

INTERNATIONAL STANDARD

IEC
60335-2-44

Third edition
2002-09

Household and similar electrical appliances – Safety –

Part 2-44: Particular requirements for ironers

*Appareils électrodomestiques et analogues –
Sécurité –*

*Partie 2-44:
Règles 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 IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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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This part of International Standard IEC 60335 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances.

This third edition cancels and replaces the second edition published in 1997. It constitutes a technical revision.

The text of this part of IEC 60335 is based on the following documents:

FDIS	Report on voting
61/2167/FDIS	61/2247/RVD

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

This part 2 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments. It was established on the basis of the fourth edition (2001) 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: Safety requirements for electric 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 publication will remain unchanged until 2004. At this date, the publication will be

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- withdrawn;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

The following differences exist in the countries indicated below.

- 11.7: The test conditions are different (USA).
- 19.13: The test criteria are different (USA).
- 20.2: The requirements for entrapment and mechanical hazards are different (USA).
- 22.7: The test is different (USA).
- 22.101: The test is different (USA).
- 22.104: The test is different (USA).

A bilingual version of this publication may be issued at a later date.

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.

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.

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.

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.

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.

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 International Standard deals with the safety of electric **ironers** for 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 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

- the use of appliances by young children or infirm persons without supervision;
- playing with the appliance by young children.

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 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)

2 Normative references

This clause of Part 1 is applicable.

3 Definitions

This clause of Part 1 is applicable except as follows.

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 The mangle cloth is not removed.

3.101

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

3.102

rotary ironer

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

NOTE **Rotary ironers** may have more than one heated surface.

3.103

ironing press

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

NOTE **Ironing presses** may have means to generate steam or to spray water.

3.104

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

3.105

mangle

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

NOTE **Mangles** may have a cloth, one end of which is attached to one of the rollers and on which the laundry is placed for ironing.

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 5012 of IEC 60417-1.

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 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 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.*

11.4 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:

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 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**.*

12 Void**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. 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. 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. It shall be possible to separate the surfaces when the supply mains is interrupted.

Compliance is checked by inspection, 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. However, the pressing surfaces of appliances 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. Such appliances 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, by measurement 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.

*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. 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.

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:

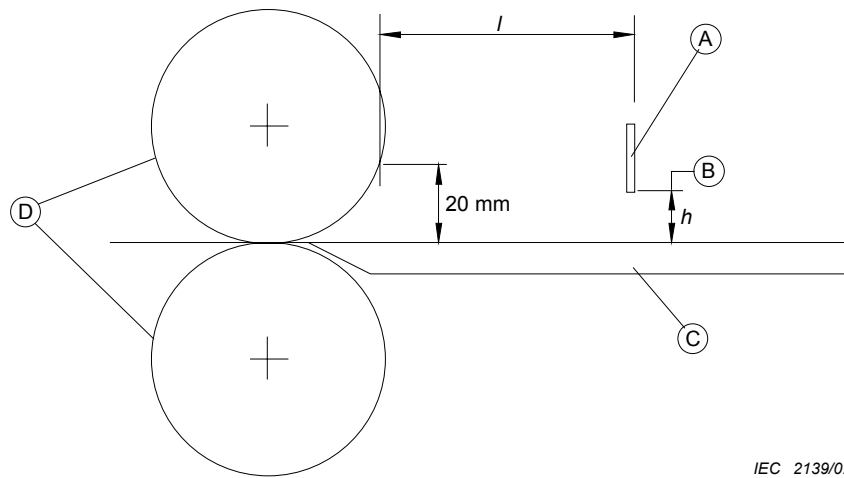
For trouser presses, 30.2.3 is applicable. For other appliances, 30.2.2 is applicable.

31 Resistance to rusting

This clause of Part 1 is applicable.

32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.



IEC 2139/02

Height (h) mm	Length (l) 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

Figure 101 – Dimensions of the feed opening of mangles

Annexes

The annexes of Part 1 are applicable.

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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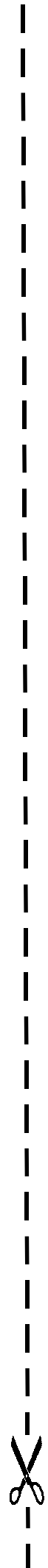
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