

Play equipment intended for permanent installation outdoors —

Part 2: Specification for construction and performance

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- Association for Childrens Play and Recreation Ltd.
- Association of County Councils
- Association of District Councils
- Association of Metropolitan Authorities
- Association of Play Industries
- British Paediatric Association
- Consumer Standards Advisory Committee of BSI
- Consumers' Association
- Department of Education and Science
- Department of the Environment (Property Services Agency)
- Design Council
- Greater London Council
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- Independent Engineering Insurers Committee
- Institute of Leisure and Amenity Management
- Institution of Civil Engineers
- Landscape Institute
- National Playing Fields Association
- Physical Education Association of Great Britain and Northern Ireland
- Royal Society for the Prevention of Accidents
- Timber Research and Development Association
- Coopted members

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Foreword

This Part of BS 5696 has been prepared under the direction of the General Mechanical Engineering Standards Committee. It supersedes BS 5696-2:1979 which is withdrawn.

The revision has been prepared in the form of a specification whereas the 1979 edition was in the form of recommendations. It is considered that this will provide a better basis for understanding between the purchaser and the manufacturer and will enable the manufacturer to demonstrate compliance with the standard.

Other Parts of BS 5696 are as follows:

— *Part 1: Methods of test;*

— *Part 3: Code of practice for installation and maintenance.*

All three Parts of the standard should be consulted and not used in isolation.

This Part of BS 5696 does not specify particular materials but care should be exercised in selecting only materials of known quantifiable properties of strength and durability. Appendix B comprises a list of British Standards for some materials that are considered applicable to the manufacture of children's playground equipment.

Experience of equipment under known use is a reliable basis for design, therefore detailed design rules have not been included.

In the absence of detailed statistics it has been necessary to adopt a reasonable attitude in trying to minimize accidents. Typical examples are the choice of height, above which medical evidence indicates that any fall to the ground will almost certainly result in concussion, fractures or other serious injuries and the choice of clearances between moving parts where heads and limbs may be trapped.

Purchasers of equipment manufactured in accordance with this Part of BS 5696 will be assured that every attempt has been made to reduce potential hazards to a practical minimum even when children use the equipment in an unconventional manner. That assurance cannot be given if a child deliberately attempts to defeat a safety precaution.

Slide profiles have not been included in appendix A at present as it is felt that they need a more detailed study before suitable requirements can be specified. The committee also considers that there are other types of equipment that need to be considered for inclusion such as aerial runways, roller slides and space nets. When requirements for chute profiles and the above items can be developed the committee plans to include these in the standard.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 18, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This Part of BS 5696 specifies requirements for the construction and performance of children's play equipment intended for permanent installation outdoors and for use by the public. It is primarily intended for equipment set into or fixed to rigid foundations.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this Part of BS 5696 the following definitions apply.

NOTE In order not to confine the application of this British Standard to those specific items of equipment in current use, and hence to allow freedom of design for the manufacturer of new equipment, only the fundamental forms of equipment and motion are defined in 2.4.

2.1

accessible part

any part of the equipment that in use may be contacted by any part of a child's body

2.2

combined equipment

equipment that combines different types of static equipment, moving equipment, or both

2.3 Component parts

2.3.1

permanent components

components designed to last the life of the equipment

2.3.2

consumable components

components subjected to wear and designed to be renewed several times during the life of the equipment

2.3.3

replaceable components

permanent or consumable components that may, if necessary, be replaced in situ

2.4 Form of equipment

2.4.1

static equipment

equipment that contains no moving part(s)

2.4.2

agility equipment and climbing frames

static equipment that enables its users to balance, climb, swing, twist, curl or otherwise play on stationary structures above the level of the ground

2.4.3

moving equipment

equipment that contains moving part(s)

NOTE There are three fundamental forms of movement of the parts of the equipment that support its users and these are defined in 2.4.4 to 2.4.6.

2.4.4

swinging equipment

moving equipment with suspended supports or seats that allows the user to move backwards and forwards in a continuous arc either side of the rest position

2.4.5

rocking equipment

moving equipment with user supports that are balanced about one or more fulcrums. Motion of the user positions is based upon an arc about each fulcrum

2.4.6

rotating equipment

moving equipment with user supports that rotate about a central axis

2.5

guardrail (protective barrier)

a rail or barrier that is intended to guard against a child falling from a platform or ramp

2.6

handrail

a rail that is intended to assist a child to balance when using the access means provided on the equipment

2.7

load cycle

one application and subsequent removal of load, and (for moving equipment) completion of one cycle of movement from any starting point through the complete range of movement back to the same starting point

2.8

permanent installation

placing (of equipment) in or on foundations in the play area in such a way that the supporting, structural members cannot be moved without the use of mechanical aids

NOTE Supporting, structural members (and, therefore, the complete item of equipment) can be removed only if:

- a) the foundations are broken up (where members are embedded in concrete); or
- b) ground fastenings are removed (where members are clamped by means of baseplates to bolts, or other devices, partially embedded in concrete); or
- c) free-standing equipment is so heavy that mechanical assistance (e.g. mobile crane) is required to move it.

2.9
potential entrapment

any space between two parts that permits entry of any test probe but has the potential to resist its removal

2.10
wedge trap

any trap formed by an acute angle between two or more adjacent parts that converge in a downward direction

3 Performance under load

When tested in accordance with clauses 2 and 3 of BS 5696-1:1986, equipment shall show no cracks, permanent deformation or damage and no connection shall have been loosened.

NOTE 1 It is recommended that the values of basic loads given in Table 1 should, as a minimum, be used in the design of equipment. Subject to maintenance as recommended by the manufacturer, consumable components should withstand at least 2×10^6 load cycles before replacement is necessary, and permanent components should withstand at least 10^8 load cycles before replacement is necessary. In most instances, however, equipment should be capable of withstanding higher loads than these to allow for the above requirements.

NOTE 2 Provision should be made for such factors as wear, corrosion, dynamic effects and where appropriate, fatigue.

4 Mechanical construction

NOTE Corrosion. Consideration should be given to the following aspects of design in order, as far as possible, to avoid corrosion of component parts of the equipment:

- a) by sealing hollow sections to prevent the ingress of water or alternatively by making provision for water to drain away;
- b) by designing joints and connections so that they are ventilated, self-draining or sealed to prevent the ingress of water by capillary or other means;
- c) by avoiding connections between dissimilar metals widely separated in the electrochemical series to prevent bimetallic corrosion (see PD 6484).

4.1 Fastenings

Fastenings used in any accessible part of the equipment shall be of round headed type or hexagon type with chamfered corners unless countersunk or counterbored to eliminate sharp protrusions.

Accessible nuts shall have the projecting screw thread cut off and the remainder peened so that no sharp edges remain.

Nuts, bolts and screws shall be secured against loosening.

4.2 Profiles and exposed surfaces

Component parts shall not have any rough or sharp edges or projections in any position that present a hazard to a child.

4.3 Finish

4.3.1 General. The surfaces of all parts not naturally resistant to corrosion or deterioration shall be protected by surface coating or impregnation.

NOTE 1 The surface coating or impregnation should contain no substances that are likely to be injurious to health. There is a similar prescription in the Toys (Safety) Regulations.

NOTE 2 Attention is drawn to the benefits in reduced maintenance that may be achieved, particularly in harsh environments, by providing in the first instance a higher degree of surface protection than that specified even though initial costs may be higher.

4.3.2 Iron and steel. Prior to painting, iron and steel shall be thoroughly clean, dry and free from welding slag, rust, scale and grease.

NOTE Painting need not be applied when other forms of protection are used.

Where paint is applied the lead content in the dry film shall be as low as possible but in any case shall not exceed 0.25 %. The equipment manufacturer shall obtain a certificate from the paint manufacturer to confirm that the paint complies with this requirement.

4.3.3 Timber. The preservative treatment for timber shall be selected from the alternative systems listed in BS 5268-5 or BS 5589, as appropriate.

Table 1 — Basic loads

	Number of children accommodated by the component part						
	1	2	3	4	5	6	7 or more
Effective load per child, kg	79.00	68.00	59.10	54.65	51.98	50.20	48.93
Multiply by dynamic factor <i>K</i> (see note)	1.38	1.31	1.23	1.16	1.09	1.02	1.00
Minimum average design load per child, kg (rounded upwards to nearest 0.5 kg)	109.5	89.5	73.0	63.5	57.0	51.5	49.0
NOTE The dynamic factor <i>K</i> is to cover all dynamic effects due to the movement of a number of children on one member and has been based on the following equation: $K = 1.45 - 0.12 L$ where <i>L</i> is the span (in m), up to 3.6 m provided that <i>K</i> is never less than 1.00. (For members longer than 3.6 m <i>K</i> is taken as 1.00.)							

5 Access

5.1 General

Where access is necessary to the top of any equipment, with the exception of climbing frames, it shall be fixed permanently and shall be as specified in 5.2 to 5.4, as appropriate. All surfaces intended for contact by feet shall be horizontal and uniform, except for ramps complying with 5.2. Treads and rungs, or the complete access shall be replaceable and non-rotating.

NOTE 1 Slip resistant surfaces are recommended for all ramps, treads or rungs but not for the bars of agility equipment.

NOTE 2 Treads or rungs may be open or closed.

5.2 Ramps

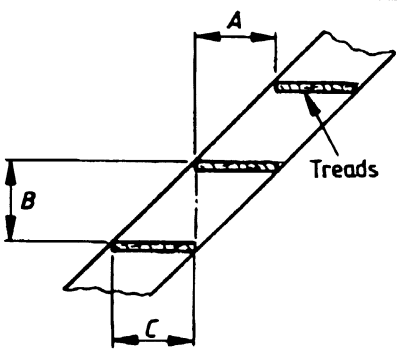
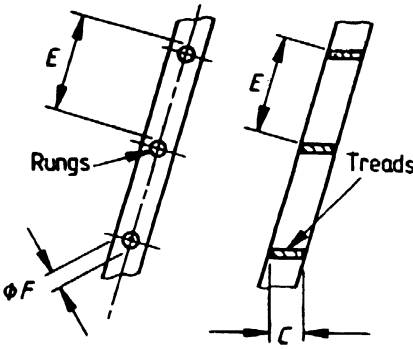
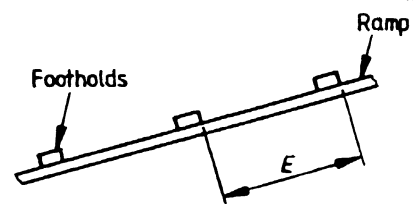
Ramps shall not be used at angles in excess of 38°. At angles of 15° and above the surface shall have footholds spaced as shown in Figure 1.

5.3 Treads or rungs

Treads or rungs shall be equally spaced. The dimensions and spacings of treads or rungs shall be as shown in Figure 1.

5.4 Spiral or helical stairs and ramps

Treads shall be equally spaced. The dimensions for spiral and helical stairs and ramps shall be as shown in Figure 2.

	Angle	Going <i>A</i>	Rise <i>B</i>	Treads	
				Depth <i>C</i>	Width
	15° to 45°	mm 220 min. 350 max.	mm 100 min. 200 max.	mm Not less than <i>A</i>	mm 600 min. 1800 max.
	45° to 55°	100 min. 220 max.	150 min. 200 max.	If open, not less than <i>A</i> If closed, not less than 150	280 min. 450 max.
	55° to 90°	Spacing <i>E</i>		If open not less than 75	230 min. 450 max.
		175 min. 320 max.		If closed not less than 150	
				Rungs diameter <i>F</i> *	
	15° to 38°	175 min. 360 max.		25 min. 38 max.	

All dimensions are in millimetres.

* It is essential that rungs are round or of other section with a top surface within the range of diameters specified and a maximum depth of 38 mm.

NOTE. Angles are taken from the horizontal.

Figure 1 — Permissible range of dimensions for straight access