

BRITISH STANDARD 3456 : Section A1 : 1966

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SPECIFICATION FOR THE TESTING AND APPROVAL OF HOUSEHOLD ELECTRICAL APPLIANCES

Part A. Heating and Cooking Appliances

Section A1

GENERAL REQUIREMENTS

BRITISH STANDARDS INSTITUTION

SPECIFICATION FOR
THE TESTING AND APPROVAL OF
HOUSEHOLD ELECTRICAL APPLIANCES

Part A. Heating and Cooking Appliances

SECTION A1
GENERAL REQUIREMENTS

B.S. 3456 : Section A1 : 1966

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THIS BRITISH STANDARD, having been approved by the Electrical Industry Standards Committee and endorsed by the chairman of the Engineering Divisional Council, was published under the authority of the General Council on 10th August, 1966.

First published, August, 1961.

First revision, August, 1966.

The Institution desires to call attention to the fact that this British Standard does not purport to include all the necessary provisions of a contract.

This British Standard makes reference to the following standards; see also Appendix A.

- B.S. 372. Two-pin side-entry wall plugs and sockets for domestic purposes.
- B.S. 546. Two-pole and earthing-pin plugs, socket-outlets and socket-outlet adaptors for circuits up to 250 volts.
- B.S. 562. Reversible connectors for portable electrical appliances.
- B.S. 613. Components and filter units for radio interference suppression.
- B.S. 1363. Two-pole and earthing-pin fused-plugs and shuttered socket-outlets for a.c. circuits up to 250 volts.
- B.S. 3042. Standard test fingers for checking protection against electric shock and mechanical hazard.
- B.S. 3283. Non-reversible connectors and appliance inlets for portable electrical appliances (for circuits up to 250 volts).
- B.S. 4491. Appliance couplers for household and similar general purposes.
- B.S. 6500. Insulated flexible cords.

British Standards are revised, when necessary, by the issue either of amendment slips or of revised editions. It is important that users of British Standards should ascertain that they are in possession of the latest amendments or editions.

The following B.S.I. references relate to the work on this standard:
Committee reference ELE/82 Draft for comment D64/3488

CONTENTS

	Page
Co-operating organizations	5
Foreword	6

SPECIFICATION

1. Scope	7
2. Definitions	7
3. General requirements	9
4. General conditions of test	9
5. Voltage rating	11
6. Classification	11
7. Marking	11
8. Protection against electric shock	16
9. Input	18
10. Operation under overload conditions	19
11. Heating	20
12. Electrical insulation at operating temperature	23
13. Spillage	24
14. Moisture resistance	24
15. Electric strength and insulation resistance	25
16. Mechanical strength	28
17. Stability	28
18. Abnormal operation	29
19. Construction	30
20. Thermal controls	33
21. Component parts other than thermal controls	34
22. Supply connection	36
23. Terminals for external conductors	40
24. Provision for earthing	41
25. Screws and connections	43
26. Creepage distances, clearances and distances through insulation	44
27. Resistance to rusting	47

APPENDICES

A. List of British Standards for component parts	49
B. Tab terminals: Requirements for snap-on connector assemblies	49

B.S. 3456 : Section A1 : 1966

FIGURES

	Page
1. Test probe	54
2. Circuit diagrams, leakage current measurements	54
3. Circuit diagram for voltage test	55
4. Impact test apparatus	55
5. Test pin	56
6. Standard tab terminal for use with solderless snap-on connector	56

B.S. 3456 : Section A1 : 1966

CO-OPERATING ORGANIZATIONS

The Electrical Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

- Associated Offices' Technical Committee
- Association of Consulting Engineers
- Association of Mining Electrical and Mechanical Engineers
- Association of Supervising Electrical Engineers
- *British Electrical and Allied Manufacturers' Association
- British Railways Board
- Crown Agents for Oversea Governments and Administrations
- Electric Cable Makers' Confederation
- Electric Lamp Industry Council
- Electric Light Fittings Association
- *Electrical Contractors' Association (Incorporated)
- Electrical Contractors' Association of Scotland
- *Electrical Research Association
- *Electricity Council, the Generating Board and the Area Boards in England and Wales
- Electronic Engineering Association
- Engineering Equipment Users' Association
- *Institution of Electrical Engineers
- Ministry of Aviation
- *Ministry of Defence, Army Department
- Ministry of Defence, Navy Department
- Ministry of Labour (H.M. Factory Inspectorate)
- *Ministry of Power
- *Ministry of Public Building and Works
- Municipal Passenger Transport Association (Incorporated)
- National Inspection Council for Electrical Installation Contracting
- *National Physical Laboratory (Ministry of Technology)
- Oil Companies Materials Association
- *Post Office
- Public Transport Association (Incorporated)
- *South of Scotland Electricity Board

The Government departments and scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

- British Electrical Approvals Board for Domestic Appliances
- Consumer Council
- Electrical Association for Women
- Home Office
- Women's Advisory Committee of the B.S.I.

B.S. 3456 : Section A1 : 1966

BRITISH STANDARD SPECIFICATION FOR THE TESTING
AND APPROVAL OF HOUSEHOLD ELECTRICAL APPLIANCES**Part A. Heating and Cooking Appliances**
SECTION A1. GENERAL REQUIREMENTS**FOREWORD***As altered
Jan., 1969*

This British Standard has been prepared under the authority of the Electrical Industry Standards Committee and is one of a series of specifications for the testing and approval of household electrical appliances by the British Electrical Approvals Board for Domestic Appliances. It is concerned with electrical and mechanical construction in so far as these affect durability of safety and reliability in service.

Part A of B.S. 3456 applies to heating and cooking appliances of all types, and Section A1 specifies general requirements. Section A2 and subsequent sections of Part A give individual requirements for particular appliances together with modifications to the general requirements of Section A1 in special cases where this is necessary.

It should be noted that it is not intended that the principle of double-insulation (Class IIB) be applied to all types of heating and cooking appliances. The references in Section A1 of this specification to Class IIB are intended to apply only to those appliances for which this classification is specifically recognized in the section for the particular appliances.

The classification and the principles of protection against electric shock are described in B.S. 2754, 'Memorandum on double-insulated and all-insulated electrical equipment'.

Attention is drawn to the fact that manufacturers or responsible vendors can only claim that their appliances have been approved by BEAB by marking them in a permanent manner with the Certification Mark of the British Electrical Approvals Board for Domestic Appliances (BEAB). This mark may be used only by manufacturers or responsible vendors who have obtained a licence from the BEAB.

This British Standard incorporates the most up-to-date ideas on safety, and it will be kept under review and revised in the light of experience.

Appliances conforming to this specification are not necessarily suitable for

NOTE 1. In place of the pound as a unit of force, the unit called a pound-force (abbreviation lbf) has been used. The unit of force in the international system is the Newton (N) = $\frac{1}{4}$ lbf approximately.

NOTE 2. Where metric equivalents are given, the British units are to be regarded as the standard. The metric conversions are approximate; more accurate conversions should be based on the tables in B.S. 350, 'Conversion factors and tables'.

use in premises to which the Offices, Shops and Railway Premises Act, 1963, and the Factories Act apply.

This standard is a revision of the 1961 edition, and it will replace that edition on the 1st July 1967. Appliances received by B.E.A.B. before 30th June 1967 can be approved on the basis of the 1961 edition, or on this edition of the specification.

SPECIFICATION

SCOPE

1. This specification applies to electrical heating and cooking appliances for household use designed for connection to supplies at voltages not exceeding 250 volts a.c. single phase or d.c.

*As altered
Jan., 1969*

The specification is intended primarily to establish a satisfactory standard of safety when the appliance is used under normal conditions, and it is based on an ambient temperature not normally exceeding 77°F (25°C).

This Section A1 of the specification applies to all electrical heating and cooking appliances except as otherwise stated in the subsequent sections for particular types of appliance for which additional or modified requirements may be specified.

An appliance of a particular type can only be considered as conforming fully to this specification if there is a subsequent section of the specification giving special requirements for this type and when the full requirements of this Section A1 and the subsequent section are met.

This section also covers heating and cooking appliances which incorporate a motor, but such appliances shall also comply with the requirements of Part B, 'Motor-operated appliances', where these are applicable.

This specification does not cover heating and cooking appliances for use under special circumstances; for example in places where small children, or aged or infirm persons are left unaccompanied by responsible persons, neither does it cover appliances for use in locations where special atmospheric conditions prevail, such as in tropical countries or for horticultural purposes. In these cases additional precautions may be necessary.

DEFINITIONS

2. For the purposes of this British Standard the following definitions apply. The terms 'voltage' and 'current' imply the r.m.s. values, unless otherwise specified.

*a. Rated voltage, current or input**. The voltage, current or input, assigned to the appliance or component part by the maker. The rated input refers to the input in watts or kilowatts at normal operating temperature.

b. Rated voltage range. The voltage limits assigned to the appliance or component part by the maker.

* If the rated current is not marked on the appliance it is determined from the rated input and the rated voltage.

c. Maximum rated input. The maximum rated input, when an input range is marked on the appliance, is the highest input of the range. When the mean input is marked, the maximum rated input is given by the formula:

$$\text{Mean rated input} \times \left[\frac{\text{maximum rated voltage}}{\text{mean rated voltage}} \right]^2$$

d. Extra-low voltage. Voltage normally not exceeding 50 volts a.c., with a maximum r.m.s. voltage to earth of 30 volts, or 50 volts d.c.

e. Portable appliance. An appliance held in the hand during normal use or easily carried by hand.

f. Transportable appliance. An appliance not intended to be portable but which can readily be moved from one place to another.

g. Stationary appliance. An appliance intended to be fixed to its supporting surface or used in one place.

h. Non-detachable flexible cord. A flexible cord, so connected to the appliance that it can be removed only with the use of tools.

j. Detachable heating element. A heating element which can be removed and replaced without the use of tools.

k. Interchangeable heating element. A detachable heating element which by its dimensions is replaceable by another element of different rating.

l. Functional insulation. The insulation necessary for the proper functioning of the equipment and for basic protection against electric shock.

m. Functionally insulated parts. Metal parts that are separated from live parts by functional insulation only.

n. Protective insulation. An independent insulation provided externally to the functional insulation and functionally insulated parts, in order to ensure protection against electric shock in case of failure of the functional insulation.

o. Double insulation. A method of insulation by which accessible metal parts are separated from live parts by both protective and functional insulation.

p. Reinforced insulation. A type of improved functional insulation used only in parts of double insulated equipment where the principle of double insulation cannot reasonably be applied and which is able to pass specified tests to ensure that at least an equivalent degree of safety is provided.

q. Double-insulated appliance. An appliance in which double insulation is used throughout, excepting for parts where, because double insulation is manifestly impracticable, reinforced insulation is used.

r. All-insulated appliance. An appliance in which a durable and substantially continuous enclosure of insulating material envelopes all metal parts, excepting small parts such as name plates, screws or rivets which are isolated from other metal parts by insulation at least equivalent to reinforced insulation.

s. Thermostat. A device which, in normal use, keeps the temperature of an appliance, or of parts of it, between certain limits by automatically opening and closing the circuit or by varying the current.

t. Thermal cut-out. A safety device limiting the temperature of an appliance under abnormal conditions by automatically opening the circuit and which is so constructed that there is no provision for adjustment of the operating temperature by the user.

u. Self-resetting thermal cut-out. A thermal cut-out which automatically recloses the circuit after the relevant part or parts have cooled sufficiently.

v. Non-self-resetting thermal cut-out. A thermal cut-out which requires resetting by hand or replacement of a part in order to reclose the circuit.

NOTE. If a thermal control device operates during the test of Clause 11, it is regarded as a thermostat; if it does not operate during the test of Clause 11 but operates during any of the tests of Clause 18, it is regarded as a thermal cut-out.

w. Energy regulator. A device which varies the rate of energy transmission to electrical heating equipment by changing the ratio of the ON and OFF times in a progressive manner between the lowest and maximum declared positions.

x. Live part. Any part which in normal use is current-carrying or any metal part which is electrically connected to such part.

*As added
Jan., 1969*

GENERAL REQUIREMENTS

3. The appliance shall be so designed and constructed that in normal use it is reliable and will operate without danger to the user or surroundings.

Compliance is checked, in general, by carrying out the relevant tests specified.

Notwithstanding the requirements specified in this standard, designs or constructions to which the tests specified do not fully apply but which give an equivalent degree of safety and durability, may be regarded as complying with this standard, subject to the findings of a special investigation by the B.E.A.B. and pending the issue of an amendment or extension to this standard.

GENERAL CONDITIONS OF TEST

4. *a.* Tests according to this specification are type tests.

b. The tests are made on a representative sample in new condition which shall pass all the relevant tests. If, after the tests of Clause 18, the appliance remains serviceable, i.e. in such condition that the average user is likely to continue to use it, then it shall comply with all subsequent clauses without modification or adjustment. If, however, a heating element ruptures or the appliance is rendered obviously unserviceable while yet complying with the requirements of Clause 18, then the tests of the subsequent clauses are made

*As altered
Sept., 1967*

B.S. 3456 : Section A1 : 1966

on a new sample which is subjected to such of the tests prior to Clause 18 as may influence the results of tests of clauses subsequent to Clause 18.

If the appliance is designed for different supply voltages, for both a.c. and d.c. etc., it may be necessary to make some tests on additional samples.

c. Unless otherwise specified in the section of the specification dealing with a particular appliance, the tests are made in the order of the clauses of this Section A1 of B.S. 3456.

Before testing is started it is verified that the appliance is in working order by applying the tests of Subclauses 15*a* and 24*a* together with an operational run, as additional tests before the main sequence is started.

d. The tests are carried out at an ambient temperature of $68 \pm 9^{\circ}\text{F}$ ($20 \pm 5^{\circ}\text{C}$) unless otherwise specified.

e. An appliance designed for both a.c. and d.c. is tested using the system of supply which will prove most exacting to the appliance. An appliance not marked with the nature of supply is presumed to be designed for both a.c. and d.c.

In the case of d.c. the possible influence of polarity on the operation of switching devices is taken into account.

f. An appliance with regulating or limiting devices is tested with these devices at their most unfavourable setting if this setting can be altered by the user without the use of tools.

g. An appliance for which alternative heating elements are available, is tested with those elements which give the most unfavourable result, provided that the alternative elements are within the appliance manufacturer's specification.

h. An appliance designed for use with a non-detachable flexible cord is tested with the flexible cord supplied with the appliance.

j. When it is specified that the appliance shall be connected to a test voltage so that the input is greater than the rated input, the test voltage as defined in the relevant clauses applies only to heating elements without appreciable positive temperature coefficient of resistance. For other heating elements the test voltage is determined in the following manner:

First, the rated voltage is applied until the heating element reaches its operating temperature. The voltage is then rapidly increased to the value necessary to give the required test input, and the tests are made as specified, this value of the voltage being maintained throughout.

In general, the temperature coefficient is deemed to be appreciable if, at rated voltage, the input of the appliance in cold condition differs by more than 25 per cent from the input at operating temperature.

k. Where it is stipulated that an appliance is to be operated from a particular transformer supplied with it, the test is made with this transformer.

B.S. 3456 : Section A1 : 1966

1. For the tests of Clauses 8, 15 and 24, parts separated from live parts by double-insulation or reinforced insulation, or which are connected to the earthing terminal or contact in accordance with Clause 24, are not regarded as likely to become live in the event of an insulation fault.

For the purpose of the label specified in Subclause 7m the term 'live' refers only to the line conductor. Throughout the remainder of the specification the term 'live' refers to parts which are (or may be) alive, irrespective of whether they are connected to line or neutral terminals.

*As added
Sept., 1967
and
Jan., 1969*

m. Any of these tests may be made at the maximum operating temperature if the result of the test is likely to be affected by the thermal characteristics of the materials used in the construction of the appliance.

VOLTAGE RATING

5. The voltage rating shall not exceed 250 volts.

TEST. Compliance is checked by inspection of the marking.

CLASSIFICATION

6. An electric heating and cooking appliance is classified according to the type of protection against electric shock:

Class I appliance. An appliance having some functionally insulated parts which can be touched and are required to be earthed.

Class IIA appliance. An all-insulated appliance.

Class IIB appliance. A double-insulated appliance.

Class III appliance. An appliance designed for operation on extra-low voltage.

NOTE. A Class I appliance may have some parts of Class IIA or Class IIB construction, such parts are then subjected to the appropriate requirements for that construction.

MARKING

7a. Every appliance shall be marked with:

- (i) The number of this British Standard, i.e. B.S. 3456.

NOTE. The Certification Mark of the British Electrical Approvals Board for Domestic Appliances which incorporates the number of this British Standard may be used only under licence from that Board.

Particulars of the conditions under which licences are granted may be obtained from The Director, The British Electrical Approvals Board for Domestic Appliances, Mark House, 153 London Road, Kingston-upon-Thames, Surrey.

*As altered
Sept., 1967
Jan., 1969
and
May, 1970*

- (ii) Rated voltage(s) or voltage range(s) in volts.
- (iii) Nature of supply (ac or dc) if to be observed.
- (iv) Rated input in watts, or kilowatts.

B.S. 3456 : Section A1 : 1966

- (v) Name or trade mark of the manufacturer or responsible vendor.
(The responsible vendor would be the person or body making application for BEAB approval.)
 - (vi) Model or type reference.
 - (vii) 'All-insulated' or 'Double-insulated' or the symbol * for Class IIA or Class IIB construction (as applicable). This symbol shall not be marked on an appliance which has some parts of Class II construction and other parts of Class I construction.
- b. Detachable heating elements shall be marked with:
- (i) Rated voltage in volts.
 - (ii) Rated input in watts or kilowatts.
 - (iii) Name or trade mark of the manufacturer or responsible vendor.
 - (iv) Model or type reference.

NOTE. Markings (iii) and (iv) may be omitted if space is very limited.

c. If the appliance can be set to different rated voltages, the voltage to which the appliance is set shall be easily and clearly discernible.

NOTE. It is sufficient if the rated voltage to which the appliance is set may be determined from instructions given on the appliance.

d. For an appliance where the difference between the limits of the rated voltage range is more than 10 per cent of the mean value of the range, the upper and lower limits of the rated input shall be marked on the appliance so that the relation between input and voltage appears distinctly.

If the difference between the limits of the rated voltage is not more than 10 per cent of the mean value of the range, the marking of rated input shall relate to the mean of the voltage range. (Alternatively, the upper and lower limits of the rated input may be marked.)

If the input of the appliance or of the interchangeable heating element in cold condition differs by more than 25 per cent from the input at operating temperature, the input in cold condition shall be marked in addition and shall be placed between brackets.

This requirement does not, however, apply to elements such as lamps, which attain their operating temperature in less than 2 seconds.

e. If abbreviations are employed the following letters shall be used:

Volts	.	.	.	.	.	.	.	.	.	V
Amperes	.	.	.	.	.	.	.	.	.	A
Watts or kilowatts	.	.	.	.	.	.	.	.	.	W or kW

f. The symbols for nature of supply shall be:

Alternating current	.	.	.	.	.	.	.	a.c. or ~
Direct current	.	.	.	.	.	.	.	d.c. or —

* This symbol should be placed with other markings on the rating plate or part of the appliance used for this purpose, in such a way that it is obvious that the symbol is part of the technical data and is not a trade mark.

g. Any switch shall be marked or placed so as to indicate its function unless this is obvious. There shall be a clear indication of the OFF position of manually operated switches unless this also is obvious, or unless the switch is mounted with the actuating member moving in a vertical plane with the OFF position at the top of its travel and above the ON position. In the case of switches with an ON and OFF position only, indication of the ON position is considered adequate.

Any regulating device shall have indications for its different positions by figures, letters or other visual means.

If figures are used for indicating the different positions of a switch the OFF position shall be indicated by the figure '0' or the word 'OFF', and the position for a greater output, input, speed, cooling effect, etc. shall be indicated by a higher figure. The figure '0' shall not be used for any other indication. *As added Sept., 1967*

h. Any adjustable thermal control shall be provided with an indication of the direction of adjustment to increase or decrease the temperature.

An indication of + and - is deemed to be sufficient.

TEST. Compliance with the requirements of Subclauses *a* to *h* is checked by inspection.

j. Marking of the appliance shall be durable, resistant to heat and easily legible and shall be placed on a main part of the appliance so that it is clearly discernible from the outside, if necessary, after the removal of a cover. This cover shall be removable without the use of tools, except in the case of a stationary appliance, and then only if the cover has also to be removed for servicing. Marking shall not be placed on any removable part which can be replaced in such a way that the marking is misleading.

Marking of detachable heating elements shall be easily legible and shall be placed on a main part of the element in such a way that it is clearly discernible when the element is removed from the appliance. The marking of the element shall be durable and resistant to heat.

TEST. Compliance is checked by inspection, and by lightly rubbing the marking by hand for 15 seconds with a piece of cloth soaked in a solution of detergent and water.

k. For a stationary appliance not provided with a flexible cord or a double-pole switch, the instructions supplied with the appliance shall include a note to the effect that a double-pole switch is to be provided in the installation.

l. For all Class I appliances the following information shall be given on a label attached to the end of the flexible cable or cord, if supplied with the appliance, otherwise the label shall be attached to or near the input terminals. For Class I appliances other than those intended to be permanently connected to fixed wiring the information shall also be included in the user instructions. *As added May, 1970*

B.S. 3456 : Section A1 : 1966

'WARNING—THIS APPLIANCE MUST BE EARTHED'

m. For all Class I appliances supplied with a flexible cable or cord having cores coloured green-and-yellow, brown and blue the user instructions and a label shall state the following:

'IMPORTANT'

*As added
May, 1970*

The wires in this mains lead are coloured in accordance with the following code:

Green and yellow	— Earth
Blue	— Neutral
Brown	— Live

In addition, the user instructions and label shall include the substance of the following:

'As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured green-and-yellow must be connected to the terminal in the plug which is marked with the letter E or by the earth symbol $\perp$ or coloured green or green-and-yellow.

The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.'

For Class II appliances supplied with a flexible cable or cord having cores coloured brown and blue, the user instructions and label shall be as specified for Class I appliances but omitting the warning and the reference to the earth core.

NOTE. For Class I appliances the label specified in Subclause 7*l* may be used for this purpose. A separate label is not required.
See Subclause 4*l*.

n. If the appliance is provided with a flexible cord having conductors with a cross-sectional area less than 0.65 mm² a label attached to the end of the flexible cord shall state that the appliance must be protected by a 3A fuse if a 13A plug is used or, if any other type of plug is used, by a 5A fuse in the plug, adaptor, or at the distribution board. This information shall also be included in the user instructions.

NOTE. The label specified in Subclauses 7*l* or 7*m* may be used for this purpose. A separate label is not required.

TEST. Compliance with Subclauses 7*l*, 7*m* and 7*n* is checked by inspection.

o. For transportable appliances with a rated input exceeding 3 kW, a label shall be attached to the flexible cord stating that the appliance must be connected to

an outlet having a rated current greater than 13 A. A 13 A (B.S. 1363) plug is therefore not suitable.

NOTE. The label specified in Subclauses 7*l*, 7*m* or 7*n* may be used for this purpose. A separate label is not required.

TEST. Compliance is checked by inspection.

p. For portable appliances having a rated input of 3 kW and a rated voltage of less than 230 V, a note shall be included in the user instructions stating that the appliance must be connected to an outlet having a rated current greater than 13A. A 13A (B.S. 1363) plug is therefore not suitable. *As added May, 1970*

TEST. Compliance is checked by inspection.

PROTECTION AGAINST ELECTRIC SHOCK

8. a. For the purposes of this specification, parts that are separated from live parts by earthed metal or by double-insulation are considered not likely to become live in the case of an insulation fault.

The enclosure of the appliance shall have no openings giving access to live parts or, for a Class II appliance, to functionally insulated parts, other than openings necessary for the use and working of the appliance. Where such openings are necessary, sufficient protection against contact with live parts or functionally insulated parts shall be provided. *As altered Sept., 1967*

In compartments of an appliance where access can be gained without the use of tools, and which are likely to be cleaned by the user, there shall be no likelihood of the user touching functional insulation during the cleaning operation, or pulling on connections when cleaning.

NOTE. Lacquering or enamelling is not deemed to be adequate protection or insulation for the purpose of this requirement.

Parts of a Class III appliance carrying extra-low voltage are considered to be live parts unless otherwise specified.

TEST. Compliance is checked by inspection and by means of the Test Fingers A and D prescribed in B.S. 3042*. In addition, the accessibility of live parts through holes in insulating material and in unearthed metal is checked by the test pin shown in Fig. 5.

Test Finger A is inserted into such holes and apertures as are accessible in every way possible, without appreciable force, as follows:

A portable appliance is tested with the appliance in all positions. A transportable appliance or a stationary appliance not designed to be secured in position weighing not more than 77 lb (35 kg) is tested with the appliance in all positions, except that when inserted into apertures which are only

* B.S. 3042, 'Standard test fingers for checking protection against electric shock and mechanical hazard'.

B.S. 3456 : Section A1 : 1966

accessible when the appliance is overturned, the circular stop plate on the test finger is not inserted beyond the plane of the opening in the base.

A transportable appliance weighing more than 77 lb (35 kg) is tested with the appliance in its normal position or positions of use.

A stationary appliance is tested with the appliance in its installed position.

In no case shall it be possible for Test Finger A to touch live parts, even if the position of the jointed members is altered after insertion, neither shall it be possible to touch functionally insulated metal parts of Class II appliances.

If an aperture is such that it prevents the entry of the tip of Test Finger A, Test Finger D is applied, with a force not exceeding 6 lbf (30 N). If this test finger then enters, the test with Test Finger A is repeated, the finger, if necessary, being pushed through the aperture.

The test pin is inserted into such holes in insulating material and in unearthed metal parts as are accessible, without undue force. A portable appliance is tested with the appliance in all positions. A transportable appliance is tested in the normal position or positions of use. A stationary appliance is tested in the installed position. It shall not be possible to touch live parts.

The tests are made after the removal of all parts which can be removed without the use of tools except that, where an appliance of Class I which can be isolated from the supply by means of a plug and socket outlet, or a double-pole switch with an obvious indication of the OFF position, has a lamp behind a cover such as a fuel effect, decorative cover or oven lamp lens removable without the use of a tool, the lamp is not removed.

So far as contact with heating elements which glow visibly during normal use is concerned, the test is made with the standard test probe shown in Fig. 1 instead of the test finger detailed above, the probe being applied without force. For the purposes of this clause, the expression 'heating element' includes all live parts which support the element provided that they can be seen to be in contact with the element without removing any covers, guards, etc.

In case of doubt a voltage of not less than 40 V is used, with a lamp for indication of contact.

NOTE. The probe shown in Fig. 1 is designed solely as a dimensional gauge for the sizes of the apertures in the enclosure and the distance of the heating elements or their terminations from the enclosure. The probe is not intended to test the strength or security of attachment of covers, guards, etc., and should be used with the least pressure necessary.

b. The live parts of appliance couplers, socket-outlets and plugs for supply to detachable components, shall be protected against accidental contact when components are removed or being removed. Edison-screw-type lamp-holders shall be shrouded or otherwise protected so as to prevent contact with the cap of the lamp during insertion and withdrawal unless access to the lamp can be gained only with the use of a tool; the screwed shell shall be connected to the terminal intended for the neutral connection.

TEST. Compliance is checked by applying the Test Finger A.

c. In the case of a portable appliance in which liquids are heated, there shall be no contact between the liquid and live parts.

TEST. Compliance is checked by inspection.

d. Operating spindles of knobs, etc., shall be adequately insulated from live parts.

e. For an appliance other than Class III, handles, levers and knobs, which are actuated in normal use, shall be either of insulating material or adequately covered by insulating material, if their shafts or fixings can become live in the event of an insulation fault.

For a stationary appliance, this requirement does not apply to handles, levers and knobs, other than those of electrical components, provided they are either reliably connected to an earthing terminal or earthing contact, or separated from live parts by earthed metal.

TEST. Compliance with the requirements of Subclauses *d* and *e* is checked by inspection and by the tests of Clause 15.

f. Parts providing protection against contact with live parts or parts which are liable to become live in the event of a defect shall have adequate mechanical strength and shall not work loose during normal use. It shall not be possible to remove these parts without the use of tools.

TEST. Compliance is checked by inspection and by manual test after the test of Clause 16.

g. An appliance the operation of which requires the immersion of the flexible cord in liquid, and an appliance such that the flexible cord is likely to be immersed during operation shall be designed as Class III appliances.

INPUT

9. a. The input of the appliance or interchangeable heating element at the rated voltage and at operating temperature, shall not differ from the rated input by more than $\pm 7\frac{1}{2}$ per cent or 10 W, whichever is the larger.

b. If the appliance or heating element has a marking for the input in cold condition, the input in cold condition shall not differ by more than 20 per cent from the marked value.

TEST. Compliance with Subclauses *a* and *b* is checked by measuring the input under conditions of normal heat discharge when the appliance is connected to the rated voltage. The input is measured when steady temperatures have been obtained and, for an appliance with a marking for the input in cold condition immediately after switching on. The time required to reach a steady temperature is noted and this time is taken as the operating period for subsequent clauses of the specification.