

# INTERNATIONAL STANDARD



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

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

Tel.: +41 22 919 02 11  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

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IEC 60335-2-13

Edition 7.0 2021-12  
COMMENTED VERSION

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INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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ICS 13.120; 97.040.50

ISBN 978-2-8322-4056-4

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

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

#### FOREWORD

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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. Furthermore, 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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://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](http://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.**



## 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

## 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 <https://standards.iten.ai/60335-2-13-2021> prevents them from using the appliance safely without supervision or instruction; [60335-2-13-2021](https://standards.iten.ai/60335-2-13-2021)
- 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:*

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.

## 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

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### 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**

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.

### 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  $4\text{ N} \pm 1\text{ N}$  to the surface in such a way that the best possible contact between the probe and the surface is ensured. 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**