BRITISH STANDARD

BS 6972:1988

Incorporating Amendment No. 1

Specification for

General requirements for luminaire supporting couplers for domestic, light industrial and commercial use

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Committees responsible for this British Standard

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ASTA Certification Services
Association of Consulting Engineers
Association of Control Manufacturers — TACRA (BEAMA Ltd.)
Association of Manufacturers of Domestic Electrical Appliances
British Electrical Systems Association (BEAMA Ltd.)
British Electrotechnical Approvals Board
British Plastics Federation
Consumer Policy Committee of BSI
Decorative Lighting Association
Department of Health and Social Security
Department of Trade and Industry (Consumer Safety Unit, C A Division)
ERA Technology Ltd.
Electrical Contractors' Association
Electrical Installation Equipment Manufacturers' Association (BEAMA Ltd.)
Electrical Power Engineers' Association
Electricity Supply Industry in England and Wales
Institution of Electrical Engineers
Lighting Industry Federation Ltd.
National Inspection Council for Electrical Installation Contracting

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Contents

Foreword

This British Standard has been prepared under the direction of the Power Electrical Engineering Standards Committee.

The growing use of luminaire supporting couplers (LSCs) in place of ceiling roses led to a request for standards to ensure the safety and interchangeability of such accessories. This standard has been based on drafts submitted by the Decorative Lighting Association and the Electrical Installation Equipment Manufacturers' Association, and gives general requirements for the construction of LSC plugs and LSC outlets with particular reference to safety.

A separate British Standard, BS 7001, specifies dimensions for interchangeability and safety of standardized LSC plugs and LSC outlets. BS 7001 calls up the general requirements given in this standard.

In the interests of interchangeability between LSCs made by different manufacturers, it is recommended that new designs should comply with BS 7001.

Product certification. Users of this British Standard are advised to consider the desirability of third party certification of product conformity with this British Standard based on testing and continuing surveillance, which may be coupled with assessment of a supplier's quality systems against the appropriate Part of BS EN ISO 9000.

Enquiries as to the availability of third party certification schemes may be forwarded by BSI to the Association of Certification Bodies. If a third party certification scheme does not already exist, users should consider approaching an appropriate body from the list of Association members.

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 20, 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 British Standard specifies requirements for luminaire supporting couplers (LSCs) comprising LSC plugs and LSC outlets for use in final circuits rated at not more than 16 A, where the supply voltage does not exceed 250 V a.c. and the electrical load connected to any one LSC plug does not exceed 6 A.

The requirements specified in this standard have particular reference to safety in normal use.

LSC outlets are intended for use with cables complying with BS 6004 or BS 6007, having copper conductors.

LSC plugs which are not integral with a luminaire are intended for use with flexible cords complying with BS 6141 or BS 6500, having a cross-sectional area from 0.5 mm^2 to 1.0 mm^2.

The standard is applicable to LSCs intended for either:

a) the mechanical and electrical connection and disconnection of luminaires suspended by flexible cords up to a maximum supported load of 5 kg; or

b) the mechanical and electrical connection and disconnection and direct mechanical support of luminaires, i.e. other than by a flexible cord.

The standard is not applicable to LSC plugs and LSC outlets intended to be used on extra low voltage (ELV) supplies.

NOTE 1 LSC outlets complying with this standard may be regarded as lighting outlets in accordance with the provisions of Appendix 4 of the 15th edition of the Regulations for Electrical Installations[1)].

NOTE 2 The titles of the publications referred to in this standard are listed on the inside back cover.

2 Conditions of use

LSC plugs and LSC outlets shall be suitable for use under the following conditions:

a) an ambient temperature having a peak value not exceeding 40 °C, with an average value not exceeding 35 °C in a period of 24 h, but not subject to exposure to direct radiation from the sun or any other source of heat likely to raise the temperature above the specified ambient temperature;

NOTE The effect of the heat generated by the luminaire may affect the ambient temperature local to the coupler but this is not included in the term "any other source of heat" [see c)].

b) an ambient temperature having a value not less than – 5 °C;

c) a temperature not exceeding 70 °C at the terminals of the LSC outlet including the effect of heat generated by the luminaire and the passage of current;

d) an altitude not exceeding 2 000 m above sea level;

e) an atmosphere not subject to excessive pollution by smoke, chemical fumes, salt laden spray, prolonged periods of high humidity or other abnormal conditions.

3 Definitions

For the purposes of this British Standard the following definitions apply.

3.1
luminaire supporting coupler (LSC)

a means, comprising an LSC outlet and an LSC plug, providing mechanical support for a luminaire and the electrical connection to and disconnection from a fixed wiring installation

3.2
LSC outlet

that part of an LSC which is intended for fixed mounting and for connection to a fixed wiring installation

3.3
surface-type LSC outlet

an LSC outlet provided with a seating surface such that when mounted as intended it projects wholly outside the surface on which it is mounted

3.4
flush-type LSC outlet

an LSC outlet intended for mounting with its base partially or completely recessed into a box or enclosure

3.5
LSC plug

that part of an LSC which is intended for the electrical connection of a luminaire to an LSC outlet

3.6
independent LSC plug

an LSC plug which is intended to be attached to the flexible cable or cord of a luminaire

3.7
rewireable independent LSC plug

an independent LSC plug for electrical connection to the flexible cable or cord of a luminaire without the use of special purpose tools

[1)] Published by the Institution of Electrical Engineers.

3.8
non-rewireable independent LSC plug

an independent LSC plug that forms a constructional unit with the flexible cord such that the cord cannot be separated from the plug either by hand or by using tools without making the unit permanently useless

NOTE Assemblies having insulating materials moulded around pre-assembled parts or an enclosure of insulating material formed by parts welded or bonded together are examples.

3.9
component LSC plug

an LSC plug manufactured as a separate item and intended to form part of the body of a luminaire after incorporation in the luminaire by a luminaire manufacturer

3.10
integral LSC plug

an LSC plug manufactured as an integral part of the body of a luminaire

3.11
terminal

a component including screws or other devices for connecting electrical conductors

3.12
supply terminals

terminals intended to accommodate conductors of the fixed wiring

3.13
loop terminal

a supply terminal intended solely for the interconnection of live conductors

3.14
live parts

current carrying parts and those metal parts connected to or in contact with them during normal use

NOTE Earthing terminals are not considered to be current carrying parts.

3.15
decorative cover

an optional component which may be mechanically attached to an LSC outlet to provide cosmetic decoration when a luminaire is not connected

3.16
touchable surface

any surface which can be touched by Test finger 1 of BS 3042 after removal of any part which can be removed without use of tools

3.17
type test

a test, or series of tests, conducted on a sample, consisting of one or more similar items, to determine whether or not an LSC, LSC outlet or LSC plug, manufactured to the same design as the sample, is capable of complying with the requirements of the specification

4 General requirements

LSC plugs and LSC outlets shall be so designed and constructed that, in normal use, they function reliably and without danger to persons or surroundings, and are capable of meeting all the relevant requirements and tests specified in this standard.

NOTE Where tolerances are not specified in this standard the values are to be regarded as nominal.

5 Requirements for type testing

5.1 A manufacturer or responsible vendor who claims compliance with this standard shall submit a representative sample to the relevant tests of this standard in the order specified in **5.3**. All tests are type tests.

The tests may be made by the manufacturer, or the responsible vendor, or may be made on his behalf by a competent testing laboratory or certification authority. The results of such tests shall be recorded and retained for reference and inspection.

Where an LSC plug or LSC outlet alone is submitted for test it shall be tested using a corresponding LSC outlet or LSC plug complying with this standard.

5.2 Unless otherwise specified in this standard, LSC plugs and LSC outlets shall be tested as delivered and installed, as in normal use, at an ambient temperature of 20 ± 5 °C.

The ambient temperature shall be measured at a distance of 1 m from the test specimen and in the same horizontal plane as the specimen.

Integral LSC plugs shall be tested when assembled or incorporated in the corresponding section of a luminaire.

5.3 A total sample of nine LSC plugs and/or LSC outlets shall be submitted to inspection and tests in the following order of clauses:

a) three specimens: clauses **4** to **16** inclusive (inspection only);

b) three specimens: clauses **11** to **22** inclusive, followed by a repeat test of clause **20** (general tests);

c) three specimens: clauses **23** to **26** inclusive (material tests).

5.4 If no specimen fails in the tests specified in **5.3**, then products of that type shall be deemed to comply with this standard.

If one specimen fails in any individual test, or series of tests, specified in **5.3**, then products of that type shall be deemed to have failed to comply with this standard, unless it can be shown that the specimen was not representative of normal design or manufacture, in which case a separate set of three specimens shall be submitted to the relevant test, or series of tests, specified in **5.3**. If no specimen fails in this retest then products of that type shall be deemed to comply with this standard.

If more than one specimen fails in the tests specified in **5.3**, then products of that type shall be deemed not to comply with this standard.

6 Rating

LSC plugs and LSC outlets shall have a rated voltage of 250 V a.c. and a rated current not exceeding 6 A.

NOTE BS 7001 specifies that the rating of the LSC outlet shall be 6 A.

6.1 Compliance shall be checked by inspection of the marking and tests described in this standard.

7 Classification

LSC outlets shall be classified as follows.

a) According to the position of mounting as:

1) wall; or

2) ceiling; or

3) wall/ceiling.

b) According to the method of mounting as:

1) surface-type; or

2) flush-type.

c) According to the current-carrying terminal arrangements as:

1) having provision for the connection of loop wiring;

2) having no provision for the connection of loop wiring.

8 Marking and information

8.1 LSC outlets shall be marked with the following information:

a) the name or trademark of the manufacturer or responsible vendor;

b) the number of this British Standard, i.e. BS 6972[2)];

NOTE If the LSC outlet complies with BS 7001, marking with BS 6972 may be omitted.

c) the rated current;

d) the rated voltage, i.e. 250 V;

e) symbol for alternating current;

f) terminal identification, i.e. line, neutral, earth, loop, etc.;

g) maximum permissible supported load in kilograms;

h) a symbol indicating that the outlet is intended to be used with luminaires.

The marking specified in g) and h) shall be visible after installation but not necessarily after insertion of the LSC plug.

8.2 Independent LSC plugs shall be marked with the following information:

a) the name or trademark of the manufacturer or responsible vendor;

b) the number of this British Standard, i.e. BS 6972[2)];

NOTE If the LSC plug complies with BS 7001, marking with BS 6972 may be omitted.

c) the rated current,

d) the rated voltage, i.e. 250 V;

e) terminal identification, i.e. line, neutral, earth;

f) maximum permissible supported load in kilograms;

g) symbol indicating that the plug is only intended to be used with luminaires.

The marking specified in f) and g) shall be visible after the fitting of the flexible cord but not necessarily after insertion into the LSC outlet.

8.3 Adequate instructions shall be provided to advise the user of the necessity to fix the LSC outlet securely to the wall or ceiling in a manner which will be capable of supporting the maximum load for which the LSC outlet is designed.

LSC outlets and independent LSC plugs shall be provided with information warning the user that these products are intended only for the connection of luminaires.

Where it is necessary for safe operation that the user should be aware of any particular characteristics of the LSC plug or LSC outlet, the necessary information shall be given.

[2)] Marking BS 6972 or BS 7001 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is therefore solely the responsibility of the person making the claim. Such a declaration is not to be confused with third party certification of conformity, which may also be desirable.

The instructions and information referred to in this subclause shall be given by markings on the LSC plug or LSC outlet itself, or where this is not practicable, in a notice which accompanies it.

8.4 Where symbols are used they shall be as follows:

amperes	A
volts	V
alternating current	∿
line	L
neutral	N
earth	⏚
for luminaires only	

For the marking of rated current and rated voltage, figures may be used alone. The figure for rated current shall be placed before or above that for the rated voltage and separated from the latter by a line. Examples of typical markings are as follows:

6 A 250 V∿ or 6/250∿ or $\frac{6}{250}$ ∿

8.5 Marking shall be easily legible and durable and shall not be placed on screws, washers, or other easily removable parts.

8.5.1 Compliance for legibility shall be by inspection, using normal or corrected vision without additional magnification. Compliance for durability shall be checked by rubbing the marking, by hand, for 15 s using a piece of cloth soaked in water and again for 15 s with a piece of cloth soaked in petroleum spirit. After this test the marking shall remain easily legible.

Petroleum spirit used for this test shall consist of a solvent hexane having a maximum aromatics content of 0.1 % by volume, a kauri-butanol value of 29, an initial boiling point of approximately 65 °C, a dry point of approximately 69 °C, and a relative density at 15/15 °C of approximately 0.68.

NOTE Relative density may be determined by the method described in BS 4714.

Marking made by engraving, moulding, or a similarly permanent process, is deemed to comply with the requirement for durability without testing.

9 Dimensions

LSC plugs and LSC outlets shall be so designed and dimensioned that they can be connected and disconnected, mechanically and electrically, without special preparation and without the use of tools other than those which may be required for operating special anti-theft devices.

9.1 Compliance shall be checked by inspection and manual test.

NOTE A standardized LSC is specified in BS 7001.

10 Creepage distances and clearances

Creepage distances and clearances shall be not less than the values shown in Table 1.

10.1 Compliance shall be checked by inspection and measurement.

11 Accessibility of live parts

LSC plugs and LSC outlets shall be so designed and constructed that when properly assembled and correctly wired, as in normal use, live parts are not accessible.

Where LSC plugs and LSC outlets incorporate parts which are intended to be removed without the use of a tool, compliance shall be checked before, during and after the removal of such parts.

LSC plugs and LSC outlets shall be so designed and constructed as to protect the user against accidental contact with live parts during insertion or withdrawal of plugs.

11.1 Compliance shall be checked by applying, with a force of 5 N, Test finger 1 of BS 3042 in a manner most likely to make contact with live parts. In applying the test a supply of 45 ± 5 V, in series with a suitable indicating lamp, shall be connected between the test finger and the relevant conducting parts of the LSC plug and/or LSC outlet.

12 Provision for earthing

12.1 All LSC outlets shall be provided with an earthing terminal, as specified in clause **14** and an earthing socket contact.

12.1.1 Compliance shall be checked by inspection.

12.2 Independent rewireable LSC plugs and component LSC plugs for incorporation into class I luminaires[3)] shall be provided with an earthing contact to make electrical connection with a corresponding LSC outlet contact.

Component LSC plugs for incorporation into class II luminaires[3)] shall have no provision for the connection of protective earthing to the luminaire.

[3)] See BS 4533-101.

Table 1 — Creepage distances and clearances

Path under consideration	Clearance		Creepage	
	If protected against deposition of dirt	If not protected against deposition of dirt	Ceramics and similar material	Other material
	mm	mm	mm	mm
a) Between live parts of different polarity	2.0	2.5	2.5	2.5
b) Between live parts and other metal parts	2.5	3.0	2.5	3.0
c) Between live metal parts and the touchable surfaces or the surface on which the accessory is mounted, unless the holes containing such live parts are filled in with a non-hygroscopic insulant of at least 1 mm thickness	3.0	3.0	—	—

NOTE 1 The relevant parts of an LSC plug or LSC outlet are deemed to be protected against deposition of dirt, provided they are substantially enclosed within a housing forming part of the LSC.
In LSC outlets intended for mounting in flush enclosures, such a housing may have openings (e.g. for access to terminals or for ventilation) but should be such as to protect the relevant parts against the direct deposition of dirt by gravity.
NOTE 2 The contribution to the creepage distance of any groove less than 1 mm wide is limited to its width; any air gap less than 1 mm wide is ignored in computing the total clearance. For further information on the effective creepage paths and clearances see PD 6499.

12.2.1 Compliance shall be checked by inspection.

12.3 Provision shall be made for the effective earthing of all metal parts that may become live in the event of failure of the insulation of the LSC plug or LSC outlet or conductors and which are capable of being touched by Test finger 1 of BS 3042, when the LSC plug or LSC outlet is correctly wired and mounted as in normal use.

NOTE This requirement does not apply to metal screws in or through non-conducting material and separated by such material from live parts in such a way that, in normal use, they cannot become live.

The earthing terminal shall comply with clause **14** and the connection between the earthing terminal or earthing contact and parts required to be connected thereto shall be of low resistance.

12.3.1 Compliance shall be checked by measuring the resistance between the earthing terminal or earthing contact and any other metal required to be earthed. The resistance shall not exceed 0.05 Ω at 25 A.

12.4 LSC plugs and LSC outlets for class I luminaires[4)] shall be so constructed that, when inserting the LSC plug, the earth connection is made before the current-carrying contacts of the LSC plug become live. When withdrawing the LSC plug, the current-carrying parts shall separate before the earth contact is broken.

12.4.1 Compliance shall be checked by inspection and electrical test.

13 Construction

13.1 An LSC outlet shall be suitable for:

a) flush-mounting, in a suitable box or enclosure; or

b) surface-mounting, direct to suitable structural surface or by means of a surface box or pattress.

An LSC outlet shall provide a connection facility for a corresponding LSC plug.

LSC outlet contacts shall be self-adjusting as to contact making and each LSC outlet contact shall be such as to make and maintain, in normal use, effective electrical and mechanical contact with the corresponding LSC plug contact.

The means for producing the contact pressure shall be associated with each LSC outlet contact independently and shall not be dependent on insulating material other than ceramic or mica. Each LSC outlet contact shall be reliably connected to the fixed parts of its terminal or termination.

13.1.1 Compliance shall be checked by inspection and by the test described in clause **20** which shall be repeated after the test described in clause **21**.

13.2 Component LSC plugs shall be suitable for incorporation as part of a luminaire.

An LSC plug shall engage electrically and mechanically with a corresponding LSC outlet. The contacts of all forms of LSC plugs shall be positioned so as to make satisfactory contact with the corresponding contacts of an LSC outlet when the LSC plug is correctly and fully inserted.

[4)] See BS 4533-101.

Independent LSC plugs shall be suitable for the connection and retention of a flexible cord.

13.2.1 Compliance shall be checked by inspection and by the test described in clause **20** which shall be repeated after the test described in clause **21**.

13.3 The force required for the connection and disconnection of an LSC plug and a corresponding LSC outlet, with any anti-theft device rendered inoperative, shall be within the following limits:

a) connection and disconnection: not greater than 45 N;

b) disconnection: not less than 10 N.

13.3.1 Compliance shall be checked by inspection and test. The tests shall be repeated after the test described in clause **21**.

13.4 The various parts of LSC plugs shall be reliably connected together and the various parts of LSC outlets shall be reliably connected together and shall provide an adequate enclosure for live parts and conductors connected thereto.

13.4.1 Compliance shall be checked by inspection and by the test described in clause **22**.

14 Terminals and terminations

14.1 Terminals shall be of a type in which each conductor is gripped firmly and they shall be so designed as to prevent the strands of the conductor from slipping out.

In LSC outlets, terminals shall be provided for the connection of line, neutral and protective earthing conductors. Additional terminals may be provided for loop connections, etc.

All terminals intended for the connection of fixed wiring shall accept up to three 1.5 mm^2 solid or stranded conductors and may be screw type as detailed in **14.2** or screwless as detailed in **14.3**.

In rewireable independent LSC plugs, terminals shall be provided for the connection of line, neutral and protective earthing conductors of flexible cords from 0.5 mm^2 up to 1.0 mm^2 and shall be of screw type as detailed in **14.2**.

In integral and component LSC plugs, terminals shall be provided for the connection of line, neutral and, where applicable, protective earthing conductors (see **12.2**) of flexible cords from 0.5 mm^2 up to 1.0 mm^2 and/or solid and/or stranded conductors up to 1.0 mm^2 and may be screw type as detailed in **14.2** or screwless as detailed in **14.4**, in which case they shall accept solid and/or stranded conductors from 0.5 mm^2 to 1.0 mm^2 or conductors appropriate to the luminaire with which they are to be used.

In non-rewireable independent LSC plugs, terminations shall be provided as detailed in **14.5**.

In component LSC plugs, terminals shall be provided for the connection of line, neutral and, where applicable, protective earthing conductors (see **12.2**) of flexible cords from 0.5 mm^2 up to 1.0 mm^2 and/or solid and/or stranded conductors up to 1.0 mm^2 and may be screw type as detailed in **14.2** or terminations as described in **14.5**.

14.1.1 Compliance shall be checked by inspection and by the relevant tests of **14.2** and **14.4**.

14.2 Screw type terminals shall be so located that they are prevented from rotating when the terminal screws are turned. When pillar type terminals are used they shall comply with the following requirements.

a) The minimum nominal diameter of terminal screw shall be 2.5 mm.

b) The minimum thickness of wall through which the terminal screw passes shall be equal to half the nominal core diameter of the thread of the terminal screw.

c) The sizes of the conductor hole and the clamping screw shall be such that the clearance between each side of the major diameter of the clamping screw and the conductor hole does not exceed 0.4 mm when intended for the connection of flexible cords and 0.6 mm when intended solely for the connection of fixed wiring.

14.2.1 Compliance shall be checked by inspection, measurement and the following test.

A rigid conductor of 1.0 mm^2 cross-sectional area is placed in the terminal. Screws and nuts are tightened and loosened five times by means of a suitable screwdriver or spanner applying a torque as given in Table 2.

It is essential that the shape of the blade of the test screwdriver suits the head of the screw to be tested and that screws and nuts are not tightened in jerks.

The conductor is moved each time the screw or nut is loosened.

During the test, no change shall occur that impairs the further use of the terminal.

14.3 It is permissible for screwless terminals to be suitable for rigid and/or flexible conductors. If the screwless terminal is suitable for both rigid and flexible conductors, tests shall be carried out with rigid conductors first and then repeated with flexible conductors.

Screwless terminals shall be provided with clamping units which allow the proper connection of copper conductors having nominal cross-sectional areas complying with **14.1**.

NOTE 1 The screwless terminals are intended for the connection of copper conductors only, without special preparation.

Table 2 — Screw torque values

Nominal outside diameter of thread	Mechanical strength test (see **14.2.1** and **15.1.1**)		Normal use (see **16.3.1**, **20.2**, **22.4** and **22.5.1**)	
	For screws described below[a]	For other screws and nuts	For screws described below[a]	For other screws and nuts
mm	N m	N m	N m	N m
Up to and including 2.6	0.15	0.30	0.1	0.20
Over 2.6, up to and including 2.8	0.20	0.40	0.13	0.26
Over 2.8, up to and including 3.0	0.25	0.50	0.16	0.32
Over 3.0, up to and including 3.2	0.30	0.60	0.20	0.40
Over 3.2, up to and including 3.6	0.40	0.80	0.30	0.60

[a] This column applies to screws without heads if the screw, when tightened, does not protrude from the hole and to other screws which cannot be tightened by means of a screwdriver with a blade wider than the screw diameter.

When two or more conductors have to be connected, each conductor shall be introduced into a separate independent clamping unit.

NOTE 2 This does not necessarily mean in separate holes.

Parts of screwless terminals mainly intended for carrying current shall be of materials specified in **15.3**.

NOTE 3 Springs, resilient units, clamping plates and the like are not considered as parts mainly intended for carrying current.

14.3.1 Compliance shall be checked by inspection.

14.4 Screwless terminals for integral LSC plugs may be permanent or non-permanent connection type and shall comply with the relevant requirements of **15.5** and **15.6** of BS 4533-101:1981.

14.5 Terminations in non-rewireable LSC plugs shall be soldered, welded, crimped or of a similar permanent type. Screws, or snap-on terminals, shall not be used. Crimped connections shall not be made on pre-soldered flexible cores unless the soldered area is entirely outside the crimp area.

14.5.1 Compliance shall be checked by inspection.

15 Screws, current-carrying parts and connections

15.1 Screwed connections, electrical and otherwise, shall withstand the mechanical stresses occurring in normal use. Screws transmitting electrical contact pressure shall screw into metal. Screws shall not be of soft metal or of metal which is liable to creep. Screws shall not be of insulating material if their replacement by a metal screw would affect compliance with clause **10**.

Electrical connections shall be so designed that contact pressure is not transmitted through insulating material other than ceramic, unless there is sufficient resiliency in the metal parts to compensate for any possible shrinkage of the insulating material.

Screws used exclusively for cord-grip purposes shall comply with **16.3**.

15.1.1 Compliance shall be checked by inspection and, for screws and nuts which are intended to be tightened during installation or use, by the following test.

The screw is tightened and loosened as follows:

a) 10 times for screws in engagement with a thread of insulating material, the screw being completely removed and replaced each time;

b) 5 times for nuts and other screws.

The requirements for the verification of terminals are given in clause **14**.

The test is made by means of a suitable test screwdriver, applying a torque as shown in Table 2.

During the test no damage impairing the further use of the screwed connection shall occur.

It is essential that the shape of the blade of the test screwdriver suits the head of the screw to be tested and that screws and nuts are not tightened in jerks.

15.2 Thread-forming screws shall not be used for the connection of current-carrying parts.

NOTE Thread-forming screws may be used to provide earthing continuity, provided that it is not necessary to disturb the connection in normal use and at least two screws are used for each connection.

Screws which make a mechanical connection between different parts of the accessory shall be locked against loosening, if the connection carries current.

Rivets used for current-carrying connections shall be locked against loosening, if these connections are subject to torsion in normal use.

15.2.1 Compliance shall be checked by inspection and manual test to check tightness.

NOTE 1 Spring washers and the like may provide satisfactory locking.

NOTE 2 For rivets a non-circular shank or an appropriate notch may be sufficient.

15.3 Current-carrying parts shall be of brass, copper, phosphor-bronze or other metal at least equivalent with regard to its conductivity and resistance to corrosion.

NOTE This requirement does not apply to screws, nuts, washers, clamping plates and similar parts of terminals, nor to parts used for earth continuity purposes.

15.3.1 Compliance shall be checked by inspection and by the relevant tests described in clauses **20** and **26**.

16 Provision for cables and cords

16.1 LSC outlets shall have terminals as specified in clause **14** suitable for the connection of solid or stranded copper conductors of cables complying with BS 6004. The entry to the LSC outlets for the acceptance of insulated conductors shall ensure that they may be connected without exposing the bared conductors in a manner which would fail to comply with clause **10**.

16.1.1 Compliance shall be checked by inspection.

16.2 LSC plugs intended for incorporation into luminaires shall be provided with means to connect conductors of up to 1.0 mm^2 cross-sectional area for rewireable types and conductors appropriate to the luminaire for which they are intended, for non-rewireable types.

16.2.1 Compliance shall be checked by inspection.

16.3 Rewireable independent LSC plugs shall have provision for the entry of a 3-core, 1.0 mm^2 circular sheathed flexible cord complying with Table 16 of BS 6500:1984. The means of entry shall be smooth and shall not cause abrasion or other damage to the sheath of the cord. Means shall be provided to prevent strain upon flexible conductors connected to the plug, being transmitted to the terminals.

16.3.1 Compliance shall be checked by the following tests.

The LSC plug is fitted with 3-core, 1.0 mm^2 circular sheathed flexible cord complying with Table 16 of BS 6500:1984.

The terminal screws are tightened only sufficiently to stop the conductors slipping out of the terminals but not sufficiently to influence the effectiveness of the cord-grip. The cord-grip is then tightened in a manner appropriate to its design, as in normal use. If the cord-grip incorporates one or more screws, then these are tightened to the appropriate torque value given in Table 2. The cord is subjected to a pull of 50 N for 1 min steadily applied along the axis of the cord entry. The test is applied three times, the force being removed after each test.

The test is then repeated using 2-core, 0.5 mm^2 circular sheathed flexible cord complying with Table 15 of BS 6500:1984.

At the conclusion of these tests, the conductors shall not have moved noticeably in the terminals.

16.4 Non-rewireable independent LSC plugs shall have a form of entry for the flexible cord which does not cause abrasion or other damage to the cord. The cord shall be retained so that strain on the conductors is not transmitted to the terminals.

16.4.1 Compliance shall be checked by the following test.

The cord is subjected to a pull of 50 N applied steadily along the axis of the cord entry for 1 min. The test is applied three times, the force being removed after each test.

After the test the cord shall show no damage except that breakage of no more than 10 % of the total number of conductor strands in any core is ignored, provided they have not pierced the insulation. There shall not have been more than 1 mm movement of the cord at the point of entry.

17 Resistance to ageing

17.1 LSC plugs and LSC outlets shall be resistant to ageing.

17.1.1 Compliance shall be checked by an accelerated ageing test made in an atmosphere having the composition and pressure of the ambient air.

The specimens are suspended freely in a heating cabinet, ventilated by natural or fan assisted circulation.

NOTE The use of an electrically heated cabinet is recommended. Natural circulation may be provided by holes in the walls of the cabinet.

The temperature in the cabinet, depending on the part under test, is as follows:

a) LSC outlets	70 ± 2 °C;
b) independent LSC plugs	70 ± 2 °C;
c) component and integral LSC plugs	90 ± 2 °C.

The duration of the ageing test is 7 days (168 h).

After the treatment the specimens are allowed to attain approximately room temperature. They are examined and shall show no cracks visible with normal or corrected vision without additional magnification and the specimen shall be capable of meeting the remaining requirements of this standard.

18 Resistance to moisture and humidity

LSC plugs and LSC outlets shall be proof against humid conditions that may occur in normal use.

18.1 Compliance shall be checked by the humidity treatment described in this clause followed immediately by the measurement of the insulation resistance and by the electric strength tests described in **19.2** and **19.3** which shall be made in the humidity cabinet or in a room in which the specified temperature is maintained.

Cable entries, if any, shall be left open; if knock-outs are provided one of them shall be opened.

The humidity treatment is carried out in a humidity cabinet containing air with a relative humidity maintained between 91 % and 95 %. The temperature of the air, at all places where samples can be located, is maintained within 1 K of any convenient value t between 20 °C and 30 °C.

Before being placed in the humidity cabinet the specimens are brought to a temperature between t °C and t + 4 °C.

Specimens are kept in the cabinet for 2 days (48 h).

After this treatment, the specimens shall show no damage within the meaning of this specification.

NOTE 1 In most cases, the specimens may be brought to the specified temperature by keeping them at this temperature for at least 4 h before the humidity treatment.

NOTE 2 Relative humidity between 91 % and 95 % can be obtained by placing in the humidity cabinet a saturated solution of sodium sulphate (Na_2SO_4) or potassium nitrate (KNO_3) in water, having a sufficiently large contact surface with the air. In order to achieve the specified conditions within the cabinet, it is necessary to ensure constant circulation of the air within and, in general, to use a cabinet that is thermally insulated.

19 Insulation resistance and electric strength

19.1 Electrical insulation of LSC plugs and LSC outlets shall be effective between:

a) live parts of opposite polarity;

b) live parts of opposite polarity, connected together, and other metal parts insulated therefrom, including earthed metal parts;

c) live parts and metal foil in contact with the touchable surfaces.

19.1.1 Compliance shall be checked by the tests described in **19.2** and **19.3**.

19.2 The insulation resistance is measured with a d.c. voltage of approximately 500 V, the measurement being made 1 min after the application of the voltage consecutively between the points defined in **19.1**.

The insulation resistance shall be not less than 5 MΩ.

19.3 Immediately after the test described in **19.2** an a.c. voltage of substantially sine-wave form, with a frequency of 50 Hz or 60 Hz and with an r.m.s. value of 2 000 ± 60 V is applied for 1 min between the points defined in **19.1**. The high voltage source used shall be such that when the output is adjusted to 2 000 ± 60 V for 1 min and is then short circuited, the output current is not less than 200 mA. Any overcurrent protection shall not operate at a current less than 100 mA.

Initially not more than half the prescribed voltage is applied, then it is raised rapidly to the full value.

No breakdown or flashover shall occur.

Glow discharges without drop in voltage are ignored.

NOTE LSC plugs incorporated in class II luminaires may be required to withstand 4 000 V a.c. when tested in the luminaire.

20 Temperature rise

20.1 LSC plugs and LSC outlets shall be so designed and constructed that, when installed and used as in normal use, the temperature rise of current-carrying parts is not excessive.

20.1.1 Compliance shall be checked by the tests described in **20.2** and **20.3** using corresponding LSC outlets and LSC plugs.

20.2 LSC outlets are mounted in a manner appropriate to the classification (see clause **7**), on a surface comprising a piece of plywood approximately 10 mm thick and 500 mm × 500 mm square, painted matt white. Any necessary mounting box or device shall be used in a manner typical of normal installation practice and the LSC outlet shall be located in the centre of the mounting surface.

LSC outlet terminals are wired with 1.5 mm^2 flat twin with circuit protective conductor cable complying with Table 5(a) of BS 6004:1984.

In rewireable independent and component LSC plugs, terminals intended for the connection of flexible cords are wired with 0.75 mm^2 circular twin flexible cord complying with Table 16 of BS 6500:1984. Non-rewireable independent LSC plugs are tested with the flexible cord supplied. Integral LSC plugs are tested in the luminaire as connected by the luminaire manufacturer.

The length of the specified cables or cords, outside the LSC plug or LSC outlet, shall be at least 1.0 m for cables and 0.5 m for cords.

The following circuit connections are made:

a) incoming supply: 1.5 mm^2 cable;

b) outgoing supply: 1.5 mm^2 cable;

c) switch connections: 1.5 mm^2 cable[5)];

d) load connections appropriate to the LSC plug type.

Terminal screws are tightened with a torque as given in Table 2.

20.3 Loads are then connected to the cables referred to in **20.2** a), b), c) and d) to provide two test conditions as follows.

Test 1:

a) connect to supply source;

b) connect to a 16 A resistive load;

c) open circuit[5)];

d) open circuit (no plug).

Test 2:

a) connect to supply source;

b) connect to a resistive load equal to 16 A less the rated current declared by the manufacturer;

c) closed circuit[5)];

d) connect to a resistive load equal to the rated current declared by the manufacturer.

The temperature rise of any current-carrying terminal, on load, shall not exceed 35 K in either test. The test shall continue until stability is reached, stability being taken as not more than 1 K rise in 1 h.

20.4 Non-rewireable independent LSC plugs shall be tested as described in **20.2** and test 2 of **20.3**, substituting the rated current declared by the manufacturer.

21 Load making and breaking

21.1 LSC plugs and LSC outlets shall withstand connection and disconnection under electrical load conditions typical of normal operation.

21.1.1 Compliance shall be checked by the test described in **21.3** with connections as described in **21.2**.

21.2 The LSC plugs and LSC outlets shall be prepared for tests as follows.

a) Supply terminals of the LSC outlet shall be connected by 1.5 mm^2, flat twin with circuit protective conductor cable complying with Table 5(a) of BS 6004:1984.

b) Load terminals of an independent LSC plug shall be connected by 3-core 0.75 mm^2 circular sheathed flexible cord, complying with Table 16 of BS 6500:1984.

Component and integral LSC plugs shall be connected by a suitable means to the flexible cord for connection of the test loads.

21.3 A supply of 250 V a.c. is connected to the LSC outlet.

The LSC plugs are inserted and withdrawn, as appropriate to the design, with the current flowing, allowing approximately 5 s between consecutive movements.

The following tests are conducted.

a) An inductive load equal to the rated current, at 0.6 power factor (lagging) is connected to the LSC plug. 100 operations (200 movements) are carried out.

b) A load comprising five 100 W 250 V tungsten filament lamps for general service complying with BS 161, at approximately unity power factor, is connected to the LSC plug. 100 operations (200 movements) are carried out.

At the conclusion of the test, the LSC plugs and LSC outlets shall remain in a safe and satisfactory condition and shall be capable of complying with clauses **22** to **26**.

22 Mechanical strength

22.1 LSC plugs and LSC outlets shall have adequate mechanical strength to withstand the stresses imposed during installation and use.

22.1.1 For LSC outlets, compliance shall be checked by the tests described in **22.3** using the apparatus described in **22.2**.

For independent LSC plugs, compliance shall be checked by the test described in **22.4**.

22.2 Specimens are tested by means of the impact apparatus shown in Figure 1(a).

The pendulum consists of a steel tube suspended in such a way that it swings only in a vertical plane. A striking element of 0.15 kg is rigidly fixed to the lower end with its axis 1 m from the axis of suspension.

The striking element has a hemispherical face made of polyamide having a Rockwell hardness of R 100[6)], or hornbeam, and has a radius of 10 mm. [See Figure 1(b).]

The design of the apparatus is such that a force of between 1.9 N and 2 N has to be applied to the face of the striking element to maintain the pendulum in a horizontal position.

[5)] In the case of an LSC outlet not intended for the connection of a switching circuit, item c) is omitted.

[6)] See BS 2782:Method 365C.

Specimens are mounted on a sheet of plywood, 8 mm thick and 175 mm square, secured at its top and bottom edges to a mounting support shown in Figure 1(c).

The mounting support, having a mass of 10 ± 1 kg, is mounted on a rigid bracket by means of pivots. The bracket is mounted on a frame which is fixed to a solid wall. The design of the mounting assembly is such that:

a) the specimen can be so placed that the point of impact lies in the vertical plane through the axis of the pivot of the pendulum;

b) the specimen can be moved horizontally and turned about an axis perpendicular to the surface of the plywood;

c) the plywood can be turned about a vertical axis.

22.3 Surface-type LSC outlets are mounted on the plywood, using the normal mounting means.

Flush-type LSC outlets and their boxes, if any, are placed in a block of hardwood which is itself fixed to the sheet of plywood. The wood used shall have the direction of the wood fibres perpendicular to the direction of impact. To simulate the condition of normal use the rear of the plate is flush with the surface of the block. The front edge of the box is between 2.5 mm and 5 mm behind the face of the block.

For all tests the striking element falls from a height of 150 mm measured vertically between the point of impact on the specimen and the face of the striking element at the point of release.

Five blows are applied, evenly distributed over the LSC outlet.

After the tests the specimen shall still comply with clauses **10**, **11** and **19**.

Damage to the finish, small dents which do not reduce creepage clearances and distances below the values specified in clause **10** and small chips that do not adversely affect the protection against electric shock or moisture are ignored.

Cracks not visible with normal or corrected vision without additional magnification, and surface cracks in fibre-reinforced mouldings and the like are ignored.

22.4 Independent LSC plugs are tested in the tumbling barrel shown in Figure 2, falling 500 mm on to a plywood base 10 mm thick.

Rewireable independent LSC plugs are wired with 3-core, 0.75 mm^2, PVC sheathed, circular flexible cord complying with Table 16 of BS 6500:1984.

Non-rewireable independent LSC plugs are tested with the flexible cord fitted.

The flexible cords attached to independent LSC plugs are cut to a length of 100 mm measured from the cord entry.

Only one LSC plug is tested at one time in the tumbling barrel, turned at a rate of 5 r/min, 10 falls per minute thus taking place.

The total number of falls for each LSC plug is 250.

After the test the LSC plugs shall show no external damage which might affect safety and no components shall have become detached. External contacts shall not sustain damage which might prevent proper engagement with a corresponding LSC outlet.

Slight damage, chips or small cracks which do not affect accessibility to live parts, as defined in clause **11**, may be ignored.

22.5 LSC outlets and LSC plugs, when assembled together, shall be capable of sustaining the load of luminaires as follows:

a) by flexible cord: 5 kg;

b) by direct mechanical support from a horizontal surface: 5 kg or as declared by the manufacturer, whichever is the greater;

c) by direct support from a vertical surface: a load of 2.5 kg producing a turning moment of 1.5 N m or as declared by the manufacturer, whichever is the greater.

22.5.1 Compliance shall be checked by inspection and by one of the tests described in **22.6**, **22.7** or **22.8**.

22.6 For an LSC plug intended to suspend a luminaire by means of a flexible cord, the LSC outlet is fixed securely to the underside of a rigid horizontal surface as in normal use, the fixing screws being tightened to the torque value given in Table 2. The corresponding LSC plug is wired with a 3-core, 1.0 mm^2 circular sheathed flexible cord, approximately 100 mm in length and complying with Table 16 of BS 6500:1984. The terminal screws of the LSC plug are tightened to the torque given in Table 2 and the cord-restraint device or means is tightened as described in **16.3.1**. The LSC plug is connected to the socket in the intended manner but with any anti-theft device rendered inoperative and a load of 7.5 kg is suspended from the lower end of the flexible cord for a period of 24 h, in an oven at a temperature of 70 °C.

At the conclusion of this test the LSC outlet and the LSC plug shall comply with **13.3** and clauses **19** and **20** and shall be capable of disconnection without difficulty. The cord shall not have moved noticeably in the LSC plug.

22.7 For an LSC outlet intended to support a luminaire from a horizontal surface, by means other than a flexible cord, the outlet is fixed as described in **22.6**. The corresponding LSC plug is then connected to the LSC outlet in the intended manner but with any anti-theft device rendered inoperative and a load of x kg is suspended from the LSC plug as shown in Figure 3(a).

The value of load x shall be either 7.5 kg or 1.5 times the maximum value declared by the manufacturer, whichever is the greater.

The complete assembly is placed, for a period of 24 h, in an oven at a temperature of 70 °C.

22.8 For an LSC outlet intended to support a luminaire from a vertical surface, by means other than a flexible cord, the outlet is fixed securely to a rigid vertical surface as in normal use. The corresponding LSC plug is then connected to the LSC outlet in the intended manner so that a load of 2.5 kg projecting perpendicular to the vertical surface produces a turning moment of 2.5 N m when calculated from the interface plane between the LSC plug and LSC outlet. The complete assembly is then placed, for a period of 24 h, in an oven at a temperature of 70 °C.

The test load is applied as shown in Figure 3(b).

22.9 The LSC plugs and LSC outlets tested in **22.8** are subjected to three further tests, with the LSC outlet mounted as before. For the first test the load projects horizontally to the left and for the second test the load projects horizontally to the right. In each test a load of 2.5 kg lies parallel with the mounting surface and produces a turning moment of 2.5 N m when calculated from the vertical centreline of the LSC outlet. For the third test a load of 3.75 kg is suspended from the LSC plug. In each test the load shall be maintained for 2 h, in an oven at a temperature of 70 °C.

The test load is applied as shown in Figure 3(c) and Figure 3(d).

22.10 At the conclusion of the tests described in **22.7**, **22.8** and **22.9**, when the loads are removed, the LSC plug shall not have become disengaged from the LSC outlet, both shall remain in a serviceable condition and be capable of disconnection and reconnection without difficulty. The means of attachment of the LSC plug to the luminaire shall remain effective and undamaged.

Screws and rivets shall be checked for tightness by inspection and manual test.

The material around holes used to fix the LSC outlet to the mounting surface shall show no damage which will preclude further use.

23 Resistance to heat

23.1 LSC plugs and LSC outlets shall be resistant to heat.

23.1.1 Compliance shall be checked by the tests described in **23.2** and **23.3**.

23.2 The specimens are kept for 1 h in a heating cabinet at a temperature of 100 ± 2 °C.

During the test, they shall not undergo any change impairing their further use and sealing compound shall not flow to such an extent that live parts are exposed. A slight displacement of the sealing compound should be disregarded.

After the test the specimens shall still comply with clause **11**.

23.3 Parts of insulating material are subjected to a ball pressure test by means of the apparatus shown in Figure 4. The surface of the part to be tested is placed in a horizontal position and a steel ball of 5 mm diameter is pressed against this surface by a force of 20 N.

When it is not possible to carry out the test on the LSC plug or LSC outlet itself the test shall be carried out on a specimen of the same material not less than 2 mm thick.

The tests are made in a heating cabinet at a temperature of either:

a) 125 ± 2 °C for parts of insulating material necessary to retain current-carrying parts in position; or

b) 75 ± 2 °C for other parts of insulating material.

The underside of the part being tested is supported to withstand the test force and to minimize the risk of distortion.

The test load and the supporting means are placed within the heating cabinet for a sufficient time to ensure they have attained the stabilized testing temperature before the test commences.

The part to be tested is placed in the heating cabinet, for a period of 10 min, before the test load is applied.

After 1 h, the ball is removed from the specimen which is then cooled down, by immersion for at least 10 s in water at approximately room temperature.

The diameter of the impression caused by the ball shall be measured and shall not exceed 2 mm.

24 Resistance to abnormal heat and to fire

24.1 Parts of insulating material which might be exposed to thermal stresses due to electric effects and the deterioration of which might impair the safety of the LSC plug and/or LSC outlet shall not be unduly affected by abnormal heat and by fire.

24.1.1 Compliance shall be checked by the glow-wire test described in **24.2**.

The test is not performed on decorative covers (see **3.15**), on small parts such as washers or on parts made from ceramic material.

24.2 The glow-wire test is performed as described in clauses **4** to **10** of BS 6458-2.1:1984 at the test temperature given in Table 3.

Table 3 — Application of glow-wire test

Part	Temperature of glow-wire	
	LSC plugs	LSC outlets
	°C	°C
Parts necessary to retain live parts in position	750 ± 10	850 ± 15
Parts not necessary to retain live parts in position (although they may be in contact with live parts)	650 ± 10	650 ± 10

If the test is to be made at more than one place on the same specimen, it is essential that care is taken to ensure that any deterioration caused by previous tests does not affect the result of the test to be made.

The glow-wire test is applied to ensure that an electrically heated test wire under defined test conditions does not cause ignition of insulating parts or to ensure that a part of insulating material, which might be ignited by the heated test wire under defined conditions, has a limited time to burn without spreading fire by flame or burning parts or droplets failing down from the test part on to a pinewood board covered with tissue paper.

If possible, the specimen should be a complete LSC plug or LSC outlet. If the test cannot be made on a complete item, a suitable part may be cut from it for the purpose of the test.

The test is made on one specimen.

In case of doubt, the test shall be repeated on two further specimens.

The test is made by applying the glow-wire once.

The specimen is positioned during the test in the most unfavourable position of its intended use (with the surface tested in a vertical position).

The tip of the glow-wire is applied to the specified surface of the specimen taking into account the conditions of the intended use under which a heated or glowing element may come into contact with the specimen.

The specimen is regarded as having passed the glow-wire test if:

a) there is no visible flame and no sustained glowing; or

b) flames and glowing at the specimen extinguish within 30 s after the removal of the glow-wire.

There shall be no ignition of the tissue paper or scorching of the board.

25 Resistance to tracking

Insulating parts supporting or in contact with live parts of LSC plugs and LSC outlets shall be of a material resistant to tracking.

25.1 For material other than ceramic, compliance shall be checked by the test described in BS 5901 carried out on three specimens.

A flat surface of the part to be tested, at least 15 mm × 15 mm and at least 3 mm thick, is placed in the horizontal position on the apparatus.

The material under test shall pass at a proof tracking index of 175 V using the test solution A with the interval between drops of 30 ± 5 s.

NOTE If the part requiring test does not meet the dimensional criteria, it is permitted to stack specimens to reach the 3 mm thickness value or else a plaque of the identical material 3 mm thick may be used.

In case of doubt, the test is repeated on a new set of specimens.

26 Resistance to excessive residual stresses and to rusting

NOTE Attention is drawn to the fact that due precautions should be taken when using the liquids prescribed in the tests of this clause as they are toxic.

26.1 Contacts and other functional parts of copper or copper alloy shall be resistant to failure in use due to brittleness.

26.1.1 For copper alloys containing less than 80 % copper, compliance shall be checked by the following test.

The part is degreased in a suitable alkaline degreasing solution or organic solvent, then immersed in an aqueous solution of mercurous nitrate containing 10 g of $Hg_2(NO_3)_2$ and 10 mL of HNO_3 (relative density 1.42) per litre of solution for 30 min at a temperature of 20 ± 5 °C.

After the treatment the part is washed in running water, any excess mercury wiped off and the part *immediately* visually examined. There shall be no cracks visible with normal or corrected vision without additional magnification.

26.2 Ferrous parts shall be adequately protected against rusting.

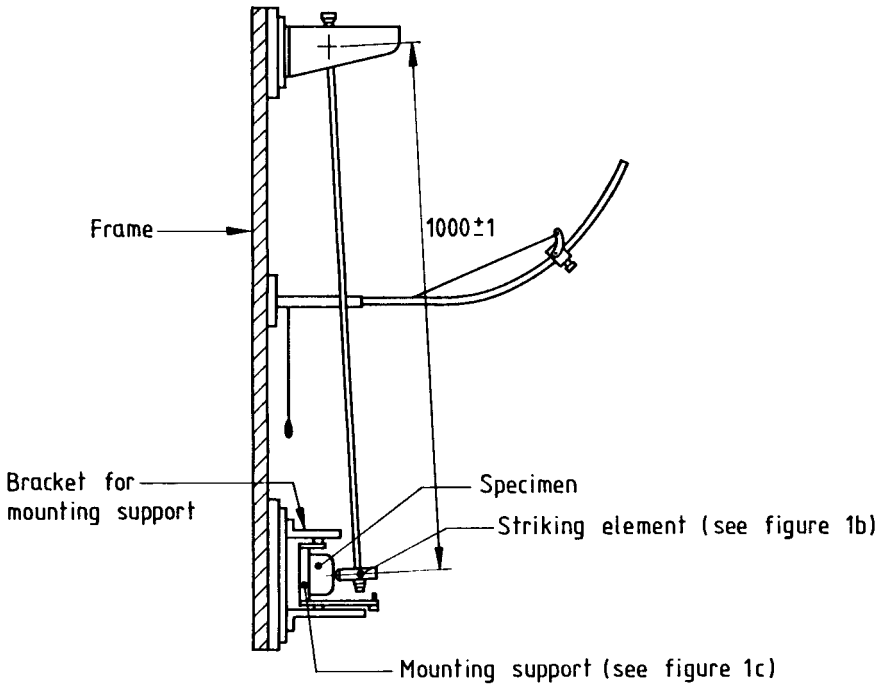
26.2.1 Compliance shall be checked by the following test.

All grease is removed from the parts to be tested, by immersion in trichloroethane or any other suitable degreasing agent for 10 min. The parts are then immersed for 10 min in a 10 % solution of ammonium chloride in water at a temperature of 20 ± 5 °C.

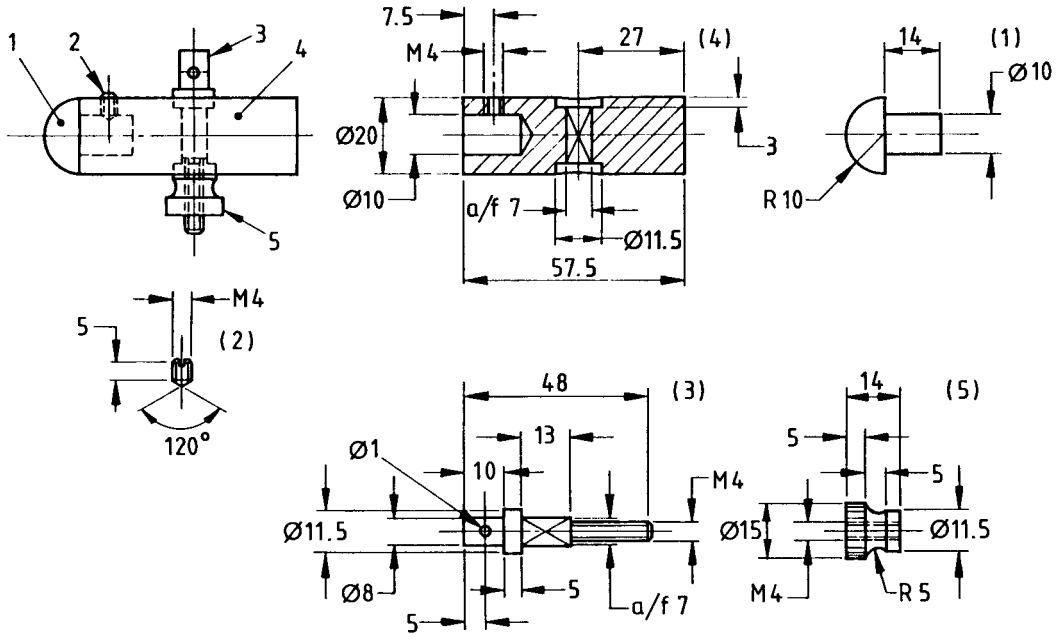
Without drying, but after shaking off any drops, the parts are placed for 10 min in a box containing air saturated with moisture at a temperature of 20 ± 5 °C. After the parts have been dried for 10 min in a heating cabinet at a temperature of 100 ± 5 °C, surfaces shall show no signs of rust.

NOTE 1 Traces of rust on sharp edges and any yellowish film removable by rubbing should be ignored.

NOTE 2 For small helical springs etc., and for parts exposed to abrasion, a layer of grease may provide sufficient protection against rusting. Such parts are subjected to the test only if the testing authority is in doubt about the effectiveness of the grease film, and the test is then carried out without previous removal of the grease.



(a) General view of test apparatus



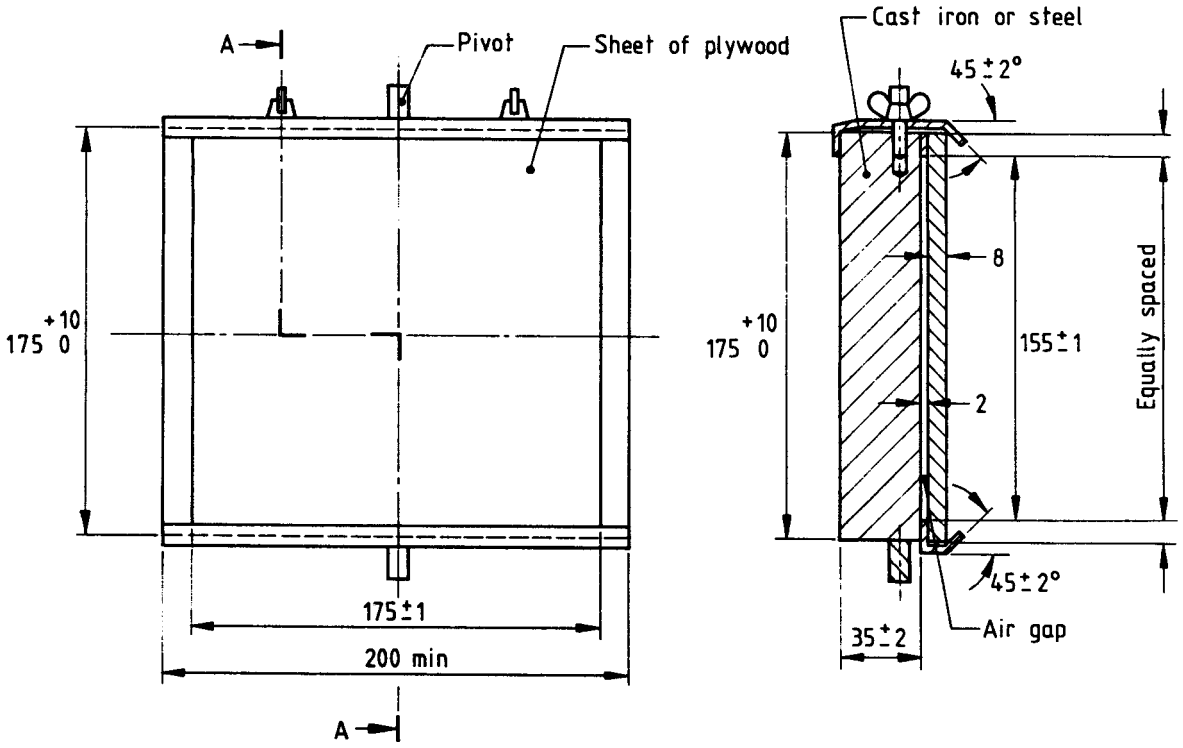
Materials

1 : polyamide or hornbeam
2, 3, 4 and 5 : steel

(b) Constructional details of striking element

NOTE This drawing is not intended to govern design except as regards the dimensions and specific requirements shown.
All dimensions are in millimetres.

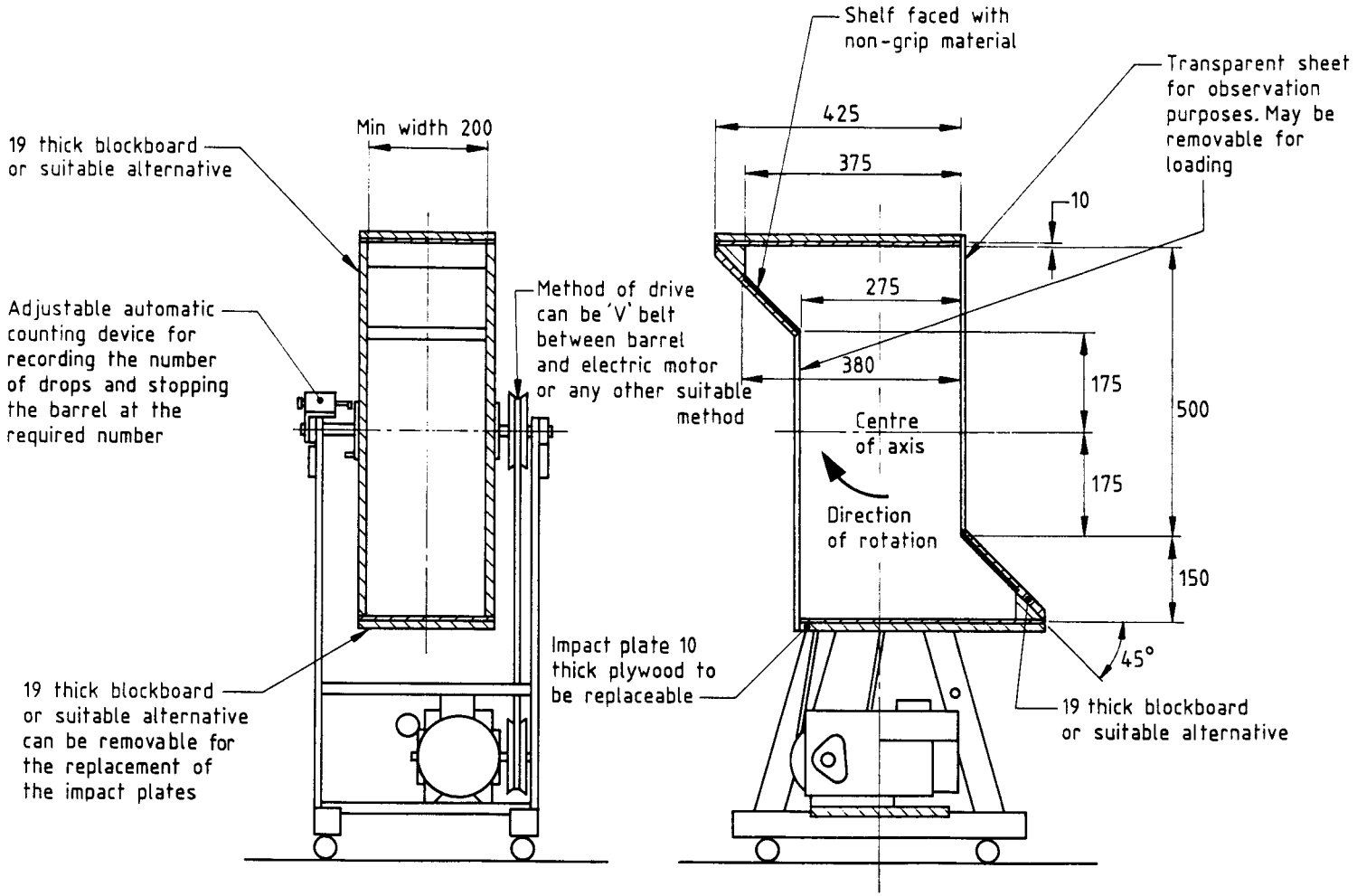
Figure 1 — Pendulum impact test apparatus



(c) Constructional details of mounting support for test samples

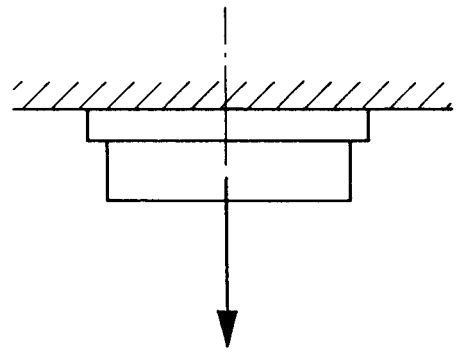
NOTE This drawing is not intended to govern design except as regards the dimensions and specific requirements shown.
All linear dimensions are in millimetres.

Figure 1 — Pendulum impact test apparatus *(concluded)*

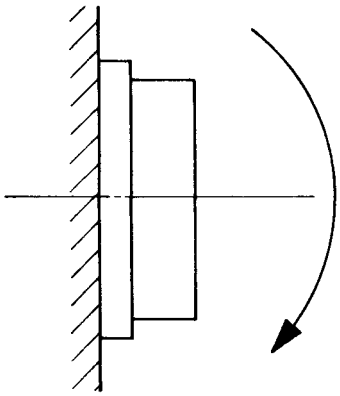


NOTE This drawing is not intended to govern design except as regards the dimensions and specific requirements shown.
All linear dimensions are in millimetres.

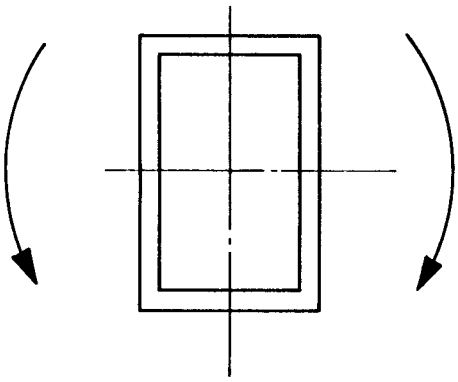
Figure 2 — Tumbling barrel



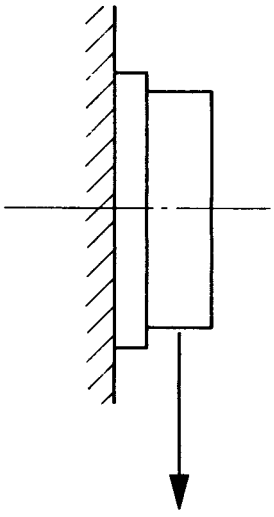
(a) (See **22.7**.)



(b) (See **22.8**.)

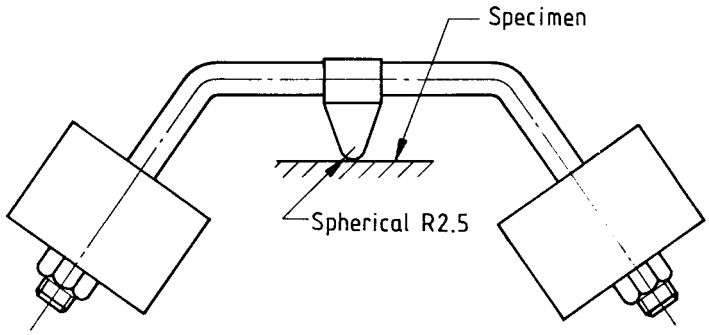


(c) (See **22.9**.)



(d) (See **22.9**.)

Figure 3 — Application of test load



NOTE This drawing is not intended to govern design except as regards the dimension and specific requirements shown.
The dimension is in millimetres.

Figure 4 — Ball pressure test apparatus

blank

Publications referred to

BS 161, *Specification for tungsten filament lamps for general service (batch testing).*

BS 2782, *Methods of testing plastics.*

BS 2782:Method 365C, *Determination of Rockwell hardness.*

BS 3042, *Specification for standard test fingers and probes for checking protection against electrical, mechanical and thermal hazard.*

BS 4533, *Luminaires.*

BS 4533-101, *Specification for general requirements and tests.*

BS 4714, *Method for laboratory determination of density or relative density of crude petroleum and liquid petroleum products (hydrometer method).*

BS 5750, *Quality systems.*

BS 5901, *Method of test for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions.*

BS 6004, *Specification for PVC-insulated cables (non-armoured) for electric power and lighting.*

BS 6007, *Specification for rubber-insulated cables for electric power and lighting.*

BS 6141, *Specification for insulated cables and flexible cords for use in high temperature zones.*

BS 6458, *Fire hazard testing for electrotechnical products.*

BS 6458-2.1, *Glow-wire test.*

BS 6500, *Specification for insulated flexible cords and cables.*

BS 7001, *Specification for interchangeability and safety of a standardized luminaire supporting coupler.*

PD 6499, *Guide to insulation co-ordination within low-voltage systems including clearances and creepage distances for equipment.*

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