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

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

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

About the IEC
The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications
The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC online collection - oc.iec.ch
Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org
The world's leading online dictionary on electrotechnology, containing more than 22 000 terminological entries in English and French, with equivalent terms in 18 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

A propos de l'IEC
La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC
Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC - webstore.iec.ch/advsearchform
La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études, ...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished
Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc
Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

IEC online collection - oc.iec.ch
Découvrez notre puissant moteur de recherche et consultez gratuitement tous les aperçus des publications. Avec un abonnement, vous aurez toujours accès à un contenu à jour adapté à vos besoins.

Electropedia - www.electropedia.org
Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 000 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 16 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

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

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 13.120; 97.040.50

ISBN 978-2-8322-1044-4

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

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.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 60335-2-13 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.

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.

INTRODUCTION

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-13: 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**.

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.

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.

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.*

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.

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**.

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.

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 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.

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,*

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.

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:*

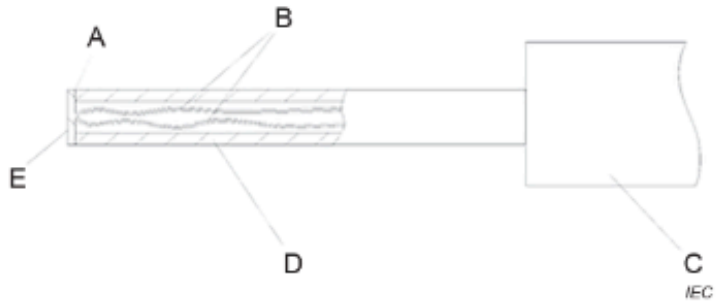
For frying pans, 30.2.2 is applicable. For deep fat fryers, 30.2.3 is applicable.

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

Annexes

The annexes of Part 1 are applicable except as follows.

Annex B
(normative)

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

Annex B of Part 1 is not applicable.

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*

_____

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

3, rue de Varembé
PO Box 131
CH-1211 Geneva 20
Switzerland

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