

CONFIRMED

APR 1984

Specification for

Safety of electrical commercial catering equipment

Part 1. Particular requirements for ranges, ovens and hob elements

Spécification pour la sécurité des appareils électriques à usage des collectivités
Partie 1. Règles particulières pour cuisinières, fours, et foyers de cuisson

Spezifikation für die Sicherheit von handelsüblichen elektrischen Kücheneinrichtungen
Teil 1. Besondere Anforderungen an Herde, Ofen und Wulden

Contents

	Page		Page
Foreword	1	Tables	
Cooperating organizations	Back cover	1. No requirement	
Specification		2. Permissible variations in rated input	11
1. Scope	2	3. Permissible temperature rises	12
2. Definitions	2	4. Insulation resistance	17
3. General requirement	5	5. Test voltages	18
4. General conditions for the tests	5	6. No requirement	
5. Rating	6	7. Limiting temperatures of windings under abnormal operation	19
6. Classification	6	8. Permissible temperature rises under abnormal operation	20
7. Marking	6	9. Test force for screwed glands	21
8. Protection against electric shock	8	10. Size of cable and conduit entries	27
9. Starting of motor-operated appliances	10	11. Size of flexible cord	27
10. Input and current	10	12. Test figures for flexible cord pull and torque	28
11. Heating	11	13. No requirement	
12. Operation under overload conditions of appliances with heating elements	14	14. Conductor cross-sectional areas for which terminals shall be suitable	30
13. Electrical insulation and leakage current at operating temperature	14	15. Dimensions of pillar type terminals	31
14. Radio and television interference suppression	15	16. Dimensions of screw type terminals	31
15. Moisture resistance	15	17. Dimensions of stud type terminals	31
16. Insulation resistance and electric strength	17	18. Axial pull on conductors	32
17. Overload protection	18	19. Torque values for screws and nuts	33
18. No requirement		20. Creepage distances and clearances	35
19. Abnormal operation	19	Figures	
20. Stability and mechanical hazards	20	1. Standard test finger	37
21. Mechanical strength	21	2. Test pin	37
22. Construction	22	3. Test probe	37
23. Internal wiring	24	4. No requirement	
24. Components	25	5. Diagram for leakage current measurement at operating temperature for single-phase connection of appliances other than those of class II	38
25. Supply connection and external flexible cables and cords	26	6. No requirement	
26. Terminals for external conductors	29	7. Diagram for leakage current measurement at operating temperature for three-phase connection of appliances other than those of class II	38
27. Provision for earthing	32	8. Diagram for electric strength test at operating temperature	38
28. Screws and connections	33	9. No requirement	
29. Creepage distances, clearances and distances through insulation	34	10. Splash apparatus	39
30. Resistance to heat, fire and tracking	35	11. No requirement	
31. Resistance to rusting	36	12. Impact-test apparatus	40
32. No requirement		13. Device for testing shoulders in conduit entries	40
Appendices		14. Ball-pressure apparatus	40
A. Electronic circuits	43	15. Hot mandrel apparatus	41
B. Measurement of creepage distances and clearances	45	16. Arrangement and dimensions of the electrodes for the tracking test	41
C. Classification of controls in accordance with the requirements of BS 3955 : Part 3 as type 1 or type 2	47	17. No requirement	
		18. Schematic representation of cord anchorages	42



Amendment No. 1
published and effective from 30 November 1983
to BS 5784 : Part 1 : 1979

Specification for safety of electrical
commercial catering equipment
Part 1. Particular requirements for ranges, ovens
and hob elements

Revised text

AMD 4404
November 1983

Contents

Under the heading 'Specification' delete '18. No requirement' and substitute '18. Endurance'.

Under the heading 'Figures' insert the following at the end of the list.

'101. Long test pin'

AMD 4404
November 1983

Foreword

Delete the existing text (but retain the associated footnote) and substitute the following.

'Foreword

This Part of this British Standard has been prepared under the direction of the Light Electrical Engineering Standards Committee and is one of a new series of standards covering the safety of electrical commercial catering equipment.

At present, both safety and performance requirements for commercial catering equipment are covered by the BS 4167 series, the safety requirements of which are now somewhat out-dated. The IEC is preparing safety standards for this type of equipment but is not yet dealing with performance requirements.

The performance requirements of the BS 4167 series are the concern of Technical Committee LEL/116 who may publish a separate series to replace withdrawn Parts of BS 4167.

A new series of British Standards for the safety of commercial catering equipment, in complete alignment with the corresponding IEC standards, will therefore be published and these will replace the safety requirements of the BS 4167 series. As each new standard is published the corresponding Part of BS 4167 will be withdrawn.

This standard is based on corresponding IEC Publication 335-2-36 which is itself based on IEC Publication 335-1 'Safety of household and similar electrical appliances'. However, because IEC 335-1 has been endorsed with some deviations by CENELEC as HD 251.S3, and because it is also probable that the series of Part 2 IEC standards may eventually be adopted by CENELEC as harmonized standards, this standard has been based on CENELEC HD 251.S3 rather than on IEC 335-1.

BS 4167 : Parts 1 and 2 are withdrawn.

For ease of reference the clause and subclause numbers in this standard are the same as those in the 1978 edition of BS 3456 : Part 101 which is exactly equivalent to HD 251.S2 and in which approved UK deviations to this HD are shown by a margin mark *. Where a clause of BS 3456 : Part 101 : 1978 does not apply to the appliances covered by this standard the clause number has been retained marked 'No requirement'. Additional subclauses introducing particular requirements for ranges, ovens and hob elements are numbered .101, .102 etc.

Users of this British Standard should satisfy themselves that the installation of equipment conforming to this specification meets the requirements of the model by-laws issued by the Ministry of Housing and Local Government and the Department of Health for Scotland respectively, where these are applicable.

The equipment described in this standard is not necessarily suitable for use in ships or road vehicles.

AMD 4404
November 1983

Clause 2.4 rated input

Delete the existing clause and substitute the following.

'2.4 rated input. The sum of the inputs, under conditions of adequate heat discharge or under normal load and at normal operating temperature assigned to the appliance by the manufacturer, of all the individual elements in the appliance that can be on at one time; where several such combinations are possible, that giving the highest input is used in determining the rated input.'

AMD 4404
November 1983

Clause 2.29 conditions of adequate heat discharge

At the end of the last paragraph insert the following sentence.

'If this temperature cannot be reached the control is set at maximum.'

AMD 4404
November 1983

New clause 4.101

At the end of clause 4 insert the following new clause.

'4.101 For combined appliances, if the voltage required to increase the input for the heating section to 1.15 times the rated input exceeds the voltage required to increase the voltage of the motors to 1.06 times the rated voltage by 3 V, a separate supply is used for the motors.'

AMD 4404
November 1983

Clause 7.6

In the list of symbols to be used, after '*Pa' insert:

'* bar bars'.

At the end of the clause insert the following new paragraph.

'This list of symbols is not exclusive and other symbols for different purposes are allowed if they do not lead to misunderstanding.'

AMD 4404
November 1983

Clause 7.8

In paragraph 2, delete the last sentence and substitute the following.

'For appliances for star-delta connection, the connection diagram shall show how the connections are to be made.'

AMD 4404
November 1983

Clause 7.I

In paragraph 1, line 3, delete 'blow' and substitute 'blue'.

AMD 4404
November 1983

Clause 7.101

Delete the existing clause and substitute the following.

'7.101 If during the test described in clause **11** the temperature rise of the side and rear walls of the test corner above the level of the hob (cooking top) exceeds 65 K, and/or during the test described in clause **19** the temperature rise of the walls above and below hob level exceeds 125 K, the installation instructions provided by the manufacturer shall include the substance of the following which shall also be included on a non-permanent label, for example tie-on type, attached to the appliance.

Where this appliance is to be positioned in close proximity to a wall, partitions, kitchen furniture, decorative finishes, etc, it is recommended that they be made of non-combustible material, if not, they shall be clad with a suitable non-combustible heat-insulating material. The closest attention shall be paid to fire prevention regulations.'

AMD 4404
November 1983

Clause 8.1

Delete the last paragraph beginning 'Heating units which are liable' and the test paragraph.

AMD 4404
November 1983

New clause 8.101

At the end of clause **8**, insert the following new clause.

'8.101 Heating elements that are liable to be touched accidentally by a fork or similar pointed object in normal use, shall be so protected that it is not possible to touch their live parts with such an object.

TEST. Compliance shall be checked by inserting the long test pin shown in figure 101 at all points where the pin can enter in the vicinity of live parts. The pin shall be applied without appreciable force.'

AMD 4404
November 1983

Clause 11.2

In paragraph 2, item (a) insert the following new sentence.

'Fixed floor mounted appliances shall be installed according to the manufacturer's instructions.'

AMD 4404
November 1983

Clause 11.4

Delete paragraph 2 and substitute the following.

'If the appliance is provided with a control which limits the total input, the test is made with whichever combination of heating units that may be selected by the control imposes the most severe conditions.'

AMD 4404
November 1983

Clause 13.2

In paragraph 8, item (a), delete items (3) and (4) and substitute the following.

'(3) for cord and plug connected appliances	1 mA per kW with a maximum of 10 mA
(4) for other appliances	1 mA per kW with no maximum'

AMD 4404
November 1983

Clause 15.3

Delete paragraph 2 of the test beginning 'Appliances are positioned' and substitute the following.

'Appliances are so positioned that the edges of the hob are horizontal and if the hob elements are adjusted separately, their contact surfaces shall also be horizontal.'

AMD 4404
November 1983

Clause 16.2

In paragraph 4, item (a), delete items (2) and (3) and substitute the following.

'(2) for cord and plug connected appliances	2 mA per kW with a maximum of 10 mA
(3) for other appliances	2 mA per kW'

AMD 4404
November 1983

Clause 18

Delete 'No requirement' and substitute the following new clause.

'18. Endurance

18.1 Appliances shall be so constructed that, in normal use, no electrical or mechanical failure occurs that might impair compliance with the requirements of this standard. The insulation shall not be damaged and contacts and connections shall not work loose as a result of heating, vibration etc. Moreover, overload protection devices shall not operate under normal running conditions.

TEST. For appliances incorporating motors, compliance shall be checked by the tests specified in **18.2** and **18.6**, and by such of the additional tests specified in **18.3** to **18.5** as are applicable.

NOTE. The tests are made on the motor-operated part of the appliance only.

18.2 The appliance shall be operated under normal load and at a voltage equal to 1.1 times rated voltage for 48 h, reduced by the running time necessary for the tests specified in clauses 11 and 13 and, for motor-operated appliances with heating elements, by the running time necessary for the tests specified in clause 12.

The motor-operated part of the appliance shall then be operated under normal load and at a voltage equal to 0.9 times rated voltage for 48 h.

Appliances shall be operated continuously, or for a corresponding number of periods, each period being not less than 8 h.

The specified operating time is the actual running time.

If the appliance incorporates more than one motor, the operating time specified applies to each motor separately.

18.3 Appliances shall be started under normal load, 50 times at a voltage equal to 1.1 times rated voltage and 50 times at a voltage equal to 0.85 times rated voltage, the duration of each period of supply being at least equal to ten times the time necessary from start to full speed, but not less than 10 s.

An interval sufficient to prevent overheating and at least equal to three times the period of supply shall be introduced after each running period.

18.4 Appliances provided with a centrifugal or other automatic starting switch shall be started 10 000 times under normal load and at a voltage equal to 0.9 times rated voltage, the operating cycle being that specified in **18.3**.

NOTE. Forced cooling may be used, if necessary.

18.5 Appliances provided with self-resetting thermal cut-outs shall be operated at a voltage equal to 1.1 times rated voltage, under such a load as will cause the thermal cut-out to operate within a few minutes until the thermal cut-out has performed 200 cycles of operation.

18.6 During the tests specified in **18.2** and **18.3**, overload protection devices shall not operate.

After the tests specified in **18.2** to **18.5**, the appliance shall withstand the tests specified in clause **16**, the limits for the insulation resistance being, however, reduced by 50 %.

Connections, handles, guards, brush-caps and other fittings or components shall not have worked loose, and there shall be no deterioration impairing safety in normal use.'

AMD 4404
November 1983

Clause 19.1

Delete paragraph 2 of the test and substitute the following.

'If, in any of the tests, a non-self-resetting thermal cut-out operates, a heating element ruptures or if the current is interrupted by any other non-cycling means before steady conditions are established, the heating period shall be considered to be ended, but if the interruption is caused by the rupture of a heating element or of an intentionally weak part, the relevant test shall be repeated on a second sample which shall then also comply with the conditions specified in **19.11**.'

AMD 4404
November 1983

Clause 19.2

Delete paragraph 3 and substitute the following.

'If a non-self-resetting thermal cut-out operates, or if the current is interrupted by any other non-cycling means before steady conditions are established, the operating period shall be considered to be ended and the test specified in **19.3** shall not be carried out.'

AMD 4404
November 1983

Clause 19.8

Delete 'No requirement' and substitute the following new clause.

'19.8 A running overload test shall be carried out on appliances incorporating motors that are either intended to be remotely or automatically controlled, or liable to be operated continuously while unattended, the appliance being operated under normal load, at rated voltage or at the upper limit of the rated voltage range until steady conditions are established.

The load shall then be increased in appropriate steps so that the current through the motor windings is raised, the supply voltage being maintained at its original value. When new steady conditions are established, the load shall again be increased. This operation shall be repeated until the overload protection device operates.

The winding temperature shall be continuously measured and noted during each period of steady conditions, and the maximum temperature value recorded shall not exceed:

- (a) 140 °C for class A material;
- (b) 155 °C for class E material;
- (c) 165 °C for class B material.

NOTE 1. If the load cannot be increased in appropriate steps in the appliance, it will be necessary to remove the motor from the appliance and to test the motor separately.

NOTE 2. Values for class F and class H materials are under consideration.'

AMD 4404
November 1983

Clause 20.1

Number the existing note as 'NOTE 1'.

Insert the following new note.

'NOTE 2. There are no tests for doors, shelves and hobs at present.'

AMD 4404
November 1983

Clause 20.101

Delete the existing clause entirely.

AMD 4404
November 1983

Clause 22.4

Delete 'No requirement' and substitute the following new clause.

'22.4 Portable appliances shall be so constructed as to prevent the penetration from table or floor of objects that might result in a hazard.

TEST. Compliance shall be checked by inspection.

NOTE. Appliances without legs are considered to comply with this requirement if all live parts are at least 6 mm from the supporting surface measured through any opening. If the appliance is fitted with legs, this distance is increased to 10 mm for appliances intended to be placed on a table and to 20 mm for appliances intended to be placed on the floor.'

AMD 4404
November 1983

Clause 22.103

In paragraph 2, line 1, insert 'temperature' between 'a' and 'hazard'.

Delete the last paragraph headed 'TEST'.

AMD 4404
November 1983

New clauses 22.104 and 22.105

At the end of clause 22, insert the following new clauses.

22.104 Thermal cut-outs shall be of the non-self-resetting trip-free cut-out type.

TEST. Compliance with the requirements of 22.101 to 22.104 shall be checked by inspection and manual test.

22.105 Detachable hob elements and their supports shall be so constructed that the hob elements are prevented from rotating about a vertical axis and are adequately supported in all positions of adjustment of the supports.

Hinged hob elements of mass exceeding 3 kg shall be protected against accidental dropping. Hob elements which are provided with a click stop hinge or which can be jammed or prevented from turning down in a similar way, or which can be opened through an angle of at least 100°, even if placed against a wall, shall be considered to comply with this requirement.

TEST. Compliance shall be checked by inspection, measurement and manual test.'

AMD 4404
November 1983

Clause 24.4

In the last line before 'BS 3283' insert 'BS 562, '.

AMD 4404
November 1983

Clause 24.5

In line 7 before 'BS 3283' insert 'BS 562, '.

AMD 4404
November 1983

Clause 25.1

After paragraph 2 and before the test, insert the following new paragraph.

'Terminals on appliances shall be so arranged that they can be used either for the connection to permanent fixed wiring or to a power supply cord.'

AMD 4404
November 1983

Clause 25.2

Delete the first four lines and substitute the following.

25.2 Fixed appliances and appliances with a mass greater than 40 kg not provided with rollers or castors shall be so designed that the supply wires can be connected after the appliance has been fixed or placed in its intended position of use; they shall be provided with: '

Delete paragraph 2 beginning 'Fixed appliances'.

AMD 4404
November 1983

Clause 25.5

Insert a marginal mark against this requirement and the test.

AMD 4404
November 1983

Clause 25.6

Delete paragraph 1, including items (a) and (b), and substitute the following.

'25.6 Power supply cords shall be oil-resistant, sheathed flexible cable not lighter than ordinary polychloroprene or other equivalent synthetic elastomer-sheathed flexible cord (code designation H05RN-F as specified in table 6 of BS 6500 : 1975).'

AMD 4404
November 1983

Table 11. Size of flexible cord

Replace the existing margin mark by one opposite the two lines beginning 'Over 10' and ending 'including 16'.

AMD 4404
November 1983

Clause 27.1

After paragraph 2 and before the test, insert the following new paragraph.

'Stationary appliances shall be provided with a terminal for the connection of an external equipotential conductor. This terminal shall be in effective electrical contact with all fixed exposed metal parts of the appliance and shall allow the connection of a conductor having a nominal cross-sectional area of up to 6 mm². It shall be located in a position convenient for the connection of the bonding conductor after installation of the appliance.'

AMD 4404
November 1983

Clause 27.2

Delete paragraph 4 before the test.

AMD 4404
November 1983

Clause 27.4

In paragraph 2, line 4, delete 'brass-plated' and substitute 'brass, plated'.

AMD 4404
November 1983

Clause 29.1

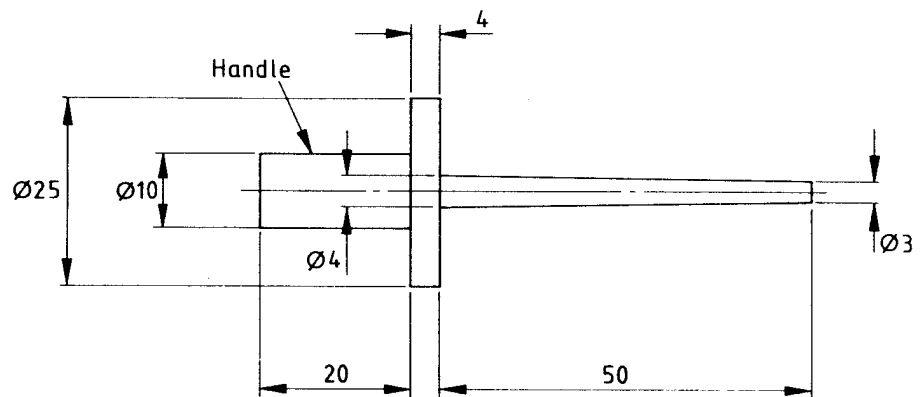
Delete paragraph 5 of the test and substitute the following.

'The clearances between terminals and accessible metal parts shall also be measured with the screws or nuts unscrewed as far as possible, but the clearances shall be not less than 50 % of the values shown in table 20.'

AMD 4404
November 1983

New figure 101

After figure 18, insert the following new figure 101.



Dimensions are in millimetres.

Figure 101. Long test pin

AMD 4404
November 1983

Standards publications referred to

After 'BS 546' insert the following.

'BS 562 Reversible connectors for portable electrical appliances'



Amendment No. 2
published and effective from 30 September 1985
to BS 5784 : Part 1 : 1979

Specification for safety of electrical commercial
catering equipment

Part 1. Particular requirements for ranges,
ovens and hob elements

Revised text

AMD 4836
September 1985

Front cover

Delete the existing title and substitute the following.

'British Standard

Safety of electrical commercial catering equipment

Part 1. Specification for ranges, ovens and hob elements'.

Delete the existing French and German translations and substitute the following.

Sécurité des appareils électriques à usage des collectivités

Partie 1. Cuisiniers, fours, et foyers de cuisson — Spécifications

Sicherheit von handelsüblichen elektrischen Kucheneinrichtungen

Teil 1. Herde, Ofen und Wulden

AMD 4836
September 1985

Contents

For table 1 delete the existing statement and substitute the following:

'1. Diameter of silver wire for fuse test'.

For figures 4 and 6 delete the existing statements and substitute the following:

'4. Diagram for leakage current measurement at
operating temperature for single-phase
connection of class II parts'

'6. Diagram for leakage current measurement
at operating temperature for three-phase
connection of class II parts'.

AMD 4836
September 1985

Page 2

Delete the existing half title at the top of the page and substitute the following.

'British Standard

Safety of electrical commercial catering equipment

Part 1. Specification for ranges, ovens and hob elements'.

AMD 4836
September 1985

Clause 2.9

Delete the existing clause and substitute the following.

'2.9 detachable flexible cable or cord. A flexible cable or
cord, for supply or other purposes, intended to be
connected to the appliance by means of a suitable
appliance coupler.'

AMD 4836
September 1985

Clause 2.45 all-pole disconnection

In line 1, delete 'For single-phase a.c. appliances,' and substitute 'For single-phase a.c.
appliances and for d.c. appliances,'.

AMD 4836
September 1985

Clause 4.6

Delete paragraph 1 and substitute the following.

'4.6 Appliances for a.c. only shall be tested with a.c., at rated frequency, if marked; those for d.c. only shall be tested with d.c. and those for a.c./d.c. shall be tested at the most unfavourable supply.'

AMD 4836
September 1985

Clause 5.1

Delete line 2 and substitute the following.

'250 V for portable single-phase a.c. appliances and for portable d.c. appliances; '.

AMD 4836
September 1985

Clause 7.1

In paragraph 1, delete item (h) and substitute the following.

'(h) symbol for degree of protection against moisture, if applicable.'

AMD 4836
September 1985

Clause 7.6 (as amended by Amendment No. 1)

In the list of symbols, after '3N~ three-phase alternating current with neutral', insert the following.

'===== direct current'.

AMD 4836
September 1985

Clause 9.2

Delete the existing clause and substitute the following.

'9.2 The starting current shall not blow a quick-acting fuse-link having a rated current which is either

- (a) according to the marking, if the rated current of the appropriate fuse-link is marked on the appliance; or
- (b) equal to the rated current of the appliance, with a minimum of 10 A for appliances having a rated voltage exceeding 130 V, and 16 A for appliances have a rated voltage of 130 V and less, if the rated current of the appropriate fuse-link is not marked on the appliance.

During the test, the silver wire shall not melt and neither shall any overload protection device operate.

TEST. Compliance shall be checked by the following test.

The appliance is connected in series with a silver wire having a length of 85 mm and a diameter as shown in table 1.

The wire has a silver content not less than 99.9 % and it is stretched horizontally along the centreline of a box with inside dimensions of 80 mm × 80 mm × 150 mm.

The motor is so loaded that the conditions for starting are the most unfavourable encountered in normal use. Heating elements are operated, but they are not connected to a separate supply.

The motor is then started 10 times at a voltage equal to 0.9 times rated voltage and 10 times at a voltage equal to 1.1 times rated voltage. The interval between consecutive starts is made sufficiently long to prevent undue heating, and not less than 5 min.

NOTE 1. The supply source is such that, during the test, the drop in voltage does not exceed 1 %.

NOTE 2. A revision of this test is under consideration.'



Documents
Document Sharing Hub

