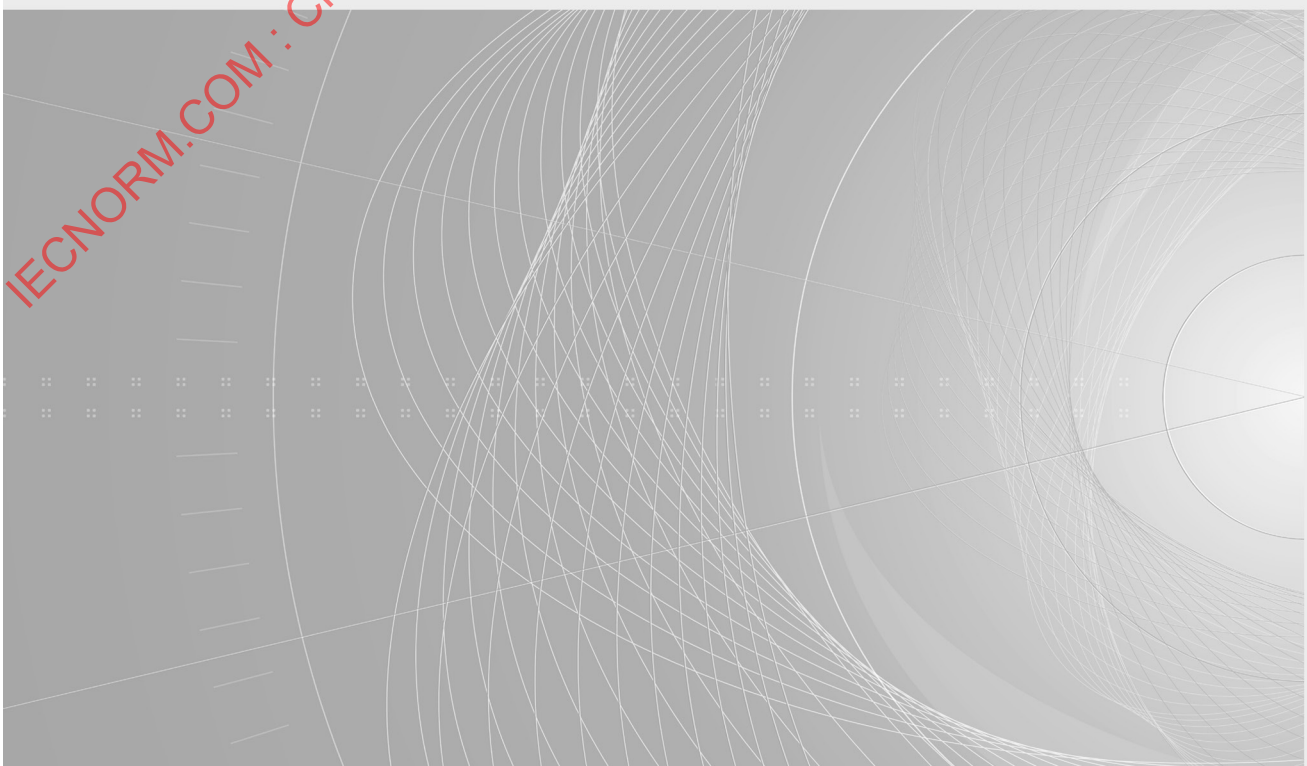
# IEC 60335-2-44

Edition 4.1 2025-01
CONSOLIDATED VERSION

# INTERNATIONAL STANDARD

## Household and similar electrical appliances – Safety – Part 2-44: Particular requirements for ironers





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IEC Secretariat
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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# HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

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## FOREWORD

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**This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.**

**IEC 60335-2-44 edition 4.1 contains the fourth edition (2021-11) [documents 61/6362/FDIS and 61/6414/RVD] and its amendment 1 (2025-01) [documents 61/7245/CDV and 61/7354/RVC].**

**In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.**

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 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 and its amendment 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, or
- revised.

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.

# 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 including direct current (DC) supplied 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 knowledge

  prevents 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*~~ *Modification:*

Replace the first paragraph with the following:

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 N ± 1 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**~~.

*Modification:*

*Replace the first paragraph with the following:*

***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.*

**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 $mm^2$ 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:*

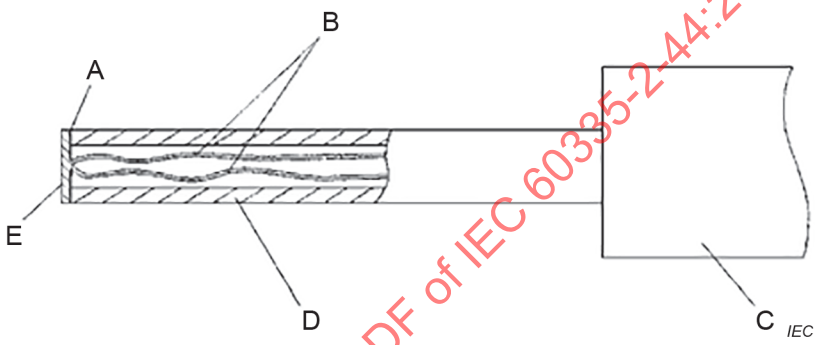
*For **trouser presses**, 30.2.3 is applicable. For other appliances, 30.2.2 is applicable.*

## 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

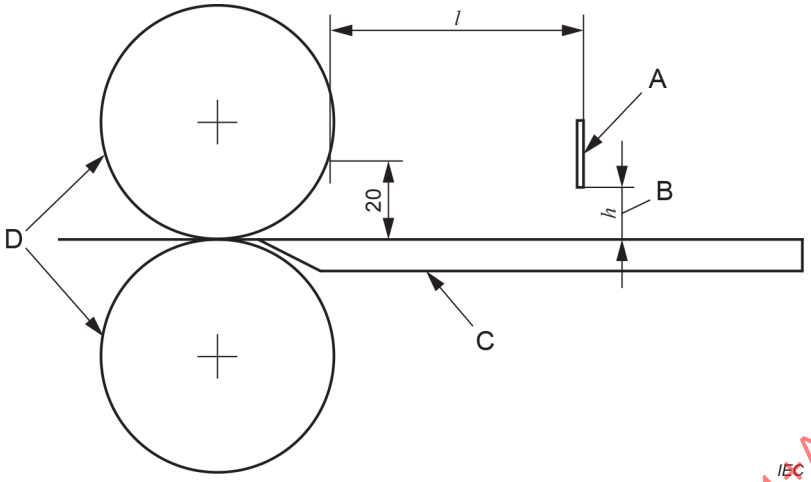
C handle arrangement permitting a contact force of 4 N ± 1 N

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**

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.

## ~~Annex B~~
~~(normative)~~

## ~~Battery-operated appliances, separable batteries and detachable batteries for battery-operated appliances~~

~~This annex of Part 1 is not applicable.~~

# 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.

## 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*

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

# HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

## Part 2-44: Particular requirements for ironers

## FOREWORD

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**This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.**

**IEC 60335-2-44 edition 4.1 contains the fourth edition (2021-11) [documents 61/6362/FDIS and 61/6414/RVD] and its amendment 1 (2025-01) [documents 61/7245/CDV and 61/7354/RVC].**

**This Final version does not show where the technical content is modified by amendment 1. A separate Redline version with all changes highlighted is available in this publication.**

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 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 and its amendment 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, or
- revised.

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.

# 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 including direct current (DC) supplied 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 knowledge

  prevents 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).

## 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** *Modification:*

Replace the first paragraph with the following:

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 N ± 1 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** *Modification:*

*Replace the first paragraph with the following:*

***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.*

**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 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.*