

INTERNATIONAL STANDARD

Household and similar electrical appliances – Safety –
Part 2-37: Particular requirements for commercial electric doughnut fryers and
deep fat fryers (<https://standards.iteh.ai>)

Document Preview

[IEC 60335-2-37:2021](https://standards.iteh.ai/catalog/standards/iec/02726773-c3f2-494d-b2f7-fdfe5ce96f8c/iec-60335-2-37-2021)

<https://standards.iteh.ai/catalog/standards/iec/02726773-c3f2-494d-b2f7-fdfe5ce96f8c/iec-60335-2-37-2021>



THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2025 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Secretariat
3, rue de Varembe
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 It also gives information on projects, replaced and withdrawn publications.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 Products & Services Portal - products.iec.ch

Discover our powerful search engine and read freely all the publications previews, graphical symbols and the glossary. 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 22 500 terminological entries in English and French, with equivalent terms in 25 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

International Standards
Document Preview
standards.iteh.ai

[IEC 60335-2-37:2021](https://standards.iteh.ai/catalog/standards/iec/02726773-c3f2-494d-b2f7-fdfe5ce96f8c/iec-60335-2-37-2021)

<https://standards.iteh.ai/catalog/standards/iec/02726773-c3f2-494d-b2f7-fdfe5ce96f8c/iec-60335-2-37-2021>



IEC 60335-2-37

Edition 7.1 2025-02
CONSOLIDATED VERSION

INTERNATIONAL STANDARD

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

<https://standards.iteh.ai>
Document Preview

[IEC 60335-2-37:2021](https://standards.iteh.ai/catalog/standards/iec/02726773-c3f2-494d-b2f7-fdfe5ce96f8c/iec-60335-2-37-2021)

<https://standards.iteh.ai/catalog/standards/iec/02726773-c3f2-494d-b2f7-fdfe5ce96f8c/iec-60335-2-37-2021>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 97.040.50

ISBN 978-2-8327-0218-5

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references	8
3 Terms and definitions	9
4 General requirement.....	10
5 General conditions for the tests	10
6 Classification.....	11
7 Marking and instructions.....	11
8 Protection against access to live parts.....	14
9 Starting of motor-operated appliances	14
10 Power input and current.....	14
11 Heating.....	14
12 Charging of metal-ion batteries.....	16
13 Leakage current and electric strength at operating temperature.....	16
14 Transient overvoltages	17
15 Moisture resistance	17
16 Leakage current and electric strength.....	18
17 Overload protection of transformers and associated circuits	19
18 Endurance	19
19 Abnormal operation	19
20 Stability and mechanical hazards.....	20
21 Mechanical strength	21
22 Construction	21
23 Internal wiring.....	24
24 Components	24
25 Supply connection and external flexible cords	25
26 Terminals for external conductors.....	25
27 Provision for earthing	25
28 Screws and connections	25
29 Clearances, creepage distances and solid insulation	26
30 Resistance to heat and fire	26
31 Resistance to rusting.....	27
32 Radiation, toxicity and similar hazards.....	27
Annexes	30
Annex B (normative) Battery-operated appliances, separable batteries and detachable batteries for battery-operated appliances.....
Annex P (informative) Guidance for the application of this standard to appliances used in tropical climates.....	32
Bibliography.....	33
Figure 101 – Probe for measuring surface temperatures.....	27

Figure 102 – Identification of surfaces for temperature measurement	28
Figure 103 – Splash apparatus	29
Table 101 – Maximum temperature rises for specified external accessible surfaces under normal operating conditions	16
Table 102 – Assembling torques for screwed connections providing earthing continuity	26

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[IEC 60335-2-37:2021](https://standards.iteh.ai/catalog/standards/iec/02726773-c3f2-494d-b2f7-fdfe5ce96f8c/iec-60335-2-37-2021)

<https://standards.iteh.ai/catalog/standards/iec/02726773-c3f2-494d-b2f7-fdfe5ce96f8c/iec-60335-2-37-2021>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –
SAFETY –****Part 2-37: Particular requirements for commercial electric
doughnut fryers and deep fat fryers**

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) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 60335-2-37 edition 7.1 contains the seventh edition (2021-11) [documents 61/6376/FDIS and 61/6426/RVD] and its amendment 1 (2025-02) [documents 61/7243/CDV and 61/7350/RVC].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

IEC 60335-2-37 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 2017. 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 or modified (Clause 1, 7.15, 15.102, 19.1, 22.101, 22.104, 22.105, 22.110, 27.2, 30.101);
- c) conciliation of the text of IEC 60335-2-37 with other standards under IEC/TC61/MT32;
- d) exclusion of battery-operated appliances and appliances used in areas open to the public (Clause 1);
- e) clarification of the testing procedure in 15.1.1;
- f) relocation of cleaning instructions from 7.12.1 to 7.12;
- g) relocation of 24.101 to 22.121;
- h) clarification on the test conditions in 19.1 and 23.3;
- i) clarifications in the requirements in 25.3.

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 commercial electric doughnut fryers and deep fat fryers.

When a particular subclause of Part 1 is not mentioned in this Part 2, that subclause applies as far as is reasonable. When this standard states "addition", "modification" or "replacement", the relevant text in Part 1 is to be adapted accordingly.

NOTE 2 The following numbering system is used:

- subclauses, tables and figures that are numbered starting from 101 are additional to those in Part 1;
- unless notes are in a new subclause or involve notes in Part 1, they are numbered starting from 101, including those in a replaced clause or subclause;
- additional annexes are lettered AA, BB, etc.

NOTE 3 The following print types are used:

- requirements: in roman type;
- *test specifications: in italic type;*
- notes: in small roman type.

Words in **bold** in the text are defined in Clause 3. When a definition concerns an adjective, the adjective and the associated noun are also in bold.

The committee has decided that the contents of this document and its amendment 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, or
- revised.

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 from the date of publication.

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[IEC 60335-2-37:2021](https://standards.iteh.ai/catalog/standards/iec/02726773-c3f2-494d-b2f7-fdfe5ce96f8c/iec-60335-2-37-2021)

<https://standards.iteh.ai/catalog/standards/iec/02726773-c3f2-494d-b2f7-fdfe5ce96f8c/iec-60335-2-37-2021>

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 for 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 2-37: Particular requirements for commercial electric doughnut fryers and deep fat fryers

1 Scope

This clause of Part 1 is replaced by the following.

This Part of IEC 60335 deals with the safety of electrically operated commercial **deep fat fryers** and **doughnut fryers** including pressurized types with a pressure not exceeding 50 kPa and a pressure volume litres product not exceeding 200, their **rated voltage** being not more than 250 V for single-phase appliances connected between one phase and neutral and 480 V for other appliances including direct current (DC) supplied appliances.

These appliances are not intended for household and similar purposes. They are used for commercial processing of food in areas not open to the public, for example in kitchens of restaurants, canteens, hospitals and in commercial enterprises such as bakeries and butcheries.

The electrical part of appliances making use of other forms of energy is also within the scope of this standard.

As far as is practicable, this standard deals with the common hazards presented by these types of appliances.

Attention is drawn to the fact that

[IEC 60335-2-37:2021](https://standards.iteh.ai/catalog/standards/iec/02726773-c3f2-494d-b2f7-fdfe5ce96f8c/iec-60335-2-37-2021)

- 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, the national water supply authorities and similar authorities;
- in many countries, additional requirements are specified for pressure appliances.

This standard does not apply to

- appliances designed exclusively for industrial purposes;
- appliances intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere (dust, vapour or gas);
- appliances for continuous mass production of food;

~~— battery-operated appliances.~~

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

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

ISO 898-1, *Mechanical properties of fasteners made of carbon steel and alloy steel – Part 1: Bolts, screws and studs with specified property classes – Coarse thread and fine pitch thread*

ISO 3506-1, *Fasteners – Mechanical properties of corrosion-resistant stainless steel fasteners – Part 1: Bolts, screws and studs with specified grades and property classes*

ISO 3506-2, *Fasteners – Mechanical properties of corrosion-resistant stainless steel fasteners – Part 2: Nuts with specified grades and property classes*

ISO 3506-3, *Mechanical properties of corrosion-resistant stainless steel fasteners – Part 3: Set screws and similar fasteners not under tensile stress*

ISO 3506-4, *Mechanical properties of corrosion-resistant stainless steel fasteners – Part 4: Tapping screws*

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

3.1 Definitions relating to physical characteristics

3.1.4 Addition:

Note 101 to entry: The **rated power input** is the sum of the power inputs of all the individual elements in the appliance that can be on at one time; where there are several such combinations possible, that giving the highest power input is used in determining the **rated power input**.

3.1.9 ~~Replacement:~~

Modification:

Replace the first paragraph with the following:

operation of the appliance under the following conditions:

The appliance is filled with oil or fat according to the manufacturer's instructions up to the minimum **indicated level**.

The thermal control is set at the maximum setting. Lids, if provided, are left in the open position or removed unless the manufacturer's instructions indicate that the appliance is designed for operation with the lid closed.

Motors and **detachable electrical parts** incorporated in the appliance are operated under the most unfavourable conditions that can be expected in normal use taking into account the manufacturer's instructions.

3.1.101

rated pressure

maximum working pressure assigned by the manufacturer to the pressurized part of the appliance

3.5 Definitions relating to types of appliances

3.5.101

deep fat fryer

appliance provided with one or more containers in which the food to be cooked is immersed in the frying medium

Note 1 to entry: The container(s) can be fixed, removable, lifting, tilting, etc.

Note 2 to entry: The pressure within the container can exceed atmospheric pressure.

3.5.102**doughnut fryer**

appliance with large surface area and flat container in which the bakery products e. g. donuts are prepared in fat or oil by floating

Note 1 to entry: The **doughnut fryer** is generally not equipped with a cold area. The appliance can be delivered with a removable bakery product basket, a lifting or turning device.

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.

3.6.102**adjacent surface**

surface that is adjacent to a **functional surface** and which can become hot through conduction

3.8 Definitions relating to miscellaneous matters**3.8.101****indicated level**

mark on the appliance to indicate either the minimum or the maximum liquid level for correct operation

3.8.102**installation wall**

special fixed construction containing supply facilities for appliances installed in conjunction with it

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.

5.5 Addition:

The tests are carried out with the container in the position of normal use for frying.

5.10 Addition:

*Appliances intended for installation in a bank of other appliances and appliances intended to be fixed to an **installation wall** are enclosed to obtain protection against electric shock and harmful ingress of water equivalent to that obtained when installed in accordance with the instructions provided with the appliance.*

NOTE Appropriate enclosures or additional appliances can be needed for test purposes.

5.101 Appliances are tested as *heating appliances* when during a mode of operation electrical heaters are energized. If no electrical heaters are energized, the appliances are tested as *motor-operated appliances*.

5.102 *Appliances, when assembled in combination with or incorporating other appliances, are tested in accordance with the requirements of this standard. The other appliances are operated simultaneously in accordance with the requirements of the relevant standards.*

5.103 *Appliances are initially filled with unused vegetable oil. The series of relevant tests are carried out with this oil, unused oil being added as necessary to maintain a constant level.*

6 Classification

This clause of Part 1 is applicable except as follows.

6.1 Replacement:

Appliances shall be **class I** with respect to protection against electric shock.

Compliance is checked by inspection and by the relevant tests.

6.2 Addition:

Appliances normally used on a table shall be at least IPX3. Other appliances shall be at least IPX4.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 Addition:

Appliances shall be marked with the **rated pressure**, in kilopascals (kPa), on pressurized parts of the appliance.

If appliances have external **accessible surfaces** or lids, 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.

7.6 Addition:



[symbol IEC 60417-5041
(2002-10)]

caution, hot surface

7.10 Addition:

Devices controlling the tilting process of appliances with tilting parts shall be clearly marked to show the direction of movement.

7.12 Addition:

The instructions shall include a warning that danger of fire exists if the fat or oil level is below the minimum **indicated level**. To avoid a fire hazard, the instruction for appliances which are intended to be used with solid fat shall include information how to melt the fat.

The instructions shall include the kind of frying medium (fat or oil) and the maximum batch load in kilograms.

The instructions shall include the substance of the following:

These appliances are intended to be used for commercial applications, for example in kitchens of restaurants, canteens, hospitals and in commercial enterprises such as bakeries, butcheries, etc., but not for continuous mass production of food.

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

The instructions shall include a warning regarding the danger of using old fat or oil, emphasizing that this will have a reduced flash-point and be more prone to surge boiling.

The instructions shall also include the substance of the following warnings:

WARNING: Do not open drain cocks or other emptying devices until the pressure has been reduced to approximately atmospheric pressure.

WARNING: Opening the drain cock will lead to the outflow of the hot contents of the **deep fat fryer**.

Attention shall also be drawn to the effect on surge boiling of over-wet food and of a too large charge.

Appliances that are provided with an appliance inlet, and are intended to be immersed in water for cleaning shall be accompanied by an instruction stating that the connector shall be removed before the appliance is cleaned and that the appliance inlet shall be dried before the appliance is used again.

Unless the appliance or part is intended to be partially or completely immersed in water for cleaning, the instructions for appliances with **detachable electrical parts** and appliances, other than **stationary appliances**, shall state that the appliance or part must not be immersed.

If any of symbols IEC 60417-5021 (2002-10) or IEC 60417-5041 (2002-10) are marked on the appliance, its meaning shall be explained.

Modification:

The instruction concerning persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge and children playing with the appliance is not applicable.

7.12.1 Addition:

The appliance shall be accompanied by instructions detailing any special precautions necessary for installation. For appliances intended for installation in a bank of other appliances and appliances intended to be fixed to an **installation wall**, details of how to ensure appropriate protection against electric shock and harmful ingress of water shall be supplied. If the controls of more than one appliance are combined in a separate enclosure, detailed installation instructions shall be supplied. Instructions for **user maintenance**, for example cleaning, shall also be given. They shall include a statement that the appliance is not to be cleaned with a water jet or a steam cleaner.

For appliances that are permanently connected to fixed wiring and for which leakage currents can exceed 10 mA, particularly if disconnected or not used for long periods, or during initial installation, the instructions shall give recommendations regarding the rating of **protective devices**, such as residual current devices (RCD), to be installed.