

**BS 1363-3:2016+A1:2018**



**BSI Standards Publication**

## **13 A plugs, socket-outlets, adaptors and connection units**

Part 3: Specification for adaptors

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# Foreword

## Publishing information

This part of BS 1363 is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 August 2016. It was prepared by Technical Committee PEL/23, *Electrical accessories*. A list of organizations represented on this committee can be obtained on request to its secretary.

## Supersession

BS 1363-3:2016+A1:2018 supersedes BS 1363-3:2016, which is withdrawn.

BS 1363-3:2016 superseded BS 1363-3:1995+A4:2012, which remains current and will be withdrawn on 31 August 2019.

## Information about this document

BS 1363 comprises five parts covering the following:

- *Part 1: Specification for rewirable and non-rewirable 13 A fused plugs;*
- *Part 2: Specification for 13 A switched and unswitched socket-outlets;*
- *Part 3: Specification for adaptors;*
- *Part 4: Specification for 13 A fused connection units switched and unswitched;*
- *Part 5: Specification for fused conversion plugs.*

*NOTE* In order to prevent confusion with [BS 1363:1984](#), the figure and clause numbers have been retained.

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 I](#) for the convenience of users of this part of BS 1363.

BS 1363-3 was a new edition, which incorporated technical changes only. It did not represent a full review or revision of the standard, which will be undertaken in due course.

Text introduced or altered by Amendment No. 1 is indicated in the text by tags  . Minor editorial changes are not tagged.

## Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "shall".

*Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.*

Requirements in this standard are drafted in accordance with *Rules for the structure and drafting of UK standards*, subclause **G.1.1**, which states, "Requirements should be expressed using wording such as: 'When tested as described in [Annex A](#), the product shall ...'". This means that only those products that are capable of passing the specified test will be deemed to conform to this standard.

## Contractual and legal considerations

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.**

Particular attention is drawn to the following specific regulations:

- The Plugs and Sockets etc. (Safety) Regulations 1994. SI No. 1768.[1]



## 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 conforming to BS 1363-2:2016, 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. Adapters incorporating electronic components detailed in [Annex H](#) are included within this part of BS 1363.

This standard also applies to shaver adaptors which have the 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 1363-2:2016.

Adaptors conforming to this standard are shuttered and therefore do not require the use of additional means to shield the current-carrying contacts when no plug is present in the adapter socket-outlets.

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

*NOTE 1 The titles of the publications referred to in this standard are listed in the bibliography.*

*NOTE 2 In order to maintain safety and interchangeability with plugs and socket-outlets it is necessary that these products conform to 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 surface.*

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

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

This British Standard does not cover travel adapters.

*NOTE 3 Attention is drawn to BS 8546:2016, which covers travel adapters.*

## 2 Conditions of use

Adaptors shall be suitable for use under the following conditions:

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

*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 [Annex E](#), and Overvoltage Category III, see [Annex D](#).

### 3 Terms and definitions

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

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

#### 3.1 adaptor

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 of BS 1363-1:2016 or [BS 546:1950](#) type

#### 3.2 adaptor socket-outlet

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

#### 3.3 multiway adaptor

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

adaptor as in [3.7](#) or [3.8](#), so constructed that it forms a complete unit with the flexible cable which cannot be replaced after assembly by the manufacturer of the adaptor

*NOTE* See also [12.6](#).

#### 3.5 rewirable adaptor

adaptor as in [3.7](#) or [3.8](#), so constructed that a flexible cable can be fitted or replaced using general purpose tools

#### 3.6 fused adaptor

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

#### 3.7 adaptor plug

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

#### 3.8 intermediate adaptor

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

#### 3.9 (Not used)

#### 3.10 shaver adaptor

fused adaptor specifically designed to have a single socket-outlet capable of accepting plugs of the following types: [BS 4573:1970](#); [BS EN 50075:1991](#); IEC 60083, sheet US1, NEMA 1-15

#### 3.11 shutter

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

### 3.12 terminal

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

### 3.13 screw-type terminal

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

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

### 3.15 fuse carrier

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

### 3.16 type test

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

### 3.17 type test sample

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 the plug portion of an adaptor

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

thermocouple having wires not exceeding 0.3 mm in diameter

### 3.22 calibrated link

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

**3.23 indicator lamp (pilot lamp)**

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

**3.24 resilient material**

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

**3.25 creepage distance**

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**

single insulation system applied to live parts, which provide 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).*

*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**

surface, ignoring any raised marking, which is in contact with or directly beneath the [Figure 11](#) gauge when it is in full engagement with the socket-outlet

*NOTE See [13.1](#).*

### **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

[SOURCE: [BS EN 60695-2-11:2014](#), 3.15, modified]

*NOTE More information concerning small parts can be found in [BS EN 60695-2-11:2014](#), 4.4.*

### **3.37 switched adaptor**

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**

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.

---

## **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 °C ±5 °C after being conditioned at normal laboratory temperature and humidity levels for at least four 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 cable which shall be at least 1 m long.

Adaptors shall be deemed to conform to this part of BS 1363 if no sample fails in the complete series of tests given in [Table 1](#).

**Table 1** — *Schedule of tests*

| Sequence         | Samples | Tests                                                            | Clause number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------|---------|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                | 3       | Inspection, measurement, gauging and manipulation                | <a href="#">5</a> , <a href="#">6</a> , <a href="#">7</a> , <a href="#">9.1</a> , <a href="#">9.2</a> , <a href="#">9.3</a> , <a href="#">9.5</a> , <a href="#">9.6</a> , <a href="#">10.1</a> , <a href="#">11.1</a> , <a href="#">12.1</a> , <a href="#">12.2</a> , <a href="#">12.3</a> , <a href="#">12.4</a> , <a href="#">12.5</a> , <a href="#">12.11</a> ( <a href="#">12.11.1</a> , <a href="#">12.11.2</a> , <a href="#">12.11.3</a> and <a href="#">12.11.6</a> only), <a href="#">12.15</a> , <a href="#">12.16</a> , <a href="#">12.17</a> , <a href="#">12.18</a> , <a href="#">13.1</a> , <a href="#">13.2</a> , <a href="#">13.3</a> , <a href="#">13.4</a> , <a href="#">13.5</a> , <a href="#">13.8</a> , <a href="#">13.9</a> , <a href="#">13.10</a> , <a href="#">A1</a> <a href="#">13.13</a> ** <a href="#">A1</a> , <a href="#">19.2</a> , <a href="#">19.3</a> , <a href="#">19.4</a> , <a href="#">19.6</a> , <a href="#">8</a> (except <a href="#">Annex C</a> ), <a href="#">21</a> |
| 2                | 3       | General                                                          | <a href="#">5</a> , <a href="#">9.4</a> , <a href="#">19.1</a> , <a href="#">12.14</a> , <a href="#">12.19.2</a> , <a href="#">12.19.3</a> , <a href="#">12.19.2</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| 7                | 3*      |                                                                  | <a href="#">5</a> , <a href="#">12.11.4</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 8a)              | 9       | Additional tests for adaptors with non-solid pins and/or an ISOD | <a href="#">5</a> , <a href="#">12.11.5</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 8b)              | 3       | Additional tests for adaptors fitted with an ISOD                | <a href="#">5</a> , <a href="#">12.11.4.3</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 9                | 3       | Materials                                                        | <a href="#">5</a> , <a href="#">22</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 10               | 3       |                                                                  | <a href="#">5</a> , <a href="#">23.2</a> , <a href="#">8.2</a> ( <a href="#">Annex C</a> only)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 11               | 3       |                                                                  | <a href="#">5</a> , <a href="#">24</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 12 <sup>A)</sup> | 3       | Positive break (switched adaptors)                               | <a href="#">5</a> , <a href="#">13.12.2</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 13               | 3       | Overloads                                                        | <a href="#">5</a> , <a href="#">14.1</a> , <a href="#">26</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

**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 1 is preferred but not obligatory except where required within the text of the appropriate clause.

**A1** **NOTE 3** \*\* denotes that additional samples may be required for adaptors incorporating electronic components.

<sup>A)</sup> An additional new set of three samples prepared with the contacts closed is supplied by the manufacturer for this test. **A1**

If one sample fails in a complete series of tests given in [Table 1](#), then adaptors of that type shall be deemed to have failed to conform to 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 conform to this part of BS 1363.

If more than one sample fails in the complete series of tests given in [Table 1](#) the adaptors of that type shall be deemed not to conform to this part of BS 1363.

*NOTE 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.*

- 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 samples 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 conform to 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  $\pm 0.005$  mm.

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## 6 Classification and rating

6.1 Adaptors shall be classified as follows, as appropriate:

- fused or unfused;
- switched or unswitched;
- 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);
- shaver adaptor;
- for shaver adaptors for class II applications only, fitted with an un-terminated brass earth pin or ISOD.

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 currents 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-outlets is equal to or greater than 13 A.

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## 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 1363<sup>1</sup> .
- 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 cable;
- 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 shall be fitted with a 1 A rated fuse conforming to BS 646:1958+A2:2013;

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

- 7.1.1** Conformity 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 conform 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** Conformity shall be checked by inspection.
- 7.3** Except where an intermediate adaptor or adaptor plug fitted with a flexible cable is supplied direct to a manufacturer for incorporation in other equipment, the free end of such an assembly shall have label attached which shall include the following:
- a) the statement: “The flexible cable is 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 cable as follows:

<sup>1</sup> 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. Such a declaration is not to be confused with second or third-party certification of conformity. Further testing and conformity certification remains at the discretion of the manufacturer and is not a requirement of this standard.

“IMPORTANT. Wires in the mains lead are coloured in accordance with the following code:

|                  |                |
|------------------|----------------|
| Green-and-yellow | Earth (if any) |
| Blue             | Neutral        |
| Brown            | Line”;         |

- d) if the intermediate adaptor or adaptor plug is fitted with a 2-core flexible cable, the following statement:

“This lead must not be used with equipment requiring the protection of an earth continuity conductor”.

#### 7.3.1 Conformity 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 cables including clear instructions for the removal of insulation from the conductors.

#### 7.4.1 Conformity shall be checked by inspection.

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

| Flex cable nominal cross-sectional area<br>mm <sup>2</sup> | Rated current <sup>D)</sup><br>A | Test current<br>±0.4 A<br>A | Fuse rating<br>A      | Load for flexing test | Cable grip tests       |                            |
|------------------------------------------------------------|----------------------------------|-----------------------------|-----------------------|-----------------------|------------------------|----------------------------|
|                                                            |                                  |                             |                       | +2%, -0%<br>kg        | Load<br>+2%, -0%<br>kg | Torque <sup>B)</sup><br>Nm |
| 0.5                                                        | 3                                | 3.5                         | 3 (5) <sup>A)</sup>   | 1                     | 3                      | 0.15                       |
| 0.75                                                       | 6                                | 7                           | 7 (13) <sup>A)</sup>  | 1                     | 3                      | 0.20                       |
| 1 (0.75) <sup>C)</sup>                                     | 10                               | 11                          | 10 (13) <sup>A)</sup> | 2                     | 3                      | 0.25                       |
| 1.25 (1) <sup>C)</sup>                                     | 13                               | 14                          | 13                    | 2                     | 6                      | 0.30                       |
| 1.5                                                        | 13                               | 14                          | 13                    | 2                     | 6                      | 0.35                       |

<sup>A)</sup> The figure in brackets indicates the fuse rating when a non-rewirable adaptor is used with certain types of appliances where the use of the higher rated fuse link is necessary because of their characteristics. Portable socket-outlets are not considered to be appliances and therefore the higher rated fuse cannot be used.

<sup>B)</sup> The recording of a measured value of torque in accordance with this table is considered to conform to this part of BS 1363 on condition that the uncertainty of measurement at not less than 95% confidence level does not exceed ±10%.

<sup>C)</sup> The figure in brackets indicates the flexible cable size which may be used with a maximum flexible cable length of 2 m.

<sup>D)</sup> Non-rewirable adaptors may have a rated current appropriate to a smaller cable size than that fitted. (e.g. a non-rewirable adaptor rated at 3 A may be fitted with an 0.75 mm cable). In such cases, load and torque parameters for testing shall relate to the size of cable fitted and the test current shall relate to the rated current of the adaptor.

#### 7.5 Symbols shall be as follows:

|         |   |
|---------|---|
| amperes | A |
| volts   | V |

|                                              |                                                                                   |                                                                                                    |
|----------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| *alternating current                         | ~                                                                                 |                                                                                                    |
| *direct current (d.c.)                       | — — — —                                                                           |                                                                                                    |
| line (adaptor plugs)                         | L                                                                                 |                                                                                                    |
| neutral                                      | N                                                                                 |                                                                                                    |
| *earth                                       |  | (preferred) or  |
| supply line terminal (intermediate adaptors) | L in or L1                                                                        | supply line terminal (intermediate adaptors)                                                       |
| load line terminal (intermediate adaptors)   | L out or L2                                                                       | load line terminal (intermediate adaptors)                                                         |
| *fuse                                        |  |                                                                                                    |

NOTE 1 IEC 60417-DB gives details of symbols marked with \*.

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 are as follows:

13 A 250 V ~ or 13/250 ~ or  $\frac{13}{250}$  ~  
 or 13 A 250 V a.c. or 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](#), [8.3](#) and [8.4](#).

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

Adaptors conforming to 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 60664-1:2007](#).

NOTE 2 Product insulation consists of basic insulation and protective earthing as required by BS EN 61140:2016 for Class I equipment. Mechanical strength equivalent to that which would be provided by reinforced insulation as listed in BS EN 61140:2016 is achieved in BS 1363 products through specific mechanical and material tests.

### 8.1 Clearances

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

The clearances shall 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.

### 8.1.1 Clearances for basic insulation

The clearances for basic insulation shall not be less than the values given in [Table 3](#) except as described below.

Smaller unspecified clearances (except those values marked in [Table 3](#) with footnote “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 parts 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.

Conformity 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](#).

Conformity 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](#).

### 8.1.3 Clearances for supplementary insulation

The clearances for supplementary insulation shall not be less than the values specified for basic insulation in [8.1.1](#).

Conformity 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](#).

**Table 3** — *Minimum clearances for basic insulation*

| Rated impulse withstand voltage<br>kV <sup>A)</sup> | Minimum clearances in air up to 2 000 m above sea level<br>mm |
|-----------------------------------------------------|---------------------------------------------------------------|
| 0.33                                                | 0.2 <sup>B)</sup>                                             |
| 0.50                                                | 0.2 <sup>B)</sup>                                             |
| 0.80                                                | 0.2 <sup>B)</sup>                                             |
| 1.5                                                 | 0.5                                                           |
| 2.5                                                 | 1.5                                                           |
| 4.0                                                 | 3.0                                                           |
| 6.0                                                 | 5.5                                                           |

**Table 3** (continued)

| Rated impulse withstand voltage<br>kV <sup>A)</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Minimum clearances in air up to 2 000 m above sea level<br>mm |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| <sup>A)</sup> See <a href="#">Annex D</a> . This voltage is: <ul style="list-style-type: none"> <li>• for functional insulation: the minimum impulse voltage expected to occur across the clearance;</li> <li>• for basic insulation directly exposed to or significantly influenced by transient overvoltage from the low voltage mains: the rated impulse withstand voltage of the adaptor;</li> <li>• for other basic insulation: the highest impulse voltage that can occur in the circuit.</li> </ul> |                                                               |
| <sup>B)</sup> Minimum clearances values are based on <a href="#">BS EN 60664-1:2007</a> .                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                               |

#### 8.1.4 Clearances for reinforced insulation

The clearances 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 3](#).

This requirement shall not be applied to the sleeves of the adaptor plug pins.

Conformity shall be checked by inspection and by measurement, or by the test of [Annex F](#).

#### 8.1.5 Contact gap

The minimum contact gap shall be 1.2 mm when the switch is in the open position, except for electronic switches covered by Annex H.5.

Conformity shall be checked by measurement.

### 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 B](#).

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 C](#).

*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 4](#).

Conformity shall be checked by measurement.

**Table 4** — *Minimum creepage distances (mm) for basic insulation*

| Rated voltage <sup>A)</sup><br>V (r.m.s.) | Pollution degree 2 <sup>B)</sup> |     |           | Pollution degree 3 <sup>B)</sup> |     |      |
|-------------------------------------------|----------------------------------|-----|-----------|----------------------------------|-----|------|
| Up to and including                       | Material group                   |     |           | Material group                   |     |      |
| —                                         | I                                | II  | IIIa/IIIb | I                                | II  | IIIa |
| 250                                       | 1.3                              | 1.8 | 2.5       | 3.2                              | 3.6 | 4.0  |

<sup>A)</sup> This voltage is the voltage rationalized through Table F.3a and Table F.3b of [BS EN 60664-1:2007](#) based on the nominal voltage of the supply system.

<sup>B)</sup> Details of pollution degrees are given in [Annex E](#).

### 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](#).

Conformity 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](#).

Conformity 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 4](#).

This requirement shall not be applied to the sleeves of the adaptor plug pins.

Conformity shall be checked by measurement.

## 8.3 Solid insulation

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

No minimum thickness is specified for solid insulation.

### 8.3.1 Conformity shall be checked by tests in accordance with [15.1.3](#) using the values given in [Table 5](#).

**Table 5** — *Withstand voltages for insulation types*

| Insulation               | Test voltage<br>V (r.m.s.) |
|--------------------------|----------------------------|
| Functional insulation    | 1 500                      |
| Basic insulation         | 1 500                      |
| Supplementary insulation | 1 500                      |
| Reinforced insulation    | 3 000                      |

## 8.4 Requirements for printed wiring boards and equivalent construction

Printed wiring boards and equivalent construction shall conform to [BS EN 60664-5:2007](#).

Where coating, potting or moulding is used articles shall conform to BS EN 60664-3:2003+A1:2010.

## 9 Accessibility of live parts

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

Additionally, adaptor plugs shall conform to this requirement without a flexible cable fitted.

- 9.1.1** Conformity 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 cables, rewirable intermediate adaptors fitted with a 2-core flexible cable as given in [BS EN 50525-2-71:2011](#). Detachable fuse carriers shall be removed before this test is undertaken.

- 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** Conformity 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.

**NOTE** *SELV parts are not considered to be live parts for the purpose of this test.*

- 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** Conformity shall be verified 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 reduced creepage distances and clearances below those given in [Clause 8](#).

- 9.4.1** Conformity 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 2a](#)).

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 waveforce is applied for  $60_{-0}^{+5}$  s between all live parts bonded together and the metal 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** Except for assemblies supplied to equipment manufacturers for incorporation into their equipment, an intermediate adaptor or adaptor plug supplied fitted with a flexible cable shall have the free end of such an assembly encapsulated in insulating material.

**9.5.1** Conformity 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** Conformity shall be checked by introducing a rigid metal pin,  $1_{-0,05}^0$  mm diameter  $\times$  60 mm  $\pm$  1 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** Conformity 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.

Metal parts having an accessible surface coating of lacquer or enamel shall be tested as accessible metal parts.

**10.2.1** Conformity 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 A  $\pm$  0.75 A, derived from an a.c. source having a no-load voltage not exceeding 12 V, is passed for  $60_{-0}^{+5}$  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 contact;
  - 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 0.05  $\Omega$ .

## 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** Conformity 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** Conformity 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<sup>2</sup> 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 cables unless the soldered area is entirely outside the crimp.

**11.3.1** Conformity shall be checked by inspection and measurement.

**11.4** Terminals in rewirable adaptors shall permit the connection, without special preparation, of flexible cables having nominal conductor cross-sectional areas of 0.5 mm<sup>2</sup> to 1.5 mm<sup>2</sup>.

**11.4.1** Conformity 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** Conformity 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** Conformity 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 cable 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** Conformity 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 mm<sup>2</sup> 3-core flexible cable as given in [BS EN 50525-2-11:2011](#) in accordance with the manufacturer's instructions. All terminal screws or nuts are tightened to the appropriate torque given in [Table 6](#).

**Table 6** — Torque values for screws and nuts

| Declared diameter of screw thread<br>mm | Torque (see Note 1)                    |                                          |                                            |
|-----------------------------------------|----------------------------------------|------------------------------------------|--------------------------------------------|
|                                         | For metal screws<br>(see Note 2)<br>Nm | For other metal<br>screws and nuts<br>Nm | For screws of<br>insulating material<br>Nm |
| 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** The recording of a measured value given in this table is considered to conform to this part of BS 1363 on condition that the uncertainty of measurement at not less than 95% confidence level does not exceed  $\pm 10\%$ .

**NOTE 2** 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.

A continuity indicating circuit operating at not less than 40 V shall be connected between the conductors and the other parts nominated. All terminal screws shall then be loosened and the cable anchorage rendered inoperative and the cover of the adaptor refitted. The flexible cable shall then be 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 cable is fitted and the flexible cable rotated through approximately  $60^\circ$  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 cable anchorage is rendered inoperative.

**11.8.1** Conformity 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 if a strand of a flexible conductor escapes 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** Conformity shall be checked by inspection, and by the following test.

A length of insulation in accordance with the manufacturer's instructions removed from the end of a flexible conductor having a nominal cross-sectional area of  $1.5 \text{ mm}^2$ . 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.

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## 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** Conformity 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 cable 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. '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.

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 maximum and 3.90 mm minimum and its height which shall be 8.05 mm maximum and 7.75 mm minimum.

**12.2.1** Conformity shall be checked by inspection, measurement and by the use of the gauge shown in [Figure 5](#).

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 1363-2:2016 shall be applied and the maximum withdrawal force from a socket-outlet conforming to BS 1363-2:2016 shall not exceed 36 N.

For the gauging test, intermediate adaptors and adaptor plugs shall be fitted with a 3-core 1.25 mm<sup>2</sup> flexible cable as given in [BS EN 50525-2-11:2011](#). 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** Conformity 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 conforming 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 conforming to other standards, shall either be:
  - 1) provided with only one fuse link which shall have a rated current of 13 A and conform to [BS 1362:1973](#); or
  - 2) provided with a 13 A fuse link, conforming to [BS 1362:1973](#), protecting the BS 1363 adaptor socket-outlets and an appropriate fuse link conforming to [BS 1362:1973](#) or BS 646:1958+A2:2013 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 conforming to [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 conforming to other standards shall be provided with an appropriate fuse link, conforming to [BS 1362:1973](#) or BS 646:1958+A2:2013 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 conforming to standards, other than BS 1363 shall be provided with an appropriate fuse link, conforming to [BS 1362:1973](#) or BS 646:1958+A2:2013 to protect the outgoing circuit or circuits.
- f) An adaptor plug or an intermediate adaptor shall be provided with an appropriate fuse link, conforming to [BS 1362:1973](#) or BS 646:1958+A2:2013 to protect the outgoing flexible cable.
- g) A shaver adaptor shall be provided with a 1 A fuse link conforming to BS 646:1958+A2:2013.

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** Conformity 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** Conformity 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 cable 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** Conformity 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** Conformity 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  $60_{+5}^0$  s whilst the surface temperature of the product is  $70\text{ °C} \pm 5\text{ °C}$ . 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** Conformity 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  $70\text{ °C} \pm 5\text{ °C}$  and the pull applied for  $60_{+5}^0$  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 adaptors are tested with the flexible cable supplied. The adaptor plug pins are clamped in the vertical position using a suitable jig with the plug pins uppermost. The plug flexible cable shall be 1 m in length and a weight of  $3_{+0.06}^0$  kg fixed to the end. With the weight initially held  $0.5\text{ m} \pm 0.05\text{ m}$  from the end of the cable anchorage, and at the same height, the weight is allowed to fall through an arc of 1 m. This test shall be carried out five times.

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

Conformity 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** Conformity 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** Conformity shall be checked by inspection and by the test described in [15.2](#).
- 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](#).
- 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** Conformity 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** Conformity 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** Conformity shall be checked by inspection and in case of doubt by the following test.
- Push a steel test probe of 0.2 mm diameter 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 and ISODs shall have adequate strength to withstand the stresses of normal use.
- 12.11.4.1** For solid pins conformity 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  $1100_{-10}^0$  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 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, conformity 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  $800_{-10}^0$  N to the moveable 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 conform to [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 samples shall be used for 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  $1.5_{-0.1}^0$  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 test and shall face the fixed anvil for the second test. The force shall be not less than 1 100 N.

**12.11.4.3** For ISODs, conformity 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 mm/min  $\pm$  2 mm/min.

A force of  $400_{-0}^{+10}$  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 1363-2:2016 shall be applied and the maximum withdrawal force from a socket-outlet conforming to BS 1363-2:2016 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 1363-2:2016. For adaptors with non-solid pins, conformity shall be checked by [12.11.5.1](#). For adaptors with ISODs, conformity shall be checked by [12.11.5.2](#).

**12.11.5.1** Conformity shall be checked by the following tests.

The test is carried out with adaptors with non-solid pins and three different types of new socket-outlets in accordance with BS 1363-2:2016. 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.

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 cable 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 period 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 1363-2:2016, with the permitted values of voltage drop specified in [13.4.1a](#)) of BS 1363-2:2016 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](#).

**12.11.5.2** Conformity shall be checked by the following.

Using a selection of three different makes of rewirable plugs conforming to BS 1363-1:2016 and three different makes of unswitched socket-outlets conforming to BS 1363-2:2016, 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 1363-2:2016, **10.2.1b**).

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.

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 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 1363-2:2016, **10.2.1b**). 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.

**12.11.6** Adaptor plug pins and ISODs (if any) shall have adequate mechanical strength to ensure that they cannot be distorted by twisting.**12.11.6.1** Conformity 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  $1 \text{ Nm} \pm 10\%$  for  $60^{+5}_0 \text{ s}$ . 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** Conformity 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** Conformity 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 fit 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 surface when the pins are subjected to a force as shown in [Figure 8](#).

**12.14.1** Conformity 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 engagement surface 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  $4.4^{+0}_{-0.2}$  N,  $25^{+0}_{-0.5}$  mm from the engagement surface 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 cable to stress.

**12.15.1** Conformity shall be checked by inspection.

- 12.16** Non-rewirable intermediate adaptors and adaptor plugs shall be fitted with flexible cables in accordance with [19.4](#).

**12.16.1** Conformity 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** Conformity 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** Conformity 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** Conformity 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 1 250 V  $\pm 30$  V which is maintained for  $60^{+5}_0$  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 mm  $\pm 0.02$  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  $4^{+0}_{-0.1}$  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 the pin abrasion 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 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 sample pins are tested by means of the apparatus shown in [Figure 10](#) which has a blade  $0.70^{+0.05}_0$  mm wide and a radius of 3 mm  $\pm 0.1$  mm. The test is made on one pin of each adaptor not used for the test described in [12.19.3](#).

A sample is positioned as shown in [Figure 10](#) and the apparatus is loaded so that the blade exerts a force of  $2.5^{+0}_{-0.1}$  N on the sample. The apparatus, complete with sample, is placed in a heating cabinet at  $200^{+0}_{-8}$  °C for a period of  $120^{+0}_{-5}$  min, after which the sample 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%.