BRITISH STANDARD

BS EN 1176-6:2008

Incorporating corrigendum August 2008

Playground equipment and surfacing —

Part 6: Additional specific safety requirements and test methods for rocking equipment

ICS 97.200.40

BSI British Standards

National foreword

This British Standard is the UK implementation of EN 1176-6:2008. It supersedes BS EN 1176-6:1998 which will be withdrawn on 31 May 2009.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It is advised that the previous version of BS EN 1176 will not be withdrawn until 31 May 2009 to give manufacturers time to amend their product lines.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

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Date	Comments
30 September 2008	Correction to national foreword

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1176-6

May 2008

ICS 97.200.40

Supersedes EN 1176-6:1998

English Version

Playground equipment and surfacing - Part 6: Additional specific safety requirements and test methods for rocking equipment

Équipements et sols d'aires de jeux - Partie 6 : Exigences de sécurité et méthodes d'essai complémentaires spécifiques aux équipements oscillants

Spielplatzgeräte und Spielplatzböden - Teil 6: Zusätzliche besondere sicherheitstechnische Anforderungen und Prüfverfahren für Wippgeräte

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.

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Ref. No. EN 1176-6:2008: E

Contents

Page

Foreword

This document (EN 1176-6:2008) 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 1176-6:1998.

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 the standard 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 sweeping seesaws supported above the users position (Type 5) and overhead single axis seesaws (Type 6).

b) The inclusion of requirements and a test method, based on the use of a ring gauge, for the projection of hand supports and foot rests.

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 is applicable to rocking equipment which is used as playground equipment for children, as defined in 3.1. Where the main play function is not rocking, the relevant requirements in this document may be used, as appropriate.

This document specifies additional safety requirements for seesaws and rocking equipment intended for permanent installation for use by children.

It is intended to provide protection to the user against possible hazards during use.

NOTE Guidance for assessing the safety of other forms of seesaw/rocking equipment is given in Annex A.

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

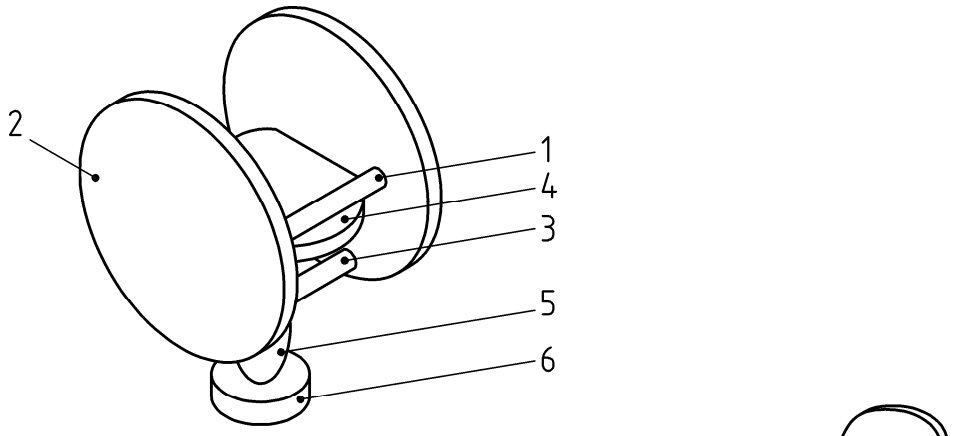
For the purposes of this document, the terms and definitions given in EN 1176-1:2008 and the following apply.

3.1
rocking equipment; seesaw (hereinafter referred to as equipment):
equipment that can be set in motion by the user and is generally characterized by a rigid element that rocks about a central support

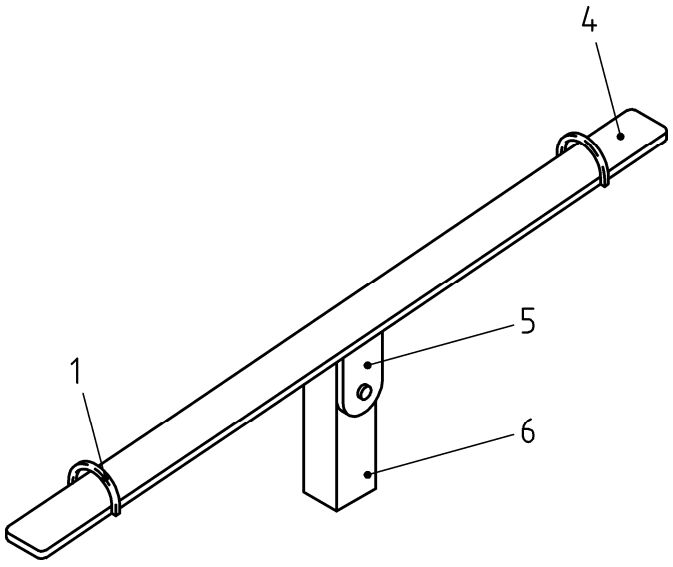
NOTE 1 The equipment can have one or several seats or stands.

NOTE 2 Figure 1a) shows the principle components for rocking equipment. Figure 1b) shows the principle components for seesaws.

NOTE 3 The seesaw/rocking movement depends on the type and configuration of fixture (see Figures 2 to 7).



a) Rocking equipment



b) Seesaw

Key

1 hand support
2 body
3 foot rest
4 seat/stand
5 supporting component
6 anchorage

Figure 1 — Principal components for rocking equipment/seesaw

3.2
axial seesaw (Type 1)
equipment in which only vertical movement can take place (see Figure 2)

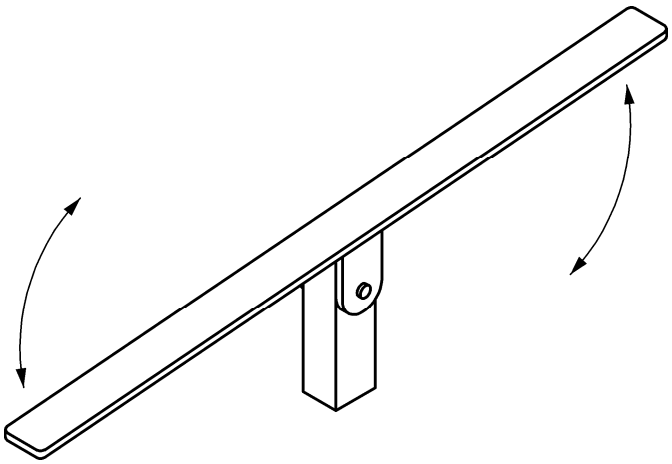
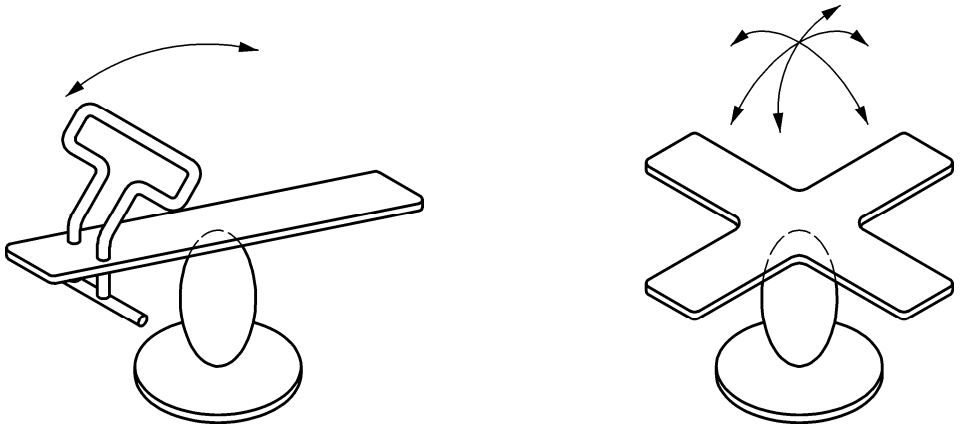


Figure 2 — Example of an axial seesaw (Type 1)

3.3
single-point seesaw/single-point rocking equipment (Type 2A and 2B)
equipment with a single-point supporting component (see Figure 3)

NOTE Typical single point supporting components include: coils, springs, torsion and compression blocks.



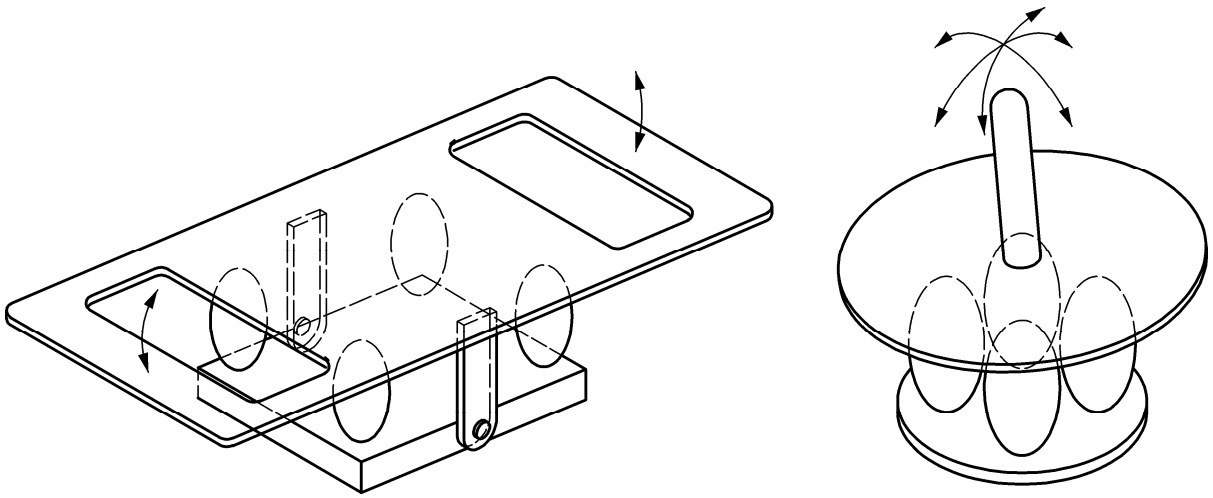
a) Type 2A with predetermined main direction of movement

b) Type 2B with multi-directional movement

Figure 3 — Examples of single-point seesaw/rocking equipment (Types 2A and 2B)

3.4
multi-point seesaw/multi-point rocking equipment (Types 3A and 3B)
equipment with several supporting components (see Figure 4)

NOTE The movement depends upon the placement and type of supporting components.



a) Type 3A with predetermined movement

b) Type 3B with multi-directional movement

Figure 4 — Examples of multi-point seesaw (Types 3A and 3B)

3.5
rocking seesaw (Type 4)
equipment that is fixed so that the movement, which is mainly horizontal, is guided by several parallel axes and moves in one (to-fro) direction only (see Figure 5)

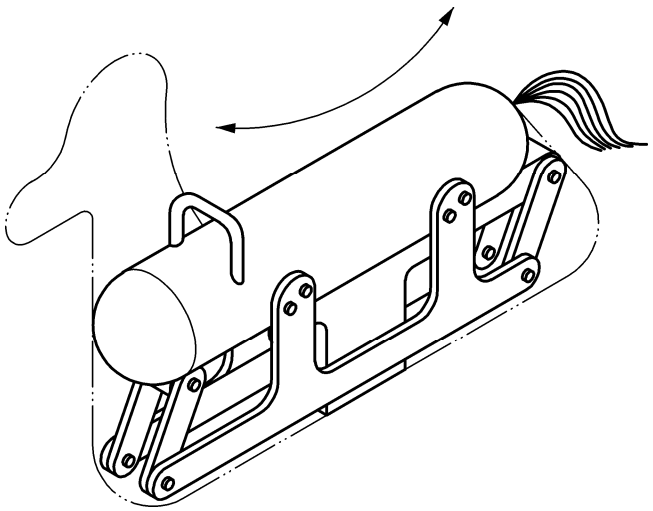
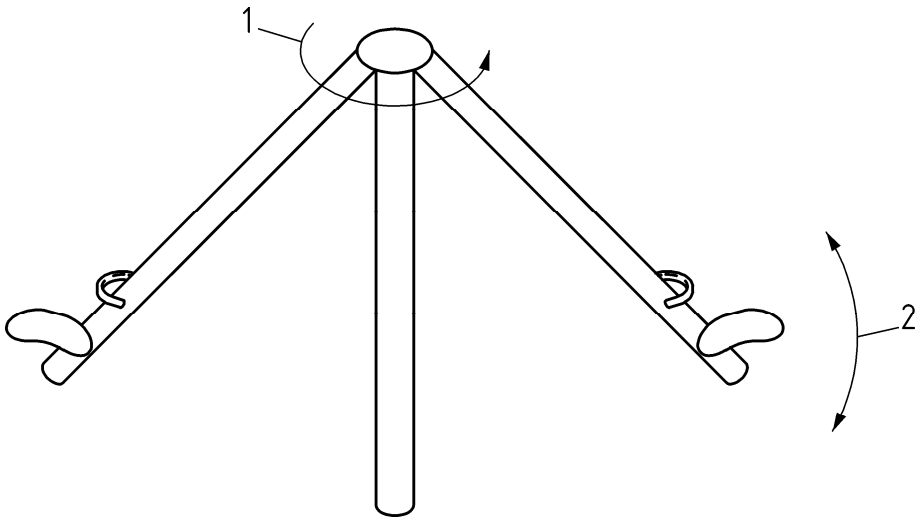


Figure 5 — Example of a rocking seesaw (Type 4)

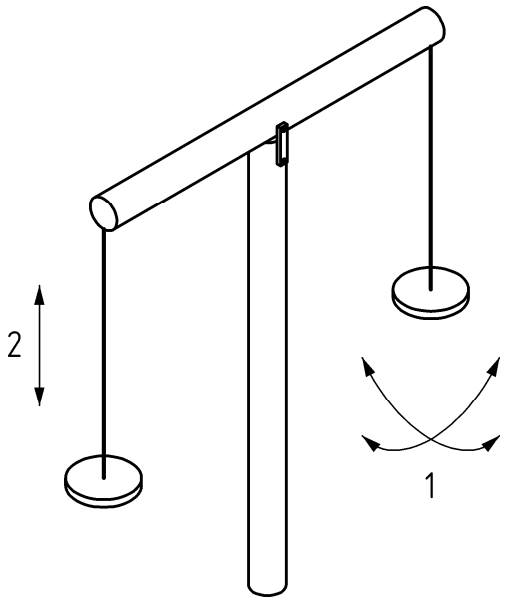
3.6
sweeping seesaw supported above the users position (Type 5)
equipment in which both vertical and horizontal movement takes place (multi-directional), which may result in a sweeping motion (see Figure 6)



Key
1 circular movement around central post
2 rocking movement

Figure 6 — Example of a sweeping seesaw supported above the users position (Type 5)

3.7
overhead single axis seesaw (Type 6)
equipment with a single overhead rocking axis, where the user stations are flexibly suspended below to provide an additional limited swinging motion (see Figure 7)



Key
1 limited swinging movement
2 rocking movement

Figure 7 — Example of overhead single axis seesaw (Type 6)

3.8
equipment body
main moving part connected to the equipment supporting component(s)

3.9
supporting component
component which connects the equipment body to the anchorage

3.10
anchorage
means by which stability and fixation to the ground/surface is made

3.11
damping
combined effect of the supporting component(s) that moderates the speed at which the equipment can move and the reduction of shock effects at the outer positions of the equipment

3.12
range of movement
maximum horizontal and/or vertical deviation of the seat/stand during use from the centre point at equilibrium position

4 Safety requirements

4.1 General

Unless otherwise specified, seesaw/rocking equipment shall conform to EN 1176-1.

4.2 Free height of fall

When measured at extreme positions of movement, the centre of the seat/stand shall have a maximum free height of fall in accordance with Table 1.

4.3 Seat/stand slope

When tested in accordance with Annex B, the maximum slope at the seat/stand shall be in accordance with Table 1.

4.4 Pinch, crush

When tested in accordance with Annex C, gaps in all accessible joints and supporting components shall conform to EN 1176-1:2008, 4.2.6 and 4.2.7.

NOTE This requirement is intended to prevent pinching and crushing.

4.5 Restraint of motion

The motion of equipment should be regulated towards the extremities of movement so that no sudden stop or sudden reversal of the motion can occur, e.g. damping.

NOTE 1 The damping effect can be:

a) constant, where the effect is constant throughout the entire range of movement;

or

b) varied, where the effect depends on the speed, mass and/or position of the rocking parts of the equipment.

NOTE 2 This is to reduce the risk of spinal injuries due to sudden shock load, e.g. by use of a spring or other damping elements.

4.6 Foot rests

Foot rests shall be provided for each seating position when both of the following apply: the ground clearance is less than 230 mm and the structure is not damped.

Foot rests shall be firmly fixed and unable to rotate without using tools.

When tested in accordance with Annex E, no part of the foot rest shall project beyond the outer face of the gauge.

4.7 Hand supports

Hand supports shall be provided for each seat/stand position.

They shall be firmly fixed and unable to rotate without using tools.

The diameter of the hand support (hand bars, grip handles) shall conform to the grip requirements of EN 1176-1:2008, 4.2.4.6.

For equipment accessible for use by younger children, the grip requirements should be selected from the lower end of the range; 30 mm maximum is recommended.

When tested in accordance with Annex E, no part of the hand support shall project beyond the outer face of the gauge.

NOTE The intention of this requirement is to reduce the hazard of eye injury from the ends of projecting hand supports, by maintaining a cross sectional area of at least 15 cm^2.

4.8 Side view profiles

Those parts of the side profile, which may give an impact on children passing by or on the user shall not have projections with a radius of less than 20 mm (see Figure 8).

Changes in the shape of the edge of the front and the back of parts, projecting from the principal profile, shall be rounded with a radius of at least 20 mm (see Figure 8).

Dimension in millimetres

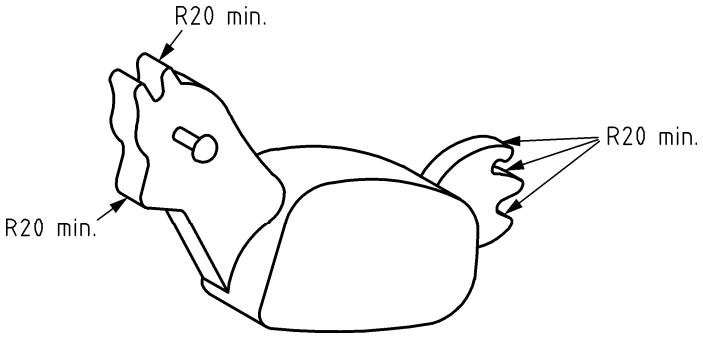


Figure 8 — Example for rounded side profile

4.9 Entrapment

Equipment shall be designed to prevent entrapment between the equipment and ground surface (see Table 1). This may be achieved by

a) having a minimum ground clearance of 230 mm; or

b) use of damping effects; or

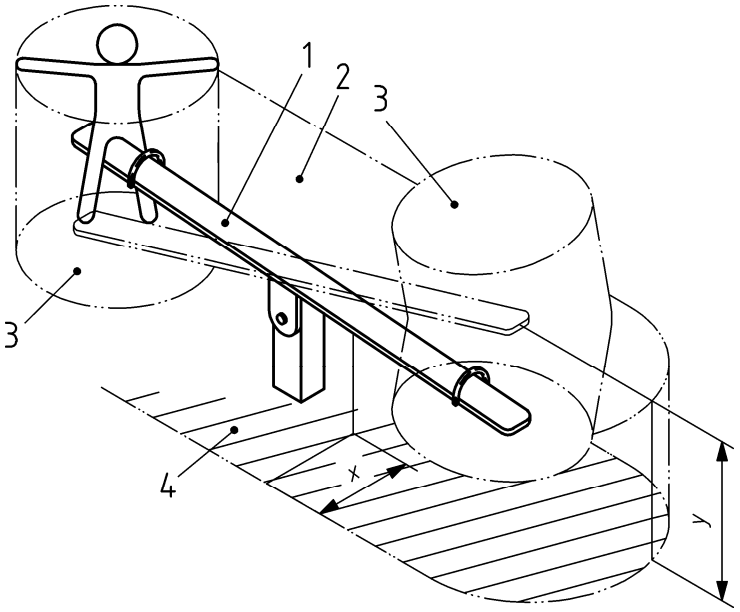
c) deflecting effects from the construction of the equipment.

NOTE Equipment which is moving mainly horizontally has, depending on the shapes of construction and the mass of equipment, deflecting effects and can deflect passing children from the equipment.

When tested in accordance with Annex C, the supporting component shall not compress by more than 5 % and it shall be possible to insert the 12 mm diameter rod at all extreme positions.

4.10 Falling space

For equipment Types 1, 2, 3 and 4, when measured from the perimeter of the equipment in its most extreme positions the falling space shall be a minimum of 1 000 mm (see Figure 9).



Key
1 space occupied by the equipment
2 falling space
3 free space
4 impact area
x extent of falling space
y height of falling space

Figure 9 — Examples of falling space of rocking equipment Type 1

For equipment Types 5 and 6, the requirements for the impact and falling space shall be in accordance with EN 1176-1:2008, 4.2.8.2.4. and 4.2.8.2.5.

Table 1 — Safety requirements

Type	Maximum free height of fall (see 4.2) mm	Maximum slope of seats/stand (see 4.3) °	Ground clearance [a] mm
1	1 500	20	230 min.
2A	1 000	30	optional
2B	1 000	30	230 min.
3A	1 000	30	optional
3B	1 000	30	230 min.
4	1 000	20	230 min.
5	2 000	–	230 min.
6	2 000	–	230 min.

[a] Minimum ground clearance is not required when:

1) there is a damping effect, e.g. the supporting component is a spring;

2) the motion of the extremity of the structure is mainly in a horizontal direction (deflecting effect).

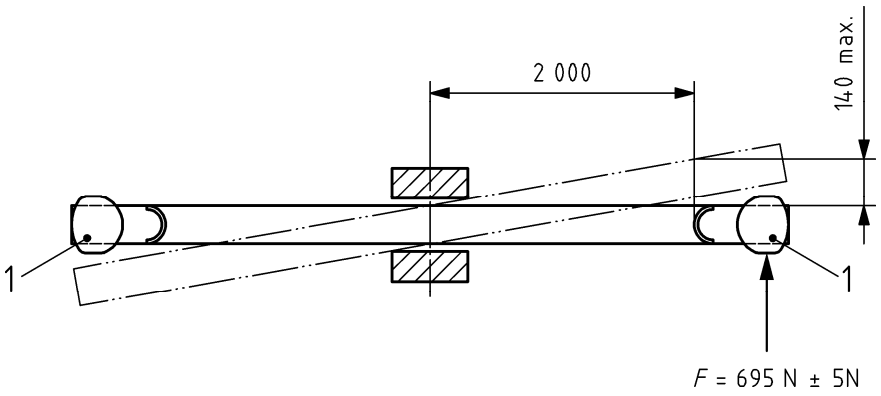
5 Additional type requirements

5.1 Axial seesaw (Type 1)

When measured at a distance of 2 000 mm from the axis point, and tested in accordance with Annex D, the lateral deviation shall not be greater than 140 mm (see Figure 10).

Suitable damping shall be provided.

Dimensions in millimetres

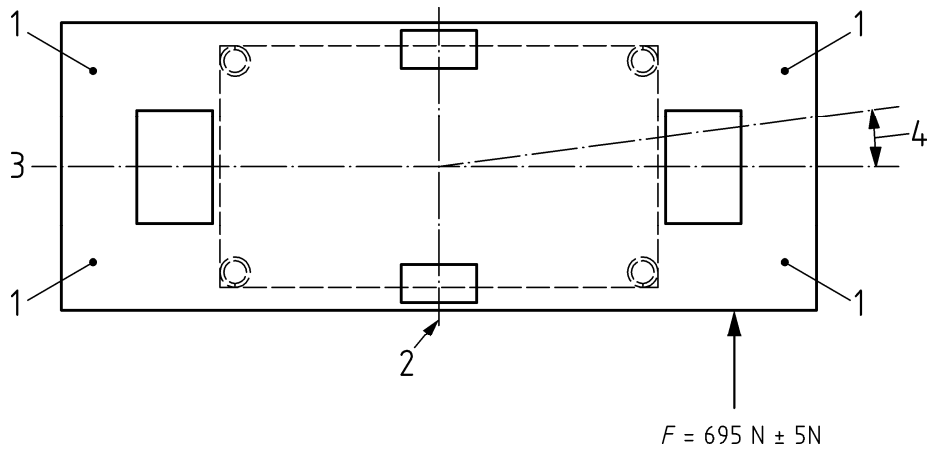


Key
1 seat

Figure 10 — Type 1 seesaw lateral deviation

5.2 Multi-point seesaw/rocking equipment (Type 3A)

For Type 3A equipment, changes in the angle during rotation around the vertical axis shall not exceed 5º when loaded with the intended number of users and tested in accordance with Annex D (see Figure 11).



Key
1 seat position
2 horizontal axis of seesaw
3 longitudinal axis of seesaw
4 deviation of longitudinal axis when application of *F*

Figure 11 — Type 3A multipoint equipment deviation (aerial view)

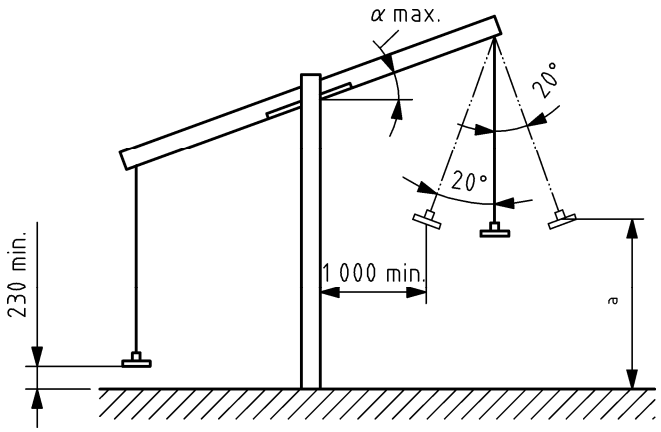
5.3 Rocking seesaw (Type 4)

The total range of the movement shall not exceed 600 mm.

5.4 Overhead single axis seesaw (Type 6)

The free height of fall of an overhead single axis seesaw shall not exceed 2 000 mm, when measured as shown in Figure 12.
The free space for a type 6 seesaw shall be as specified in EN 1176-1:2008, 4.2.8.2.3, for a seated user.

Dimensions in millimetres



Key
α maximum inclination of the beam during use of the equipment
a free height of fall

Figure 12 — Free height of fall of overhead single axis seesaw (Type 6)

NOTE As the main motion of the user is rocking, the angle of the swinging part of the motion should be not more than 20°.

6 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 1176-6;

b) certification of conformity with the relevant requirements of EN 1176-1 and EN 1176-6;

c) the number and date of this European Standard, i.e. EN 1176-6:2008.

7 Marking

Seesaw/rocking equipment shall be marked in accordance with EN 1176-1:2008, Clause 7.

Marking shall be positioned on the seesaw/rocking equipment in a location that will be visible when erected on site.

Annex A
(informative)

Guidance for assessing the safety of seesaw/rocking equipment other than Types 1 to 6

Some equipment is supplied with supporting components designed to provide motion. Such equipment is characterized by different sizes and configurations and additional safety requirements not addressed in this part of EN 1176 may need to be considered.

If there are borderline contradictions in the requirements and test methods presented in this part of EN 1176, play value should be favoured after consideration of the professional judgement of approved, reputable test houses based within the EU.

Annex B
(normative)

Determination of seat/stand slope and ground clearance

B.1 Principle

A load is applied to the equipment in the worst case position on the seat/stand, the angle of tilt is measured and the equipment is examined to see if extreme parts of the equipment touch the ground.

B.2 Apparatus

B.2.1 Device, capable of applying a force in accordance with EN 1176-1:2008, Table A.1.

B.2.2 Device for Type 2B, capable of applying a force of (167 ± 2,1) N for age group 0 to 4 years and/or a force of (279 ± 5) N for age group 0 to 8 years.

B.3 Procedure

B.3.1 Load the seat/stand in its equilibrium position, in each user position, with the test load given in EN 1176-1:2008, Table A.1. Incline the loaded seat/stand to the maximum specified seat/stand angle, as given in Table 1, and release the seat/stand. If the seat/stand does not continue moving towards the ground or if the loaded seat/stand moves back towards its equilibrium position, the equipment will be in compliance with the requirement for maximum seat/stand angle.

B.3.2 For Type 2B, apply the force in accordance with B.2.2.

Measure and record the angle of the seat/stand.

Examine and record whether the extreme parts of the equipment touch the ground.

Annex C
(normative)

Determination of freedom from pinch and crush points

C.1 Principle

The support components are loaded with a known force and the compression at the support components is measured. The equipment is moved to its extreme positions and the support components and surround part of the equipment are tested to establish whether a 12 mm diameter rod can be inserted during the course of movement.

C.2 Apparatus

C.2.1 Device**,** capable of applying a force of 695 N ± 5 N vertically in the centre line of each seat/standing surface.

C.2.2 Device for Type 2B, capable of applying a force of (167 ± 2,1) N for age group 0 to 4 years and/or a force of (279 ± 5) N for age group 0 to 8 years.

C.2.3 Rod, of 12 mm diameter.

C.3 Procedure

C.3.1 Load the equipment with a force at 695 N ± 5 N (C.2.1) and record whether the supporting component compresses by more than 5 %. For Type 2B, apply the force in accordance with C.2.2 selecting the age group that represents the worst case foreseeable use.

C.3.2 Move the equipment to one of its most extreme positions. Using the rod (C.2.3) examine the supporting component and the surrounding area to check whether the rod can be inserted.

Repeat the procedure at all of the other extreme positions.

Record whether the rod could be inserted at all extreme positions.

Annex D
(normative)

Determination of sideways stability

D.1 Principle

A load is applied and the deviation of the longitudinal axis is measured.

D.2 Apparatus

Device, capable of applying a force of 695 N ± 5 N horizontally.

D.3 Procedure

Apply a force of 695 N ± 5 N horizontally, at a position perpendicular to the centre of the seat/stand position.

If the damping mechanism involves elements that are set into the ground, ensure that the seesaw makes contact with the damping element.

Measure the deviation from the rest position.

Record the results.

Annex E
(normative)

Determination of hand support and/or foot rest projection

E.1 Apparatus

A ring gauge as shown in Figure E.1.

Dimensions in millimetres

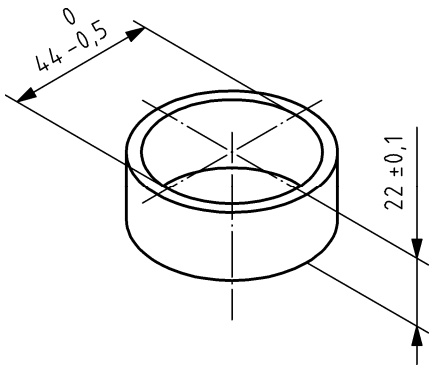
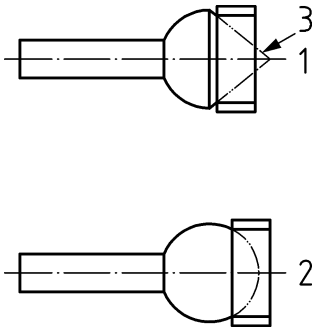


Figure E.1 — Ring gauge

E.2 Procedure

Place the gauge (see Figure E.1) over the projecting end of the hand support or foot rest, as appropriate; apply the gauge only along the centre line of the hand support or foot rest. Determine whether the hand support or foot rest protrudes beyond the outer face of the gauge (see Figure E.2).



Key
1 fail
2 pass
3 projecting part

Figure E.2 — Gauge

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