

INTERNATIONAL STANDARD



**Hold and similar electrical appliances – Safety –
Part 2-44: Particular requirements for ironers**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-44: Particular requirements for ironers

FOREWORD

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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 60335-2-44:2002+AMD1:2008+AMD2:2011 CSV. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

IEC 60335-2-44 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2002, Amendment 1:2008 and Amendment 2:2011. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) the text has been aligned with IEC 60335-1:2020;
- b) some notes have been converted to normative text (1, 20.1, 22.103);
- c) exclusion of battery-operated appliances (Clause 1);
- d) introduction of accessible surface temperature limits (Clause 11).

The text of this International Standard is based on the following documents:

FDIS	Report on voting
61/6362/FDIS	61/6414/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

A list of all parts in the IEC 60335 series, published under the general title *Household and similar electrical appliances – Safety*, can be found on the IEC website.

This Part 2 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments unless that edition precludes it; in that case, the latest edition that does not preclude it is used. It was established on the basis of the sixth edition (2020) of that standard.

NOTE 1 When "Part 1" is mentioned in this standard, it refers to IEC 60335-1.

This Part 2 supplements or modifies the corresponding clauses in IEC 60335-1, so as to convert that publication into the IEC standard: Particular requirements for ironers.

When a particular subclause of Part 1 is not mentioned in this Part 2, that subclause applies as far as is reasonable. When this standard states "addition", "modification" or "replacement", the relevant text in Part 1 is to be adapted accordingly.

NOTE 2 The following numbering system is used:

- subclauses, tables and figures that are numbered starting from 101 are additional to those in Part 1;
- unless notes are in a new subclause or involve notes in Part 1, they are numbered starting from 101, including those in a replaced clause or subclause;
- additional annexes are lettered AA, BB, etc.

NOTE 3 The following print types are used:

- requirements: in roman type;
- *test specifications: in italic type;*
- notes: in small roman type.

Words in **bold** in the text are defined in Clause 3. When a definition concerns an adjective, the adjective and the associated noun are also in bold.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

NOTE 4 The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations may need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 12 months or later than 36 months from the date of publication.

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INTRODUCTION

It has been assumed in the drafting of this International Standard that the execution of its provisions is entrusted to appropriately qualified and experienced persons.

Guidance documents concerning the application of the safety requirements for appliances can be accessed via TC 61 supporting documents on the IEC website:

<https://www.iec.ch/tc61/supportingdocuments>

This information is given for the convenience of users of this International Standard and does not constitute a replacement for the normative text in this standard.

This standard recognizes the internationally accepted level of protection against hazards such as electrical, mechanical, thermal, fire and radiation of appliances when operated as in normal use taking into account the manufacturer's instructions. It also covers abnormal situations that can be expected in practice and takes into account the way in which electromagnetic phenomena can affect the safe operation of appliances.

This standard takes into account the requirements of IEC 60364 as far as possible so that there is compatibility with the wiring rules when the appliance is connected to the supply mains. However, national wiring rules may differ.

If an appliance within the scope of this standard also incorporates functions that are covered by another Part 2 of IEC 60335, the relevant Part 2 is applied to each function separately, as far as is reasonable. If applicable, the influence of one function on the other is taken into account.

When a Part 2 standard does not include additional requirements to cover hazards dealt with in Part 1, Part 1 applies.

NOTE 1 This means that the technical committees responsible for the Part 2 standards have determined that it is not necessary to specify particular requirements for the appliance in question over and above the general requirements.

This standard is a product family standard dealing with the safety of appliances and takes precedence over horizontal and generic standards covering the same subject.

NOTE 2 Horizontal publications, basic safety publications and ~~generic standards~~ group safety publications covering a hazard are not applicable since they have been taken into consideration when developing the general and particular requirements for the IEC 60335 series of standards. ~~For example, in the case of temperature requirements for surfaces on many appliances, generic standards, such as ISO 13732-1 for hot surfaces, are not applicable in addition to Part 1 or part 2 standards.~~

An appliance that complies with the text of this standard will not necessarily be considered to comply with the safety principles of the standard if, when examined and tested, it is found to have other features that impair the level of safety covered by these requirements.

An appliance employing materials or having forms of construction differing from those detailed in the requirements of this standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be considered to comply with the standard.

NOTE 3 Standards dealing with non-safety aspects of household appliances are:

- IEC standards published by TC 59 concerning methods of measuring performance;
- CISPR 11, CISPR 14-1 and relevant IEC 61000-3 series standards concerning electromagnetic emissions;
- CISPR 14-2 concerning electromagnetic immunity;
- IEC standards published by TC 111 concerning environmental matters.

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-44: Particular requirements for ironers

1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of electric **ironers** for both commercial and household and similar purposes, their **rated voltage** being not more than 250 V for single-phase appliances and 480 V for other appliances.

Appliances not intended for normal household ~~use~~, but which nevertheless ~~may~~ can 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 within the scope of this standard.

NOTE 101—Examples of appliances within the scope of this standard are:

- **ironing presses** for one-person operation;
- **mangles**;
- **rotary ironers** for one-person operation;
- **trouser presses**.

As far as is practicable, this standard deals with the common hazards presented by appliances that are encountered by all persons in and around the home. However, in general, it does not take into account:

- persons (including children) whose
 - physical, sensory or mental capabilities; or
 - lack of experience and knowledgeprevents them from using the appliance safely without supervision or instruction;
- children playing with the appliance.

NOTE 102—Attention is drawn to the fact that:

- for appliances intended to be used in vehicles or on board ships or aircraft, additional requirements ~~may~~ can be necessary;
- in many countries additional requirements are specified by the national health authorities, the national authorities responsible for the protection of labour and similar authorities.

NOTE 103—This standard does not apply to:

- **rotary ironers** for operation by more than one person. The roller length of such appliances normally exceeds 1,6 m in length;
- appliances intended exclusively for industrial purposes;
- 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);
- electric irons (IEC 60335-2-3);
- **battery-operated appliances**.

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

IEC 60584-1, *Thermocouples – Part 1: EMF specifications and tolerances*

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

3.1 Definitions relating to physical characteristics

3.1.9 Replacement:

normal operation

operation of the appliance under the following conditions

Appliances are operated without laundry.

Ironing presses are operated with the pressing surfaces separated as far as possible. Appliances that generate steam are operated in cycles with the water reservoir filled and with maximum steam emission. Each cycle consists of 10 s with the pressing surfaces in contact with each other and 10 s apart. Appliances that can generate steam or spray water are also operated with the water reservoir empty.

Rotary ironers are operated with the movable surface raised and lowered in cycles. Each cycle consists of 24 s with the pressing surfaces in contact with each other and 6 s apart.

Trouser presses are operated with the pressing surfaces in contact with each other.

Mangles are operated with the rollers in contact with each other.

Note 101 to entry: The mangle cloth is not removed.

3.5 Definitions relating to types of appliances

3.5.101

ironer

appliance in which the laundry is supported by a padded surface and having a heated surface that can be brought into contact with the laundry

3.5.102

rotary ironer

ironer in which the laundry is passed between a heated surface and a padded roller that is rotated by a motor

Note 1 to entry: **Rotary ironers** may can have more than one heated surface.

3.5.103

ironing press

ironer in which the surface supporting the laundry and the heated surface are substantially flat

Note 1 to entry: **Ironing presses** may can have means to generate steam or to spray water.

3.5.104

trouser press

appliance having a pair of flat surfaces, one or both of which can be heated and that can be closed together with trousers positioned between them

3.5.105 mangle

appliance for ironing laundry by unheated rollers that are pressed together and rotated by a motor

Note 1 to entry: **Mangles** ~~may~~ can have a cloth, one end of which is attached to one of the rollers and on which the laundry is placed for ironing.

3.6 Definitions relating to parts of an appliance

3.6.101

functional surface

surface that is intentionally heated by an internal heat source and has to be hot to carry out the function for which the appliance is intended

Note 1 to entry: An example is the heated sheath of pressing surfaces.

4 General requirement

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable.

6 Classification

This clause of Part 1 is applicable.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 Addition:

Appliances shall be marked on or near lampholders with the maximum power input of replaceable illumination lamps as follows:

lamp max. ... W

The word "lamp" may be replaced by symbol IEC 60417-5012 (2002-10).

Appliances intended to be supplied with compressed air shall be marked with the maximum air pressure in megapascals.

7.12 Addition:

The instructions for **mangles** shall state that the appliances ~~must~~ shall be disconnected when not in use and when the mangle cloth is being replaced.

The instructions for **ironing presses** in which steam is generated under pressure shall state that the filling cap ~~must~~ shall not be removed during use. Instructions for the safe refilling of the water reservoir shall be given.

8 Protection against access to live parts

This clause of Part 1 is applicable.

9 Starting of motor-operated appliances

This clause of Part 1 is not applicable.

10 Power input and current

This clause of Part 1 is applicable.

11 Heating

This clause of Part 1 is applicable except as follows.

11.2 Modification:

Appliances normally used on a floor or table are placed away from the walls of the test corner.

*Separate steam generators of **ironing presses** are placed as near as possible to the walls of the test corner.*

11.3 Addition:

*Where the external **accessible surfaces** are suitably flat and access permits, then the test probe of Figure 101 is used to measure the temperature rises of external **accessible surfaces** specified in Table 101. The probe is applied with a force of $4\text{ N} \pm 1\text{ N}$ to the surface in such a way that the best possible contact between the probe and the surface is ensured. The measurement is performed after a contact period of 30 s.*

The probe may be held in place using a laboratory stand clamp or similar device. Any measuring instrument giving the same results as the probe may be used.

11.4 Addition:

*If the temperature rise limits are exceeded in appliances incorporating motors, transformers or **electronic circuits**, and the power input is lower than the **rated power input**, the test is repeated with the appliance supplied at 1,06 times **rated voltage**.*

11.6 Replacement:

Combined appliances are operated as heating appliances.

11.7 ~~Addition~~ Replacement:

Trouser presses incorporating a timer are operated for three cycles of operation without rest periods.

NOTE 101 One cycle is the maximum operating period allowed by the timer.

Other appliances are operated until steady conditions are established.

Appliance outlets accessible to the user and socket-outlets accessible to the user are loaded with a resistive load that gives the marked **outlet load**.

11.8 Modification:

During the test, the temperature rises are monitored continuously and shall not exceed the values shown in Table 3 and Table 101.

Addition:

The temperature rise limits of motors, transformers and components of **electronic circuits**, including parts directly influenced by them, may be exceeded when the appliance is operated at 1,15 times **rated power input**.

The temperature rise of handles or grips of vents and air shutters shall not exceed the value specified in Table 3 for surfaces of handles, knobs, grips and similar parts which are held for short periods only in normal use.

Table 101 – Maximum temperature rises for accessible external surfaces under normal operating conditions

Surface	Temperature rise of external accessible surfaces ^a K		
	Surfaces of portable appliances situated on the floor – surfaces that are below 850 mm	Surfaces of appliances intended to be used on a work surface and surfaces of portable appliances that are at or above 850 mm when situated on the floor	Surfaces of appliances for commercial use
Bare metal	38	42	48
Coated metal ^b	42	49	59
Glass and ceramic	51	56	65
Plastic and plastic coating > 0,4 mm ^{c, d}	58	62	74

NOTE 101 The temperature rise limits of knobs, grips, keyboards, keypads and similar parts are specified in Table 3.

- ^a Temperature rises are not measured on:
 - the underside of appliances intended to be used on a working surface or floor where these surfaces are inaccessible to a 75 mm diameter probe having a hemispherical end applied with a force not exceeding 1 N;
 - the rear surface of appliances that, according to the instructions, shall be placed against a wall and where these surfaces are inaccessible to a 75 mm diameter probe having a hemispherical end, applied with a force not exceeding 1 N;
 - **functional surfaces** and surfaces within 25 mm of **functional surfaces** that can become hot due to proximity to the **functional surface**.
- ^b Metal is considered coated when a coating having a minimum thickness of 90 µm made of enamel or non-substantially plastic coating is used.
- ^c The temperature rise limit applies also for plastic material having a metal finish of thickness less than 0,1 mm.
- ^d When the thickness of plastic coating does not exceed 0,4 mm, the temperature rise limits of coated metal or glass and ceramic apply.

12 ~~Void~~ Charging of metal-ion batteries

This clause of Part 1 is not applicable.

13 Leakage current and electric strength at operating temperature

This clause of Part 1 is applicable.

14 Transient overvoltages

This clause of Part 1 is applicable.

15 Moisture resistance

This clause of Part 1 is applicable.

16 Leakage current and electric strength

This clause of Part 1 is applicable.

17 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

18 Endurance

This clause of Part 1 is not applicable.

19 Abnormal operation

This clause of Part 1 is applicable except as follows.

19.2 Addition:

Appliances are tested with their pressing surfaces in contact with each other, unless they automatically separate when the closing force is released.

19.4 Addition:

For appliances that generate steam, any control that limits the pressure during the test of Clause 11 is rendered inoperative.

19.7 Addition:

Mangles are operated for 5 min.

19.9 Not applicable.

19.13 Addition:

*The temperature rise of the surface intended to support the laundry shall not exceed 150 K 5 min after a **protective device** has operated.*

20 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows.

20.1 Addition:

The test with the angle of inclination increased to 15° is not carried out.

***Mangles** are also checked by the following test.*

*The **mangle** is placed in any normal position of use on a horizontal plane in such a way as to prevent it from sliding during test. A force of 90 N is applied horizontally to the top of the **mangle**. The force is removed and a force of 180 N is applied vertically downwards at the most unfavourable place.*

*The **mangle** shall not overturn.*

~~NOTE 101—The **mangle** is prevented from sliding during the test.~~

21 Mechanical strength

This clause of Part 1 is applicable.

22 Construction

This clause of Part 1 is applicable except as follows.

22.7 Replacement:

Ironing presses in which steam is generated under pressure shall incorporate adequate safeguards against the risk of excessive pressure.

If jets of steam or hot water are emitted by **protective devices**, the electrical insulation shall not be affected or the user exposed to a hazard.

Compliance is checked by inspection and by the following test.

The appliance is operated as specified in Clause 11, but without steam emission. The pressure in the water reservoir is measured. All pressure regulating devices that operate during the test are rendered inoperative and the pressure measured again. The pressure shall not increase by more than 200 kPa.

*Any pressure limiting **protective device** is then rendered inoperative and the pressure in the water reservoir is raised hydraulically to five times the pressure measured originally, or twice the pressure measured with the pressure regulating devices rendered inoperative, whichever is higher.*

There shall be no leakage from the water reservoir.

22.101 Rotary ironers shall be constructed so that the feed aperture has a width not exceeding 8 mm during operation and a width of at least 20 mm when the surfaces are fully separated.

Rotary ironers having surfaces that are lowered and raised by a motor, shall be constructed so that the surfaces separate as soon as the closing force is released. It shall be possible to separate the surfaces when the supply mains is interrupted.

Compliance is checked by measurement and by manual test.

22.102 Ironing presses shall be constructed so that the pressing surfaces are held in contact with each other by using a hand, elbow, knee or foot and so that they separate when the closing force is released.

The pressing surfaces of **ironing presses**, intended for direct operation by both hands, may be locked in contact with each other and shall be constructed so that the pressing surfaces can be separated without using the hands, even when the supply mains is interrupted.

Compliance is checked by inspection and by manual test.

22.103 Mangles shall be constructed so that the mechanical connection between moving parts protecting the feed opening withstands the stresses occurring in normal use.

Compliance is checked by subjecting the moving parts to 10 000 cycles of movement through the maximum angle that the construction allows, at the rate of 15 cycles per min. Each cycle consists of two movements, one in each direction.

After the test, the mangle shall not be damaged to such an extent that compliance with this standard is impaired.

~~NOTE—A cycle consists of two movements, one in each direction.~~

22.104 Mangles shall incorporate means to prevent contact with the rollers when feeding in laundry.

The dimensions of the feed opening shall be in accordance with ~~Figure 101~~ Figure 102. When the feed opening is protected by a movable barrier that is interlocked with the rollers, the dimensions correspond to the position of the barrier when the rollers stop.

Compliance is checked by inspection and by measurement.

22.105 Steam generators shall incorporate at least one **non-self-resetting thermal cut-out** that is only accessible by means of a **tool**.

Compliance is checked by inspection.

22.106 Appliances that generate steam shall be constructed so that there is no spillage of water or sudden jets of steam or hot water likely to expose the user to a hazard when the appliance is used in accordance with the instructions.

Compliance is checked by inspection during the test of Clause 11 and by removing the filling cap of the water reservoir at the end of the test.

22.107 Pressure-limiting **protective devices** that operate during the tests of 19.4 and 22.7 shall have an inlet aperture at least 5 mm in diameter or 20 mm² in area and a width of at least 3 mm. The area of the aperture at the outlet shall not be less than that at the inlet.

Compliance is checked by measurement.

22.108 Rotary ironers shall be constructed so that when the means for separating the surfaces is actuated, the roller shall stop before it has rotated more than 10 mm.

Rotary ironers having surfaces that are lowered and raised by a motor shall be constructed so that the surfaces separate as soon as the closing force is released.

Compliance is checked by the following test.

*The appliance is supplied at **rated voltage** with the surfaces in the closed position. The means for separating the surfaces is then actuated. The surfaces shall separate as soon as the closing force is released and the roller shall stop before it has rotated more than 10 mm.*

*If compliance relies on the operation of an **electronic circuit**, the appliance is supplied at **rated voltage** with the surfaces in the closed position and is further tested as follows:*

The electromagnetic phenomena test of 19.11.4.2 and 19.11.4.5 are applied in turn. During application of the electromagnetic phenomena tests, the means for separating the surfaces is actuated. The tests are carried out with surge protective devices disconnected, unless they incorporate spark gaps. The surfaces shall immediately separate and the roller shall stop before it has rotated more than 10 mm.

*The fault conditions in a) to g) of 19.11.2 are applied one at a time to the **electronic circuit**. During application of each of the fault conditions, the means for separating the surfaces is actuated. The surfaces shall immediately separate and the roller shall stop before it has rotated more than 10 mm.*

*If the **electronic circuit** is programmable, the software shall contain measures to control the fault/error conditions specified in Table R.1 and is evaluated in accordance with the relevant requirements of *normative Annex R*.*

22.109 The pressing surfaces of **ironing presses**, intended for direct operation by both hands, may be locked in contact with each other provided that the heating elements are automatically switched off within 15 s by non-self-resetting means and the pressing surfaces separate when the locking means is released.

Compliance is checked by the following test.

*The appliance is supplied at **rated voltage** with the surfaces locked in contact with each other. When the locking means is released, the surfaces shall immediately separate and the heating elements shall automatically be switched off within 15 s by a non-self-resetting means.*

*If compliance relies on the operation of an **electronic circuit**, the appliance is supplied at **rated voltage** with the surfaces locked in contact with each other and is subjected to the following tests.*

The electromagnetic phenomena test of 19.11.4.2 and 19.11.4.5 are applied in turn. During application of the electromagnetic phenomena tests, the locking means is released. The tests are carried out with surge protective devices disconnected, unless they incorporate spark gaps. The surfaces shall immediately separate and the heating elements shall automatically be switched off within 15 s by a non-self-resetting means.

*The fault conditions in a) to g) of 19.11.2 are applied one at a time to the **electronic circuit**. During application of each of the fault conditions, the locking means is released. The surfaces shall immediately separate and the heating elements shall automatically be switched off within 15 s by a non-self-resetting means.*

If the **electronic circuit** is programmable, the software shall contain measures to control the fault/error conditions specified in Table R.1 and is evaluated in accordance with the relevant requirements of *normative Annex R*.

23 Internal wiring

This clause of Part 1 is applicable except as follows.

23.3 Addition:

For appliances other than **trouser presses**, the number of flexings for conductors flexed in normal use is increased to 100 000.

24 Components

This clause of Part 1 is applicable except as follows.

24.1.3 Addition:

Switches of **mangles** actuated by the device protecting the feed opening are subjected to 50 000 cycles of operation.

25 Supply connection and external flexible cords

This clause of Part 1 is applicable.

26 Terminals for external conductors

This clause of Part 1 is applicable.

27 Provision for earthing

This clause of Part 1 is applicable.

28 Screws and connections

This clause of Part 1 is applicable.

29 Clearances, creepage distances and solid insulation

This clause of Part 1 is applicable.

30 Resistance to heat and fire

This clause of Part 1 is applicable except as follows.

30.2 Addition:

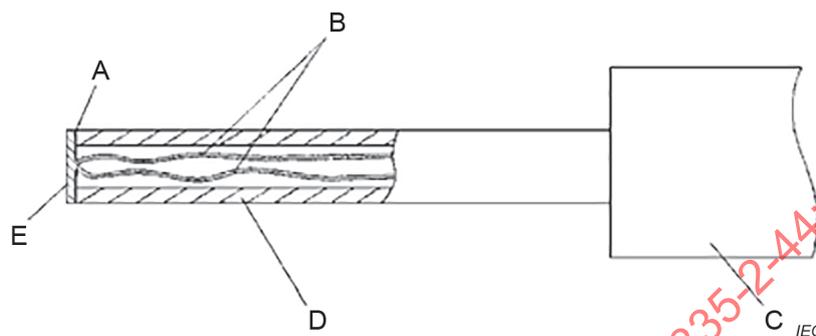
For **trouser presses**, 30.2.3 is applicable. For other appliances, 30.2.2 is applicable.

31 Resistance to rusting

This clause of Part 1 is applicable.

32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

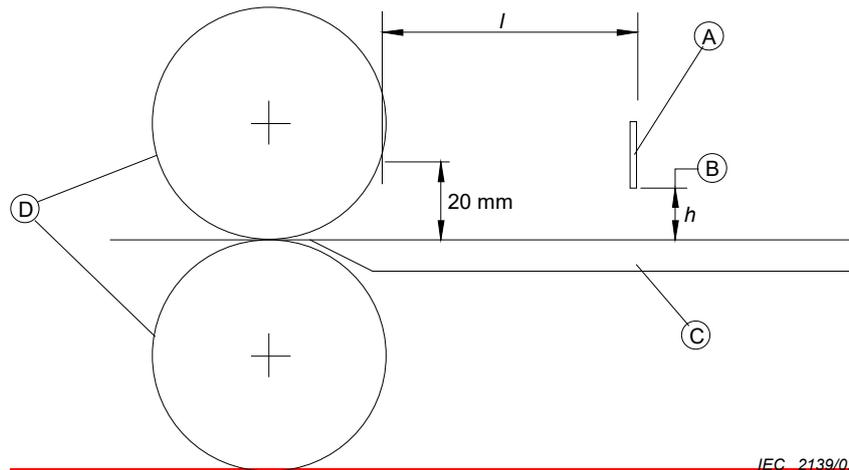


Key

- A adhesive
- B thermocouple wires 0,3 mm diameter to IEC 60584-1, Type K
- C handle arrangement permitting a contact force of $4\text{ N} \pm 1\text{ N}$
- D polycarbonate tube: inside diameter 3 mm, outside diameter 5 mm
- E tinned copper disc: 5 mm diameter, 0,5 mm thick with flat contact face

Figure 101 – Probe for measuring surface temperatures

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IEC 2139/02

Height (<i>h</i>) mm	Length (<i>l</i>) mm
≤4	≥15
≤8	≥40
≤15	≥95
≤20	≥120

NOTE— Dimension *h* is the height of the feed opening.

— Dimension *l* is the distance between the outside of the barrier at the feed opening and the point on the roller 20 mm above the feed table.

Key

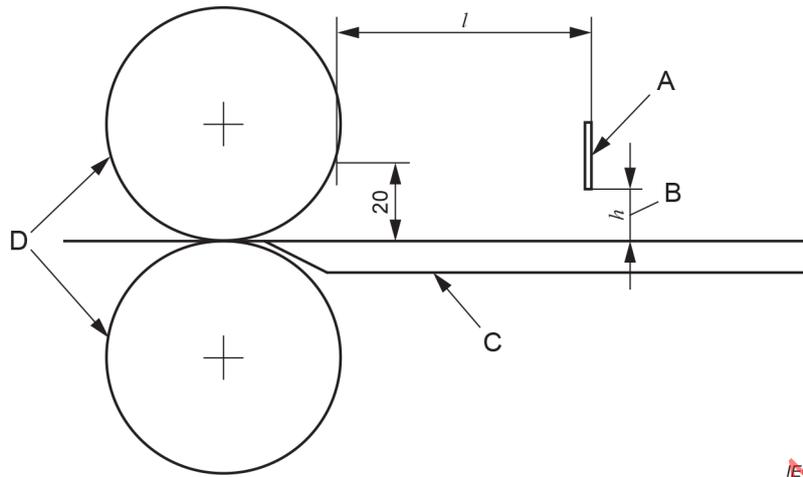
A—Barrier

B—Feed opening

C—Feed table

D—Roller

Dimensions in millimetres



Height (h) mm	Length (l) mm
≤ 4	≥ 15
≤ 8	≥ 40
≤ 15	≥ 95
≤ 20	≥ 120

Key

A barrier

B feed opening

C feed table

D roller

h height of the feed opening

l distance between the outside of the barrier at the feed opening and the point on the roller 20 mm above the feed table

Figure 101 102 – Dimensions of the feed opening of mangles

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Annexes

The annexes of Part 1 are applicable except as follows.

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Annex B
(normative)

**Battery-operated appliances, separable batteries and detachable batteries
for battery-operated appliances**

This annex of Part 1 is not applicable.

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Annex R (normative)

Software evaluation

Annex R of Part 1 is applicable except as follows.

R.2.2.5 *Modification:*

For programmable **electronic circuits** with functions requiring software incorporating measures to control the fault/error conditions specified in Table R.1 or Table R.2, detection of a fault/error shall occur before compliance with Clause 19, 22.108 and 22.109 is impaired.

R.2.2.9 *Modification:*

The software and safety-related hardware under its control shall be initialized and shall terminate before compliance with Clause 19, 22.108 and 22.109 is impaired.

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Bibliography

The bibliography of Part 1 is applicable except as follows.

Addition:

IEC 60335-2-3, *Household and similar electrical appliances – Safety – Part 2-3: Particular requirements for electric irons*

~~ISO 13732-1, *Ergonomics of the thermal environment – Methods for the assessment of human responses to contact with surfaces – Part 1: Hot surfaces*~~

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Hold and similar electrical appliances – Safety –
Part 2-44: Particular requirements for ironers**

**Appareils électrodomestiques et analogues – Sécurité –
Partie 2-44: Exigences particulières pour les machines à repasser**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-44: Particular requirements for ironers

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 60335-2-44 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2002, Amendment 1:2008 and Amendment 2:2011. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) the text has been aligned with IEC 60335-1:2020;
- b) some notes have been converted to normative text (1, 20.1, 22.103);
- c) exclusion of battery-operated appliances (Clause 1);
- d) introduction of accessible surface temperature limits (Clause 11).

The text of this International Standard is based on the following documents:

FDIS	Report on voting
61/6362/FDIS	61/6414/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

A list of all parts in the IEC 60335 series, published under the general title *Household and similar electrical appliances – Safety*, can be found on the IEC website.

This Part 2 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments unless that edition precludes it; in that case, the latest edition that does not preclude it is used. It was established on the basis of the sixth edition (2020) of that standard.

NOTE 1 When "Part 1" is mentioned in this standard, it refers to IEC 60335-1.

This Part 2 supplements or modifies the corresponding clauses in IEC 60335-1, so as to convert that publication into the IEC standard: Particular requirements for ironers.

When a particular subclause of Part 1 is not mentioned in this Part 2, that subclause applies as far as is reasonable. When this standard states "addition", "modification" or "replacement", the relevant text in Part 1 is to be adapted accordingly.

NOTE 2 The following numbering system is used:

- subclauses, tables and figures that are numbered starting from 101 are additional to those in Part 1;
- unless notes are in a new subclause or involve notes in Part 1, they are numbered starting from 101, including those in a replaced clause or subclause;
- additional annexes are lettered AA, BB, etc.

NOTE 3 The following print types are used:

- requirements: in roman type;
- *test specifications: in italic type;*
- notes: in small roman type.

Words in **bold** in the text are defined in Clause 3. When a definition concerns an adjective, the adjective and the associated noun are also in bold.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

NOTE 4 The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations may need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 12 months or later than 36 months from the date of publication.

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INTRODUCTION

It has been assumed in the drafting of this International Standard that the execution of its provisions is entrusted to appropriately qualified and experienced persons.

Guidance documents concerning the application of the safety requirements for appliances can be accessed via TC 61 supporting documents on the IEC website:

<https://www.iec.ch/tc61/supportingdocuments>

This information is given for the convenience of users of this International Standard and does not constitute a replacement for the normative text in this standard.

This standard recognizes the internationally accepted level of protection against hazards such as electrical, mechanical, thermal, fire and radiation of appliances when operated as in normal use taking into account the manufacturer's instructions. It also covers abnormal situations that can be expected in practice and takes into account the way in which electromagnetic phenomena can affect the safe operation of appliances.

This standard takes into account the requirements of IEC 60364 as far as possible so that there is compatibility with the wiring rules when the appliance is connected to the supply mains. However, national wiring rules may differ.

If an appliance within the scope of this standard also incorporates functions that are covered by another Part 2 of IEC 60335, the relevant Part 2 is applied to each function separately, as far as is reasonable. If applicable, the influence of one function on the other is taken into account.

When a Part 2 standard does not include additional requirements to cover hazards dealt with in Part 1, Part 1 applies.

NOTE 1 This means that the technical committees responsible for the Part 2 standards have determined that it is not necessary to specify particular requirements for the appliance in question over and above the general requirements.

This standard is a product family standard dealing with the safety of appliances and takes precedence over horizontal and generic standards covering the same subject.

NOTE 2 Horizontal publications, basic safety publications and group safety publications covering a hazard are not applicable since they have been taken into consideration when developing the general and particular requirements for the IEC 60335 series of standards.

An appliance that complies with the text of this standard will not necessarily be considered to comply with the safety principles of the standard if, when examined and tested, it is found to have other features that impair the level of safety covered by these requirements.

An appliance employing materials or having forms of construction differing from those detailed in the requirements of this standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be considered to comply with the standard.

NOTE 3 Standards dealing with non-safety aspects of household appliances are:

- IEC standards published by TC 59 concerning methods of measuring performance;
- CISPR 11, CISPR 14-1 and relevant IEC 61000-3 series standards concerning electromagnetic emissions;
- CISPR 14-2 concerning electromagnetic immunity;
- IEC standards published by TC 111 concerning environmental matters.

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-44: Particular requirements for ironers

1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of electric **ironers** for both commercial and household and similar purposes, their **rated voltage** being not more than 250 V for single-phase appliances and 480 V for other appliances.

Appliances not intended for normal household, but which nevertheless can 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 within the scope of this standard.

Examples of appliances within the scope of this standard are:

- **ironing presses** for one-person operation;
- **mangles**;
- **rotary ironers** for one-person operation;
- **trouser presses**.

As far as is practicable, this standard deals with the common hazards presented by appliances that are encountered by all persons in and around the home. However, in general, it does not take into account:

- persons (including children) whose
 - physical, sensory or mental capabilities; or
 - lack of experience and knowledgeprevents them from using the appliance safely without supervision or instruction;
- children playing with the appliance.

Attention is drawn to the fact that:

- for appliances intended to be used in vehicles or on board ships or aircraft, additional requirements can be necessary;
- in many countries additional requirements are specified by the national health authorities, the national authorities responsible for the protection of labour and similar authorities.

This standard does not apply to:

- **rotary ironers** for operation by more than one person. The roller length of such appliances normally exceeds 1,6 m in length;
- appliances intended exclusively for industrial purposes;
- 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);
- electric irons (IEC 60335-2-3);
- **battery-operated appliances**.

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

IEC 60584-1, *Thermocouples – Part 1: EMF specifications and tolerances*

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

3.1 Definitions relating to physical characteristics

3.1.9 *Replacement:*

operation of the appliance under the following conditions

Appliances are operated without laundry.

Ironing presses are operated with the pressing surfaces separated as far as possible. Appliances that generate steam are operated in cycles with the water reservoir filled and with maximum steam emission. Each cycle consists of 10 s with the pressing surfaces in contact with each other and 10 s apart. Appliances that can generate steam or spray water are also operated with the water reservoir empty.

Rotary ironers are operated with the movable surface raised and lowered in cycles. Each cycle consists of 24 s with the pressing surfaces in contact with each other and 6 s apart.

Trouser presses are operated with the pressing surfaces in contact with each other.

Mangles are operated with the rollers in contact with each other.

Note 101 to entry: The mangle cloth is not removed.

3.5 Definitions relating to types of appliances

3.5.101

ironer

appliance in which the laundry is supported by a padded surface and having a heated surface that can be brought into contact with the laundry

3.5.102

rotary ironer

ironer in which the laundry is passed between a heated surface and a padded roller that is rotated by a motor

Note 1 to entry: **Rotary ironers** can have more than one heated surface.

3.5.103

ironing press

ironer in which the surface supporting the laundry and the heated surface are substantially flat

Note 1 to entry: **Ironing presses** can have means to generate steam or to spray water.

3.5.104

trouser press

appliance having a pair of flat surfaces, one or both of which can be heated and that can be closed together with trousers positioned between them

3.5.105**mangle**

appliance for ironing laundry by unheated rollers that are pressed together and rotated by a motor

Note 1 to entry: **Mangles** can have a cloth, one end of which is attached to one of the rollers and on which the laundry is placed for ironing.

3.6 Definitions relating to parts of an appliance**3.6.101****functional surface**

surface that is intentionally heated by an internal heat source and has to be hot to carry out the function for which the appliance is intended

Note 1 to entry: An example is the heated sheath of pressing surfaces.

4 General requirement

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable.

6 Classification

This clause of Part 1 is applicable.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 Addition:

Appliances shall be marked on or near lampholders with the maximum power input of replaceable illumination lamps as follows:

lamp max. ... W

The word "lamp" may be replaced by symbol IEC 60417-5012 (2002-10).

Appliances intended to be supplied with compressed air shall be marked with the maximum air pressure in megapascals.

7.12 Addition:

The instructions for **mangles** shall state that the appliances shall be disconnected when not in use and when the mangle cloth is being replaced.

The instructions for **ironing presses** in which steam is generated under pressure shall state that the filling cap shall not be removed during use. Instructions for the safe refilling of the water reservoir shall be given.

8 Protection against access to live parts

This clause of Part 1 is applicable.

9 Starting of motor-operated appliances

This clause of Part 1 is not applicable.

10 Power input and current

This clause of Part 1 is applicable.

11 Heating

This clause of Part 1 is applicable except as follows.

11.2 Modification:

Appliances normally used on a floor or table are placed away from the walls of the test corner.

*Separate steam generators of **ironing presses** are placed as near as possible to the walls of the test corner.*

11.3 Addition:

*Where the external **accessible surfaces** are suitably flat and access permits, then the test probe of Figure 101 is used to measure the temperature rises of external **accessible surfaces** specified in Table 101. The probe is applied with a force of $4\text{ N} \pm 1\text{ N}$ to the surface in such a way that the best possible contact between the probe and the surface is ensured. The measurement is performed after a contact period of 30 s.*

The probe may be held in place using a laboratory stand clamp or similar device. Any measuring instrument giving the same results as the probe may be used.

11.4 Addition:

*If the temperature rise limits are exceeded in appliances incorporating motors, transformers or **electronic circuits**, and the power input is lower than the **rated power input**, the test is repeated with the appliance supplied at 1,06 times **rated voltage**.*

11.6 Replacement:

Combined appliances are operated as heating appliances.

11.7 Replacement:

Trouser presses incorporating a timer are operated for three cycles of operation without rest periods.

NOTE 101 One cycle is the maximum operating period allowed by the timer.

Other appliances are operated until steady conditions are established.

Appliance outlets accessible to the user and socket-outlets accessible to the user are loaded with a resistive load that gives the marked **outlet load**.

11.8 Modification:

During the test, the temperature rises are monitored continuously and shall not exceed the values shown in Table 3 and Table 101.

Addition:

The temperature rise limits of motors, transformers and components of **electronic circuits**, including parts directly influenced by them, may be exceeded when the appliance is operated at 1,15 times **rated power input**.

The temperature rise of handles or grips of vents and air shutters shall not exceed the value specified in Table 3 for surfaces of handles, knobs, grips and similar parts which are held for short periods only in normal use.

Table 101 – Maximum temperature rises for accessible external surfaces under normal operating conditions

Surface	Temperature rise of external accessible surfaces ^a K		
	Surfaces of portable appliances situated on the floor – surfaces that are below 850 mm	Surfaces of appliances intended to be used on a work surface and surfaces of portable appliances that are at or above 850 mm when situated on the floor	Surfaces of appliances for commercial use
Bare metal	38	42	48
Coated metal ^b	42	49	59
Glass and ceramic	51	56	65
Plastic and plastic coating > 0,4 mm ^{c, d}	58	62	74

NOTE 101 The temperature rise limits of knobs, grips, keyboards, keypads and similar parts are specified in Table 3.

^a Temperature rises are not measured on:

- the underside of appliances intended to be used on a working surface or floor where these surfaces are inaccessible to a 75 mm diameter probe having a hemispherical end applied with a force not exceeding 1 N;
- the rear surface of appliances that, according to the instructions, shall be placed against a wall and where these surfaces are inaccessible to a 75 mm diameter probe having a hemispherical end, applied with a force not exceeding 1 N;
- **functional surfaces** and surfaces within 25 mm of **functional surfaces** that can become hot due to proximity to the **functional surface**.

^b Metal is considered coated when a coating having a minimum thickness of 90 µm made of enamel or non-substantially plastic coating is used.

^c The temperature rise limit applies also for plastic material having a metal finish of thickness less than 0,1 mm.

^d When the thickness of plastic coating does not exceed 0,4 mm, the temperature rise limits of coated metal or glass and ceramic apply.

12 Charging of metal-ion batteries

This clause of Part 1 is not applicable.

13 Leakage current and electric strength at operating temperature

This clause of Part 1 is applicable.

14 Transient overvoltages

This clause of Part 1 is applicable.

15 Moisture resistance

This clause of Part 1 is applicable.

16 Leakage current and electric strength

This clause of Part 1 is applicable.

17 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

18 Endurance

This clause of Part 1 is not applicable.

19 Abnormal operation

This clause of Part 1 is applicable except as follows.

19.2 Addition:

Appliances are tested with their pressing surfaces in contact with each other, unless they automatically separate when the closing force is released.

19.4 Addition:

For appliances that generate steam, any control that limits the pressure during the test of Clause 11 is rendered inoperative.

19.7 Addition:

Mangles are operated for 5 min.

19.9 Not applicable.

19.13 Addition:

The temperature rise of the surface intended to support the laundry shall not exceed 150 K 5 min after a **protective device** has operated.

20 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows.

20.1 Addition:

The test with the angle of inclination increased to 15° is not carried out.

Mangles are also checked by the following test.

The **mangle** is placed in any normal position of use on a horizontal plane in such a way as to prevent it from sliding during test. A force of 90 N is applied horizontally to the top of the **mangle**. The force is removed and a force of 180 N is applied vertically downwards at the most unfavourable place.

The **mangle** shall not overturn.

21 Mechanical strength

This clause of Part 1 is applicable.

22 Construction

This clause of Part 1 is applicable except as follows.

22.7 Replacement:

Ironing presses in which steam is generated under pressure shall incorporate adequate safeguards against the risk of excessive pressure.

If jets of steam or hot water are emitted by **protective devices**, the electrical insulation shall not be affected or the user exposed to a hazard.

Compliance is checked by inspection and by the following test.

The appliance is operated as specified in Clause 11, but without steam emission. The pressure in the water reservoir is measured. All pressure regulating devices that operate during the test are rendered inoperative and the pressure measured again. The pressure shall not increase by more than 200 kPa.

Any pressure limiting **protective device** is then rendered inoperative and the pressure in the water reservoir is raised hydraulically to five times the pressure measured originally, or twice the pressure measured with the pressure regulating devices rendered inoperative, whichever is higher.

There shall be no leakage from the water reservoir.

22.101 Rotary ironers shall be constructed so that the feed aperture has a width not exceeding 8 mm during operation and a width of at least 20 mm when the surfaces are fully separated.

Rotary ironers having surfaces that are lowered and raised by a motor, shall be constructed so that the surfaces separate as soon as the closing force is released. It shall be possible to separate the surfaces when the supply mains is interrupted.

Compliance is checked by measurement and by manual test.

22.102 Ironing presses shall be constructed so that the pressing surfaces are held in contact with each other by using a hand, elbow, knee or foot and so that they separate when the closing force is released.

The pressing surfaces of **ironing presses**, intended for direct operation by both hands, may be locked in contact with each other and shall be constructed so that the pressing surfaces can be separated without using the hands, even when the supply mains is interrupted.

Compliance is checked by inspection and by manual test.

22.103 Mangles shall be constructed so that the mechanical connection between moving parts protecting the feed opening withstands the stresses occurring in normal use.

Compliance is checked by subjecting the moving parts to 10 000 cycles of movement through the maximum angle that the construction allows, at the rate of 15 cycles per min. Each cycle consists of two movements, one in each direction.

After the test, the mangle shall not be damaged to such an extent that compliance with this standard is impaired.

22.104 Mangles shall incorporate means to prevent contact with the rollers when feeding in laundry.

The dimensions of the feed opening shall be in accordance with Figure 102. When the feed opening is protected by a movable barrier that is interlocked with the rollers, the dimensions correspond to the position of the barrier when the rollers stop.

Compliance is checked by inspection and by measurement.

22.105 Steam generators shall incorporate at least one **non-self-resetting thermal cut-out** that is only accessible by means of a **tool**.

Compliance is checked by inspection.

22.106 Appliances that generate steam shall be constructed so that there is no spillage of water or sudden jets of steam or hot water likely to expose the user to a hazard when the appliance is used in accordance with the instructions.

Compliance is checked by inspection during the test of Clause 11 and by removing the filling cap of the water reservoir at the end of the test.

22.107 Pressure-limiting **protective devices** that operate during the tests of 19.4 and 22.7 shall have an inlet aperture at least 5 mm in diameter or 20 mm² in area and a width of at least 3 mm. The area of the aperture at the outlet shall not be less than that at the inlet.

Compliance is checked by measurement.

22.108 Rotary ironers shall be constructed so that when the means for separating the surfaces is actuated, the roller shall stop before it has rotated more than 10 mm.

Rotary ironers having surfaces that are lowered and raised by a motor shall be constructed so that the surfaces separate as soon as the closing force is released.

Compliance is checked by the following test.

*The appliance is supplied at **rated voltage** with the surfaces in the closed position. The means for separating the surfaces is then actuated. The surfaces shall separate as soon as the closing force is released and the roller shall stop before it has rotated more than 10 mm.*

*If compliance relies on the operation of an **electronic circuit**, the appliance is supplied at **rated voltage** with the surfaces in the closed position and is further tested as follows.*

The electromagnetic phenomena test of 19.11.4.2 and 19.11.4.5 are applied in turn. During application of the electromagnetic phenomena tests, the means for separating the surfaces is actuated. The tests are carried out with surge protective devices disconnected, unless they incorporate spark gaps. The surfaces shall immediately separate and the roller shall stop before it has rotated more than 10 mm.

*The fault conditions in a) to g) of 19.11.2 are applied one at a time to the **electronic circuit**. During application of each of the fault conditions, the means for separating the surfaces is actuated. The surfaces shall immediately separate and the roller shall stop before it has rotated more than 10 mm.*

*If the **electronic circuit** is programmable, the software shall contain measures to control the fault/error conditions specified in Table R.1 and is evaluated in accordance with the relevant requirements of normative Annex R.*

22.109 The pressing surfaces of **ironing presses**, intended for direct operation by both hands, may be locked in contact with each other provided that the heating elements are automatically switched off within 15 s by non-self-resetting means and the pressing surfaces separate when the locking means is released.

Compliance is checked by the following test.

*The appliance is supplied at **rated voltage** with the surfaces locked in contact with each other. When the locking means is released, the surfaces shall immediately separate and the heating elements shall automatically be switched off within 15 s by a non-self-resetting means.*

*If compliance relies on the operation of an **electronic circuit**, the appliance is supplied at **rated voltage** with the surfaces locked in contact with each other and is subjected to the following tests.*

The electromagnetic phenomena test of 19.11.4.2 and 19.11.4.5 are applied in turn. During application of the electromagnetic phenomena tests, the locking means is released. The tests are carried out with surge protective devices disconnected, unless they incorporate spark gaps. The surfaces shall immediately separate and the heating elements shall automatically be switched off within 15 s by a non-self-resetting means.

*The fault conditions in a) to g) of 19.11.2 are applied one at a time to the **electronic circuit**. During application of each of the fault conditions, the locking means is released. The surfaces shall immediately separate and the heating elements shall automatically be switched off within 15 s by a non-self-resetting means.*

If the **electronic circuit** is programmable, the software shall contain measures to control the fault/error conditions specified in Table R.1 and is evaluated in accordance with the relevant requirements of normative Annex R.

23 Internal wiring

This clause of Part 1 is applicable except as follows.

23.3 Addition:

For appliances other than **trouser presses**, the number of flexings for conductors flexed in normal use is increased to 100 000.

24 Components

This clause of Part 1 is applicable except as follows.

24.1.3 Addition:

Switches of **mangles** actuated by the device protecting the feed opening are subjected to 50 000 cycles of operation.

25 Supply connection and external flexible cords

This clause of Part 1 is applicable.

26 Terminals for external conductors

This clause of Part 1 is applicable.

27 Provision for earthing

This clause of Part 1 is applicable.

28 Screws and connections

This clause of Part 1 is applicable.

29 Clearances, creepage distances and solid insulation

This clause of Part 1 is applicable.

30 Resistance to heat and fire

This clause of Part 1 is applicable except as follows.

30.2 Addition:

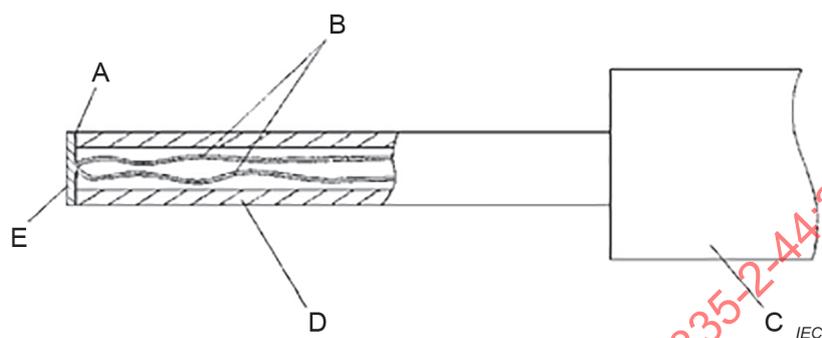
For **trouser presses**, 30.2.3 is applicable. For other appliances, 30.2.2 is applicable.

31 Resistance to rusting

This clause of Part 1 is applicable.

32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.



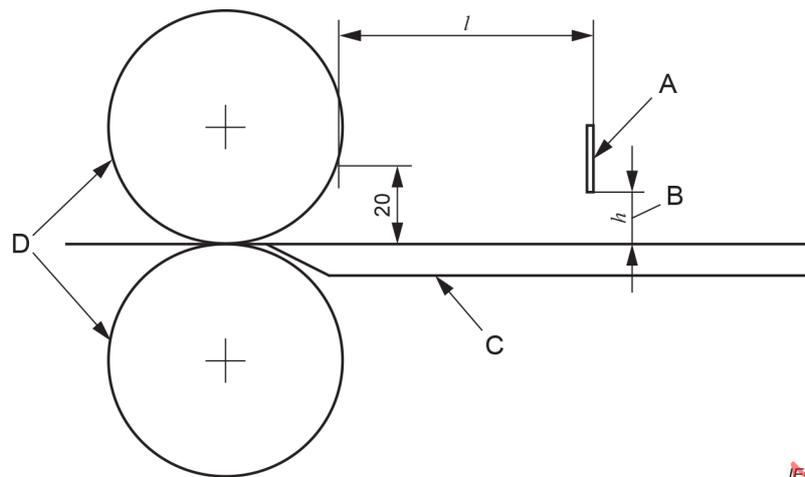
Key

- A adhesive
- B thermocouple wires 0,3 mm diameter to IEC 60584-1, Type K
- C handle arrangement permitting a contact force of $4\text{ N} \pm 1\text{ N}$
- D polycarbonate tube: inside diameter 3 mm, outside diameter 5 mm
- E tinned copper disc: 5 mm diameter, 0,5 mm thick with flat contact face

Figure 101 – Probe for measuring surface temperatures

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Dimensions in millimetres



Height (h) mm	Length (l) mm
≤ 4	≥ 15
≤ 8	≥ 40
≤ 15	≥ 95
≤ 20	≥ 120

Key

A barrier

B feed opening

C feed table

D roller

 h height of the feed opening l distance between the outside of the barrier at the feed opening and the point on the roller 20 mm above the feed table**Figure 102 – Dimensions of the feed opening of mangles**

Annexes

The annexes of Part 1 are applicable except as follows.

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Annex B
(normative)

**Battery-operated appliances, separable batteries and detachable batteries
for battery-operated appliances**

This annex of Part 1 is not applicable.

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Annex R (normative)

Software evaluation

Annex R of Part 1 is applicable except as follows.

R.2.2.5 *Modification:*

For programmable **electronic circuits** with functions requiring software incorporating measures to control the fault/error conditions specified in Table R.1 or Table R.2, detection of a fault/error shall occur before compliance with Clause 19, 22.108 and 22.109 is impaired.

R.2.2.9 *Modification:*

The software and safety-related hardware under its control shall be initialized and shall terminate before compliance with Clause 19, 22.108 and 22.109 is impaired.

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Bibliography

The bibliography of Part 1 is applicable except as follows.

Addition:

IEC 60335-2-3, *Household and similar electrical appliances – Safety – Part 2-3: Particular requirements for electric irons*

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES – SÉCURITÉ –

Partie 2-44: Exigences particulières pour les machines à repasser

AVANT-PROPOS

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- 9) L'attention est attirée sur le fait que certains des éléments de la présente Publication de l'IEC peuvent faire l'objet de droits de brevet. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié de tels droits de brevets.

L'IEC 60335-2-44 a été établie par le comité d'études 61 de l'IEC: Sécurité des appareils électrodomestiques et analogues. Il s'agit d'une Norme internationale.

Cette quatrième édition annule et remplace la troisième édition parue en 2002, l'Amendement 1:2008 et l'Amendement 2:2011. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- a) alignement du texte sur l'IEC 60335-1:2020;
- b) conversion en texte normatif de certaines notes (Article 1, 20.1, 22.103);
- c) exclusion des appareils alimentés par batteries (Article 1);

d) introduction des limites de température des surfaces accessibles (Article 11).

Le texte de cette Norme internationale est issu des documents suivants:

FDIS	Rapport de vote
61/6362/FDIS	61/6414/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/standardsdev/publications.

Une liste de toutes les parties de la série IEC 60335, publiées sous le titre général *Appareils électrodomestiques et analogues – Sécurité*, se trouve sur le site web de l'IEC.

La présente Partie 2 doit être utilisée conjointement avec la dernière édition de l'IEC 60335-1 et ses amendements, sauf si cette édition l'exclut. Dans ce cas, la dernière édition qui n'exclut pas la présente Partie 2 est utilisée. Elle a été établie sur la base de la sixième édition (2020) de cette norme.

NOTE 1 L'expression "la Partie 1" utilisée dans la présente norme fait référence à l'IEC 60335-1.

La présente Partie 2 complète ou modifie les articles correspondants de l'IEC 60335-1, de façon à transformer cette publication en norme IEC: Exigences particulières pour les machines à repasser.

Lorsqu'un paragraphe particulier de la Partie 1 n'est pas mentionné dans cette Partie 2, ce paragraphe s'applique pour autant que cela soit raisonnable. Lorsque la présente norme mentionne "addition", "modification" ou "remplacement", le texte correspondant de la Partie 1 doit être adapté en conséquence.

NOTE 2 Le système de numérotation suivant est utilisé:

- les paragraphes, tableaux et figures qui s'ajoutent à ceux de la Partie 1 sont numérotés à partir de 101;
- à l'exception de celles qui sont dans un nouveau paragraphe ou de celles qui concernent des notes de la Partie 1, les notes sont numérotées à partir de 101, y compris celles des articles ou paragraphes qui sont remplacés;
- les annexes qui sont ajoutées sont désignées AA, BB, etc.

NOTE 3 Les caractères d'imprimerie suivants sont utilisés:

- exigences: caractères romains;
- *modalités d'essais: caractères italiques;*
- notes: petits caractères romains.

Les termes en **gras** dans le texte sont définis à l'Article 3. Lorsqu'une définition concerne un adjectif, l'adjectif et le nom associé figurent également en gras.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous webstore.iec.ch dans les données relatives au document recherché. A cette date, le document sera

- reconduit,
- supprimé,
- remplacé par une édition révisée, ou
- amendé.

NOTE 4 L'attention des Comités nationaux est attirée sur le fait que les fabricants d'appareils et les organismes d'essai peuvent avoir besoin d'une période transitoire après la publication d'une nouvelle publication IEC, ou d'une publication amendée ou révisée, pour fabriquer des produits conformes aux nouvelles exigences et pour adapter leurs équipements aux nouveaux essais ou aux essais révisés.

Le comité recommande que le contenu de cette publication soit entériné au niveau national au plus tôt 12 mois et au plus tard 36 mois après la date de publication.

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INTRODUCTION

Il a été considéré en établissant cette Norme internationale que l'exécution de ses dispositions était confiée à des personnes expérimentées et ayant une qualification appropriée.

Les documents de recommandations concernant l'application des exigences de sécurité pour les appareils peuvent être consultés dans les documents de support du CE 61, accessibles sur le site web de l'IEC à l'adresse:

<https://www.iec.ch/tc61/supportingdocuments>

Cette information est donnée à l'intention des utilisateurs de la présente Norme internationale et n'a pas pour objet de remplacer le texte normatif de la présente norme.

La présente norme reconnaît le niveau de protection internationalement accepté contre les dangers électriques, mécaniques, thermiques, liés au feu et au rayonnement des appareils, lorsqu'ils fonctionnent comme en usage normal en tenant compte des instructions du fabricant. Elle couvre également les situations anormales auxquelles on peut s'attendre dans la pratique et elle tient compte de la façon dont les phénomènes électromagnétiques peuvent affecter le fonctionnement sûr des appareils.

Cette norme tient compte autant que possible des exigences de l'IEC 60364, de façon à rester compatible avec les règles d'installation quand l'appareil est raccordé au réseau d'alimentation. Cependant, des règles nationales d'installation peuvent être différentes.

Si un appareil relevant du domaine d'application de la présente norme comporte également des fonctions couvertes par une autre Partie 2 de l'IEC 60335, la Partie 2 correspondante est appliquée à chaque fonction séparément, dans la limite du raisonnable. Si cela est applicable, on tient compte de l'influence d'une fonction sur les autres fonctions.

Lorsqu'une Partie 2 ne comporte pas d'exigences complémentaires pour couvrir les risques traités dans la Partie 1, la Partie 1 s'applique.

NOTE 1 Cela signifie que les comités d'études responsables pour les Parties 2 ont déterminé qu'il n'était pas nécessaire de spécifier des exigences particulières pour l'appareil en question en plus des exigences générales.

Cette norme est une norme de famille de produits traitant de la sécurité d'appareils et a préséance sur les normes horizontales et génériques couvrant le même sujet.

NOTE 2 Les publications horizontales, les publications fondamentales de sécurité et les publications groupées de sécurité couvrant un risque ne sont pas applicables parce qu'elles ont été prises en considération lorsque les exigences générales et particulières ont été étudiées pour la série de normes IEC 60335.

Un appareil conforme au texte de la présente norme ne sera pas nécessairement jugé conforme aux principes de sécurité de la norme si, lorsqu'il est examiné et soumis aux essais, il apparaît qu'il présente d'autres caractéristiques qui compromettent le niveau de sécurité visé par ces exigences.

Un appareil utilisant des matériaux ou présentant des modes de construction différents de ceux décrits dans les exigences de cette norme peut être examiné et essayé en fonction de l'objectif poursuivi par ces exigences et, s'il est jugé pratiquement équivalent, il peut être estimé conforme aux principes de sécurité de la norme.

NOTE 3 Les normes traitant des aspects non relatifs à la sécurité des appareils électrodomestiques sont:

- les normes IEC publiées par le comité d'études 59 concernant les méthodes de mesure d'aptitude à la fonction;
- les normes CISPR 11 et CISPR 14-1, ainsi que les normes applicables de la série IEC 61000-3 concernant les émissions électromagnétiques;
- la norme CISPR 14-2 concernant l'immunité électromagnétique;
- les normes IEC publiées par le comité d'études 111 concernant l'environnement.

APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES – SÉCURITÉ –

Partie 2-44: Exigences particulières pour les machines à repasser

1 Domaine d'application

L'article de la Partie 1 est remplacé par l'article ci-après.

La présente partie de l'IEC 60335 traite de la sécurité des **machines à repasser** électriques destinées à un usage commercial, domestique et analogue, dont la **tension assignée** est inférieure ou égale à 250 V pour les appareils monophasés et à 480 V pour les autres appareils.

Les appareils non destinés à un usage domestique normal, mais qui peuvent néanmoins constituer une source de danger pour le public, tels que les appareils destinés à être utilisés par des usagers non avertis dans des magasins, chez des artisans et dans des fermes, sont compris dans le domaine d'application de la présente norme.

La liste suivante répertorie les exemples d'appareils qui relèvent du domaine d'application de la présente norme:

- les **presses à repasser** dont le fonctionnement nécessite une seule personne;
- les **machines à lisser le linge**;
- les **machines à repasser à rouleau** dont le fonctionnement nécessite une seule personne;
- les **presse-pantalons**.

Dans la mesure du possible, la présente norme traite des dangers courants que présentent les appareils et auxquels sont exposés tous les individus situés à l'intérieur et autour de l'habitation. Cependant, elle ne tient en général pas compte:

- des personnes (y compris des enfants) dont
 - les capacités physiques, sensorielles ou mentales; ou
 - le manque d'expérience et de connaissanceles empêchent d'utiliser l'appareil en toute sécurité sans surveillance ou instruction;
- de l'utilisation de l'appareil comme jouet par des enfants.

L'attention est attirée sur le fait que:

- pour les appareils destinés à être utilisés dans des véhicules ou à bord de navires ou d'avions, des exigences supplémentaires peuvent être nécessaires;
- dans de nombreux pays, des exigences supplémentaires sont spécifiées par les organismes nationaux de la santé, par les organismes nationaux responsables de la protection des travailleurs et par des organismes similaires.

La présente norme ne s'applique pas:

- aux **machines à repasser à rouleau** destinées à être utilisées par plusieurs personnes. La longueur du rouleau de ces appareils est généralement supérieure à 1,6 m;
- aux appareils prévus exclusivement pour des usages industriels;
- aux appareils destinés à être utilisés dans des locaux qui présentent des conditions particulières, telles que la présence d'une atmosphère corrosive ou explosive (poussière, vapeur ou gaz);

- aux fers à repasser électriques (IEC 60335-2-3);
- aux **appareils alimentés par batteries**.

2 Références normatives

L'article de la Partie 1 est applicable, avec l'exception suivante.

Addition:

IEC 60584-1, *Couples thermoélectriques – Partie 1: Spécifications et tolérances en matière de FEM*

3 Termes et définitions

L'article de la Partie 1 est applicable, avec les exceptions suivantes.

3.1 Définitions relatives aux caractéristiques physiques

3.1.9 Remplacement:

fonctionnement de l'appareil dans les conditions suivantes

Les appareils sont mis en fonctionnement sans linge.

Les **presses à repasser** sont mises en fonctionnement en séparant les surfaces de repassage autant que possible. Les appareils qui produisent de la vapeur sont mis en fonctionnement par cycles avec le réservoir d'eau rempli et l'émission de vapeur maximale. Chaque cycle comprend une période de 10 s où les surfaces de repassage sont en contact l'une avec l'autre et une période de 10 s où les surfaces de repassage sont séparées. Les appareils qui peuvent produire de la vapeur ou pulvériser de l'eau sont également mis en fonctionnement avec le réservoir d'eau vide.

Les **machines à repasser à rouleau** sont mises en fonctionnement en soulevant et en abaissant la surface mobile par cycles. Chaque cycle comprend une période de 24 s où les surfaces de repassage sont en contact l'une avec l'autre et une période de 6 s où les surfaces de repassage sont séparées.

Les **presse-pantalons** sont mis en fonctionnement avec les surfaces de repassage en contact l'une avec l'autre.

Les **machines à lisser le linge** sont mises en fonctionnement avec les rouleaux en contact l'un avec l'autre.

Note 101 à l'article: La toile d'entraînement des machines à lisser le linge n'est pas retirée.

3.5 Définitions relatives aux types d'appareils

3.5.101

machine à repasser

appareil dans lequel le linge est supporté par une surface matelassée et qui comporte une surface chauffée qui peut être mise en contact avec le linge

3.5.102

machine à repasser à rouleau

machine à repasser dans laquelle le linge passe entre une surface chauffée et un rouleau matelassé entraîné par un moteur

Note 1 à l'article: Les **machines à repasser à rouleau** peuvent comporter plusieurs surfaces chauffées.

3.5.103**presse à repasser**

machine à repasser dans laquelle la surface qui supporte le linge et la surface chauffée sont pratiquement planes

Note 1 à l'article: Les **presses à repasser** peuvent comporter des dispositifs pour produire de la vapeur ou pulvériser de l'eau.

3.5.104**presse-pantalon**

appareil qui comporte une paire de surfaces planes, dont au moins une surface peut être chauffée et qui peuvent se rejoindre avec le pantalon placé entre elles

3.5.105**machine à lisser le linge**

appareil dans lequel le linge est repassé par des rouleaux non chauffés, pressés l'un contre l'autre et entraînés par un moteur

Note 1 à l'article: Les **machines à lisser le linge** peuvent comporter une toile, dont l'une des extrémités est fixée à l'un des rouleaux et sur laquelle est placé le linge pour le repassage.

3.6 Définitions relatives aux parties d'un appareil**3.6.101****surface fonctionnelle**

surface qui est volontairement chauffée par une source de chaleur interne et qui doit être chaude pour assurer la fonction prévue de l'appareil

Note 1 à l'article: La gaine chauffée des surfaces de repassage constitue un exemple.

4 Exigences générales

L'article de la Partie 1 est applicable.

5 Conditions générales d'essais

L'article de la Partie 1 est applicable.

6 Classification

L'article de la Partie 1 est applicable.

7 Marquage et instructions

L'article de la Partie 1 est applicable, avec les exceptions suivantes.

7.1 Addition:

Les appareils doivent porter, sur la douille ou à proximité de celle-ci, un marquage de la puissance maximale des lampes d'éclairage remplaçables:

Puissance maximale de la lampe ... W

Le mot "lampe" peut être remplacé par le symbole IEC 60417-5012 (2002-10).

Les appareils destinés à être alimentés en air comprimé doivent porter un marquage de la pression d'air maximale en mégapascals.

7.12 Addition:

Les instructions pour les **machines à lisser le linge** doivent indiquer que les appareils doivent être débranchés lorsqu'ils ne sont pas utilisés et lorsque la toile d'entraînement est remplacée.

Les instructions pour les **presses à repasser** dans lesquelles la vapeur est produite sous pression doivent indiquer que le bouchon de remplissage ne doit pas être retiré en cours d'utilisation. Des instructions doivent être fournies pour effectuer l'appoint du réservoir d'eau en toute sécurité.

8 Protection contre l'accès aux parties actives

L'article de la Partie 1 est applicable.

9 Démarrage des appareils à moteur

L'article de la Partie 1 n'est pas applicable.

10 Puissance et courant

L'article de la Partie 1 est applicable.

11 Echauffements

L'article de la Partie 1 est applicable, avec les exceptions suivantes.

11.2 Modification:

Les appareils normalement placés sur le sol ou une table lors de l'utilisation sont placés à distance des parois du coin d'essai.

*Les générateurs de vapeur séparés pour **presses à repasser** sont placés aussi près que possible des parois du coin d'essai.*

11.3 Addition:

*Lorsque les **surfaces accessibles** extérieures sont suffisamment planes et permettent l'accès, le calibre d'essai de la Figure 101 est utilisé pour mesurer les échauffements des **surfaces accessibles** extérieures spécifiées dans le Tableau 101. Le calibre est appliqué avec une force de $4\text{ N} \pm 1\text{ N}$ sur la surface de manière à établir le meilleur contact possible entre le calibre et la surface. Le mesurage est réalisé après une durée de contact de 30 s.*

Le calibre peut être maintenu en place à l'aide d'une pince de laboratoire sur statif ou d'un dispositif analogue. Il est admis d'utiliser tout instrument de mesure qui produit les mêmes résultats que le calibre.

11.4 Addition:

*Si les limites d'échauffement sont dépassées dans les appareils qui incorporent des moteurs, des transformateurs ou des **circuits électroniques** et si la puissance est inférieure à la **puissance assignée**, l'essai est répété en alimentant l'appareil à 1,06 fois la **tension assignée**.*