

13 A plugs, socket-outlets, adaptors and connection units —

Part 3: Specification for adaptors

ICS 29.120.30

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee PEL/4, Electrical accessories, upon which the following bodies were represented:

Association of Control Manufacturers [TACMA (BEAMA Ltd.)]
 Association of Manufacturers of Domestic Electrical Appliances
 ASTA Certification Services
 British Cable Makers Confederation
 British Electrical Systems Association (BEAMA Ltd.)
 British Electrotechnical Approvals Board
 British Radio and Electronic Equipment Manufacturers' Association
 BSI Testing Services Consumers' Association
 Consumer Policy Committee of BSI
 Copper Development Association
 Department of Trade and Industry (Consumer Safety Unit, CA Division)
 BEAMA Installation
 Electricity Association
 ERA Technology Ltd.
 Federation of the Electronics Industry
 Industry Council for Electronic Equipment
 Recycling Institute of Trading Standards Administration
 Institution of Electrical Engineers
 Institution of Incorporated Executive Engineers
 International Consumer Electronics Association (ICEA)
 Lighting Association
 Lighting Industry Federation Ltd.
 National Inspection Council for Electrical Installation Contracting
 National Standards Authority of Ireland
 Royal Society for the Prevention of Accidents

This British Standard, having been prepared under the direction of the Electrotechnical Sector Board, was published under the authority of the Standards Board and comes into effect on 15 September 1995

© The British Standards Institution 2012
 Published by BSI Standards Limited 2012

First published February 1989
 Second edition September 1995

The following BSI references relate to the work on this British Standard:

Committee reference PEL/4
 Drafts for comment
 92/03484 DC,
 11/30203496 DC,
 12/30262599 DC

Amendments issued since publication

Amd. No.	Date	Comments
9543	October 1997	
14225 Corrigendum No. 1	12 November 2002	Corrections to Clauses 6.2 and 14.1.1
14540	9 October 2003	
17437	30 November 2007	See Foreword.
A4	30 November 2012	See Foreword.

ISBN 978 0 580 67799 1

Contents

	Page
Committees responsible	Inside front cover
Foreword	iii
1 Scope	1
2 Conditions of use	1
3 Terms and definitions	1
4 General	5
5 General conditions for type testing	5
6 Classification and rating	6
7 Marking and labelling	7
8 Clearances, creepage distances and solid insulation	9
9 Accessibility of live parts	12
10 Provision for earthing	13
11 Terminals and terminations of intermediate adaptors and adaptor plugs	13
12 Construction of adaptors (plug portion)	15
13 Construction of adaptors (adaptor socket-outlet portion)	22
14 Resistance to ageing and to humidity	26
15 Insulation resistance and electric strength	27
16 Temperature rise	27
17 Breaking capacity of adaptors	29
18 Normal operation of adaptors	30
19 Connection of flexible cords and cord anchorage in intermediate adaptors and adaptor plugs	31
20 Mechanical strength	33
21 Screws, current-carrying parts and connections	34
22 Resistance to heat	35
23 Resistance to abnormal heat, fire and tracking	36
24 Resistance to excessive residual stresses and to rusting	36
25 <i>(Not used)</i>	37
26 Overload tests	37
Annex A (normative) The construction and calibration of a calibrated link	74
Annex B (normative) Measurement of clearances and creepage distances	75
Annex C (normative) Determination of the Comparative Tracking Index (CTI) and Proof Tracking Index (PTI)	79
Annex D (normative) Relation between rated impulse withstand voltage, rated voltage and Overvoltage Category	80
Annex E (normative) Pollution degree	80
Annex F (normative) Impulse voltage test	81
Annex G (normative) Test plug for temperature rise test	82
Annex H (informative) Specific structure of BS EN 50525 and its derivation from British Standards and from HD 21 and HD 22	83
List of references	84
Figure 1 — Test pin	38
Figure 2a) — Apparatus for mechanical strength test on resilient covers	39
Figure 2b) — Hardwood block for Figure 2a)	40
Figure 3 — Disposition of socket contacts	41
Figure 4a) — Dimensions and disposition of pins	42
Figure 4b) — Concave shrinkage allowance for ISODs	44

Figure 5 — Gauge for adaptor pins	46
Figure 6 — Apparatus for testing plug cover fixing screws	47
Figure 7 — Mounting plate	47
Figure 8 — Plug pin deflection test apparatus for resilient adaptors	48
Figure 9 — Apparatus for abrasion test on insulating sleeves of plug pins	49
Figure 10 — Apparatus for pressure test at high temperatures	50
Figure 11 — GO gauge for socket-outlet	51
Figure 12 — Contact test gauge	52
Figure 13 — Test apparatus and circuit for use with contact and non-contact test gauges	53
Figure 14 — Non-contact test gauge	54
Figure 16 — Withdrawal pull gauges for effectiveness of contact	55
Figure 17a) — Test apparatus for temperature-rise test	56
Figure 17b) — Dummy front plate for temperature-rise test	57
Figure 18 — Apparatus for flexing test	58
Figure 19 — Solid link for test on fuse clips	59
Figure 20 — Tumbling barrel	60
Figure 21 — Pendulum impact test	61
Figure 23 — Apparatus for pressure test	63
Figure 24 — <i>Figure deleted</i>	64
Figure 28 — Calibrated link	65
Figure 29 — Calibration jig for calibrated link	66
Figure 30 — Test plug for temperature rise test	67
Figure 32 — Apparatus for tests on adaptor pins	68
Figure 33 — Apparatus for torsion test on pins	69
Figure 34 — Test plug	69
Figure 35 — Simulated plug and cord devices	70
Figure 36 — Apparatus for calibration of turning moment of simulated plug	71
Figure 37 — Turning moment apparatus	72
Figure 38 — Solid links for test on fuse clips	73
Table 1 — Schedule of tests	6
Table 2 — Rated current and maximum fuse rating in normal use, and load for flexing and cord grip tests related to size of flexible cord	8
Table 3a — Torque values for screws and nuts	14
Table 3b — Actuator test force	25
Table 4 — Permitted temperature rises	29
Table 5 — <i>Not used</i>	
Table 6 — Connection of flexible cords	32
Table 7 — Application of glow-wire test	36
Table 8 — Minimum clearances for basic insulation	10
Table 9 — Minimum creepage distances for basic insulation	11
Table 10 — Withstand voltages for insulation types	11
Table B.1 — Minimum values of width X	75
Table D.1 — Rated impulse withstand voltage for accessories energized directly from the low voltage mains	80
Table F.1 — Test voltages for verifying clearances at sea level	81

Foreword

This part of BS 1363 is published by BSI Standards Limited, under license from the British Standards Institution. This part of BS 1363 has been prepared by Technical Committee PEL/23. This part of BS 1363 supersedes BS 1363-3:1989.

BS 1363-3:1995+A4:2012 supersedes BS 1363-3:1995 (incorporating Amendments Nos. 1:1997, 2:2003 and 3:2007), which, however, remains current and will be withdrawn on 31 December 2015.

The start and finish of text introduced or altered by Amendment No. 3 and Amendment No. 4, respectively is indicated in the text by tags **A3** and **A4** respectively. Text introduced or altered by Amendment No. 1 and Amendment No. 2 is not tagged. Minor editorial corrections are not tagged.

BS 1363 comprises four parts covering the following.

- *Part 1: Rewirable and non-rewirable 13 A fused plugs;*
- *Part 2: Switched and unswitched socket-outlets;*
- *Part 3: Adaptors;*
- *Part 4: 13 A fused connection units: switched and unswitched.*

NOTE In order to prevent confusion with BS 1363:1984, the figure and clause numbers have been retained.

BS 6500, which is called up in this part of BS 1363, has been superseded by BS EN 50525. In the transition period up until 31 December 2012 cords to either standard may be used. After that date all cords have to be to the relevant part of BS EN 50525.

The structure of BS EN 50525 and its derivation from British Standards and HD 21 and HD 22 is set out in BS EN 50525-1:2011, National Annex NA. This is reproduced in Annex H for the convenience of users of this part of BS 1363.

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.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 84, an inside back cover and a back cover.

The BSI copyright notice displayed in this document indicates when the document was last issued.

1 Scope

This part of BS 1363 specifies requirements for adaptors having insulating sleeves on the line and neutral plug pins and suitable for use with socket-outlets complying with BS 1363-2, with particular reference to safety in normal use. Adaptors specified in this part of BS 1363 are intended for household, commercial and light industrial purposes. The adaptors are suitable for the connection of portable appliances, sound-vision equipment, luminaires, etc., in a.c. circuits only, operating at voltages not exceeding 250 V r.m.s. at 50 Hz.

A3 This standard also applies to shaver adaptors which have the brass earth pin replaced with a similarly dimensioned protrusion made of insulating material designated as an insulated shutter opening device (ISOD) designed to operate the shutter mechanism of a socket-outlet conforming to BS 1363-2.

NOTE 1 Brass can be copper, phosphor-bronze or other metal at least equivalent with regard to its conductivity, resistance to abrasion, and resistance to corrosion. **A3**

Assemblies comprising a plug and one of more portable socket-outlets connected together by a flexible cord or cable are not considered to be adaptors according to this part of BS 1363. Devices incorporating **A4** *Text deleted* **A4**, transformers, timers, thermostats or other control means are outside the scope of this part of BS 1363.

NOTE **A3** 2 **A3** The titles of the publications referred to in this standard are listed on the inside back cover.

NOTE **A3** 3 **A3** In order to maintain safety and interchangeability with plugs and socket-outlets it is necessary that these products comply with the requirements of Clause 9, Clause 12 and Clause 13, however their body outline need not be limited at a distance of 6.35 mm from the plug engagement **A3** surface **A3**.

NOTE **A3** 4 **A3** Requirements for electromagnetic compatibility are not given for the following reasons.

An adaptor does not emit intolerable electromagnetic interference since significant electromagnetic disturbances are only generated during insertion and withdrawal which are not continuous.

An adaptor is mechanical by nature of construction. The product is therefore immune from electromagnetic interference.

2 Conditions of use

Adaptors shall be suitable for use under the following conditions:

- a) an ambient temperature in the range -5°C to $+40^{\circ}\text{C}$, the average value over 24 h not exceeding 25°C ;

NOTE Under normal conditions of use, the available cooling air is subject to natural atmospheric variations of temperature and hence the peak temperature occurs only occasionally during the hot season, and on those days when it does occur it does not persist for lengthy periods.

- b) a situation not subject to exposure to direct radiation from the sun or other source of heat likely to raise temperatures above the limits specified in a);

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

- d) an atmosphere not subject to abnormal pollution by smoke, chemical fumes, rain, spray, prolonged periods of high humidity or other abnormal conditions. This is the equivalent to pollution degree 2, see **A3** Annex E, and overvoltage category III, see Annex D. **A3**

3 Terms and definitions

For the purposes of this part of BS 1363 the following definitions apply.

NOTE Where the terms voltage and current are used, they imply r.m.s. values, unless otherwise, stated.

3.1

adaptor

a portable accessory having plug pins, intended to engage with the contacts of a BS 1363 socket-outlet, and having socket-outlet contacts to accommodate one or more plugs

3.2

adaptor socket-outlet

a set of contacts forming part of an adaptor and designed to engage with the pins of a corresponding plug

3.3

multiway adaptor

an adaptor having more than one set of socket contacts (the socket contacts may or may not be of the same type or rating as the plug pin portion)

3.4

non-rewirable adaptor

A4 an adaptor as in 3.7 or 3.8, so constructed that it forms a complete unit with the flexible cord which cannot be replaced after assembly by the manufacturer of the adaptor **A4**

NOTE See also 12.6.

3.5

rewirable adaptor

an adaptor as in 3.7 or 3.8, so constructed that a flexible cord can be fitted or replaced using general purpose tools

3.6

fused adaptor

an adaptor having a replaceable cartridge fuse link interposed between the line pin and one or more line socket contacts

3.7

adaptor plug

a fused adaptor having one or more socket-outlets and provision for the connection of a flexible cord to a portable appliance, in parallel with the socket-outlet

3.8

intermediate adaptor

a fused adaptor having one or more socket-outlets and provision for the connection of a flexible cord to a remote control device in series with the socket-outlet

3.9

conversion adaptor

a fused adaptor having one or more sets of socket contacts of a type or rating differing from the plug pin portion

3.10

shaver adaptor

a fused conversion adaptor specifically designed to have a single socket-outlet capable of accepting the plugs normally fitted to electrical shavers as referred to in Clause 18

3.11

shutter

a movable device arranged to shield the current carrying socket-outlet contacts automatically when a corresponding plug is removed

3.12

terminal

a means by which the user can make an electrical connection between the appropriate flexible cord and the conducting parts of the adaptor without the use of special tools

3.13

screw-type terminal

a terminal in which the connection is made directly by means of screws or nuts of any kind or indirectly through an intermediate metal part such as a washer, clamping plate or anti spread device on which the screw bears directly

NOTE The following are examples of screw-type terminals.

- a) A pillar terminal is a terminal in which the conductor is inserted into a hole or cavity, where it is clamped under the shank of the screw or screws.
- b) A screw terminal is a terminal in which the conductor is clamped under the head of the screw.
- c) A stud terminal is a terminal in which the conductor is clamped under a nut.

3.14**termination**

a means by which an electrical connection can be made between the appropriate flexible cord and the conducting part of the adaptor using special purpose tools, e.g. soldering, welding, crimping

3.15**fuse carrier**

a movable or removable part designed to carry, retain, cover and/or remove the fuse link

3.16**type test**

a test or series of tests made on a type test sample, for the purpose of checking compliance of the design of a given product with the requirements of the relevant standard

3.17**type test sample**

a sample consisting of one or more similar units or specimens submitted by the manufacturer or responsible vendor for the purpose of a type test

3.18**accessible external surface of an adaptor**

all surfaces which can be touched by test probe B of BS EN 61032:1998 when the adaptor is in full engagement with the corresponding socket-outlet without any plugs being in engagement with the adaptor

3.19**engagement surface of A_3 the plug portion of A_3 an adaptor**

that surface which cannot be touched by test probe B of BS EN 61032:1998 when the adaptor is in full engagement with a corresponding socket-outlet without any plugs being in engagement with the adaptor

3.20**live parts**

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

NOTE Metal parts of the earthing circuit are not considered to be current-carrying parts.

3.21**fine wire thermocouple**

a thermocouple having wires not exceeding 0.3 mm in diameter

3.22**calibrated link**

a calibrated heat source for use in place of a fuse link during temperature-rise tests

3.23**indicator lamp (pilot lamp)**

a lamp A_3 or similar device A_3 which illuminates to indicate that the adaptor is energized.

3.24**resilient material**

a material having the inherent capability of regaining or substantially regaining its original form when deforming loads are removed

3.25**creepage distance**

the shortest distance along the surface of the insulating material between two conductive parts

3.26**clearance**

shortest distance in air between two conductive parts

3.27

basic insulation

insulation applied to live parts to provide basic protection against electric shock

NOTE Basic insulation does not necessarily include insulation used exclusively for functional purposes.

3.28

supplementary insulation

independent insulation applied in addition to basic insulation, in order to provide protection against electric shock in the event of failure of basic insulation

3.29

reinforced insulation

a single insulation system applied to live parts, which provides a degree of protection against electric shock equivalent to double insulation under the conditions specified in the relevant standard

3.30

functional insulation

insulation between conductive parts which is necessary only for the proper functioning of the equipment

3.31

Insulated Shutter Opening Device (ISOD)

protrusion from the engagement surface of the adaptor, in place of a brass earth pin, made of insulating material having dimensions similar to those of a brass earth pin

3.32

class I

method of protection against electric shock which does not rely on basic insulation only, but which includes means for the connection of exposed-conductive-parts to a protective conductor in the fixed wiring of the installation

3.33

class II

method of protection against electric shock which does not rely on basic insulation only, but in which additional safety precautions, such as double insulation or reinforced insulation are provided, there being no provision for protective earthing or reliance upon installation conditions

NOTE 1 Such a method may be one of the following.

- a) Equipment having double and substantially continuous enclosure of insulation material which envelopes all metal parts with the exception of small parts such as name plates, screws and rivets which are isolated from live parts by insulation at least equivalent to reinforced insulation. Such equipment is called "insulated encased class II equipment".
- b) Equipment having a substantially continuous enclosure of metal, in which double insulation is used throughout, except for those parts where reinforced insulation is used. Such equipment is called "metal encased class II equipment".
- c) Equipment that is a combination of types a) and b) above.

NOTE 2 The enclosure of an insulation encased class II appliance may form a part or whole of the supplementary insulation, or reinforced insulation.

NOTE 3 If an appliance with double insulation and/or reinforced insulation throughout has an earthing terminal or an earthing contact, it is of class I construction.

NOTE 4 Class II appliances may have parts in which protection against electric shock relies on operation at safety extra-low voltage (SELV).

3.34

engagement surface of the socket-outlet portion of an adaptor

that surface which cannot be touched by test probe B of BS EN 61032:1998 when Figure 11 gauge or a plug conforming to the corresponding standard is in full engagement with the adaptor 

3.35

insignificant mass

insufficient combustible mass to constitute a fire hazard

NOTE Parts of insignificant mass are usually less than 2 g. 

3.36**small parts**

parts where each surface lies completely within a circle of 15 mm diameter or where some of the surface lies outside the 15 mm diameter circle but in such a way that it is not possible to place a circle of 8 mm diameter on any of this remaining surface

[BS EN 60695-2-11:2001, 3.1, modified]

NOTE More information concerning small parts can be found in BS 60695-2-11:2001, 3.1. 

3.37**switched adaptor**

an adaptor with associated switch or switches to disconnect the supply to the line socket contact or to both line and neutral socket contacts 

3.38**actuating member**

that part which is moved, e.g. pulled, pushed or turned by the user, to operate the switch mechanism of a switched adaptor 

4 General

Adaptors shall be so designed and constructed that in normal use their performance is reliable and minimizes the risk of danger to the user or to the surroundings. Such adaptors shall be capable of meeting all the relevant requirements and tests specified in this part of BS 1363.

 Throughout this standard, where cords to BS 6500 are referred to these may be replaced by equivalent cords (now referred to as cables) to BS EN 50525 which has superseded BS 6500; when BS 6500 is withdrawn, equivalent cables (cords) to BS EN 50525 shall be used. 

5 General conditions for type testing

5.1 All tests shall be type tests.

Unless otherwise specified in this part of BS 1363, the adaptors shall be tested as delivered by the manufacturer or responsible vendor and under normal conditions of use, at an ambient temperature of $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ after being conditioned at normal laboratory temperature and humidity levels for at least 4 days.

The adaptors used for the tests shall be representative of normal production items in respect of all details which may affect the test results.

Non-rewirable adaptors shall be supplied with an appropriate flexible cord which shall be at least 1 m long.

Adaptors shall be deemed to comply with this part of BS 1363 if no specimen fails in the complete series of tests given in Table 1.

If one specimen fails in a complete series of tests given in Table 1, then adaptors of that type shall be deemed to have failed to comply with this part of BS 1363, unless the adaptor shall be shown to be not representative of normal production or design, in which case a further type test sample shall be submitted to the test or tests in that particular group. If there is no failure in this retest then adaptors of that type shall be deemed to comply with this part of BS 1363.

If more than one specimen fails in the complete series of tests given in Table 1 then adaptors of that type shall be deemed not to comply with this part of BS 1363.

NOTE 1 For type testing, all tests have been included in the test schedule and should be performed in the specified order. References to carrying out specific tests in various clauses are not intended to indicate a sequence of testing different to that in the schedule and should not be conducted as separate additional tests.

NOTE 2 Where reference to BS 6500:2000 is made, equivalent flexible cords to the latest version of that standard may be used.

5.2 All inspections and tests, of any one classification (see Clause 6), shall be carried out as specified in the clauses listed in Table 1 on the number of specimens in the sample column and in the order given.

5.3 Gauges in accordance with Figure 5, Figure 11, Figure 12, Figure 14, and Figure 16 shall be considered to comply with the dimensional requirements if the measured values are within the specified dimensions and the uncertainty of measurement at not less than 95 % confidence level does not exceed ± 0.005 mm.

6 Classification and rating

6.1 Adaptors shall be classified as follows, as appropriate:

- fused or unfused;
- conversion (from BS 1363 system to another);
- multiway (from BS 1363 system to multiple outlets);
- intermediate;
- adaptor plug;
- rewirable or non-rewirable (in the case of an intermediate adaptor or adaptor plug);
- A_3 shaver adaptor;
- for shaver adaptors for class II applications only, fitted with an un-terminated brass earth pin or ISOD. A_3

6.2 The rated current of an adaptor shall be one of the following:

- equal to the sum of the rated currents of the adaptor socket-outlet portions, if this sum is lower than 13 A;
- 13 A if the sum of the rated current of the adaptor socket-outlet portions is higher than 13 A;
- 13 A for an adaptor plug;
- 13 A if the sum of the rated currents of the socket-outlet is equal to or greater than 13 A.

A_3 Table 1 — Schedule of tests A_3

Sequence	Samples	Tests	Clause number
1	3	Inspection, measurement, gauging and manipulation	5, 6, 7, 9.1, 9.2, 9.3, 9.5, 9.6, 10.1, 11.1, 12.1, 12.2, 12.3, 12.4, 12.5, 12.11 (12.11.1, 12.11.2, 12.11.3 and 12.11.6 only), 12.15, 12.16, 12.17, 12.18, 13.1, 13.2, 13.3, 13.4, 13.5, 13.8, 13.9, 13.10, 19.2, 19.3, 19.4, 19.6, 21, 8 A_4 (except Annex C) A_4
2	3	General	5, 9.4, 19.1, 12.14, 12.19.2, 12.19.3, 12.19.2
3	3		5, 20.1.2, 20.1.3, 17, A_4 13.12.1 A_4 , 20.1.4, 16
4	3		5, 14.2 12.10, 19.5, 12.19.4
5	3		5, 14.1, 20.1.5, 12.9, 10.2, 12.12, 12.6, 12.7, 12.8, 12.13, 21.3
6	3		5, 14.1, 15, 13.7, 18 (13.7, 9.1, 16, 15, 13.5, 13.6, 10.2), 13.11
7	3*		5, 12.11.4
A_3 8a)	9	Additional tests for adaptors with non-solid pins and/or an ISOD	5, 12.11.5
8b)	3	Additional tests for adaptors fitted with an ISOD	5, 12.11.4.3 A_3
9	3	Materials	5, 22
10	3		5, 23.2, 8.2 A_4 (Annex C only) A_4
11	3		5, 24, 21.3
12	3	Positive break (switched adaptors)	5, 13.12.2
13	3	Overloads	5, 14.1, 26

NOTE 1 *denotes that an additional three samples will be required for adaptors with non-solid pins.

NOTE 2 The order of tests given in sequence no. 1 is preferred but not obligatory except where required within the text of the appropriate clause.

7 Marking and labelling

7.1 Adaptors shall be legibly and durably marked with the following information, which shall not be placed on screws, removable washers or other easily removable parts, or upon parts intended for separate sale:

- a) either the name, trade mark or identification mark of the manufacturer or responsible vendor, which may be duplicated on a removable fuse carrier;
- b) the number of this British Standard, i.e. BS 1363¹⁾;
- c) on rewirable adaptors, the terminals intended for the connection of the various conductors shall be identified by the symbols given in **7.5**;
- d) for fused adaptors, the words “FUSE” or “FUSED” or the symbol (given in **7.5**) on the external accessible surface of the adaptor;
- e) non-rewirable adaptors shall be marked on the engagement surface with the rated current of the fuse link fitted, which shall not exceed the value given in Table 2 for the appropriate size of flexible cord;
- f) adaptors other than shaver adaptors shall be marked, on the engagement surface with their total maximum electrical load intended to be connected in amperes, as calculated in **6.2**, e.g. “MAX 13 A”;
- g) shaver adaptors shall be marked on the accessible external surface with appropriate words, e.g. “SHAVERS ONLY”.

Shaver adaptors shall be marked on the engagement surface with appropriate words to indicate that the adaptor should be fitted with a 1 A rated fuse complying with BS 646:1958;

- h) all adaptors shall be marked with:
 - 1) rated volts;
 - 2) nature of supply.

7.1.1 Compliance shall be checked by inspection and by rubbing the marking for approximately 15 s with a cloth soaked in water, and again for approximately 15 s with a cloth soaked in an aliphatic solvent hexane with a content of aromatics of maximum 0.1 % by volume, a kauri-butanol value of 29, initial boiling point of approximately 69 °C, and relative density of approximately 0.68. The marking shall remain legible. Markings produced by an engraving or moulding process shall be deemed to comply without test.

7.2 Rewirable intermediate adaptors and adaptor plugs shall have a removable tag or label indicating the rating of the fuse link fitted, e.g. “Fitted with X ampere fuse” (where X denotes the rating of the fuse link).

7.2.1 Compliance shall be checked by inspection.

7.3 Except where an intermediate adaptor or adaptor plug fitted with a flexible cord is supplied direct to a manufacturer for incorporation in other equipment, the free end of such an assembly shall have a label attached which shall include the following:

- a) the statement: “The flexible cord of this intermediate adaptor (or adaptor plug) must be connected to a piece of equipment before being plugged into a socket-outlet”;
- b) the maximum rating, in amperes, of the equipment to which it may be fitted (as given in Table 2);
- c) the colour code of the cores of the flexible cord as follows: IMPORTANT. Wires in the mains lead are coloured in accordance with the following code:

Green/Yellow	Earth (if any)
Blue	Neutral
Brown	Live

- d) if the intermediate adaptor or adaptor plug is fitted with a 2-core flexible cord, the following statement: “This lead must not be used with equipment requiring the protection of an earth continuity conductor”.

¹⁾ Marking BS 1363 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 solely the claimant’s responsibility. ~~A3~~ Text deleted ~~A3~~

7.3.1 Compliance shall be checked by inspection.

7.4 Rewirable adaptors and adaptor plugs shall be provided with adequate instructions for the safe connection of the appropriate flexible cords including clear instructions for the removal of insulation from the conductors.

7.4.1 Compliance shall be checked by inspection.

Table 2 — Rated current and maximum fuse rating in normal use, and load for flexing and cord grip tests related to size of flexible cord

Flex cord nominal cross-sectional area mm ^b	Rated current A	Test current ±0.4 A A	Fuse rating A	Load for flexing test +2 %, -0 % kg	Cord grip tests	
					Load +2 %, -0 % kg	Torque ^b N·m
0.5	3	3.5	3(5) ^a	1	3	0.15
0.75	6	7	7 (13) ^c	1	3	0.20
1	10	11	10 (13) ^c	2	3	0.25
1.25	13	14	13	2	6	0.30
1.5	13	14	13	2	6	0.35

^a The figure in brackets indicates the fuse rating when a non-rewirable adaptor is used with certain types of equipment where the use of a 5 A fuse link is necessary because of the high instantaneous inrush current.

^b The recording of a measured value of torque in accordance with Table 2 is considered to comply with this part of BS 1363 on condition that the uncertainty of measurement at not less than 95 % confidence level does not exceed ±10 %.

^c The figure in brackets indicates the maximum fuse rating when a non-rewirable plug/cord assembly is used with certain equipment which because of its operating characteristic needs a higher rating of fuse link.

7.5 Symbols shall be as follows:

A	amperes
V	volts
~	alternating current
L	line (adaptor plugs)
L in or L1	supply line terminal (intermediate adaptors)
L out or L2	load line terminal (intermediate adaptors)
N	neutral
	(preferred) or
	earth*
	fuse*

NOTE 1 BS 6217 gives details of symbols marked.

NOTE 2 For the marking of the rated current and rated voltage of the adaptor, figures may be used alone. The figures for the current rating being placed before or above that of the rated voltage and separated by a line.

If a symbol for nature of supply is used, it shall be placed next to the marking for rated current and rated voltage.

Examples:

13 A 250 V ~

13/250 ~

or

$\frac{13}{250}$ ~

or

13 A 250 V a.c.

13/250 a.c.

or

$\frac{13}{250}$ a.c.

8 Clearances, creepage distances and solid insulation

Adaptors shall be constructed so that the clearances, creepage distances and solid insulation are adequate to withstand the electrical stresses taking into account the environmental influences that may occur. Clearances, creepage distances and solid insulation shall conform to the relevant requirements of 8.1, 8.2 and 8.3.

The distance between lead wires in the pinch of a neon lamp with external resistor shall be a minimum of 1 mm. *Text deleted*

Adaptors complying with the requirements for basic insulation shall be deemed to meet the requirements of this clause. If the manufacturer declares an insulation level exceeding basic insulation then the adaptor shall be tested accordingly.

NOTE 1 The requirements and tests are based on BS EN 60664-1.

NOTE 2 Product insulation consists of Basic Insulation and Protective Earthing as required by BS EN 61140 for Class I equipment. Mechanical strength equivalent to that which would be provided by Reinforced Insulation as listed in BS EN 61140 is achieved in BS 1363 products through the specific mechanical and material tests of BS 1363.

8.1 Clearances

Adaptors energized directly from the low-voltage supply fall into Overvoltage Category III.

The clearances shall be dimensioned to withstand the rated impulse voltage declared by the manufacturer considering the rated voltage and the Overvoltage Category as given in Annex D and the pollution degree declared by the manufacturer according to Annex E.

For the measurements:

- all parts which may be removed without the use of a tool are removed and moveable parts which can be assembled in different orientations are placed in the most unfavourable position.

NOTE Moveable parts are, for example hexagonal nuts, the position of which cannot be controlled throughout an assembly.

Text deleted

8.1.1 Clearances for basic insulation

The clearances for basic insulation shall not be less than the values given in Table 8 except as described below.

Smaller unspecified clearances (except those values marked in Table 8 with Note b) may be used if the adaptor meets the impulse withstand voltage test of Annex F at the impulse voltage specified in Annex D but only if the part are rigid or located by mouldings or if the construction is such that it is unlikely that distances will be reduced by distortion or by movement of the parts during mounting, connection and normal use.

Compliance shall be checked by inspection, and if necessary by measurement, or by the test of Annex F.

If clearance distances are to be measured, this shall be carried out in accordance with Annex B.

8.1.2 Clearances for functional insulation

The clearances for functional insulation shall not be less than the values specified for basic insulation in 8.1.1.

Compliance shall be checked by inspection, and if necessary by measurement, or by the test of Annex **A3** F **A3**.

A4 If clearance distances are to be measured, this shall be carried out in accordance with Annex B **A4**.

8.1.3 Clearances for supplementary insulation

The clearances for supplementary insulation shall not be less than the values specified for basic insulation in 8.1.1.

Compliance shall be checked by inspection, and if necessary by measurement, or by the test of Annex **A3** F **A3**.

A4 If clearance distances are to be measured, this shall be carried out in accordance with Annex B **A4**.

Table 8 — Minimum clearances for basic insulation

Rated impulse withstand voltage kV ^a	Minimum clearances in air up to 2 000 m above sea level mm
0.33	0.2 ^b
0.50	0.2 ^b
0.80	0.2 ^b
1.5	0.5
2.5	1.5
4.0	3
6.0	5.5

^a See Annex **A3** D **A3**. This voltage is:

- for functional insulation: the minimum impulse voltage expected to occur across the clearance;
- for basic insulation directly exposed to or significantly influenced by transient overvoltage from the low-voltage mains: the rated impulse withstand voltage of the **A4** adaptor **A4**;
- for other basic insulation: the highest impulse voltage that can occur in the circuit.

^b Minimum clearance values are based on BS EN 60664-1.

8.1.4 Clearances for reinforced insulation

The clearance for reinforced insulation shall be not less than the values specified for basic insulation in 8.1.1 but using the next higher step for rated impulse withstand voltage given in Table 8.

A3 NOTE The requirement is not applicable to the sleeves of the adaptor plug pins. **A3**

Compliance shall be checked by inspection and by measurement **A4**, or by the test of Annex F. **A4**

A4 8.1.5 Contact gap of switch

The minimum contact gap shall be 1.2 mm when the switch is in the open position. Compliance shall be checked by measurement. **A4**

8.2 Creepage distances

The creepage distance shall be dimensioned for the voltage, which is expected to occur in normal use taking into account the pollution degree, and the material group as declared by the manufacturer.

For the measurements:

- all parts which may be removed without the use of a tool are removed and moveable parts which can be assembled in different orientations are placed in the most unfavourable position.

NOTE 1 Moveable parts are, for example hexagonal nuts, the position of which cannot be controlled throughout an assembly.

NOTE 2 A creepage distance cannot be less than the associated clearance.

Creepage distances are measured in accordance with Annex **A3** B **A3**.

The relationship between material group and between comparative tracking index (CTI) values and proof tracking index (PTI) values is as follows:

Material group I	$600 \leq \text{CTI/PTI}$
Material group II	$400 \leq \text{CTI/PTI} < 600$
Material group IIIa	$175 \leq \text{CTI/PTI} < 400$
Material group IIIb	$100 \leq \text{CTI/PTI} < 175$

The CTI or PTI values are determined in accordance with Annex **A3** C **A3**.

NOTE 3 For glass, ceramics and other inorganic materials which do not track, creepage distances need not be greater than their associated clearance.

8.2.1 Creepage distances for basic insulation

The creepage distances for basic insulation shall not be less than the values given in Table 9. Compliance shall be checked by measurement.

Table 9 — Minimum creepage distances for basic insulation

Rated voltage ^a V (r.m.s.)	Pollution Degree 2			Pollution Degree 3		
up to and including	Material group ^b			Material group ^b		
	I	II	IIIa/IIIb	I	II	IIIa
250	1.3	1.8	2.5	3.2	3.6	4.0

^a This voltage is the voltage rationalized through Table 3a and Table 3b of BS EN 60664-1 based on the rated voltage.
^b Details of pollution degrees are given in Annex **A3** E **A3**.

8.2.2 Creepage distances for functional insulation

The creepage distance for functional insulation shall not be less than the values specified for basic insulation in 8.2.1.

Compliance shall be checked by measurement.

8.2.3 Creepage distances for supplementary insulation

The creepage distances for supplementary insulation shall not be less than the values specified for basic insulation in 8.2.1.

Compliance shall be checked by measurement.

8.2.4 Creepage distances for reinforced insulation

The creepage distances for reinforced insulation shall not be less than those derived from twice the distance specified for basic insulation in Table 9.

A3 NOTE The requirement is not applicable to the sleeves of the adaptor plug pins. **A3**

Compliance shall be checked by measurement.

8.3 Solid insulation

Solid insulation for basic, **A4** functional, **A4** supplementary and reinforced insulation shall be capable of withstanding electrical stresses which may occur in normal use.

No minimum thickness is specified for solid insulation.

A4 8.3.1 Compliance shall be checked by tests in accordance with 15.1.3 using the values given in Table 10. **A4**

A4 Text deleted **A4**

A3 Table 10 — Withstand voltages for insulation types

Insulation	Test voltage V (r.m.s.)
Functional Insulation	1 500
Basic Insulation	1 500
Supplementary Insulation	1 500
Reinforced Insulation	3 000

A3

9 Accessibility of live parts

9.1 Live parts of intermediate adaptors shall not be accessible when wired as in use and in full engagement in a corresponding socket-outlet. **A4** Removal of detachable fuse carriers shall not result in live parts becoming accessible when the adaptor is in full engagement with the socket outlet. **A4**

Additionally, adaptor plugs shall comply with this requirement without a flexible cord fitted.

9.1.1 Compliance shall be checked by the application of test probe 12 of BS EN 61032:1998 applied with a force of 5_{-1}^0 N with non-rewirable adaptors fitted with their appropriate flexible cords, rewirable intermediate adaptors fitted with a 2-core flexible cord as given in Table 24 of BS 6500:2000.

A4 Detachable fuse carriers shall be removed before this test is undertaken. **A4**

9.2 Adaptors shall be so designed that when they are mounted and wired as in normal use live parts are not accessible.

9.2.1 Compliance shall be checked by the application of the test pin shown in Figure 1 perpendicular to the accessible external surface of the adaptor with a force of 5_{-1}^0 N. It shall not be possible to touch live parts.

9.3 The plug portion of an adaptor shall be designed and constructed so as to protect the user against accidental contact with live parts during insertion or withdrawal from corresponding socket-outlets. The socket-outlets of an adaptor shall be designed and constructed so as to protect the user against accidental contact with live parts during insertion or withdrawal of plugs.

9.3.1 Compliance shall be proved by satisfying the dimensional and gauging requirements of this part of BS 1363.

9.4 Resilient covers of adaptors shall be so designed and constructed that when assembled and wired as in normal use, there is no risk that, as a result of undue pressure, live parts could penetrate the cover or become so disposed as to reduce creepage distances and clearances below those given in Clause 8.

9.4.1 Compliance shall be checked by the following test (an example of a suitable apparatus is shown in Figure 2a).

The design of the apparatus shall be such that a steady force of 240_{-10}^0 N can be applied to those places where the possibility of a failure exists, the force being applied through a metal test pressure block as shown in Figure 2.

Each sample shall be subjected to the force at each chosen place in turn. During each application of force, a test voltage of $2\,000\text{ V} \pm 60\text{ V}$, 50 Hz of substantially sinusoidal waveform is applied for 60_{+5}^0 s between all live parts bonded together and the earthed test pressure block.

During the test no flashover or breakdown shall occur.

After the test it shall not be possible to touch live parts with test probe 11 of BS EN 61032:1998 applied with a force of 30_{-2}^0 N.

9.5 Where an intermediate adaptor or adaptor plug is supplied fitted with a flexible cord, the free end of such an assembly shall be encapsulated in insulating material.

NOTE This does not apply to assemblies supplied to equipment manufacturers for incorporation into their equipment.

9.5.1 Compliance shall be checked by inspection.

9.6 It shall not be possible to introduce a conducting device through the earthing socket aperture(s) of an adaptor in such a manner that there is a risk of making contact with live parts, or a live conductor with or without insulation.

9.6.1 Compliance shall be checked by introducing a rigid metal pin, $1_{-0.05}^0$ mm diameter $\times$ $60\text{ mm} \pm 1\text{ mm}$ long, through any earthing socket aperture or apertures of a socket outlet of an adaptor mounted as in normal use, applying a force of 5_{-1}^0 N, and with the conductors, if any, in the most unfavourable position.

10 Provision for earthing

10.1 Adaptors shall be so constructed that, when inserting a plug with an earthing pin into a corresponding socket-outlet of an adaptor the earth connection is made before the current-carrying pins of the plug become live. When withdrawing a plug the current-carrying parts shall separate before the earth contact is broken.

10.1.1 Compliance shall be checked by inspection and electrical test.

10.2 All accessible metal parts of adaptors shall be in effective electrical contact with the earthing socket contact and earthing plug pin, except that metal parts on or screws in or through, non-conducting material, and separated by such material from current-carrying parts in such a way that in normal use they cannot become live, need not be in effective electrical contact with the earthing socket contact and earthing plug pin.

NOTE Metal parts having an accessible surface coating of lacquer or enamel are accessible metal parts within the meaning of this requirement.

10.2.1 Compliance shall be checked by inspection, and the following:

- a) for metal parts insulated from live parts, by the test described in **15.1.3**;
- b) for metal parts connected to an earthing terminal or earthing plug pin, by the following test.

A current of $25\text{ A} \pm 0.75\text{ A}$, derived from an a.c. source having a no-load voltage not exceeding 12 V, is passed for 60^{+5}_0 s as follows:

- 1) for all adaptors, between the earthing pin of the adaptor, and the following:
 - i) the terminal of an earthing pin of an appropriate plug inserted into each adaptor earthing socket control;
 - ii) any accessible metal part intended to be earthed;
- 2) for intermediate adaptors and adaptor plugs, between the earthing terminal, and the following:
 - i) the remote end of an earthing pin of an adaptor;
 - ii) any accessible metal part intended to be earthed.

The resistance between the earthing plug pin or earthing terminal and any other nominated part shall not exceed $\boxed{A_4} 0.05\ \Omega \boxed{A_4}$.

11 Terminals and terminations of intermediate adaptors and adaptor plugs

11.1 Terminals and terminations shall provide for effective clamping and securing of conductors connected to them, so that efficient electrical connection is made.

11.1.1 Compliance shall be checked in accordance with **11.2** to **11.9**.

11.2 Rewirable adaptors shall be provided with terminals as defined in **3.12** or **3.13**.

11.2.1 Compliance shall be checked by inspection.

11.3 Non-rewirable adaptors shall be provided with soldered, welded, crimped or similar terminations. For all these methods of termination, not more than one strand of a 0.5 mm^2 conductor or two strands of other sized conductors shall be fractured during connection. Screwed and “snap-on” terminals shall not be used. Crimped connections shall not be made on to pre-soldered flexible cords unless the soldered area is entirely outside the crimp.

11.3.1 Compliance shall be checked by inspection and measurement.

$\boxed{A_4}$ Text deleted $\boxed{A_4}$

11.4 Terminals in rewirable adaptors shall permit the connection, without special preparation, of flexible cords having nominal conductor cross-sectional areas of 0.5 mm² to 1.5 mm².

11.4.1 Compliance shall be checked by inspection and fitting the appropriate conductors.

11.5 Where pillar terminals are used they shall have clamping screws of sufficient length to extend to the far side of the conductor hole. The end of the screw shall be slightly rounded so as to minimize damage to the conductors. 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.

11.5.1 Compliance shall be checked by inspection and measurement.

11.6 Terminal screws shall have a declared outside diameter of not less than 3 mm or be not smaller than 6 B.A.

Thread cutting and/or thread forming screws shall not be used.

11.6.1 Compliance shall be checked by inspection and measurement.

11.7 Insulating barriers in intermediate adaptors or adaptor plugs shall be an integral part, so arranged that with the cord anchorage rendered inoperative and the earth or line conductors becoming detached from their respective terminals, there is negligible risk of the following:

- a) the earth conductor coming into contact with parts at line potential;
- b) the line conductor in a fused adaptor coming into contact with the line pin assembly.

11.7.1 Compliance shall be checked by inspection and, except for non-rewirable adaptors, by the following test.

Rewirable adaptors are wired as in normal use with an appropriate 0.5 mm² 3-core flexible cord as given in Table 27 of BS 6500:2000 in accordance with the manufacturer's instructions. All terminal screws or nuts are tightened to the appropriate torque given in Table 3a.

Table 3a — Torque values for screws and nuts

Declared diameter of screw thread mm	Torque		
	For metal screws (See Note 1) N·m	For other metal screws and nuts N·m	For screws of insulating material N·m
Up to and including 2.8	0.2	0.4	0.4
Over 2.8 up to and including 3	0.25	0.5	0.5
Over 3.0 up to and including 3.2	0.3	0.6	0.6
Over 3.2 up to and including 3.6	0.4	0.8	0.6
Over 3.6 up to and including 4.1	0.7	1.2	0.6
Over 4.1 up to and including 4.7	0.8	1.8	0.9
Over 4.7 up to and including 5.3	0.8	2.0	1.0
Over 5.3 up to and including 6	—	2.5	1.25
NOTE 1 This column applies to metal screws without heads if the screw when tightened does not protrude from the hole, and to other metal screws which cannot be tightened by means of a screwdriver with blade wider than the diameter of the screw.			
NOTE 2 The recording of a measured value given in this table is considered to comply with this part of BS 1363 on condition that the uncertainty of measurement at not less than 95 % confidence level does not exceed ±10 %.			

A continuity indicating circuit operating at not less than 40 V is connected between the conductors and the other parts nominated. All terminal screws are then loosened and the cord anchorage rendered inoperative and the cover of the adaptor refitted. The flexible cord is then withdrawn from the adaptor at a rate not exceeding 50 mm/min, the direction of the pull being varied, until the earth core is pulled free of the adaptor. The test is made six times in all. For each new test, a fresh section of the cord is fitted and the flexible cord rotated through approximately 60° in the plane perpendicular to its major axis in a clockwise direction before fitting, unless the design is such that this is not practicable.

There shall be no contact between parts at line potential and the earth conductor, or between the line conductor and line pin assembly, thus bypassing the fuse link.

11.8 Intermediate adaptors or adaptor plugs shall be designed so that they can be wired in a manner which prevents strain to the earth connection before the line and/or neutral connection when the cord anchorage is rendered inoperative.

11.8.1 Compliance shall be checked by inspection and manipulation using an intermediate adaptor or adaptor plug wired in accordance with the manufacturer's instructions.

11.9 Terminals of intermediate adaptors or adaptor plugs shall be so located or shielded that should a strand of a flexible conductor escape when the conductors are fitted, there is negligible risk of accidental connection between live parts and accessible external surfaces, or of a stray strand bypassing the fuse link.

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

A length of insulation in accordance with the manufacturer's instructions is removed from the end of a flexible conductor having a nominal cross-sectional area of 1.5 mm². One strand of the flexible conductor is left free and the other strands are fully inserted into and clamped in the terminal. The free strand is bent, without tearing the insulation back, in every possible direction, but without making sharp bends round barriers unless a bend is reproduced by the replacement of the cover.

The free strand of a conductor connected to a live terminal shall not:

- a) touch any metal part so as to bypass the fuse link;
- b) touch any metal part which is accessible or is connected to an accessible metal part;
- c) reduce creepage distance and clearance to accessible surfaces to less than 1.3 mm.

The free strand of a conductor connected to an earthing terminal shall not touch any live parts.

12 Construction of adaptors (plug portion)

12.1 The disposition of the  adaptor plug pins (including ISODs where applicable) shall be as shown in Figure 4a). 

12.1.1 Compliance shall be checked by inspection.

 **12.2** The outline of the adaptor shall not exceed the dimensions shown in Figure 4a) for a distance of not less than 6.35 mm from the engagement surface and within these dimensions there shall be no axial projection from the engagement surface of the adaptor, except that at a distance more than 6.35 mm from the engagement surface the outline of the adaptor plug can exceed the dimensions shown in Figure 4a) in the plane of the earth pin and in the plane of the cord entry to facilitate the removal of the adaptor from the socket.

Pin disposition, length and body outline shall be checked by use of the gauge shown in Figure 5 in accordance with the following test. Pin and sleeve dimensions shall be checked by measurement and shall conform to Figure 4a), except for non-solid pins and ISOD where the chamfers shall generally fall within the profiles of Figure 4a) and their adequacy shall be checked by the tests of **12.11.5**. ISODs shall be of generally rectangular cross-section.

NOTE "I" sections are not permitted although castellated cross-sections are permitted provided their dimensions conform to Figure 4b) and all the other requirements of the standard are met.

The maintenance of these dimensions shall not rely on the terminal screws. 

Ⓐ₃ Adaptors fitted with an ISOD shall conform to all the dimensions specified in Figure 4a) with the exception of the ISOD width which shall be 4.05 mm max. and 3.90 mm min. and its height which shall be 8.05 mm max. and 7.75 mm min. Ⓐ₃

12.2.1 Compliance shall be checked by inspection, measurement and by the use of the gauge shown in Figure 5. Ⓐ₃ In the case of adaptors with ISODs, where alignment cannot be maintained due to the flexibility of plastic materials, the test given in 13.8 of BS 1363-2:1995 shall be applied and the maximum withdrawal force from a socket-outlet conforming to BS 1363-2 shall not exceed 36N. Ⓐ₃

In the case of adaptors with ISODs, where alignment cannot be maintained due to the flexibility of plastic materials, the test given in 13.8 of BS 1363-2:1995 shall be applied and the maximum withdrawal force from a socket-outlet conforming to BS 1363-2 shall not exceed 36N.

For the gauging test, intermediate adaptors and adaptor plugs shall be fitted with a 3-core 1.25 mm² flexible cord as given in Table 27 of BS 6500:2000. Non-rewirable intermediate adaptors and adaptor plugs shall be tested as delivered.

With the gauge in an approximately vertical position and the engagement surfaces of the adaptor and the gauge parallel to each other, the line and neutral pins shall be entered into the gauge for a distance not exceeding 2 mm. The adaptor shall then enter the gauge fully when a force of 10 N or less is applied to the centre of the adaptor at right angles to the engagement surface and without any additional force being applied to the pins to bring them into alignment.

12.3 No part of a line or neutral pin shall be less than 9.5 mm from the periphery of the adaptor measured along the engagement surface.

12.3.1 Compliance shall be checked by measurement.

12.4 The provision of fuses in adaptors shall be in accordance with the following.

a) An adaptor having only one or two adaptor socket-outlets for 13 A plugs complying only with BS 1363 and having no other adaptor socket-outlets need not be fused.

b) A multiway adaptor having two adaptor socket-outlets for BS 1363 plugs and one or more adaptor socket-outlets for plugs complying with other standards, shall either be:

— provided with only one fuse link which shall have a rated current of 13 A and comply with BS 1362:1973; or

— provided with a 13 A fuse link, complying with BS 1362:1973, protecting the BS 1363 adaptor socket-outlets and an appropriate fuse link complying with BS 1362:1973 or BS 646:1958 protecting all other adaptor socket-outlets.

c) A multiway adaptor having more than two adaptor socket-outlets for BS 1363 plugs shall be provided with a 13 A fuse link complying with BS 1362:1973.

d) A multiway adaptor having one adaptor socket-outlet for a BS 1363 plug and one or more adaptor socket-outlets for plugs complying with other standards, shall be provided with an appropriate fuse link, complying with BS 1362:1973 or BS 646:1958 to protect the outgoing circuit or circuits. The adaptor socket-outlet for the BS 1363 plug need not be fused.

e) An adaptor having only adaptor socket-outlets complying with standards, other than BS 1363 shall be provided with an appropriate fuse link, complying with BS 1362:1973 or BS 646:1958 to protect the outgoing circuit or circuits.

f) An adaptor plug or an intermediate adaptor shall be provided with an appropriate fuse link, complying with BS 1362:1973 or BS 646:1958 to protect the outgoing flexible cord.

g) A shaver adaptor shall be provided with a 1 A fuse link complying with BS 646:1958.

When a fuse link is provided within the body of the adaptor it shall be mounted in appropriate contacts only between the line plug pin and the corresponding line socket contact(s) in such a way that it cannot be displaced when the adaptor is in use. The design shall be such that the fuse link cannot be left in inadequate contact when the fuse cover or fuse carrier is replaced and firmly secured in position. It shall be impossible to replace the fuse link in an adaptor unless the adaptor is completely withdrawn from the socket-outlet.

12.4.1 Compliance shall be checked by inspection.

12.5 In non-rewirable intermediate adaptors and adaptor plugs, where the fuse link is retained by means of a fuse carrier, this device shall be either:

- a) non-detachable during normal replacement of the fuse link; or
- b) readily identifiable in relation to its adaptor by means of marking.

12.5.1 Compliance shall be checked by inspection.

12.6 The base and cover of non-rewirable intermediate adaptors and adaptor plugs shall be permanently attached to each other, such that the flexible cord cannot be separated without making the adaptor permanently useless, and the adaptor cannot be opened by hand or by using a general purpose tool, for example a screwdriver used as such. An adaptor shall be considered to be permanently useless when, for reassembling the adaptor, parts or materials other than the original have to be used.

12.6.1 Compliance shall be checked by inspection and for non-moulded on non-rewirable intermediate adaptors and adaptor plugs by the test given in **12.8.1**.

12.7 The base and cover of rewirable intermediate adaptors and adaptor plugs having the cover fixed by screws shall be firmly secured to each other. It shall not be possible to remove the cover unless the adaptor is completely withdrawn from the socket-outlet. Fixing screws shall be captive.

12.7.1 Compliance shall be checked by inspection and by the following test.

Each adaptor cover fixing screw has a pull of 60_{-2}^{+0} N exerted on it for 60_{+0}^{+5} s whilst the surface temperature of the product is $70\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$. The test is carried out using apparatus similar to that shown in Figure 6 and for the test the adaptor cover and apparatus are placed in an oven until they reach the required temperature.

At the end of the test, any screw thread shall be serviceable and any insert shall not have moved to such an extent that correct assembly of the adaptor is prevented.

12.8 The base and cover of adaptors other than those described in **12.6** and **12.7** shall be firmly secured to each other. It shall not be possible to remove the cover unless the adaptor is completely withdrawn from the socket-outlet.

12.8.1 Compliance shall be checked by inspection and the following test.

All the adaptor pins are clamped together in a suitable jig and subjected to a pull of 60_{-2}^{+0} N whilst suspending the cover by means of a "nest" to suit the adaptor cover profile. The test is carried out in an oven at a temperature of $70\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ and the pull applied for 60_{+0}^{+5} s after the temperature has been attained.

After the test it shall not be possible to touch live parts with the test pin shown in Figure 1 applied with a force of 5_{-1}^{+0} N.

12.8.2 Non moulded on, non-rewirable A_3 adaptors A_3 are tested with the flexible cord supplied A_3 Adaptor A_3 plug pins are clamped in the vertical position using a suitable jig with the plug pins uppermost. The plug lead fitted shall be 1 m in length and a weight of $3_{+0}^{+0.06}$ Kg fixed to the end. With the weight initially held 0.5 ± 0.05 m from the end of the cord anchorage, and at the same height. The weight is allowed to fall through an arc of 1 m and this test shall be carried out 5 times.

After this test the A_3 adaptor A_3 cover shall be in place and show no damage.

Compliance shall be checked by inspection.

12.9 adaptors shall be so designed and constructed that they cannot readily be deformed to allow access to live parts.

12.9.1 Compliance shall be checked by inspection and by the following test.

Immediately after the test described in Clause **16**, test probe 11 of BS EN 61032:1998 is applied to the accessible surface of the adaptor with a force of 30_{-5}^{+0} N. It shall not be possible to touch live parts.

12.10 For non-rewirable intermediate adaptors and adaptor plugs means shall be provided to prevent loose strands of a conductor or current-carrying parts from reducing the minimum insulation thickness requirements between such parts and all accessible external surfaces of the adaptor.

12.10.1 Compliance shall be checked by inspection and by the test described in **15.2**.

A3 **12.11** Materials other than brass shall not be used in the construction of Line and Neutral adaptor plug pins except for sleeves of pins as specified in **12.18**. Adaptor plug pins and ISODs shall conform to **12.11.1**. Non-solid pins shall conform to **12.11.2**. **A3**

12.11.1 All exposed surfaces of the adaptor plug pins shall be smooth and free from burrs or sharp edges and other irregularities which could cause damage or excessive wear to corresponding socket contacts or shutters.

12.11.1.1 Compliance shall be checked by inspection.

12.11.2 Those surfaces of the non-solid adaptor plug pins which are visible when the adaptor is correctly assembled shall be free of apertures.

12.11.2.1 Compliance shall be checked by inspection.

12.11.3 All seams and joints of non-solid adaptor plug pins shall be closed over their entire length.

12.11.3.1 Compliance shall be checked by inspection and in case of doubt by the following test.

Push a probe of 0.2 mm diameter of steel complying with Table 1 of BS 5216:1991 into all seams and joints. Check that the test probe does not enter into any seam or joint to a depth greater than the thickness of the material from which the plug pin is formed.

12.11.4 Adaptor plug pins **A3** and ISODs **A3** shall have adequate strength to withstand the stresses of normal use.

12.11.4.1 For solid pins **A4** compliance **A4** shall be checked by the following test.

Position a pin on the fixed anvil of the apparatus, as shown in Figure 32, with its contact surfaces in the horizontal plane. Apply a force of $1\,100\,^{+0}_{-10}$ N to the movable anvil by any convenient method such that the pin is strained at a rate not exceeding 10 mm/min. The test shall be made separately on the line, neutral and earth pins applying the load perpendicular to the major axis surfaces of the pins.

After this test the adaptor shall fit the gauge shown in Figure 5 when used in the manner described in **12.2.1**.

12.11.4.2 For non-solid pins, compliance shall be checked by the following tests.

a) Position a pin on the fixed anvil of the apparatus, as shown in Figure 32, with its contact surfaces in the horizontal plane. Bring the movable anvil to rest against the upper surface of the pin. Apply a force of $800\,^{+0}_{-10}$ N to the movable anvil 50 times without impact.

The test shall be made separately on the line, neutral and earth pins applying the load perpendicular to the major axis surfaces of the pins. If there is a joint or seam in one of the major axis surfaces of a pin then the test shall be made twice. The seam or joint shall face the moving anvil for the first test and shall face the fixed anvil for the second test.

After the test the pins shall comply with **12.11.2** and **12.11.3** and the adaptor shall fit the gauge shown in Figure 5 when used in the manner described in **12.2.1**.

b) Separate specimens shall be used to check in accordance with the following test.

Position a pin on the fixed anvil of the apparatus, as shown in Figure 32, with the widest surface in the horizontal plane. Bring the movable anvil to rest against the upper surface of the pin. This quiescent position shall be taken as the datum point. Apply a force to the movable anvil by any convenient method such that the pin is strained at a rate not exceeding 10 mm/min. Measure the applied force when the movement of the anvil from the datum point reaches $1.5\,^{+0}_{-0.1}$ min. The test shall be made separately on the line, neutral and earth pins applying the load perpendicular to the major axis surfaces of the pins. If there is a joint or seam in one of the major axis surfaces of a pin then the test shall be made twice. The seam or joint shall face the moving anvil for the first test and shall face the fixed anvil for the second test. The force shall be not less than 1 100 N.

Ⓐ₃ 12.11.4.3 For ISODs, compliance shall be checked by the following test.

Position the ISOD on the fixed anvil of the apparatus as shown in Figure 32 with the widest surface in the horizontal plane. Bring the moveable anvil to rest against the upper surface of the ISOD. The quiescent position shall be taken as the datum point. Apply a force to the moveable anvil by any convenient method such that the ISOD is strained at a rate of 10 ± 2 mm/min.

A force of 400^{+10}_0 N is applied and the measured deflection shall not exceed 1.5 mm. The ISOD shall not be broken or show cracks that are visible with normal or corrected vision without additional magnification.

After the test the adaptor plug pins shall fit the Figure 5 gauge when used in the manner described in **12.2.1** with a force not exceeding 20 N.

When testing an adaptor fitted with an ISOD due to the flexibility of plastic materials some additional alignment of the ISOD is allowed when inserting into the Figure 5 gauge. Where alignment cannot be maintained, the test of **13.8** of BS 1363-2:1995 shall be applied and the maximum withdrawal force from a socket-outlet conforming to BS 1363-2 shall not exceed 36 N.

12.11.5 Adaptors with non-solid pins and/or ISODs shall not cause excessive wear to socket contacts or shutters of socket-outlets in accordance with BS 1363-2. For adaptors with non-solid pins, compliance shall be checked by **Ⓐ₄ 12.11.5.1** **Ⓐ₄**. For adaptors with ISODs, compliance shall be checked by **12.11.5.2**. **Ⓐ₃**

12.11.5.1 Compliance shall be checked by the following tests

Ⓐ₃ The test is carried out with adaptors with non-solid pins and three different types of new socket-outlets in accordance with BS 1363-2:1995. Two types of the socket-outlet shall have the shutters operated by the earth pin, one of which is preferably operated by all three pins and one of which is preferably operated by live and neutral pins only. **Ⓐ₃**

The combination of rewirable adaptors having non-solid pins and each type of socket-outlet as described shall make and break a current of $13 \text{ A} \pm 0.4 \text{ A}$, non-rewirable adaptors shall be tested with the rated current appropriate to the flexible cord given in Table 2, at $250 \text{ V} \pm 10 \text{ V a.c.}$ 15 000 times (30 000 movements) in a substantially non-inductive circuit.

Each adaptor is inserted into and withdrawn from the socket-outlet at a rate of six insertions and six withdrawals per minute, the speed of travel of the adaptor being approximately 150 mm/s. The periods during which the adaptor is inserted and withdrawn shall be approximately equal. The adaptor pins are renewed or a new adaptor is used after each 5 000 insertions and withdrawals. For the purpose of this test, no lubrication is applied to the pins of the adaptor or the socket-outlet contacts.

After the test the shutters of the socket-outlets shall be operating satisfactorily, the socket contacts shall be safely shielded and the socket-outlets shall be in accordance with **9.1**, **16**, **15**, **13.4.1a**), **10.2**, **13.6**, **13.7**, and **13.8** of BS 1363-2:1995, with the permitted values of voltage drop specified in **13.4.1a**) of BS 1363-2:1995 for the adaptor pin to socket contact measurements increased by 50 %. The pins of the adaptor shall remain intact with no openings in the surface, joints or seams which will accept the probe specified in **12.11.3**.

A3 12.11.5.2 Compliance shall be checked by the following.

Using a selection of three different makes of rewirable **A4** plugs conforming to BS 1363-1 **A4** and three different makes of unswitched socket-outlets conforming to BS 1363-2, selected to represent different earth contact designs, the earth resistance between the earthing adaptor plug pin and the earthing socket contact of the socket-outlets shall be established in accordance with BS 1363-2:1995, **10.2.1 b**).

All socket-outlets shall be of the type where the earth pin or ISOD of an adaptor inserted into the socket-outlet operates the shutter mechanism.

A4 *Text deleted* **A4**

The test shall be made using a separate sample of adaptor plug with ISOD for each type of socket-outlet, with each sample being inserted into and withdrawn from the socket-outlet at a rate of six insertions and six withdrawals per minute, the speed of travel of the adaptor plug being approximately 150 mm/s. The period during which the adaptor is inserted and withdrawn shall be approximately equal. For the purpose of this test no lubrication is applied to the adaptor plug pins or socket-outlet contacts either prior to or during the test.

After 5 000 insertions and withdrawals, the standard rewirable adaptor used prior to the test for each type of socket-outlet shall be reinserted and the earth resistance test repeated. After the test the earth resistance between the earthing adaptor plug pin and the earthing socket contact of the socket-outlets shall be in accordance with BS 1363-2:1995, **10.2.1 b**). The socket-outlet shall be examined and shall show no sign of damage that would impair further use. The adaptors under test shall show no damage and shall conform to the dimensional requirements of this standard.

After the test, the shutters of the socket-outlet shall operate satisfactorily and the socket contacts shall be safely shielded. **A3**

12.11.6 Adaptor plug pins **A3** and ISODs (if any) **A3** shall have adequate mechanical strength to ensure that they cannot be distorted by twisting.

12.11.6.1 Compliance shall be checked by inspection and by the following test.

The adaptor is clamped in a block as shown in Figure 33. Each pin is twisted about its longitudinal axis by applying a torque of $1 \text{ N}\cdot\text{m} \pm 10 \%$ for 60^{+5}_0 s . The torque tube and its position on the plug pin shall be as shown in Figure 33. After each pin has been separately twisted the adaptor shall fit the gauge shown in Figure 5. The test shall then be repeated with each adaptor plug pin being twisted in the opposite direction to that of the first test. After this second test the adaptor shall fit the gauge shown in Figure 5. In each case the gauge is used in the manner as described in **12.2.1**.

12.12 The socket contacts and any terminals or terminations shall be formed as one piece with or shall be permanently connected to the pin in such a way that efficient electrical connection is made that cannot work loose in use. This connection shall not be made by means of a screw.

The contact for the fuse link, if any, shall be connected to the line socket contact and any line terminal or termination shall be formed in one piece with the socket contact and the fixed part of any terminal or termination. Alternatively, it shall be permanently connected in such a way that efficient electrical connection is made that cannot work loose in normal use, and the other contact for the fuse link shall be similarly connected to the corresponding adaptor plug pin. These connections shall not be made by means of screws.

12.12.1 Compliance shall be checked by inspection and the tests described in **20.1.5** and Clause **16**.

12.13 Adaptors shall be so designed that when fully assembled the pins are adequately retained in position such that there is no likelihood of them becoming detached from the adaptor during normal use.

12.13.1 Compliance shall be checked by the following test.

After the tests described in Clause **20**, each pin is subjected for 60^{+5}_0 s to a pull of 100^{+0}_{-2} N in one smooth and continuous movement in the direction of the major axis. The adaptor is mounted using the steel plate shown in Figure 7. The apparatus is placed within an oven and the pull is applied at least 1 h after the adaptor body has attained the test temperature of $70 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$ while maintained at this temperature.

After the test the adaptor pin shall comply with the gauge shown in Figure 5 when used in the manner as described in 12.2.1.

12.14 The degree of flexibility of mounting of the adaptor plug pins or the angular movement of the pins in the base shall be not greater than $3^{\circ} 30'$ in the directions shown in Figure 8 from an axis which is perpendicular to the plug engagement A_3 surface A_3 when the pins are subjected to a force as shown in Figure 8.

12.14.1 Compliance shall be checked by inspection and in case of doubt by the following test.

NOTE Adaptors may be checked using an apparatus similar to that shown in Figure 8. (Other methods of measuring the $3^{\circ} 30'$ deflection may be used.)

The adaptor is clamped in the mounting block by means of any two of the adaptor plug pins in such a manner as to ensure that the A_3 engagement surface A_3 of the adaptor, from which the adaptor plug pins project, is supported and in contact with the corresponding flat surface of the mounting block. The back of the adaptor is not supported and does not come into contact with the fixture. The axis of the clamped pins is horizontal.

The unclamped pin shall be tested for declination from the horizontal by applying a force of $4.4_{-0.2}^0$ N, $25_{-0.5}^0$ mm from the engagement A_3 surface A_3 of the adaptor and parallel with it in the four directions shown in Figure 8. The test shall be repeated in turn on the other two pins of the adaptor.

During each test the declination from the horizontal measured on the scale shall not exceed $3^{\circ} 30'$. After all tests have been completed the adaptor shall fit the gauge shown in Figure 5 when used in the manner as described in 12.2.1.

12.15 Suitable means shall be provided for withdrawing the intermediate adaptor or adaptor plug without subjecting the flexible cord to stress.

12.15.1 Compliance shall be checked by inspection.

12.16 Non-rewirable intermediate adaptors and adaptor plugs shall be fitted with flexible cords in accordance with 19.4.

12.16.1 Compliance shall be checked by inspection.

12.17 Conductive component parts of adaptors shall be so located and separated that, in normal use, they cannot be displaced so as to affect adversely the safety or proper operation of the adaptor.

12.17.1 Compliance shall be checked by inspection and manual manipulations.

12.18 Line and neutral adaptor plug pins shall be fitted with insulating sleeves. The dimensions of the pin and sleeve shall fall within those given in Figure 4. Sleeves shall not be fitted to any earthing adaptor plug pin.

12.18.1 Compliance shall be checked by inspection and by measurement for pin and sleeve and use of the gauge shown in Figure 5 as described in 12.2.1 for socket-outlet compatibility.

12.19 Adaptor plug pin sleeves shall have adequate electric strength, resistance to abrasion and resistance to deformation due to overheating of pins.

12.19.1 Compliance shall be checked by the tests given in 12.19.2, 12.19.3 and 12.19.4.

12.19.2 A 50 Hz voltage of substantially sinusoidal waveform is applied between each L and N pin and a thin metal strip of between 5.5 mm and 6 mm width wrapped around the base of the adaptor plug pin sleeve adjacent to the base of the adaptor. Initially not more than 500 V is applied, the voltage then being raised to $1250 \text{ V} \pm 30 \text{ V}$ which is maintained for 60_{-0}^{+5} s.

During the test no breakdown or flashover shall occur.

12.19.3 The test apparatus for resistance to abrasion (see Figure 9) comprises a horizontally disposed beam pivoted about its centre point. A short length of steel wire, $1 \text{ mm} \pm 0.02 \text{ mm}$ in diameter and bent into a U-shape, the base of the U being straight, with no surface defects, is rigidly attached at both ends to one end of the beam so that the straight part of the wire projects below the beam and is parallel to the axis of the beam pivot.

The adaptor is held in a suitable clamp as shown in Figure 9 in such a position that the straight part of the steel wire rests upon the adaptor plug pin at right angles to it and the adaptor plug pin slopes downward at an angle between 5° and 10° to the horizontal. The beam is loaded so that the wire exerts a force of $4 \begin{smallmatrix} 0 \\ -0.1 \end{smallmatrix}$ N on the pin.

The adaptor is moved backwards and forwards in a horizontal direction in the plane of the axis of the beam so that the wire rubs along the pin. The length of pin thus abraded is approximately 9 mm of which approximately 7 mm is over the insulating sleeve.

The adaptor is moved 10 000 times in each direction (20 000 movements) at a rate of 25 movements to 30 movements per minute.

The test shall be made on one pin of each adaptor.

After the test the sleeve shall show no damage which might impair the further use of the adaptor. The sleeve shall not have been penetrated or creased and shall satisfy the tests described in **12.19.2**, any abraded brass contamination on the sleeve having been removed.

12.19.4 A set of three specimen pins is tested by means of the apparatus shown in Figure 10 which has a blade $0.70 \begin{smallmatrix} +0.05 \\ 0 \end{smallmatrix}$ mm wide and a radius of $3 \text{ mm} \pm 0.1 \text{ mm}$. The test is made on one pin of each adaptor not used for the test described in **12.19.3**.

A specimen is positioned as shown in Figure 10 and the apparatus is loaded so that the blade exerts a force of $2.5 \begin{smallmatrix} 0 \\ -0.1 \end{smallmatrix}$ N on the specimen. The apparatus, complete with specimen, is placed in a heating cabinet at $200 \begin{smallmatrix} 0 \\ -8 \end{smallmatrix}$ °C for a period of $120 \begin{smallmatrix} 0 \\ -5 \end{smallmatrix}$ min, after which the specimen is removed and immediately cooled by immersion in water at approximately room temperature.

The thickness of the insulation remaining at the point of impression is measured and shall not have been reduced by more than 50 %.

13 Construction of adaptors (adaptor socket-outlet portion)

13.1 For adaptors with adaptor socket-outlets for BS 1363 plugs, the disposition of the socket contacts shall be as shown in Figure 3.

There shall be no projection on the engagement surface of the adaptor such as would prevent the full insertion of an appropriate plug. The spacing of the socket contacts shall correspond with that of the plug pins as specified in BS 1363-1:1995.

13.1.1 Compliance shall be checked by inspection and the use of the gauges shown in Figure 11.

If raised marking is used, it shall not project more than 0.5 mm from the engagement $\boxed{A_3}$ surface $\langle A_3 \rangle$ and shall allow compliance with **13.2**.

13.2 For adaptors with adaptor socket-outlets for BS 1363 plugs the line and neutral socket contacts in adaptors shall be positioned so as to make satisfactory contact with the corresponding pins of a plug in all positions that the contact may occupy when the plug is correctly and fully inserted.

13.2.1 Compliance shall be checked by inspection and the use of the gauge shown in Figure 12 and the circuit shown in Figure 13. Both indicator lamps shall light.

13.3 For adaptors with adaptor socket-outlets for BS 1363 plugs, on insertion of a plug into an adaptor, the travel of the end of either current-carrying pin from the front face of the adaptor to the first point of contact with the appropriate socket contact, in any position the socket contacts may occupy, shall be not less than 9.6 mm.

13.3.1 Compliance shall be checked by inspection and the use of the gauge shown in Figure 14 and the circuit shown in Figure 13. Neither indicator shall light.

13.4 For adaptor socket-outlets intended to accept plugs complying with other standards, the disposition and dimensions shall enable reliable and safe interconnection and there shall be no projection on the engagement surface of the adaptor such as would prevent the full insertion of a plug. The spacing of the socket contacts shall correspond with that of the plug pins.

Raised marking is permitted provided it does not project more than 0.5 mm from the engagement face.

13.4.1 Compliance shall be checked by inspection and measurement and the requirements in the appropriate standards.