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COMMENTED VERSION

INTERNATIONAL STANDARD

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Household and similar electrical appliances – Safety –
Part 2-13: Particular requirements for deep fat fryers, frying pans and similar appliances

IEC 60335-2-13:2021-12 CMV(en)

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Household and similar electrical appliances – Safety – Part 2-13: Particular requirements for deep fat fryers, frying pans and similar appliances

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-13: Particular requirements for deep fat fryers, frying pans and similar appliances

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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This commented version (CMV) of the official standard IEC 60335-2-13:2021 edition 7.0 allows the user to identify the changes made to the previous IEC 60335-2-13:2009 +AMD1:2016 CSV edition 6.1. Futhermore, comments from IEC TC 61 experts are provided to explain the reasons of the most relevant changes.

A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text. Experts' comments are identified by a blue-background number. Mouse over a number to display a pop-up note with the comment.

This publication contains the CMV and the official standard. The full list of comments is available at the end of the CMV.

IEC 60335-2-13 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

This seventh edition cancels and replaces the sixth edition published in 2009 and Amendment 1:2016. 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 (Clause 1, 5.2, 5.101, 7.12, 15.101, 22.35, 24.1.5);
c) exclusion of battery-operated appliances (Clause 1);
d) an additional test has been introduced to limit the temperature rise of external accessible surfaces including marking of hot surfaces (Clause 7, Clause 11).

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

Draft	Report on voting
61/6381/FDIS	61/6431/RVD

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

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

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

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

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

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

This Part 2 supplements or modifies the corresponding clauses in IEC 60335-1, so as to convert that publication into the IEC standard: Particular requirements for deep fat fryers, frying pans and similar appliances.

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.

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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.

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.

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

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

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

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

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

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INTRODUCTION

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

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

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

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

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

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

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

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

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

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

NOTE 2 Horizontal ~~and generic standards~~ 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. ~~For example, in the case of temperature requirements for surfaces on many appliances, generic standards, such as ISO 13732-1 for hot surfaces, are not applicable in addition to Part 1 or part 2 standards.~~ 1

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. 1

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HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-13: Particular requirements for deep fat fryers, frying pans and similar appliances

1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of electric deep fat fryers having a recommended maximum quantity of oil not exceeding 5 l, frying pans, woks and other appliances in which oil is used for cooking, and intended for household use and similar use, their **rated voltage** being not more than 250 V.

Appliances intended for normal household and similar use and that may also be used by laymen in shops, in light industry and on farms are within the scope of this standard. However, if the appliance is intended to be used professionally to process food for commercial consumption, the appliance is not considered to be for household and similar use only.

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.

~~NOTE 101~~ Attention is drawn to the fact that

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

~~NOTE 102~~ This standard does not apply to

– deep fat fryers for commercial use (IEC 60335-2-37);
– commercial multi-purpose cooking pans (IEC 60335-2-39);
– 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);
– **battery-operated appliances**. **2**

2 Normative references

This clause of Part 1 is applicable except as follows.

Replacement:

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IEC 60320-1:2021, *Appliance couplers for household and similar general purposes – Part 1: General requirements*

Addition:

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

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

3.1 Definitions relating to physical characteristics

3.1.9 *Replacement:*
~~**normal operation**~~
operation of the appliance under the following conditions:

Deep fat fryers are operated filled with sunflower oil to the minimum oil level marked on the appliance.

Frying pans are operated filled with frying oil to a height of 10 mm above the highest point of the heated surface until the temperature of the oil attains 250 °C at the centre of the heated surface. The temperature of the oil is maintained at 250 °C ± 15 °C, or at the highest temperature allowed by the **thermostat** if this is lower. If the appliance does not have a **thermostat**, the temperature is maintained by switching the supply on and off.

Woks are filled with frying oil to a depth of 10 mm and operated as specified for frying pans.

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 a tubular heating element.

4 General requirement

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable except as follows.

5.2 *Addition:*

~~NOTE 101~~ *If the test of 15.101 has to be carried out, three additional samples are required.*

5.101 ~~*Deep fat fryers that can also be used as frying pans are tested as deep fat fryers or as frying pans, whichever is more unfavourable.*~~

~~NOTE~~ *Deep fat fryers incorporating heating elements that do not project into the oil container~~,~~ and are not marked with the minimum oil level~~, are considered to be usable~~ can also be used as frying pans. They are tested as deep fat fryers or as frying pans, whichever is more unfavourable.*

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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:*

If appliances have external **accessible surfaces**, for which temperature rise limits are specified in Table 101 and for which the provisions of footnote "b" to Table 101 apply, then the appliance shall be marked with symbol IEC 60417-5041 (2002-10), or with the substance of the following: **3**

CAUTION: Hot surfaces.

Deep fat fryers shall be marked with the maximum oil level. They shall also be marked with the minimum oil level, unless they can be used as frying pans.

Appliances intended to be partially immersed in water for cleaning shall be marked with the maximum level of immersion and with the substance of the following:

Do not immerse beyond this level.

7.6 *Addition:*

[symbol IEC 60417-5041 (2002-10)] caution, hot surface

7.12 *Addition:*

If symbol IEC 60417-5041 (2002-10) is marked on the appliance, its meaning shall be explained.

The instructions for appliances incorporating an appliance inlet, and intended to be partially or completely immersed in water for cleaning, shall state that the connector must be removed before the appliance is cleaned and that the appliance inlet must be dried before the appliance is used again.

The instructions for **portable deep fat fryers** and other appliances not intended to be immersed in water for cleaning shall state that the appliance must not be immersed (instruction not necessary for **portable frying pans**).

~~NOTE 101 **Portable frying pans** are considered to be appliances that are intended to be immersed in water for cleaning.~~

The instructions shall include the substance of the following:

WARNING: Keep the appliance out of reach from young children, particularly during use and cool down. **4**

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The instructions for appliances intended to be used with a connector incorporating a **thermostat** shall state that only the appropriate connector must be used.

The instructions shall include details on how to clean surfaces in contact with food or oil.

The instructions shall state that the appliance is not intended to be operated by means of an external timer or a separate remote-control system.

The instructions shall include the substance of the following:

- This appliance is intended to be used in household and similar applications such as:
  - staff kitchen areas in shops, offices and other working environments;
  - farm houses;
  - those used by clients in hotels, motels and other residential type environments;
  - bed and breakfast type environments.

~~NOTE 102~~ If the manufacturer wants to limit the use of the appliance to less than the above, this ~~must~~ shall be clearly stated in the instructions.

7.14 *Addition:*

The height of the triangle in symbol IEC 60417-5041 (2002-10) shall be at least 5 mm.

7.15 *Addition:*

The marking specified for external **accessible surfaces** shall be visible when the appliance is operated as in normal use, including when actuating any switch, adjusting any control or opening a lid or door. It shall not be placed on a **functional surface**.

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:*

Portable appliances *are placed away from the walls of the test corner.*

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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. **5**

The temperature rise of the oil in deep fat fryers is determined by means of thermocouples attached to disks of copper or brass, 15 mm in diameter and 1 mm thick.

11.7 *Replacement:*

Appliances are operated until steady conditions are established.

11.8 *Addition*:

The temperature of the oil in deep fat fryers and similar appliances is measured at least 10 mm from the wall of the container and 10 mm above the bottom. However, the temperature is measured 10 mm above the highest point of heating elements if they are located in the container. The temperature shall not exceed 225 °C, except that a temperature of 243 °C is allowed for the first cycle of operation of the ***thermostat****.*

The temperature rise of parts of deep fat fryers likely to be contacted by spilt oil shall not exceed 275 K.

When an appliance connector incorporates a ***thermostat****, the temperature rise limit for the pins of the inlet does not apply.*

After the appliance has cooled down to ***room temperature****, the test is repeated with the appliance supplied at* ***rated power input****.*

During this repeat test, the temperature rise of surfaces shall not exceed the values specified in Table 101. **5**

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

Surface	*Temperature rise of external accessible surfaces* [a, b] *K*
Bare metal	*42*
Coated metal [c]	*49*
Glass and ceramic	*56*
Plastic and plastic coating > 0,4 mm [d, e]	*62*
NOTE The temperature rise limits of knobs, grips, keyboards, keypads and similar parts are specified in Table 3.	

[a] *Temperature rises are not measured on:*
- *lids and covers;*
- ***functional surfaces**;*
- *vessels that contain oil or fat and that become hot through conduction;*
- *surfaces within 25 mm from the edge of the lid;*
- *surfaces within 25 mm from the ventilation openings;*
- *surfaces within 25 mm from the edge of the vessel;*
- *the underside of appliances intended to be used on a working surface; where these surfaces are inaccessible to a 75 mm diameter probe having a hemispherical end, applied with a force not exceeding 1 N.*

[b] *When the required values are not met, the maximum temperature rise shall not be higher than two times the values indicated.*

[c] *Metal is considered coated when a coating having a minimum thickness of 90 µm made of enamel or non-substantially plastic coating is used.*

[d] *The temperature rise limit of plastic also applies for plastic material having a metal finish of thickness less than 0,1 mm.*

[e] *When the thickness of the plastic coating does not exceed 0,4 mm, the temperature rise limits of coated metal for underlying metal apply or the temperature rise limits for glass or ceramic material for underlying glass or ceramic material apply.*

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

This clause of Part 1 is not applicable. **1**

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 except as follows.

15.101 Appliances intended to be partially or completely immersed in water for cleaning shall have adequate protection against the effects of immersion.

Compliance is checked by the following tests, which are carried out on three additional appliances.

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*The appliances are operated under **normal operation** at 1,15 times the **rated power input**, until the **thermostat** operates for the first time. Appliances without a **thermostat** are operated until steady conditions are established. The appliances are disconnected from the supply, any appliance connector being withdrawn. They are then completely immersed in water containing approximately 1 % NaCl and having a temperature between 10 °C and 25 °C, unless they are marked with the maximum level of immersion, in which case they are immersed 50 mm deeper than this level.*

After 1 h, the appliances are removed from the saline solution. They are then dried, taking care that all moisture is removed from the insulation around the pins of appliance inlets and are then subjected to the leakage current test of 16.2.

~~NOTE Care is to be taken to ensure that all moisture is removed from the insulation around the pins of appliance inlets.~~

This test is carried out four more times, after which the appliances shall withstand the electric strength test of 16.3, the voltage being as specified in Table 4.

*The appliance having the highest leakage current after the fifth immersion is dismantled and inspection shall show that there is no trace of liquid on insulation that could result in a reduction of **clearances** and **creepage distances** below the values specified in Clause 29.*

*The remaining two appliances are operated under **normal operation** at 1,15 times the **rated power input** for 240 h. After this period, the appliances are disconnected from the supply and immersed again for 1 h. They are then dried and subjected to the electric strength test of 16.3, the voltage being as specified in Table 4.*

*Inspection shall show that there is no trace of liquid on insulation that could result in a reduction of **clearances** and **creepage distances** below the values specified in Clause 29.*

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.

19.1 *Addition:*

*Deep fat fryers incorporating a **thermal cut-out** of the capillary type are also subjected to the test of 19.101.*

*Deep fat fryers with **detachable heating elements** are also subjected to the test of 19.102.*

Frying pans are not subjected to the tests of 19.4 and 19.5.

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19.2 *Addition:*

Deep fat fryers are filled with oil to a height of 10 mm above the highest point of the bottom of the container. If the heating element is located in the container, the appliance is filled to a height of 10 mm above the highest point of the heating element. If the container has an inclined bottom and a rotating basket, the quantity of oil is 60 % of that required to fill the appliance to the minimum marked level.

Frying pans are operated without oil in the container.

19.3 *Modification:*

Frying pans are tested at 1,15 times the ***rated power input****, the* ***thermostat*** *being adjusted to its highest setting.*

19.13 *Addition:*

The temperature of the oil in deep fat fryers and the temperature at the centre of the heated surface of frying pans shall not exceed 295 °C. During the tests of 19.2 and 19.3, the temperature of the oil in deep fat fryers, measured 5 mm below the oil level and at a distance of not less than 5 mm from any surface inside the container, shall not exceed 265 °C. However, a temperature of 280 °C is allowed for the first cycle of operation of the ***thermostat****.*

A temperature rise of 200 K is allowed for the floor and the walls of the test corner during the first minute of the test of 19.102.

19.101 *Deep fat fryers incorporating a* ***thermal cut-out*** *of the capillary type are tested as specified in 19.4 but with the capillary tube ruptured.*

19.102 ***Detachable heating elements****, which are not automatically disconnected from the supply when they are removed from the deep fat fryer, are placed on the floor of the test corner in the most unfavourable position and operated at* ***rated power input****.*

20 Stability and mechanical hazards

This clause of Part 1 is applicable.

21 Mechanical strength

This clause of Part 1 is applicable.

22 Construction

This clause of Part 1 is applicable except as follows.

22.12 *Addition:*

The test on handles of deep fat fryers is carried out with the appliance at the operating temperature obtained during the test of Clause 11. A vertical force is applied for 30 s to the lifting surface of each handle of the appliance.

The force applied on each handle is:

– *1,5 w for an appliance with one handle,*

– *0,75 w for an appliance with more than one handle,*

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where w is the weight of the appliance when filled with oil to the maximum marked level.

During the test, the handles shall not work loose or become detached from the appliance.

22.35 *Addition:*

~~NOTE 101 Handles and similar parts of accessories that do not incorporate electrical components are not considered likely to become live in the event of an insulation fault.~~

The requirement does not apply to handles and similar parts of accessories that do not incorporate electrical components.

22.101 Thermal controls shall not be incorporated in connectors complying with the standard sheets of IEC 60320-3. **6**

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.

24.1.5 *Addition:*

*For appliance couplers incorporating **thermostats**, **thermal cut-outs** or fuses in the connector, IEC 60320-1:2021 is applicable except that*

- *the earthing contact of the connector is allowed to be accessible, provided that this contact is not likely to be gripped during insertion or withdrawal of the connector;*
- *the temperature required for the test of Clause 18 is that measured on the pins of the appliance inlet during the heating test of Clause 11 of this standard;*
- *the breaking-capacity test of Clause 19 is carried out using the inlet of the appliance;*
- *the temperature rise of current-carrying parts specified in Clause 21 is not determined.*

~~NOTE 101 Thermal controls are not allowed in connectors complying with the standard sheets of IEC 60320-1.~~

24.101 **Thermal cut-outs** incorporated in appliances for compliance with 19.4 shall not be self-resetting.

Compliance is checked by inspection.

25 Supply connection and external flexible cords

This clause of Part 1 is applicable except as follows.

~~**25.1** *Addition:*~~

~~Appliances incorporating an appliance inlet that does not comply with the standard sheets of IEC 60320-1 shall be supplied with a cord set.~~ **1**

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25.7 *Addition:*

Rubber sheathed cords shall be not lighter than ordinary polychloroprene sheathed cords (code designation 60245 IEC 57).

25.14 Not 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 except as follows.

29.2 *Addition:*

The microenvironment is pollution degree 3 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.

30.2 *Addition:*

For frying pans, 30.2.2 is applicable. For deep fat fryers, 30.2.3 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.

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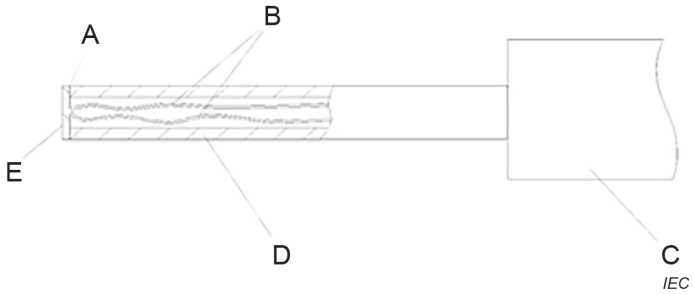

Key

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

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Annexes

The annexes of Part 1 are applicable except as follows.

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Annex B
(normative)

Battery-operated appliances, separable batteries and detachable batteries for battery-operated appliances 2

Annex B of Part 1 is not applicable.

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Bibliography

The bibliography of Part 1 is applicable except as follows.

Addition:

IEC 60335-2-37, *Household and similar electrical appliances − Safety − Part 2-37: Particular requirements for commercial electric doughnut fryers and deep fat fryers*

IEC 60335-2-39, *Household and similar electrical appliances – Safety – Part 2-39: Particular requirements for commercial electric multi-purpose cooking pans*

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List of comments

1 This revision is for alignment with IEC 60335-1:2020.

2 Battery-operated appliances are not anticipated for the appliances covered by this Part 2 Standard.

3 Limits on the temperature rise of external accessible surfaces are introduced to address the risk of thermal injury from contact with external accessible surfaces, including marking of hot surfaces.

4 This instruction is intended to warn the user of the risk of thermal injury to children during use and cool down of the appliance.

5 Limits on the temperature rise of external accessible surfaces are introduced to address the risk of thermal injury from contact with external accessible surfaces.

6 This requirement is relocated from the Note in 24.1.5.

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IEC 60335-2-13

Edition 7.0 2021-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Household and similar electrical appliances – Safety –
Part 2-13: Particular requirements for deep fat fryers, frying pans and similar appliances

Appareils électrodomestiques et analogues – Sécurité –
Partie 2-13: Exigences particulières pour les friteuses, les poêles à frire et appareils analogues

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IEC 60335-2-13:2021-11(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-13: Particular requirements for deep fat fryers, frying pans and similar appliances

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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IEC 60335-2-13 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

This seventh edition cancels and replaces the sixth edition published in 2009 and Amendment 1:2016. 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 (Clause 1, 5.2, 5.101, 7.12, 15.101, 22.35, 24.1.5);
c) exclusion of battery-operated appliances (Clause 1);
d) an additional test has been introduced to limit the temperature rise of external accessible surfaces including marking of hot surfaces (Clause 7, Clause 11).

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

Draft	Report on voting
61/6381/FDIS	61/6431/RVD

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

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

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

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

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

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

This Part 2 supplements or modifies the corresponding clauses in IEC 60335-1, so as to convert that publication into the IEC standard: Particular requirements for deep fat fryers, frying pans and similar appliances.

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.

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.

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

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

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

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

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INTRODUCTION

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-13: Particular requirements for deep fat fryers, frying pans and similar appliances

1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of electric deep fat fryers having a recommended maximum quantity of oil not exceeding 5 l, frying pans, woks and other appliances in which oil is used for cooking, and intended for household use and similar use, their **rated voltage** being not more than 250 V.

Appliances intended for normal household and similar use and that may also be used by laymen in shops, in light industry and on farms are within the scope of this standard. However, if the appliance is intended to be used professionally to process food for commercial consumption, the appliance is not considered to be for household and similar use only.

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

– deep fat fryers for commercial use (IEC 60335-2-37);
– commercial multi-purpose cooking pans (IEC 60335-2-39);
– 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);
– **battery-operated appliances**.

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2 Normative references

This clause of Part 1 is applicable except as follows.

Replacement:

IEC 60320-1:2021, *Appliance couplers for household and similar general purposes – Part 1: General requirements*

Addition:

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

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

3.1 Definitions relating to physical characteristics

3.1.9 *Replacement:*
operation of the appliance under the following conditions:

Deep fat fryers are operated filled with sunflower oil to the minimum oil level marked on the appliance.

Frying pans are operated filled with frying oil to a height of 10 mm above the highest point of the heated surface until the temperature of the oil attains 250 °C at the centre of the heated surface. The temperature of the oil is maintained at 250 °C ± 15 °C, or at the highest temperature allowed by the **thermostat** if this is lower. If the appliance does not have a **thermostat**, the temperature is maintained by switching the supply on and off.

Woks are filled with frying oil to a depth of 10 mm and operated as specified for frying pans.

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 a tubular heating element.

4 General requirement

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable except as follows.

5.2 *Addition:*

If the test of 15.101 has to be carried out, three additional samples are required.

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5.101 *Deep fat fryers incorporating heating elements that do not project into the oil container and are not marked with the minimum oil level can also be used as frying pans. They are tested as deep fat fryers or as frying pans, whichever is more unfavourable.*

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:*

If appliances have external **accessible surfaces**, for which temperature rise limits are specified in Table 101 and for which the provisions of footnote "b" to Table 101 apply, then the appliance shall be marked with symbol IEC 60417-5041 (2002-10), or with the substance of the following:

CAUTION: Hot surfaces.

Deep fat fryers shall be marked with the maximum oil level. They shall also be marked with the minimum oil level, unless they can be used as frying pans.

Appliances intended to be partially immersed in water for cleaning shall be marked with the maximum level of immersion and with the substance of the following:

Do not immerse beyond this level.

7.6 *Addition:*

[symbol IEC 60417-5041 (2002-10)] caution, hot surface

7.12 *Addition:*

If symbol IEC 60417-5041 (2002-10) is marked on the appliance, its meaning shall be explained.

The instructions for appliances incorporating an appliance inlet, and intended to be partially or completely immersed in water for cleaning, shall state that the connector must be removed before the appliance is cleaned and that the appliance inlet must be dried before the appliance is used again.

The instructions for **portable deep fat fryers** and other appliances not intended to be immersed in water for cleaning shall state that the appliance must not be immersed (instruction not necessary for **portable frying pans**).

The instructions shall include the substance of the following:

WARNING: Keep the appliance out of reach from young children, particularly during use and cool down.

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The instructions for appliances intended to be used with a connector incorporating a **thermostat** shall state that only the appropriate connector must be used.

The instructions shall include details on how to clean surfaces in contact with food or oil.

The instructions shall state that the appliance is not intended to be operated by means of an external timer or a separate remote-control system.

The instructions shall include the substance of the following:

- This appliance is intended to be used in household and similar applications such as:
  - staff kitchen areas in shops, offices and other working environments;
  - farm houses;
  - those used by clients in hotels, motels and other residential type environments;
  - bed and breakfast type environments.

If the manufacturer wants to limit the use of the appliance to less than the above, this shall be clearly stated in the instructions.

7.14 *Addition:*

The height of the triangle in symbol IEC 60417-5041 (2002-10) shall be at least 5 mm.

7.15 *Addition:*

The marking specified for external **accessible surfaces** shall be visible when the appliance is operated as in normal use, including when actuating any switch, adjusting any control or opening a lid or door. It shall not be placed on a **functional surface**.

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:*

Portable appliances *are placed away from the walls of the test corner.*

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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.

The temperature rise of the oil in deep fat fryers is determined by means of thermocouples attached to disks of copper or brass, 15 mm in diameter and 1 mm thick.

11.7 *Replacement:*

Appliances are operated until steady conditions are established.

11.8 *Addition*:

The temperature of the oil in deep fat fryers and similar appliances is measured at least 10 mm from the wall of the container and 10 mm above the bottom. However, the temperature is measured 10 mm above the highest point of heating elements if they are located in the container. The temperature shall not exceed 225 °C, except that a temperature of 243 °C is allowed for the first cycle of operation of the ***thermostat****.*

The temperature rise of parts of deep fat fryers likely to be contacted by spilt oil shall not exceed 275 K.

When an appliance connector incorporates a ***thermostat****, the temperature rise limit for the pins of the inlet does not apply.*

After the appliance has cooled down to ***room temperature****, the test is repeated with the appliance supplied at* ***rated power input****.*

During this repeat test, the temperature rise of surfaces shall not exceed the values specified in Table 101.

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

Surface	*Temperature rise of external accessible surfaces* [a, b] *K*
Bare metal	*42*
Coated metal [c]	*49*
Glass and ceramic	*56*
Plastic and plastic coating > 0,4 mm [d, e]	*62*
NOTE The temperature rise limits of knobs, grips, keyboards, keypads and similar parts are specified in Table 3.	

[a] *Temperature rises are not measured on:*
- *lids and covers;*
- ***functional surfaces**;*
- *vessels that contain oil or fat and that become hot through conduction;*
- *surfaces within 25 mm from the edge of the lid;*
- *surfaces within 25 mm from the ventilation openings;*
- *surfaces within 25 mm from the edge of the vessel;*
- *the underside of appliances intended to be used on a working surface; where these surfaces are inaccessible to a 75 mm diameter probe having a hemispherical end, applied with a force not exceeding 1 N.*

[b] *When the required values are not met, the maximum temperature rise shall not be higher than two times the values indicated.*

[c] *Metal is considered coated when a coating having a minimum thickness of 90 µm made of enamel or non-substantially plastic coating is used.*

[d] *The temperature rise limit of plastic also applies for plastic material having a metal finish of thickness less than 0,1 mm.*

[e] *When the thickness of the plastic coating does not exceed 0,4 mm, the temperature rise limits of coated metal for underlying metal apply or the temperature rise limits for glass or ceramic material for underlying glass or ceramic material apply.*

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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 except as follows.

15.101 Appliances intended to be partially or completely immersed in water for cleaning shall have adequate protection against the effects of immersion.

Compliance is checked by the following tests, which are carried out on three additional appliances.

*The appliances are operated under **normal operation** at 1,15 times the **rated power input**, until the **thermostat** operates for the first time. Appliances without a **thermostat** are operated until steady conditions are established. The appliances are disconnected from the supply, any appliance connector being withdrawn. They are then completely immersed in water containing approximately 1 % NaCl and having a temperature between 10 °C and 25 °C, unless they are marked with the maximum level of immersion, in which case they are immersed 50 mm deeper than this level.*

After 1 h, the appliances are removed from the saline solution. They are then dried, taking care that all moisture is removed from the insulation around the pins of appliance inlets and are then subjected to the leakage current test of 16.2.

This test is carried out four more times, after which the appliances shall withstand the electric strength test of 16.3, the voltage being as specified in Table 4.

*The appliance having the highest leakage current after the fifth immersion is dismantled and inspection shall show that there is no trace of liquid on insulation that could result in a reduction of **clearances** and **creepage distances** below the values specified in Clause 29.*

*The remaining two appliances are operated under **normal operation** at 1,15 times the **rated power input** for 240 h. After this period, the appliances are disconnected from the supply and immersed again for 1 h. They are then dried and subjected to the electric strength test of 16.3, the voltage being as specified in Table 4.*

*Inspection shall show that there is no trace of liquid on insulation that could result in a reduction of **clearances** and **creepage distances** below the values specified in Clause 29.*

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.

19.1 *Addition:*

*Deep fat fryers incorporating a **thermal cut-out** of the capillary type are also subjected to the test of 19.101.*

*Deep fat fryers with **detachable heating elements** are also subjected to the test of 19.102.*

Frying pans are not subjected to the tests of 19.4 and 19.5.

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19.2 *Addition:*

Deep fat fryers are filled with oil to a height of 10 mm above the highest point of the bottom of the container. If the heating element is located in the container, the appliance is filled to a height of 10 mm above the highest point of the heating element. If the container has an inclined bottom and a rotating basket, the quantity of oil is 60 % of that required to fill the appliance to the minimum marked level.

Frying pans are operated without oil in the container.

19.3 *Modification:*

*Frying pans are tested at 1,15 times the **rated power input**, the **thermostat** being adjusted to its highest setting.*

19.13 *Addition:*

*The temperature of the oil in deep fat fryers and the temperature at the centre of the heated surface of frying pans shall not exceed 295 °C. During the tests of 19.2 and 19.3, the temperature of the oil in deep fat fryers, measured 5 mm below the oil level and at a distance of not less than 5 mm from any surface inside the container, shall not exceed 265 °C. However, a temperature of 280 °C is allowed for the first cycle of operation of the **thermostat**.*

A temperature rise of 200 K is allowed for the floor and the walls of the test corner during the first minute of the test of 19.102.

19.101 *Deep fat fryers incorporating a **thermal cut-out** of the capillary type are tested as specified in 19.4 but with the capillary tube ruptured.*

19.102 ***Detachable heating elements**, which are not automatically disconnected from the supply when they are removed from the deep fat fryer, are placed on the floor of the test corner in the most unfavourable position and operated at **rated power input**.*

20 Stability and mechanical hazards

This clause of Part 1 is applicable.

21 Mechanical strength

This clause of Part 1 is applicable.

22 Construction

This clause of Part 1 is applicable except as follows.

22.12 *Addition:*

The test on handles of deep fat fryers is carried out with the appliance at the operating temperature obtained during the test of Clause 11. A vertical force is applied for 30 s to the lifting surface of each handle of the appliance.

The force applied on each handle is:

– *1,5 w for an appliance with one handle,*

– *0,75 w for an appliance with more than one handle,*

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where w is the weight of the appliance when filled with oil to the maximum marked level.

During the test, the handles shall not work loose or become detached from the appliance.

22.35 *Addition:*

The requirement does not apply to handles and similar parts of accessories that do not incorporate electrical components.

22.101 Thermal controls shall not be incorporated in connectors complying with the standard sheets of IEC 60320-3.

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.

24.1.5 *Addition:*

*For appliance couplers incorporating **thermostats**, **thermal cut-outs** or fuses in the connector, IEC 60320-1:2021 is applicable except that*

- *the earthing contact of the connector is allowed to be accessible, provided that this contact is not likely to be gripped during insertion or withdrawal of the connector;*
- *the temperature required for the test of Clause 18 is that measured on the pins of the appliance inlet during the heating test of Clause 11 of this standard;*
- *the breaking-capacity test of Clause 19 is carried out using the inlet of the appliance;*
- *the temperature rise of current-carrying parts specified in Clause 21 is not determined.*

24.101 **Thermal cut-outs** incorporated in appliances for compliance with 19.4 shall not be self-resetting.

Compliance is checked by inspection.

25 Supply connection and external flexible cords

This clause of Part 1 is applicable except as follows.

25.7 *Addition:*

Rubber sheathed cords shall be not lighter than ordinary polychloroprene sheathed cords (code designation 60245 IEC 57).

25.14 Not applicable.

26 Terminals for external conductors

This clause of Part 1 is applicable.

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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 except as follows.

29.2 *Addition:*

The microenvironment is pollution degree 3 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.

30.2 *Addition:*

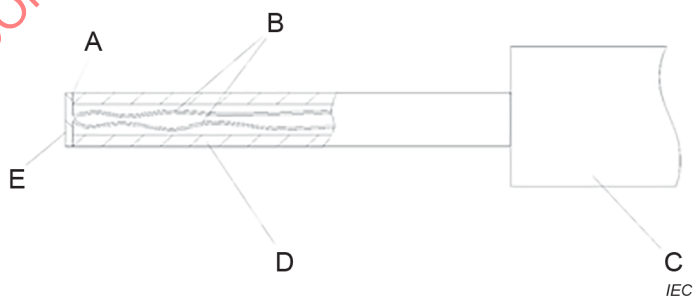
For frying pans, 30.2.2 is applicable. For deep fat fryers, 30.2.3 is applicable.

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

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Annexes

The annexes of Part 1 are applicable except as follows.

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Annex B
(normative)

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

Annex B of Part 1 is not applicable.

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Bibliography

The bibliography of Part 1 is applicable except as follows.

Addition:

IEC 60335-2-37, *Household and similar electrical appliances − Safety − Part 2-37: Particular requirements for commercial electric doughnut fryers and deep fat fryers*

IEC 60335-2-39, *Household and similar electrical appliances – Safety – Part 2-39: Particular requirements for commercial electric multi-purpose cooking pans*

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES – SÉCURITÉ –

Partie 2-13: Exigences particulières pour les friteuses, les poêles à frire et appareils analogues

AVANT-PROPOS

1) La Commission Electrotechnique Internationale (IEC) est une organisation mondiale de normalisation composée de l'ensemble des comités électrotechniques nationaux (Comités nationaux de l'IEC). L'IEC a pour objet de favoriser la coopération internationale pour toutes les questions de normalisation dans les domaines de l'électricité et de l'électronique. A cet effet, l'IEC – entre autres activités – publie des Normes internationales, des Spécifications techniques, des Rapports techniques, des Spécifications accessibles au public (PAS) et des Guides (ci-après dénommés "Publication(s) de l'IEC"). Leur élaboration est confiée à des comités d'études, aux travaux desquels tout Comité national intéressé par le sujet traité peut participer. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'IEC, participent également aux travaux. L'IEC collabore étroitement avec l'Organisation Internationale de Normalisation (ISO), selon des conditions fixées par accord entre les deux organisations.
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9) L'attention est attirée sur le fait que certains des éléments de la présente Publication de l'IEC peuvent faire l'objet de droits de brevet. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié de tels droits de brevets.

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L'IEC 60335-2-13 a été établie par le comité d'études 61 de l'IEC: Sécurité des appareils électrodomestiques et analogues. Il s'agit d'une Norme internationale.

Cette septième édition annule et remplace la sixième édition parue en 2009 et l'Amendement 1:2016. Cette édition constitue une révision technique.

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

a) alignement du texte sur l'IEC 60335-1:2020;
b) conversion en texte normatif de certaines notes (Article 1, 5.2, 5.101, 7.12, 15.101, 22.35, 24.1.5);

c) exclusion des appareils alimentés par batteries (Article 1);

d) introduction d'un essai supplémentaire pour limiter l'échauffement des surfaces accessibles extérieures, y compris le marquage des surfaces chaudes (Article 7, Article 11).

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

Projet	Rapport de vote
61/6381/FDIS	61/6431/RVD

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

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

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

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

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

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

La présente Partie 2 complète ou modifie les articles correspondants de l'IEC 60335-1, de façon à transformer cette publication en norme IEC: Exigences particulières pour les friteuses, les poêles à frire et appareils analogues.

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

NOTE 2 Le système de numérotation suivant est utilisé:

– les paragraphes, tableaux et figures qui s'ajoutent à ceux de la Partie 1 sont numérotés à partir de 101;

– à l'exception de celles qui sont dans un nouveau paragraphe ou de celles qui concernent des notes de la Partie 1, les notes sont numérotées à partir de 101, y compris celles des articles ou paragraphes qui sont remplacés;

– les annexes qui sont ajoutées sont désignées AA, BB, etc.

NOTE 3 Les caractères d'imprimerie suivants sont utilisés:

– exigences: caractères romains;

– *modalités d'essais: caractères italiques*;

– notes: petits caractères romains.

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

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

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

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

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

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

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INTRODUCTION

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES – SÉCURITÉ –

Partie 2-13: Exigences particulières pour les friteuses, les poêles à frire et appareils analogues

1 Domaine d'application

L'article de la Partie 1 est remplacé par le texte suivant.

La présente partie de l'IEC 60335 traite de la sécurité des friteuses dont la quantité d'huile maximale recommandée ne dépasse pas 5 l, ainsi que des poêles à frire, woks et autres appareils électriques qui utilisent de l'huile pour la cuisson, qui sont destinés à un usage domestique et analogue, et dont la **tension assignée** est inférieure ou égale à 250 V.

Les appareils destinés à un usage domestique normal et analogue et qui peuvent également être utilisés par des usagers non avertis dans des magasins, chez des artisans et dans des fermes, sont compris dans le domaine d'application de la présente norme. Toutefois, si l'appareil est destiné à être utilisé par des professionnels pour la préparation d'aliments à des fins commerciales, cet appareil n'est pas considéré comme étant destiné uniquement à un usage domestique et analogue.

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

– des personnes (y compris des enfants) dont:
  - les capacités physiques, sensorielles ou mentales; ou
  - le manque d'expérience et de connaissance

  les empêchent d'utiliser l'appareil en toute sécurité sans surveillance ou instruction;
– de l'utilisation de l'appareil comme jouet par des enfants.

L'attention est attirée sur le fait que:

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

La présente norme ne s'applique pas

– aux friteuses à usage commercial (IEC 60335-2-37);
– aux sauteuses à usage commercial (IEC 60335-2-39);
– aux appareils destinés à être utilisés dans des locaux qui présentent des conditions particulières, telles que la présence d'une atmosphère corrosive ou explosive (poussière, vapeur ou gaz);
– aux **appareils alimentés par batteries**.

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2 Références normatives

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

Remplacement:

IEC 60320-1:2021, *Connecteurs pour usages domestiques et usages généraux analogues – Partie 1: Exigences générales*

Addition:

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

3 Termes et définitions

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

3.1 Définitions relatives aux caractéristiques physiques

3.1.9 *Remplacement:*
fonctionnement de l'appareil dans les conditions suivantes:

Les friteuses sont mises en fonctionnement remplies d'huile de tournesol jusqu'au niveau d'huile minimal marqué sur l'appareil.

Les poêles à frire sont remplies d'huile de friture jusqu'à une hauteur de 10 mm au-dessus du point le plus haut de la surface chauffée et mises en fonctionnement jusqu'à ce que la température de l'huile atteigne 250 °C au centre de la surface chauffée. La température de l'huile est alors maintenue à 250 °C ± 15 °C ou à la température maximale admise par le **thermostat** si celle-ci est inférieure. Si l'appareil ne comporte pas de **thermostat**, la température est maintenue par établissement et coupure de l'alimentation.

Les woks sont remplis d'huile de friture jusqu'à une hauteur de 10 mm et mis en fonctionnement comme cela est spécifié pour les poêles à frire.

3.6 Définitions relatives aux parties d'un appareil

3.6.101
surface fonctionnelle
surface qui est volontairement chauffée par une source de chaleur interne et qui doit être chaude pour assurer la fonction prévue de l'appareil

Note 1 à l'article: La gaine chauffée d'un élément chauffant tubulaire constitue un exemple.

4 Exigences générales

L'article de la Partie 1 est applicable.

5 Conditions générales d'essais

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

5.2 *Addition:*

Si l'essai du 15.101 doit être réalisé, trois échantillons supplémentaires sont exigés.

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5.101 *Les friteuses, dont les éléments chauffants ne font pas saillie dans le récipient d'huile et qui ne comportent pas un marquage du niveau d'huile minimal, peuvent également être utilisées comme des poêles à frire. Elles sont soumises à l'essai comme des friteuses ou comme des poêles à frire, selon le cas le plus défavorable.*

6 Classification

L'article de la Partie 1 est applicable.

7 Marquage et instructions

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

7.1 *Addition:*

Si des appareils possèdent des **surfaces accessibles** extérieures, pour lesquelles des limites d'échauffement sont spécifiées dans le Tableau 101 et pour lesquelles les dispositions de la note de bas de tableau "b" du Tableau 101 s'appliquent, l'appareil doit porter un marquage sur lequel est apposé le symbole IEC 60417-5041 (2002-10) ou qui comporte en substance l'indication suivante:

ATTENTION: Surfaces chaudes.

Le niveau d'huile maximal doit être marqué sur les friteuses. Celles-ci doivent également comporter un marquage du niveau d'huile minimal, sauf si elles peuvent être utilisées comme des poêles à frire.

Les appareils destinés à être immergés partiellement dans l'eau pour le nettoyage doivent porter un marquage, qui indique le niveau maximal d'immersion et qui comporte en substance l'indication suivante:

Ne pas immerger au-dessus de ce niveau.

7.6 *Addition:*

[symbole IEC 60417-5041 (2002-10)] attention: surface chaude

7.12 *Addition:*

Si le symbole IEC 60417-5041 (2002-10) est marqué sur l'appareil, sa signification doit être expliquée.

Les instructions pour les appareils qui sont équipés d'un socle de connecteur, et qui sont destinés à être partiellement ou complètement immergés dans l'eau pour le nettoyage, doivent indiquer que la prise mobile de connecteur doit être débranchée avant de nettoyer l'appareil et que le socle de connecteur doit être séché avant une nouvelle utilisation de l'appareil.

Les instructions pour les **friteuses mobiles** et les autres appareils qui ne sont pas destinés à être immergés dans l'eau pour le nettoyage doivent indiquer que l'appareil ne doit pas être immergé (instruction non nécessaire pour les **poêles à frire mobiles**).

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