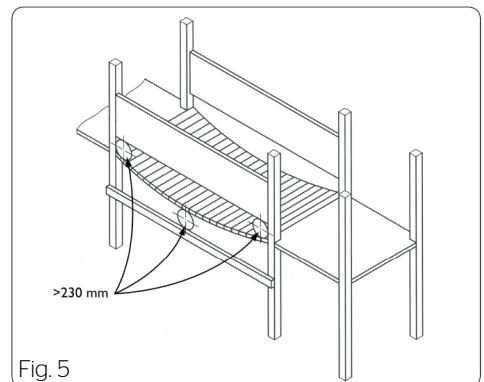
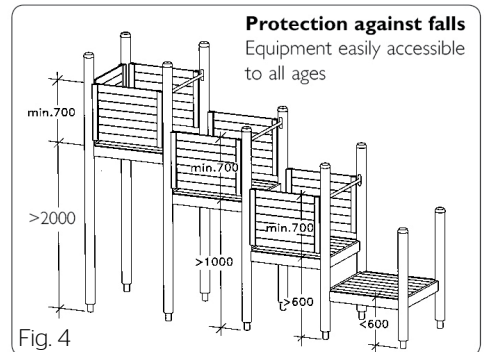
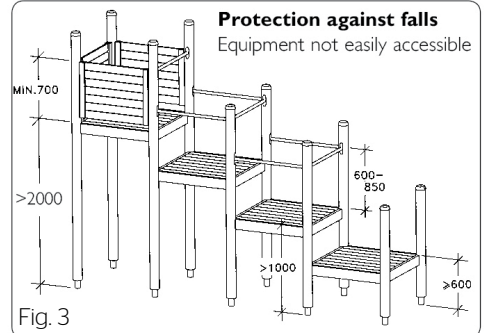
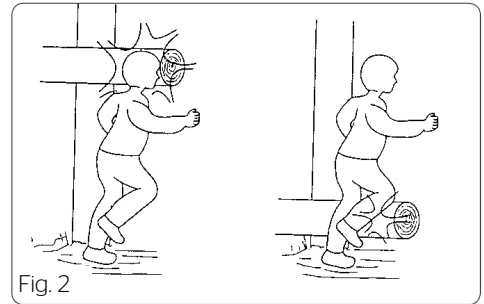


Table A

l	x	y
1,4	0,48	0,58
1,6	0,52	0,62
1,8	0,56	0,66
2,0	0,60	0,70
2,2	0,64	0,74
2,4	0,68	0,78
2,6	0,72	0,82

Table B

l	L_1	L_2
1,4	3,47	2,97
1,6	3,64	3,14
1,8	3,82	3,32
2,0	3,99	3,49
2,2	4,17	3,67
2,4	4,34	3,84
2,6	4,52	4,02

Roundabouts

- Depending on the roundabout type certain ground clearance requirements must be maintained. For a traditional platform roundabout, this is required to be flush, between 60 and 110mm or greater than 400mm.

Climbing nets, rope ladders and scrambling nets

- Rungs must be 16-45mm in diameter.

Chains

- Maximum opening in main chain: 8.6mm. <8.6 or >12mm at connection points.

Cableways

- The seat must be suspended at least 2.1m below the cableway wire, unless the carriage is fully enclosed, in which case it must be 1.8m.
- There must be an unobstructed space between the seat and the ground of at least 400mm when loaded with 130kg. Tension the wire as necessary.
- Free fall height max. 2.0m when sitting, or 3.0m when suspended overhead.
- The cable must be fixed at least 2.5m above ground level.
- There must be an unobstructed area of 2.0m on each side of the cableway wire and 2.0m at the exit point when the seat is at its lowest point.

Open slides

- Slides which form part of larger play arrangements must have guard rails fitted at the start platform.
- If steps are used to access an embankment slides they must not be positioned directly next to the slide.
- The safety zone must be greater than 1.5m around the climbing platform, 2.0m in front of the run-out section for type 1, 1.0m in front of the run-out section for type 2 and at least 1.5m on either side of the chute. Impact-absorbing surfacing at the run-out must comply with the surfacing specifications for a 1.0m fall height.
- Check there are no wedge-shaped openings where slides are connected to other equipment, (Risk of entrapment, toggles on clothing) which is covered by a test in EN 1176-1.
- The run-out section must not finish at a height of more than 350mm above the playing surface.
- There must not be any hard, fixed objects in the free area around the equipment.
- The run-out section of the slide should not face south to reduce the danger of burns from metal surfaces on hot sunny days.

Tubular slides

- Fit signs prohibiting climbing on the tubular sections.

Roofing

- Ensure clothing toggles cannot become trapped.

General Information

Information about our material, surface treatment, anchoring etc is separately available at – www.hags.com

Some products require ground anchoring with cast-in-place concrete. The casting components are fixed in place before concrete work starts. The strength of the concrete should correspond to at least the requirements for each product. Concrete work must be carried out by personnel with the required expertise.

For ground anchoring in loose fill material such as bark, wood chips, etc., deeper foundations will be required. Please contact your HAGS representative for further details.

Additional explanation documents are also available from National Standards bodies, which supplement the current EN 1176 standard. These are;

- TR 16396 – Playground equipment for children – Replies to requests for interpretation.
- TR 16467 – Playground equipment accessible to all children
- TR 16598 – Collection of rationales for EN 1176 - Requirements
- TR 16879 – Siting of Playground equipment

Assembly Instructions

To ensure that the play equipment is installed safely and correctly, the assembly work must be carried out in full compliance with the assembly instructions that are included in all products from HAGS. The equipment must be installed by qualified professionals. The failure to install equipment according to assembly instructions can involve safety hazards and may render the warranty null and void.

If additional assembly instructions are required, please contact your HAGS representative.

If additional assistance is needed, please contact your HAGS representative.

In order to prevent accidents, the play equipment must be made totally inaccessible until the assembly work has been fully completed.

Inspection

Once assembly work has been completed and the play equipment is securely and safely in place, it has to be inspected with regard to safety, functional performance and assembly. Any deviations must always be dealt with before the equipment is used.



Guidance for operating a playground

Information about Operation, Inspection and Maintenance: visit our website www.hags.com.

A good playground has well-designed features:

- Activity games to train motor skills
- Role-play
- Construction games to encourage creativeness
- Games that teach rules
- Sensory perception exercises
- Activities for toddlers
- Integrated for children of all abilities
- Attractive design
- Encouraging development of social skills
- Green and environmentally-friendly
- Shelter from the elements

Compare the features in your existing playground with what's on offer above. Add what's needed to widen the appeal and increase the use of your playground. Variety is the best way to make a playground more stimulating and interesting.

Playgrounds need to be more attractive than other places where children otherwise tend to play – streets, pavements, shopping centres, underground stations, construction sites, etc.

By adapting the playground to the existing surroundings, where trees, shrubs and grassy areas are part of the overall environment, you'll succeed in creating a place that's appreciated by the whole family.



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