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Elektriske apparater til husholdningsbrug o.l. – Særlige krav til elektriske strygeruller til erhvervsmæssig brug

Household and similar electrical appliances –
Particular requirements for electrically
operated commercial rotary ironers

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EUROPÄISCHE NORM

August 2022

ICS 97.060

English Version

Household and similar electrical appliances - Particular requirements for electrically operated commercial rotary ironers

Appareils électrodomestiques et analogues -
Exigences particulières pour les repasseuses
rotatives électriques à usage collectif

Sicherheit elektrischer Geräte für den
Hausgebrauch und ähnliche Zwecke - Besondere
Anforderungen für elektrische Bügelmaschinen
für den gewerblichen Gebrauch

This European Standard was approved by CENELEC on 30 August 2021. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

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EUROPEAN COMMITTEE FOR ELECTROTECHNICAL STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION ELECTROTECHNIQUE
EUROPÄISCHES KOMITEE FÜR ELEKTROTECHNISCHE NORMUNG

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Contents

Page

European foreword	4
Introduction	5
1 Scope.....	6
2 Normative references	6
3 Terms and definitions.....	7
4 General requirement.....	7
5 General conditions for the tests	7
6 Classification.....	8
7 Marking and instructions	8
8 Protection against access to live parts	10
9 Starting of motor-operated appliances.....	11
10 Power input and current.....	11
11 Heating.....	11
12 Void	12
13 Leakage current and electric strength at operating temperature.....	12
14 Transient overvoltages.....	12
15 Moisture resistance	12
16 Leakage current and electric strength.....	13
17 Overload protection of transformers and associated circuits	13
18 Endurance.....	13
19 Abnormal operation.....	13
20 Stability and mechanical hazards.....	14
21 Mechanical strength	15
22 Construction.....	16
23 Internal wiring.....	22
24 Components	22
25 Supply connection and external flexible cords	22
26 Terminals for external conductors.....	23
27 Provision for earthing.....	23
28 Screws and connections	23
29 Clearances, creepage distances and solid insulation	23
30 Resistance to heat and fire	23
31 Resistance to rusting.....	23
32 Radiation, toxicity and similar hazards.....	23
33 Annexes.....	24
Annex A (normative) Software evaluation	25
Annex AA (normative) Ageing test for elastomeric parts	26

This is a preview of "DS/EN 50706:2022". [Click here to purchase the full version from the ANSI store.](#)

Annex ZA (informative) Specific additional requirements for appliances and machines intended for commercial use.....	27
Annex ZZA (informative)	28
Bibliography	29

This is a preview of "DS/EN 50706:2022". [Click here to purchase the full version from the ANSI store.](#)

European foreword

This document ([EN 50706:2022](#)) has been prepared by CLC/TC 61, "Safety of household and similar electrical appliances".

The following dates are fixed:

- latest date by which this document has to be implemented at(dop) 2023-02-19
national level by publication of an identical national standard
or by endorsement
- latest date by which the national standards conflicting with(dow) 2025-08-19
this document have to be withdrawn

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a Standardization Request given to CENELEC by the European Commission and the European Free Trade Association.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

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Introduction

Addition:

[EN 50706:2022](#) is read in conjunction with [EN 60335-1:2012+A11:2014](#) +A13:2017+A1:2019 +A14:2019 +A2:2019+A15:2021+A16:2022, which is referred to in this text as "Part 1". This document supplements or modifies the corresponding clauses and subclauses of the standards of Part 1.

NOTE 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.

This document is a product family standard dealing with the safety of commercial electric **rotary ironers** and takes precedence over horizontal and generic standards covering the same subject.

This document recognizes the level of protection against hazards such as electrical, mechanical, thermal, fire and radiation of commercial electric **rotary ironers** when operated as in normal use taking into account the manufacturer's instructions. It also covers any reasonably foreseeable misuse of the machinery and takes into account the way in which electromagnetic phenomena can affect the safe operation of commercial electric **rotary ironers**.

A commercial electric **rotary ironers** 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.

This document takes into account the requirements of [HD 60364](#) as far as possible so that there is compatibility with the wiring rules when the machinery is connected to the supply mains. However, national wiring rules may differ.

This document applies in conjunction with the latest edition of [EN 60335-1](#) and its amendments, which is referred to in this text as "Part 1". This standard supplements or modifies the corresponding clauses of Part 1 as indicated in the text.

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1 Scope

This clause of Part 1 is replaced by the following:

This document deals with the safety of electrically operated commercial **rotary ironers**, intended to be used by trained users in e.g. hotels hospitals, factories, in light industry and on farms. It also covers **rotary ironers** which are declared for commercial use in **areas open to the public** and operated by lay persons e.g. in laundrettes and communal laundry rooms. Their rated voltage being not more than 250 V for single phase and 480 V for others.

This document also covers electrically operated commercial **rotary ironers** making use of other energy sources. It does not cover requirements for these other energy sources for heating purposes. However, the influence of these other energy sources on the machine is covered.

As far as is practicable, this document deals with the common hazards presented by appliances that are encountered by all persons in household and similar environments.

However, in general, it does not take into account

- **children** playing with the appliance,
- the **use of the appliance by children**,

It is recognized that **very vulnerable people** may have needs beyond the level addressed in this document.

Products covered by this document do not create a noise hazard, therefore no specific provisions concerning noise are given.

NOTE 101 Attention is drawn to the fact that

- for electrically operated commercial **rotary ironers** 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 document does not apply to

- industrial flatwork ironers having a surface contact area $\geq 1,20 \text{ m}^2$, feeders and folders ([EN ISO 10472-5](#));
- 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);

For the purpose of this document, the term “appliance” as used in Part 1 is read as “electrically operated commercial **rotary ironers**”.

2 Normative references

This clause of Part 1 is applicable except as follows:

[EN 62233:2008](#), *Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure*

[EN ISO 13857:2019](#), *Safety of machinery – Safety distances to prevent hazard zones being reached by upper and lower limbs*

[EN 60068-2-75](#), *Environmental testing – Part 2-75: Tests – Test Eh: Hammer tests*

[ISO 1817](#), *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*

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[EN 61010-1:2010](#),¹⁾ *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements*

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

Replacement

3.1.9 normal operation

appliances are operated without laundry and with the pressing surfaces in contact with each other at maximum temperature and roller speed settings until steady state conditions are reached

Note 1 to entry: The roller cover is not removed.

3.1.101 rotary ironer

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

3.1.102 guard

part of the appliance specifically designed to provide protection by means of a physical barrier

3.1.103 operator

person or persons installing, operating, adjusting, maintaining, cleaning, repairing or moving appliances

Note 1 to entry: Example is the location where the **operator** loads the appliance.

3.1.104 area open to the public

area in which the general public including children can enter

Note 1 to entry: Examples are laundrettes, communal laundry rooms.

3.Z.7 use of the appliance

Replace the "NOTE Z1" by "VOID"

4 General requirement

This clause of Part 1 is applicable except as follows:

Replace the first paragraph by the following:

Appliances shall be constructed so that they function safely so as to cause no danger to persons or surroundings during normal use, even in the event of carelessness, and during installation, adjusting, maintenance, cleaning, repairing or transportation.

5 General conditions for the tests

This clause of Part 1 is applicable.

1) As impacted by EN 61010-1:2010/A1:2019.

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6 Classification

6.1 Modification:

Appliances shall be of class I.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 Modification:

Replace the fourth and fifth dashed items by:

- business name, and full address of the manufacturer and, where applicable, his authorized representative,
- model or type reference, serial number if any and production year,

NOTE 1 Production year is the year when the production process is completed. The production year can be a part of the serial number.

Add the following new dashed items:

- designation of the appliance,

The designation may be a combination of letters and/or numbers and shall enable to identify the appliance as specified in the instructions.

- the maximum permissible steam supply pressure, in kilopascals (kPa), unless this is indicated in the instruction sheet,
- the maximum permissible steam supply temperature in degrees Celsius, unless this is indicated in the instruction sheet.

Addition:

Appliances shall be marked on or near lamp holders 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 MPa.

7.10 Addition:

If the **off position** is only indicated by letters, the word "off" shall be used.

7.12 Replace the first sentence in the requirement with the following:

Instructions shall be provided with the appliance so that the appliance can be used safely.

Replace the 4th and 5th paragraph by the following:

The instructions for appliances that can be used in **areas open to the public** shall include the substance of the following:

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This appliance may be used by persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Hazards which may occur arising from putting hands accidentally on hot surfaces, rotating parts, the application of unsuitable objects to be ironed and similar actions.

Addition:

The instructions for use shall contain at least the following information:

- the business name and full address of the manufacturer and, where applicable, his authorized representative;
- model or type reference of the appliance as marked on the appliance itself, except for the serial number;
- the designation of the appliance together with its explanation in case it is given by a combination of letters and/or numbers;

The designation shall enable the identification of the appliance as specified in the instructions.

- the general description of the appliances, when needed due to the complexity of the appliance;
- specific precautions if required during installation, operation, adjusting, user maintenance, cleaning, repairing or moving;
- when needed drawings, diagrams, descriptions and explanations necessary for the safe use, user maintenance and repair of the appliance and for checking its correct function;
- information regarding putting into service, safe operation, handling, transportation, storage of the appliance taking into account its weight and, if necessary, instructions for the training of operators;
- instructions to enable adjustment and maintenance to be carried out safely, including the protective measures that should be taken during these operations;
- the possible reasonably foreseeable misuse and, whenever relevant, a warning against the effects it may have on the safe use of the appliance.

The manufacturer shall declare if the appliance is also intended to be used in **areas open to the public**. If the appliance is not suitable for use in **areas open to the public** the instruction shall include the substance of the following warning:

CAUTION This appliance shall not be installed where the public has access.

The front cover of the instructions shall include the substance of the following warning:

CAUTION Read the instructions before using the appliance.

This wording may be replaced by symbols 0434 and 0790 of [ISO 7000](#).

If symbols [ISO 7000-0434](#) and [ISO 7000-0790](#) are used, their meaning shall be explained.

The words 'Original instructions' shall appear on the language version(s) verified by the manufacturer or by the authorized representative.

When a translation of the original instructions has been provided by a person introducing the appliance on the market; the meaning of the sentence 'Translation of the original instructions' has to appear in the relevant instructions delivered with the appliance.

The instructions needed for maintenance/service to be done by specialized personnel, mandated by the manufacturer or the authorized representative, and may be supplied in only one Community language which the specialized personnel understand.

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The instructions shall indicate the type and frequency of inspections and maintenance required for safe operation including the preventive maintenance measures.

Addition:

The instructions shall include the substance of the following:

- the appliance shall be switched off when not in use.
- how the roller cover is to be replaced
- the ironed laundry shall cool down before packing or stacking it.
- that hot laundry could self-ignite and cause a fire.
- that only materials declared as suitable for ironing shall be ironed.

The instructions for appliances 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.

Add the following new subclauses:

Specific instructions shall be given, when necessary as follows:

- on use, transportation, assembly, dismantling when out of service, testing or foreseeable breakdowns, if these operations have consequences on stability of the appliance in order to avoid overturning, falling or uncontrolled movements of the appliance or of its component parts. The instructions needed for the safe transportation of the packed appliance, should be stated on the package or should be delivered together with the package.

NOTE General rules on schedules concerning transportation requirements and tests can be found in [EN ISO 4180](#).

- on how to maintain adequate mechanical stability when in use, during transportation, assembly, dismantling, scrapping and any other action involving the appliance;
- on the operating method to be followed in the event of accident or breakdown; if a blockage is likely to occur the operating method to safely unblock the appliance;

Compliance is checked by inspection.

The instructions shall include information that the A-weighted sound pressure level is below 70 dB (A).

The instructions shall include a warning that the appliance shall be disconnected from its power source during service and when replacing parts and, if that the removal of the plug is foreseen, it shall be clearly indicated that the removal of the plug has to be such that an **operator** can check from any of the points to which he has access that the plug remains removed.

If this is not possible, due to the construction of the appliance or its installation, a disconnection with a locking system in the isolated position shall be provided.

Compliance is checked by inspection.

8 Protection against access to live parts

This clause of Part 1 is applicable except as follows:

8.1.1 Addition:

For appliances not intended to be installed in **areas open to the public** replace the third paragraph by the following:

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Test probe B of [IEC 61032](#) is applied without appreciable force, the appliance being in every possible position, except that appliances normally used on the floor and having a mass exceeding 40 kg are not tilted. Through openings, the test probe is applied to any depth that the probe will permit and is rotated or angled before, during and after insertion to any position. If the opening does not allow the entry of the probe, the force on the probe in the straight position is increased to 20 N when probe B is used. If the probe then enters the opening, the test is repeated with the probe in the angled position.

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.

11.3 Addition:

Temperature rises of the flat accessible surfaces are measured using the probe of [Figure 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.

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:

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**.

Modification:

Replace the first paragraph of Part 1 by the following:

“During the test, the temperature rises are monitored continuously and shall not exceed the values shown in Table 3 and [Table 101](#) in accordance with [11.101](#).”

In Table 3 the row “external enclosure of **motor-operated appliances**, except handles held in normal use” is not applicable.

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Table 101 — Maximum normal temperature rises

<i>Surface</i> ^a	<i>Temperature rise</i> K		
	<i>External surfaces of appliances that can be installed in an area open to the public</i>		<i>External surfaces of other appliances</i>
	<i>Front surfaces situated not more than 850 mm above the floor after installation</i>	<i>Other surfaces</i>	
<i>Bare metal</i>	38	42	48
<i>Coated metal</i> ^b	42	49	59
<i>Glass and ceramic</i>	51	56	65
<i>Plastic and plastic coating > 0,4 mm</i> ^c	58	62	74

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

^b Metal is considered coated when a coating having a minimum thickness of 90 µm made by 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.

Add the following new subclause:

11.101 *Temperature rises are not measured:*

- *on the underside of appliances intended to be used on a floor*
- *on the rear surface of appliances which, according to the instructions, shall be placed against a wall*
- *on surfaces inaccessible to a 75 mm diameter probe having a hemispherical end applied with a force not exceeding 1 N.*

12 Void

13 Leakage current and electric strength at operating temperature

This clause of Part 1 is applicable except as follows.

13.2 *Modification:*

Instead of the permissible leakage current for **stationary class I appliances**, the following applies:

- *for cord and plug connected appliances* **1 mA per kW rated power input of the appliance with a maximum of 10 mA.**
- *for other appliances* **1 mA per kW rated power input of the appliance with no maximum.**

14 Transient overvoltages

This clause of Part 1 is applicable.

15 Moisture resistance

This clause of Part 1 is applicable except as follows.

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15.2 Modification:

For all appliances, 0,5 l of the solution is poured over all surfaces of the appliance that can be used as practical storage places, the controls being placed in the on position. The controls are then operated through their working range, this operation being repeated after a period of 5 min.

The appliance shall then withstand the electric strength test of 16.3 and inspection shall show that there is no trace of water on insulation that could result in a reduction of **clearances** or **creepage distances** below the values specified in [Clause 29](#).

16 Leakage current and electric strength

This clause of Part 1 is applicable except as follows.

16.2 Modification:

Instead of the permissible leakage current for **stationary class I appliances**, the following applies:

- for cord and plug connected appliances 1 mA per kW **rated power input** of the appliance with a maximum of 10 mA.
- for other appliances 1 mA per kW **rated power input** of the appliance with no maximum.

17 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

18 Endurance

This clause of Part 1 is applicable except as follows:

Addition:

18.101 Appliances shall be constructed so that the protective devices according [22.101](#) withstands the stresses to which it may be exposed in normal use.

Compliance is checked by the following test

The protective device is subjected to 50 000 cycles of operation.

After the tests, compliance with the relevant requirements of [22.101](#) shall not be impaired.

19 Abnormal operation

This clause of Part 1 is applicable except as follows.

19.2 Not applicable.

19.3 Not applicable.

19.4 Addition:

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

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19.7 *Addition:*

Appliances are operated for 5 min.

19.9 Not applicable.

19.11.4.8 *Replace the second paragraph in the test specification by:*

A manual operation shall be required to restart the appliance without causing any hazard to the user.

19.13 *Addition:*

The roller cover shall not ignite and shall not show any charring or glowing.

NOTE 101 Light brown colouring of the roller cover or slight emission of smoke is ignored.

During the tests of [19.101](#), the temperature of windings shall not exceed the values specified in Table 8.

19.101 The appliance is supplied at **rated voltage** and operated under **normal operation**. Any fault condition or unexpected operation that may be applied in normal use is introduced.

Examples of fault conditions and unexpected operations to be applied are:

- disconnection and reconnection of one or more phases of the supply during normal operation;
- open-circuiting or short-circuiting of components;

NOTE 101 In general, tests are limited to the fault conditions that may be expected to give the most unfavourable results. The simulation of component faults is limited to those that could expose the user to a hazard.

NOTE 102 If the appliance stops at any particular point during normal operation, the test with that fault condition is considered to be ended.

NOTE 103 The fault condition with:

- thermal controls short-circuited is covered by [19.4](#),
- motor capacitors short-circuited or open-circuited is covered by [19.7](#).

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.

The appliances are also checked by the following test.

The appliance 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 appliance. The force is removed and a force of 180 N is applied vertically downwards at the most unfavourable place.

The appliance shall not overturn.

NOTE 101 The appliance is prevented from sliding during the test.

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20.2 Modification:

Moving parts of appliances shall, as far as is compatible with the use and working of the appliance, be positioned, and/or guarded, and/or enclosed and/or equipped with protective devices to provide adequate protection against personal injury in normal use.

Add the following new requirement to the requirement after Note 1:

The fixing systems of fixed **guards** which cover dangerous areas shall only be removable with the use of tools. The fixing systems of fixed **guards** which have to be removed for routine cleaning or maintenance shall remain attached to the fixed **guards** or to the appliance after removal.

This does not apply if after removal of the screws, or if the component is incorrectly repositioned, the appliance becomes inoperative.

Construction of **guards** shall be such to avoid, as far as possible, that they remain in place without their fixings.

20.101 It shall not be possible to start the movement of the roller until a separate means is operated manually.

*Compliance is checked by inspection, by measurement and by manual test, the appliance being supplied at **rated voltage** and operating under **normal operation**.*

21 Mechanical strength

This clause of Part 1 is applicable except as follows.

21.1 Replace the requirement with the following:

Appliances and their components and fittings shall have adequate mechanical strength and be constructed to withstand such rough handling that may be expected in normal use, during transportation, assembly, dismantling, scrapping and any other action involving the appliances.

Modify the first sentence of the testing specifications as follows:

Compliance is checked by verifying the instructions and by applying blows to the appliance in accordance with test Ehb of [EN 60068-2-75](#), the spring hammer test.

21.101 There shall be no risk of ejecting steam during intended use including opening of a cover without a tool.

Compliance is checked by inspection.

21.102 Fluid or gas or steam containing parts of equipment which in normal use have both of the following characteristics:

- a product of pressure and volume greater than 200 kPa x l;
- a pressure above 2 MPa,

shall not cause a hazard through rupture or leakage.

Compliance is checked by inspection and by performing the hydrostatic tests of [EN 61010-1:2010](#), Annex G.2.

NOTE Such equipment includes fluid-pressure-actuated equipment employing flexible bellows, diaphragms, Bourdon tubes, etc. and equipment such as flow meters that are connected to process pressures rated at or above 2 MPa.

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22 Construction

This clause of Part 1 is applicable except as follows.

22.6 Modification to the requirement:

The requirement relating to leakage from containers, hoses, couplings and similar parts of the appliance is not applicable to parts that withstand the ageing test specified in Annex BB.

22.7 Replacement:

Appliances 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 The pull-in area between roller and bed at the feed aperture shall be protected by means as described in [22.101.1](#) to [22.101.2](#).

Compliance is checked by measurement and by manual test.

*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 surfaces shall immediately separate and the roller shall stop within the distance between the **protective device** and the upper edge of the bed.*

*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 within the distance between the **protective device** and the upper edge of the bed.*

*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 Annex R.*

For appliances with feedbands, the pull-in area between roller and bed shall be guarded by an easily activated adequate protective device (example see [Figure 101](#)).

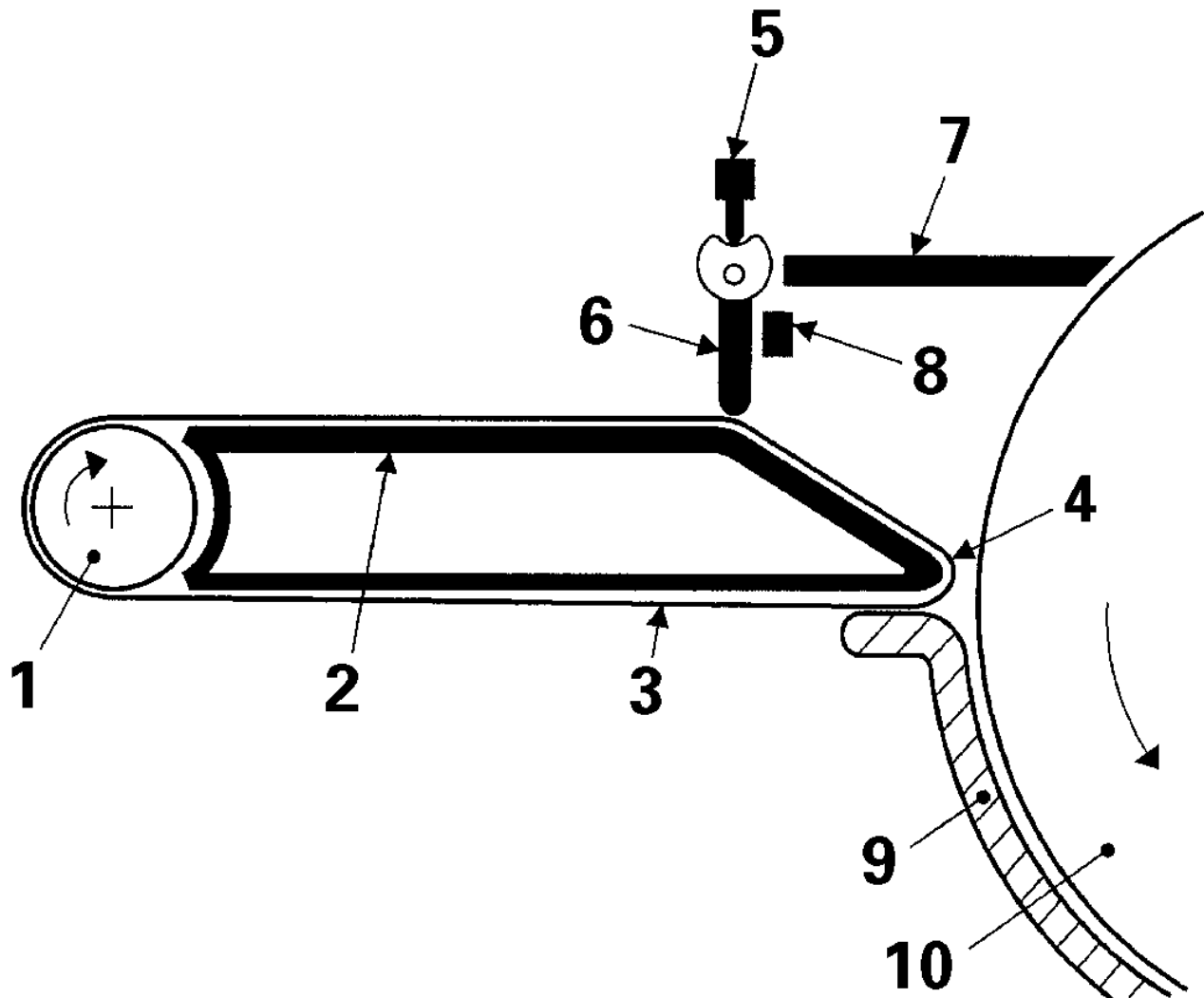
For appliances with feedbands, the maximum gap between the protective device and feedbands and the distance between this gap and the pull-in area shall not be greater than specified in Table 4 of [EN ISO 13857:2019](#).

*It shall not be possible to reach over the protective device to the pull-in area, e.g. by provision of a **guard**.*

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The movement of the roller and the feed bands shall be stopped immediately after the protective device has been activated and in addition the roller and bed shall be separated. The gap between the protective device and the feedbands shall not be reduced as specified.

The stopping distance of the roller and the feedbands shall be limited to the safety distance as specified in Table 4 of [EN ISO 13857:2019](#).



Key

- | | |
|--------------------|---------------------|
| 1 drive roller | 6 protective device |
| 2 bed plate | 7 guard |
| 3 feedband | 8 mechanical stop |
| 4 edge of feedband | 9 bed |
| 5 limit switch | 10 roller |

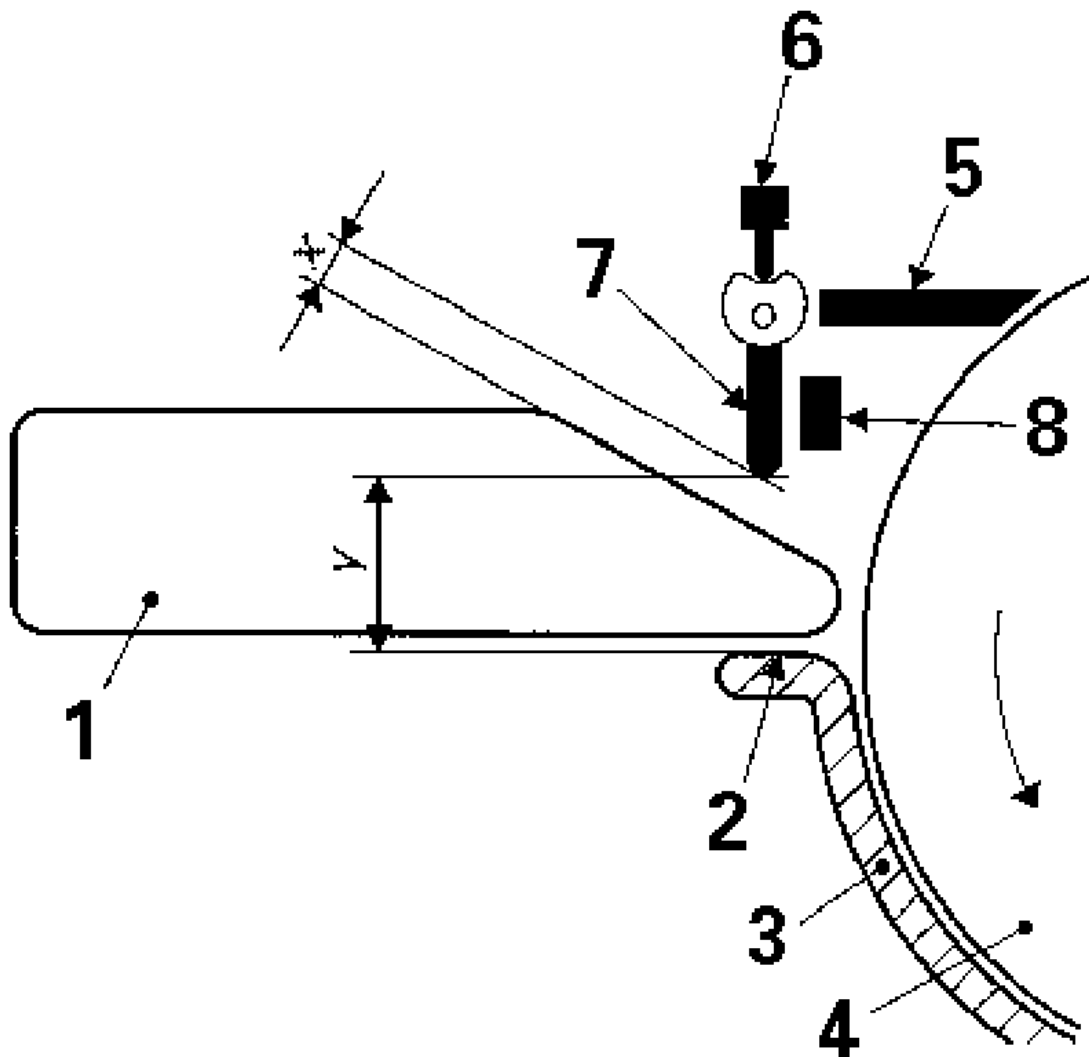
Figure 101 — Example of a protective device for appliances with feedbands

22.101.2 Appliances with a fixed feed-in table

For appliances using a fixed feed-in table, the gap (x) between the protective device and the table or roller shall be the minimum practicable to feed the material and shall not exceed 18 mm (examples see [Figures 102](#) and [103](#)).

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After the protective device has been activated, the roller shall come to rest within a roller surface movement which does not exceed the distance (y) between the protective device and the upper edge of the bed, and in addition the roller and bed shall be separated.

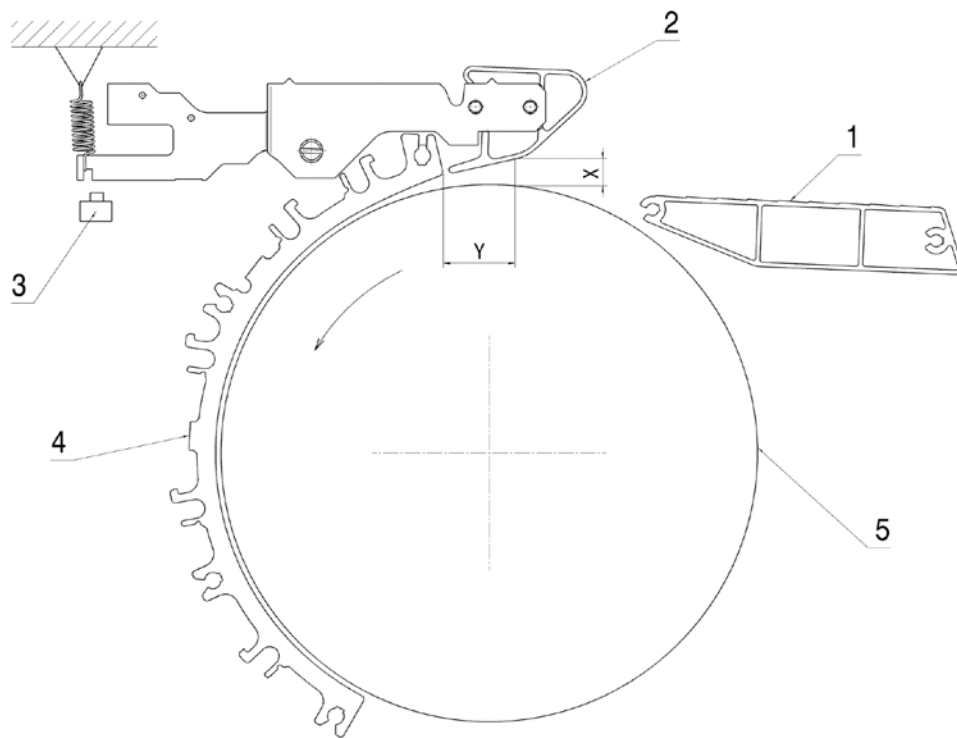


Key

- 1 fixed feed table
- 2 upper edge
- 3 bed
- 4 roller
- 5 guard
- 6 limit switch
- 7 protective device
- 8 mechanical stop
- X 18 mm max.
- Y distance between the protective device and the upper edge of bed

Figure 102 — Example of a protective device for appliances with a fixed feed-in table

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Key

- 1 fixed feed-in table
- 2 protective device
- 3 limit switch
- 4 bed
- 5 roller
- X 18 mm max.
- Y distance between the protective device and the upper edge of bed

Figure 103 — Example of a protective device for rotary ironers with a fixed feed-in table - (variation)

22.102 If the **protective device** is activated manually the released force shall be lower than 60 N.

Compliance is checked by measurement

22.103 Hazards due to reverse running shall be prevented. The design for reverse running shall be protected as follows:

- a protective device according [22.101.1](#) or [22.101.2](#), or
- a hold-to-run control at normal speed or slower, provided that it can be actuated only when roller and bed have been separated previously.

Compliance is checked by measurement and by manual test.

*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.*

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*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 surfaces shall immediately separate and the roller shall stop within the distance between the **protective device** and the upper edge of the bed.*

*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 within the distance between the **protective device** and the upper edge of the bed.*

*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 Annex R.*

22.104 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.

22.105 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.

22.106 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.

Appliances having surfaces that are lowered and raised shall be constructed so that the surfaces separate as soon as the closing force is released.

Compliance is checked by inspection and by the following tests.

*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 within the distance between the **protective device** and the upper edge of the bed.*

*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 surfaces shall immediately separate and the roller shall stop within the distance between the **protective device** and the upper edge of the bed.*

*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 within the distance between the **protective device** and the upper edge of the bed.*

*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 Annex R.*

If appliances having surfaces that are lowered and raised by electromechanically means it shall be possible to separate the surfaces when the supply mains is interrupted. The procedure for releasing shall be described in the instructions.

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Compliance is checked by inspection.

22.108 Where the weight, size or shape prevents appliances from being moved manually, they shall be fitted with attachments for lifting gear or be designed so they can be fitted with such attachments, or be shaped in such a way that standard lifting gear can easily be used.

Appliance to be moved manually shall be constructed or shall be equipped so that they can be moved easily and safely.

Compliance is checked by inspection.

22.109 The fixing systems of fixed **guards** which prevent access to dangerous moving parts shall only be removable with the use of tools.

If frequent access to the dangerous moving parts is envisaged, interlocking moveable guards shall be used. Where possible, **guards** shall be incapable of remaining in place without their fixings.

The requirement in the above paragraph does not apply if, after removal of the screws, or if the component is incorrectly repositioned, the appliance becomes inoperative.

Adjustable **guards** restricting access to those areas of the moving parts strictly necessary for the work shall be

- adjustable manually or automatically, depending on the type of work involved, and
- readily adjustable without the use of tools.

Compliance is checked by inspection.

22.110 The appliance shall be designed and constructed in such a way that the build-up of potentially dangerous electrostatic charges is prevented. Parts of the appliance that are easily accessible during intended use and maintenance have to be taken into account.

The insulation resistance between the accessible part and earth shall be sufficiently low so as to avoid a build-up of electrostatic charge.

Compliance is checked by measuring the insulation resistance between:

- ironing cloth/roller cover of the roller and the enclosure;
- the textile covering of the feedband and the enclosure, if any.

A d. c. of approximately 500 V is applied. The measurement is made 1 min after application of the voltage and the insulation resistance shall not exceed 1 MΩ.

NOTE 1 An example of a feedband is shown in [Figure 101](#).

22.111 The appliance shall be provided with a device to stop the function safely. Such device shall be suitably placed and readily visible.

Compliance is checked by inspection.

22.112 Appliances shall be designed in such a way to avoid incorrect mounting, if this can lead to an unsafe situation. If this is not possible information on the correct mounting shall be given directly on the part and/or the enclosures.

Compliance is checked by inspection.

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22.113 In case of interruption, re-establishment after an interruption or fluctuation in whatever manner of the power supply, the appliance shall not restart. The restart shall only be possible by a manual action.

Compliance is checked by inspection.

*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 surfaces shall immediately separate and the roller shall stop within the distance between the **protective device** and the upper edge of the bed.*

*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 within the distance between the **protective device** and the upper edge of the bed.*

*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 Annex R.*

22.114 Appliances shall be fitted with means to isolate them from all energy sources (e.g. steam, compressed air). Such isolators shall be clearly identified. They shall be capable of being locked if reconnection could endanger persons.

Such means may be part of the fixed installation external to the appliance.

After the energy source is disconnected, it shall be possible to dissipate any energy remaining or stored in the circuits of the appliances without risk to persons.

Compliance is checked by inspection.

23 Internal wiring

This clause of Part 1 is applicable.

24 Components

This clause of Part 1 is applicable except as follows.

24.1.3 Addition:

Switches actuated by the device protecting the pull-in area are subjected to 50 000 cycles of operation.

24.101 Thermal cut-outs incorporated in appliances for compliance with [19.4](#) shall not be self-resetting.

Compliance is checked by inspection.

24.102 Switches complying with [EN 61058-1](#) are not short-circuited during the tests of [Clause 19](#). The tests of [EN 61058-1](#) are carried out under the conditions occurring in the appliance.

25 Supply connection and external flexible cords

This clause of Part 1 is applicable.

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26 Terminals for external conductors

This clause of Part 1 is applicable.

27 Provision for earthing

This clause of Part 1 is applicable except as follows:

27.1 Addition:

If the permissible leakage current exceeds 10 mA total, the appliance shall have a supplementary equipotential bonding terminal.

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 except as follows:

29.2 Addition:

The microenvironment is pollution degree 3, and the insulation shall have a CTI not less than 250, unless the insulation is enclosed or located so that it is unlikely to be exposed to pollution during normal use of the appliance

30 Resistance to heat and fire

This clause of Part 1 is applicable except as follows.

Replace the first paragraph starting with "For appliances that are..." by the following:

For parts of the appliance that are electrically energized only during operational use and that are non-metallic material supporting current-carrying connections and non-metallic material within a distance of 3 mm of such connections are subjected to the glow-wire test of [IEC 60695-2-11](#).

Replace the first paragraph starting with "Appliances that are operated..." by the following:

For parts of the appliance that are not tested in accordance with [30.2.2](#) are tested as specified in [30.2.3.1](#) and [30.2.3.2](#).

31 Resistance to rusting

This clause of Part 1 is applicable.

32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable except as follows:

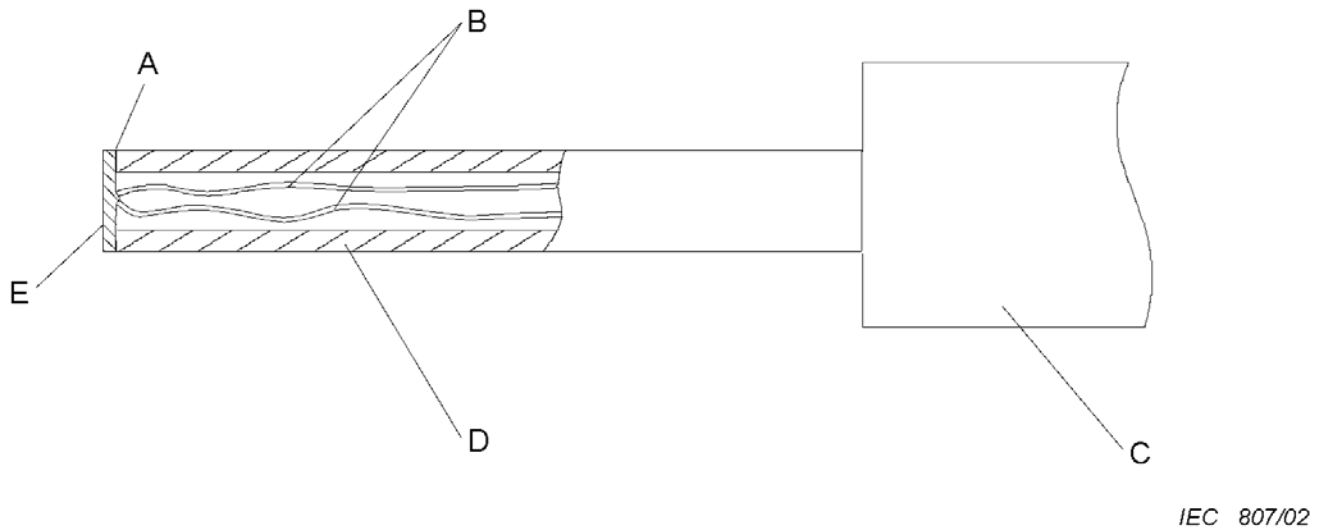
Addition:

For the emissions of electromagnetic fields the limits of [EN 62233:2008](#), Annex B apply.

Compliance is checked by measuring EMF according to [EN 62233](#).

Modification of Figures

Add the following [Figure 104](#)



Key

- A Adhesive
- B Thermocouple wires 0,3 mm diameter to [IEC 60584-1](#) Type K (chrome alumel)
- 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

NOTE The contact face of the disc is flat.

Figure 104 — Probe for measuring surface temperatures

33 Annexes

The annexes of Part 1 are applicable except as follows:

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Annex A (normative)

Software evaluation

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, detection of a fault/error shall occur before compliance with each or any of the [Clauses 19](#), [22.101](#), [22.103](#), [22.107](#) and [22.112](#) 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 each or any of the [Clauses 19](#), [22.101](#), [22.103](#), [22.107](#) and [22.112](#) is impaired.

Annex AA (normative)

Ageing test for elastomeric parts

The ageing test on elastomeric parts is carried out by measuring their hardness and mass before and after immersion in water at elevated temperature.

The test is carried out on at least three samples of each part. The samples and test procedure are as specified in [ISO 1817](#), with the following modifications:

4 Test liquids

The test is carried out with water.

Care is taken to ensure that the total mass of the test pieces immersed does not exceed 100 g for each litre of water, that the test pieces are completely immersed and that their entire surface is freely exposed to the water. During the tests, the test pieces are not exposed to direct light. Test pieces of different compounds are not immersed at the same time in the same solution.

5 Test pieces

5.4 Conditioning

The temperature is $23\text{ °C} \pm 2\text{ °C}$ and the relative humidity is $(50 \pm 5)\%$.

6 Immersion in the test liquid

6.1 Temperature

The water is heated within 1 h with the test pieces immersed, to a temperature of 75_0^{+5} °C and maintained at this value. Water at the same temperature is added to compensate for evaporation.

6.2 Duration

The test pieces are immersed for a total period of 48_0^{+1} h.

The test pieces are then immediately immersed in a fresh water, which is maintained at ambient temperature. The pieces are immersed for $45\text{ min} \pm 15\text{ min}$.

After removal from the water, the test pieces are dried with blotting paper.

7 Procedure

7.2 Change in mass

The increase in mass of the test pieces shall not exceed 10 % of the value determined before immersion.

7.6 Change in hardness

The micro-test for hardness applies.

The hardness of the test pieces shall not have changed by more than 8 IRHD. Their surface shall not have become sticky and shall show no crack visible to the naked eye or any other deterioration.

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Annex ZA (informative)

Specific additional requirements for appliances and machines intended for commercial use

This annex of Part 1 is not applicable.

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Annex ZZA

(informative)

This annex of Part 1 is not applicable

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Bibliography

The bibliography of Part 1 is applicable except as follows.

Addition:

[HD 60364](#), Low-voltage electrical installations

[EN ISO 4180](#), Packaging – Complete, filled transport packages – General rules for the compilation of performance test schedules (ISO 4180)

[EN ISO 12100:2010](#), Safety of machinery – General principles for design – Risk assessment and risk reduction (ISO 12100:2010)

[EN ISO 10472-5](#), Safety requirements for industrial laundry machinery – Part 5: Flatwork ironers, feeders and folders (ISO 10472-5)

[ISO 13732-1](#), Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces