



BS 3456 : Part 102 : Section 102.15 : 1987

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British Standard Specification for
**Safety of household and similar
electrical appliances**

Part 102. Particular requirements
Section 102.15 Appliances for heating liquids

(Implementation of CENELEC HD 264 S2)

Sécurité des appareils électrodomestiques et analogues
Partie 102. Règles particulières
Section 102.15 Appareils de chauffage des liquides

Sicherheit von Elektrogeräten für den Haushalt und ähnliche Zwecke
Teil 102. Besondere Anforderungen
Abschnitt 102.15 Geräte zur Flüssigkeitserhitzung

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Foreword

This Section of BS 3456 : Part 102 has been prepared under the direction of the Light Electrical Engineering Standards Committee. It is aligned with the CENELEC* Harmonization Document for appliances for heating liquids, HD 264 S2, which in turn is based on IEC† Publication 335-2-15 (1980—Second edition). Its number is directly related to the number of the equivalent Section of the IEC publication.

It is a revision of BS 3456 : Section 2.3 : 1970 and BS 3456 : Section 3.19 : 1980 which will be withdrawn in accordance with the CENELEC Internal Regulations before 1 January 1988. Until then they will be retained because of products that are being certified to their requirements.

It gives the particular requirements for appliances for heating liquids and is to be read in conjunction with BS 3456 : Part 101 : 1987 'General requirements' which it supplements or modifies. The many references to Part 1 should be read as references to BS 3456 : Part 101 which is the implementation of the CENELEC Harmonization Document for the general requirements, HD 251 S3. In the original IEC text of the particular requirements the precise line numbers in the IEC Part 1 are given. The lines in Part 101 of BS 3456 are not numbered but sufficient information has been included in these particular requirements for the relevant matter in Part 101 to be identified. For ease of production the text of the IEC standard has been used, but it has been modified as described.

The CENELEC modifications that appear in HD 264 S2 have been included in the text in the appropriate position and are indicated by a single side line in the margin of the page. References are included to items of the original IEC text which are given in appendix X together with the justifications in the CENELEC Harmonization Document for the modifications.

The United Kingdom deviations are included in the text of the standard and are indicated by a double side line in the margin of the page. In the event of any conflict between the requirement in the Harmonization Document and the requirement in the United Kingdom deviation, the requirement in the United Kingdom deviation takes precedence and users of this British Standard should operate to the United Kingdom deviation.

A complete list of all national deviations to the CENELEC Harmonization Document is given in appendix Y.

* CENELEC = European Committee for Electrotechnical Standardization.

† IEC = International Electrotechnical Commission.

In this British Standard the following print types are used to differentiate between requirements, test specifications and explanatory matter.

Requirements: in roman type.

Test specifications: in *italic type*.

Explanatory matter: in small roman type.

The CENELEC Harmonization Document was approved by the CENELEC Technical Board on 11 September 1984.

Cross-references

International standards

IEC 335-1 : 1976 }
HD 251 S3 : 1982 }

CEE Publication 15 : 1964

HD 21 : 1983, HD 22 : 1984 }
IEC 227 : 1979, IEC 245 : 1980 }

Code designation HO3 RT-F }
Code designation 245 IEC 51 S }

Code designation HO5 RN-F }
Code designation HO5 RR-F }
Code designation 245 IEC 53 }

Code designation HO3 VV-F }
Code designation HO3 VVH2-F }

Code designation HO5 VV-F }
Code designation HO5 VVH2-F }
Code designation 227 IEC 53 }

Corresponding British Standards

BS 3456 Specification for safety of household and similar electrical appliances
Part 101 : 1987 General requirements
(Technically equivalent)

BS 3535 : 1962 Specification for safety isolating transformers for industrial and
domestic purposes
(Technically equivalent)

BS 6500 : 1984 Specification for insulated flexible cords and cables

Table 4
(Technically equivalent)

Table 6
(Technically equivalent)

Table 15
(Technically equivalent)

Table 16
(Technically equivalent)

The Technical Committee has reviewed the provisions of IEC 320, to which reference is made in clauses 11.8 and 24.1, and has decided that they are acceptable for use in conjunction with this standard. A related British Standard for IEC 320 is BS 4491 : 1969 'Specification for appliance couplers for household and similar general purposes'.

Product approval. Attention is drawn to the fact that products conforming to this British Standard may be approved by the British Electrotechnical Approvals Board for the purposes of participation in the CENELEC Certification Agreement and in the CB Scheme of the IECEE. (Details of the BEAB approval mark scheme are given on the inside back cover.)

Compliance with a British Standard does not of itself confer immunity from legal obligations.

British Standard Specification for

Safety of household and similar electrical appliances

Part 102. Particular requirements

Section 102.15 Appliances for heating liquids

1. Scope

This clause of Part 1 is applicable except as follows:

1.1 Replacement:

This standard applies to water boilers, including kettles and the like, having a rated capacity not exceeding 10 l, and to coffee makers, milk heaters, feeding-bottle heaters, pressure cookers, cooking pans, wash boilers, livestock feed boilers, sterilizers and glue pots with water jacket.

Fixed water boilers are within the scope of this standard.

Appliances not intended for normal household use, but which nevertheless may be a source of danger to the public, such as appliances intended to be used by laymen in shops, in light industry and on farms, are also within the scope of this standard.

This standard does not take into account the special hazards which exist in nurseries and other places where there are young children or aged or infirm persons without supervision; in such cases, additional requirements may be necessary.

This standard does not apply to:

- appliances intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere (dust, vapour or gas);
- appliances for high-frequency heating;
- appliances of the electrode type;
- dry or steam pressure sterilizers;
- portable immersion heaters;
- frying pans and deep fat fryers, which are covered by a separate Part 2;
- storage water heaters, which are also covered by a separate Part 2;
- instantaneous water heaters, which are covered by another separate Part 2;
- appliances for medical purposes;
- appliances designed exclusively for commercial catering or industrial purposes.

Until an IEC standard for appliances for heating liquids for commercial catering purposes is issued, this standard may form a guide to suitable requirements and tests for such appliances.

For appliances intended to be used in vehicles or on board ships or aircraft, additional requirements may be necessary.

For appliances intended to be used in tropical countries, special requirements may be necessary.

Attention is drawn to the fact that in many countries additional requirements are specified by the national health authorities and the national authorities responsible for water supplies and for the protection of labour.

2. Definitions

This clause of Part 1 is applicable except as follows:

2.2.29 Replacement:

Conditions of adequate heat discharge denote that the appliance is operated under the following conditions:

Water boilers, coffee makers, milk heaters, feeding-bottle heaters, pressure cookers, cooking pans, wash boilers, sterilizers and glue pots are operated with their container filled with a quantity of initially cold water equal to its rated capacity and with the lid, where provided, closed.

Livestock feed boilers are operated with the container filled with a quantity of initially cold water equal to half its rated capacity and with the lid closed.

Appliances with a heated surface intended to keep the liquid warm, are operated with or without the container in position, whichever is the more unfavourable.

Feeding-bottle heaters intended to be used with a bottle having a particular type, shape or size, are operated with the relevant bottle in place. Other feeding-bottle heaters are operated with a bottle of heat resistant glass, round or hexagonal in shape, having a mass between 190 g and 200 g and a capacity of approximately 225 cm³.

The bottle is filled with a quantity of water equal to its nominal capacity or 200 cm³, whichever is less. The bottle is then placed in the heater and surrounded by water to the level indicated in the manufacturer's instructions, or, in the absence of such instructions, to the maximum level.

NOTE. For information see Y.B.1.

Additional definition:

2.2.101 *Fixed water boiler* denotes an appliance for permanent connection to the water supply mains, which is filled through a valve in the inlet pipe and is open to the atmosphere, so that under no condition of use can the pressure at the surface of the water be other than atmospheric.

2.2.102 *Feeding-bottle heater* denotes an appliance intended for heating prepared baby food to a pre-determined temperature, this food being contained in a feeding bottle. The appliance incorporates a heating element of the resistor type and water is used as the heat exchange medium.

NOTE. For information see Y.B.2.

3. General requirement

This clause of Part 1 is applicable.

4. General notes on tests

This clause of Part 1 is applicable except as follows:

4.2 Addition:

For appliances intended to be immersed in water for cleaning, the number of additional samples required for the tests of Sub-clause 15.101 is:

- five for automatic coffee makers,
- three for other appliances.

4.6 Paragraph 7. Not applicable.

4.8 and 4.13 Not applicable.

Additional sub-clause:

4.101 *The appliances are tested as portable appliances, unless it is clear from their design and the manufacturer's instructions that they are intended to be fixed to a supporting surface.*

5. Rating

This clause of Part 1 is applicable.

6. Classification

This clause of Part 1 is applicable except as follows:

See Sub-clause 22.1.

Addition:

This standard recognizes appliances which are intended to be partially or completely immersed in water for cleaning; it does not recognize watertight appliances.

7. Marking

This clause of Part 1 is applicable except as follows:

7.1 Paragraph 1, item (e) and item (h). Not applicable.

Paragraphs 5, 6 and 7. Not applicable.

Addition:

Appliances intended to be partially immersed in water for cleaning, shall be marked with a line which clearly indicates the maximum depth of immersion, together with the substance of the following warning:

Do not immerse beyond this line.

If there is any seam or seal that causes the appliance not to withstand the tests of Sub-clause 15.101, the line indicating the maximum depth of immersion shall be at least 5 cm below any such seam or seal when the appliance is in the position in which it is to be cleaned.

Appliances intended to be used with a connector incorporating a thermostat shall be marked with the substance of the following warning, unless this warning is given in the instruction sheet:

This appliance must only be used with the appropriate connector.

Kettles so designed that they can be filled beyond their rated capacity shall be provided, within the kettle, with a level mark or other clearly identifiable means to indicate their rated capacity. This indication shall be visible when the kettle is in the filling position.

If this indication is not self-evident, there shall be, on the outside of the kettle, a reference to the indication, which is visible when the kettle is in its position of normal use.

NOTE. For information see X.2.

Wash boilers, livestock feed boilers, sterilizers and glue pots must be marked with the symbol for splash-proof construction.

NOTE. For information see X.3.

7.2 Not applicable.

7.3 This sub-clause of Part 1 is applicable.

NOTE. For information see X.4.

7.12 Addition:

Appliances which are provided with an appliance inlet and are intended to be partially or completely immersed in water for cleaning, shall be accompanied by an instruction sheet stating that the connector must be removed before the appliance is cleaned and that the appliance inlet must be dried before the appliance is used again.

For coffee makers, milk heaters, pressure cookers, cooking pans, slow cookers, yoghurt makers and similar appliances normally cleaned after use and not intended to be partially or completely immersed in water for cleaning, the instruction sheet shall state that the appliance must not be immersed in water.

For kettles so designed that danger can arise from boiling water being ejected, the instruction sheet shall include the substance of the following warning:

If this kettle is overfilled, boiling water may be ejected.

NOTE. For information see X.5.

For feeding-bottle heaters, the instruction sheet shall include adequate instructions for their safe and proper use. The instruction sheet shall also state that the heater must not be switched on until feeding time and that it must be checked, by a specified means, that the required food temperature has been attained, but not exceeded.

NOTE. For information see Y.B.3.

7.14 Paragraph 6. Not applicable.

8. Protection against electric shock

This clause of Part 1 is applicable except as follows:

8.2, 8.3 and 8.9 Not applicable.

9. Starting of motor-operated appliances

This clause of Part 1 is not applicable.

10. Input and current

This clause of Part 1 is applicable except as follows:

10.2 Not applicable.

11. Heating

This clause of Part 1 is applicable except as follows:

11.2 Paragraph 3, item (a).

Replacement:

– *water boilers provided with a thermostat and normally used on a floor or a table, are placed on the floor as near to the walls as possible;*

Paragraph 4.

Replacement:

Other appliances are tested away from the walls of the test corner



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11.3 Paragraph 6. Not applicable.

11.5 and 11.6 Not applicable.

11.7 *Replacement:*

For water kettles having a rated input exceeding 1 kW, the test is continued for 5 min after the water has attained a temperature of 95 °C.

For water kettles having a rated input not exceeding 1 kW, water boilers, milk heaters, feeding-bottle heaters, cooking pans, wash boilers, livestock feed boilers, sterilizers and glue pots, the test is continued for:

- 15 min after the water in the container has attained a temperature of 95 °C or, if this temperature cannot be attained, after the water has attained its maximum temperature, for appliances without a thermostat or temperature limiter;*
- 15 min after the thermal control has operated for the first time, for portable appliances provided with a thermostat or a temperature limiter;*
- 30 min after the thermal control has operated for the first time, for stationary appliances provided with a thermostat or a temperature limiter;*
- 1 min after a continuous acoustic signal has started to sound.*

Appliances provided with controls which can be adjusted by the user are operated with the control at the setting that will just maintain boiling, or at the maximum setting if the control does not permit boiling.

Coffee makers are subjected to a number of consecutive operating periods sufficient to establish steady conditions, each operating period having a duration equal to that previously established as the time necessary to make the maximum quantity of coffee according to the manufacturer's instructions; after each operating period, the containers are refilled as soon as possible, and the next operating period started as rapidly as possible, any additional cooling period being avoided.

For appliances with a heated surface intended to keep the liquid warm, the last operating period is followed by a period during which the appliance is operated until steady conditions are established for the heated surface, first with and then without the container in position.

Pressure cookers are operated with the control at the highest setting, until steam issues from the pressure relief valve, which is also at the highest setting, and then for 15 min with the control adjusted so that steam just continues to issue from the valve.

11.8 After table 3.

Addition:

For appliances intended to be used with a connector incorporating a thermostat, a higher limit is allowed for the temperature rise of the pins of the appliance inlet, provided the appliance coupler complies with IEC Publication 320 (first edition 1970), as far as it reasonably applies; the value of the temperature prescribed for the test of Clause 16 of IEC Publication 320 is, however, increased to that attained by the pins of the appliance inlet when the appliance is operated in accordance with the conditions specified in Sub-clauses 11.4 and 11.7.

11.9 and 11.10 Not applicable.

Additional sub-clause.

11.101 Feeding-bottle heaters shall be capable of rapidly heating the food to the required temperature, in order to minimize the incubation of bacteria in the prepared food contained in the bottle.

Moreover, feeding-bottle heaters shall be provided with a visual or audible means to indicate that the required temperature of the food has been attained.

Compliance is checked by the following test.

The feeding-bottle heater is operated in accordance with conditions of adequate heat discharge, any thermal control that can be adjusted by the user being set at a suitable position of the adjustment range and the ambient temperature being maintained at 20 ± 1 °C for at least 30 min before switching on the heater.

The initial heating cycle, as determined by the first operation of any visual or audible means, shall be completed within 6 min from switching on.

Immediately on completion of the initial heating cycle the bottle is removed from the heater and is shaken so as to achieve a uniform temperature distribution in the water.

The temperature of the water is then measured and shall not be less than 37 °C.

NOTE. For information see Y.B.4.

12. Operation under overload conditions of appliances with heating elements

This clause of Part 1 is applicable except as follows:

12.2 Paragraph 4.

Replacement:

Livestock feed boilers are subjected to 4 cycles, each cycle comprising an operating period as specified in Sub-clause 11.7, in accordance with conditions of adequate heat discharge, after which the hot water is replaced by cold water and the appliance allowed to stand for a period sufficient to cool to approximately room temperature.

Other appliances are subjected to 15 cycles, each cycle comprising an operating period as specified in Sub-clause 11.7, in accordance with conditions of adequate heat discharge, and a cooling period sufficient to allow the appliance to cool down to approximately room temperature.

Addition:

Care is taken to ensure that the liquid is cold before starting each operating period.

13. Electrical insulation and leakage current at operating temperature

This clause of Part 1 is applicable except as follows:

13.1 Test, Paragraphs 1, 2 and 3.

Replacement:

Compliance is checked by the tests of Sub-clauses 13.2 and 13.3, the appliance being operated under the conditions specified in Clause 11.

13.2 Paragraph 8, item (A)(2). Not applicable.

14. Radio and television interference suppression

This clause of Part 1 is applicable.