IEC 60335-2-24

Edition 9.0 2025-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Household and similar electrical appliances – Safety – Part 2-24: Particular requirements for refrigerating appliances, ice-cream appliances and ice-makers

Appareils électrodomestiques et analogues – Sécurité – Partie 2-24: Exigences particulières pour les appareils de réfrigération, les sorbetières et les fabriques de glace

IEC 60335-2-24:2025-03(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-24: Particular requirements for refrigerating appliances, ice-cream appliances and ice-makers

FOREWORD

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IEC 60335-2-24 has been prepared by subcommittee 61C: Safety of refrigeration appliances for household and commercial use, of IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

This ninth edition cancels and replaces the eighth edition published in 2020. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) aligns the text with IEC 60335-1:2020;
b) new probe 19 has been introduced (8.1.1, 8.1.3, 20.2);

c) new exception for components inside the thermal insulation has been introduced (22.117);

d) new requirement for mobile refrigerating appliances, appliances to be used in leisure accommodation vehicles like motor caravans, boats for leisure purposes and appliances to be used on board ships has been introduced (Clause 1, 3.5.107, 3.5.108, 7.1, 7.6, 7.12, 7.14, 19.103, 21.101, 24.3, Annex FF);

e) text in 3.1.9.101, 3.1.9.102, 3.1.9.103 and 3.1.9.104 has been cancelled and the text copied in 5.104;

f) new requirement for the evaluation of non-dangerous moving parts has been introduced (20.2);

g) new abnormal test has been introduced (19.106);

h) reference to flammable refrigerant has been deleted (22.7);

i) new subclauses have been added (22.40, 22.49, 22.51);

j) requirement for the evaluation of motor-compressor has been updated (24.1);

k) Annex DD has been cancelled and the text copied to Annex A;

l) design pressure has been changed in maximum allowable pressure (3.8.101).

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

Draft	Report on voting
61C/929/FDIS	61C/931/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/publications.

A list of all parts of the IEC 60335 series, 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: Safety requirements for refrigerating appliances, ice-cream appliances and ice-makers.

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.

NOTE 4 The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations can 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.

The following differences exist in the countries indicated below.

– 22.101: E12 and E17 lamp holders are checked as specified for E14 and B15 lamp holders. E26 lamp holder is checked as specified for E27 and B22 lamp holders (Japan).

– 22.110: For unsealed glass tube heaters, the temperature requirements are different (Japan).

– 22.117: Only the first two dashed items in the first paragraph of the requirement are allowed (Australia and New Zealand).

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, or
- revised.

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 and SC 61C supporting documents on the IEC websites.

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

https://www.iec.ch/sc61c/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 can 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.

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.

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.

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-24: Particular requirements for refrigerating appliances, ice-cream appliances and ice-makers

1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of the following appliances, their **rated voltage** being not more than 250 V for single-phase appliances, 480 V for other appliances and 24 V DC for appliances when **battery-operated**:

– **refrigerating appliances** for household and similar use;
– **ice-makers** incorporating a motor-compressor and **ice-makers** intended to be incorporated in frozen food storage compartments intended for household use;
– **refrigerating appliances** and **ice-makers** for applications similar to household use such as for camping, in **leisure accommodation vehicles**, on boats for leisure purposes and on board ships;
– **mobile refrigerating appliances**.

These appliances can be operated from the mains, from a **separable battery** or operated either from the mains or from a **separable battery** or from other sources of energy (gas, liquid and solid fuel).

This standard deals also with **refrigerating appliances** intended for the use on boats for leisure purposes and on board ships, for which the normative Annex FF is applicable.

This standard also deals with the safety of **ice-cream appliances** intended for household use, their **rated voltage** being not more than 250 V for single-phase appliances and 480 V for other appliances.

It also deals with **compression-type appliances** for household and similar use, which use **flammable refrigerants**.

This standard does not cover features of the construction and operation of those **refrigerating appliances** which are dealt with in other IEC standards.

Refrigerating appliances not intended for normal household use but which nevertheless can be a source of danger to the public, such as

– **refrigerating appliances** used in staff kitchen areas in shops, offices and other working environments,
– **refrigerating appliances** used in farm houses and by clients in hotels, motels and other residential type environments,
– **refrigerating appliances** used in bed and breakfast type environments, and
– **refrigerating appliances** used in catering and similar non-retail applications

are within the scope of this standard.

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 whose
  - physical, sensory or mental capabilities or
  - lack of experience and knowledge

prevents them from using the appliance safely without supervision or instruction.

Attention is drawn to the fact that

– for appliances intended to be used in vehicles, **leisure accommodation vehicles**, boats for leisure purposes, on board ships or aircraft, additional requirements can be necessary;
– in many countries, additional requirements are specified by national health authorities, the national authorities responsible for the protection of labour, the national water supply authorities and similar authorities;
– for appliances that are operated additional from other sources of energy (gas, liquid and solid fuel), additional requirements can be necessary.

This standard does not apply to

– appliances intended for outdoor use, except for **mobile refrigerating appliances**;
– 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 incorporating a **battery** intended as a power supply for the refrigerating function;
– appliances assembled on site by the installer;
– appliances with remote motor-compressors;
– motor-compressors (IEC 60335-2-34);
– commercial dispensing appliances and vending appliances (IEC 60335-2-75);
– commercial refrigerating appliances and ice-makers with an incorporated or remote refrigerant unit or motor-compressor (IEC 60335-2-89);
– professional ice-cream makers (IEC 60335-2-118).

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

IEC 60068-2-6:2007, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-11:2021, *Environmental testing – Part 2-11: Tests – Test Ka: Salt mist*

IEC 60068-2-27:2008, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

IEC 60068-2-52:2017, *Environmental testing – Part 2-52: Tests – Test Kb: Salt mist, cyclic (sodium chloride solution)*

IEC 60079 (all parts), *Explosive atmospheres*

IEC 60079-1:2014, *Explosive atmospheres – Part 1: Equipment protection by flameproof enclosures "d"*

IEC 60079-7:2015, *Explosive atmospheres – Part 7: Equipment protection by increased safety "e"*

IEC 60079-15:2017, *Explosive atmospheres – Part 15: Equipment protection by type of protection "n"*

IEC 60252-1:2010, *AC motor capacitors – Part 1: General – Performance, testing and rating – Safety requirements – Guidance for installation and operation*
IEC 60252-1:2010/AMD1:2013

IEC 60335-2-34:2024, *Household and similar electrical appliances – Safety – Part 2-34: Particular requirements for motor-compressors*

IEC 60695-11-3:2012, *Fire hazard testing – Part 11-3: Test flames – 500 W flames – Apparatus and confirmational test methods*

IEC 60695-11-20:2015, *Fire hazard testing – Part 11-20: Test flames – 500 W flame test method*

IEC 60730-2-6:2015, *Automatic electrical controls – Particular requirements for automatic electrical pressure sensing controls including mechanical requirements*
IEC 60730-2-6:2015/AMD1:2019[1]

IEC 60730 (all parts), *Automatic electrical controls*

IEC 60851-4:2016, *Winding wires – Test methods – Part 4: Chemical properties*

ISO 209, *Aluminium and aluminium alloys – Chemical composition*

ISO 817, *Refrigerants – Designation and safety classification*

ISO 4126-2:2018, *Safety devices for protection against excessive pressure – Part 2: Bursting disc safety devices*

ISO 7010:2019, *Graphical symbols – Safety colours and safety signs – Registered safety signs*

Modification:

Replace

IEC 60598-1:2014, *Luminaires – Part 1: General requirements and tests*
IEC 60598-1:2014/AMD1:2017

with

IEC 60598-1:2020, *Luminaires – Part 1: General requirements and tests*

[1] A consolidated version of this document exists, comprising IEC 60730-2-6:2015 and IEC 60730-2-6:2015/AMD1:2019.

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

3.5 Definitions relating to types of appliances

3.5.101
refrigerating appliance
enclosed thermally insulated appliance of suitable volume for household use or similar, cooled by an incorporated device and having one or more compartments intended for the preservation of foodstuffs including cooling of beverages

3.5.102
compression-type appliance
appliance in which refrigeration is effected by the vaporization at low pressure in a heat exchanger (**evaporator**) of a liquid refrigerant, the vapour thus formed being restored to the original state by mechanical compression at a higher pressure and subsequent cooling in another heat exchanger (**condenser**)

3.5.103
ice-maker
appliance in which ice is made by freezing water by a device consuming electrical energy and having a compartment for storing the ice

3.5.104
incorporated ice-maker
ice-maker specially designed to be incorporated into a frozen food storage compartment and without independent means for freezing water

3.5.105
absorption-type appliance
appliance in which refrigeration is effected by the evaporation in a heat exchanger (**evaporator**) of a liquid refrigerant, in the liquid state, the resulting vapour being then absorbed by an absorbent medium from which it is subsequently expelled at a higher partial vapour pressure by heating and liquefied by cooling in another heat exchanger (**condenser**)

3.5.106
ice-cream appliance
compression-type appliance which is used to make ice-cream

3.5.107
mobile refrigerating appliance
appliance that is intended to be moved while in operation or operated on various areas and that can also be used where there is no access to the mains electricity grid

Note 1 to entry: **Mobile refrigerating appliances** include **portable appliances**, because **mobile refrigerating appliances** can be heavier than 18 kg.

Note 2 to entry: **Mobile refrigerating appliances** can also use extra low voltage or gas, liquid or solid fuel as the energy source for the refrigeration functionality.

3.5.108
leisure accommodation vehicle
unit of living accommodation for temporary or seasonal occupation that can meet requirements for construction and use of road vehicles

3.5.109
open deck
area which is exposed to marine environment

3.5.110
dayroom
area that can be exposed to marine environment from time to time, but usually used inside the cabin

3.6 Definitions relating to parts of an appliance

3.6.101
heating system
heating element with associated components such as timers, switches, **thermostats** and other controls

3.6.102
condenser
heat exchanger in which, after compression, vaporized refrigerant is liquefied by losing heat to an external cooling medium

3.6.103
evaporator
heat exchanger in which, after pressure reduction, the liquid refrigerant is vaporized by absorbing heat from the medium to be refrigerated

3.6.104
free space
space with a volume exceeding 60 l where a child can be entrapped and which is accessible after opening any door, lid or drawer and removing any **detachable internal part**, including shelves, containers or removable drawers which are themselves only accessible after opening any door or lid

In calculating the volume, a space with any single dimension not exceeding 150 mm or any two orthogonal dimensions, each of which do not exceed 200 mm, is ignored.

Note 1 to entry: Evaluation of the ignored volume can be checked by applying a 150 mm ± 0,5 mm diameter sphere or a square with 200 mm ± 0,5 mm side without appreciable force. The volume can be ignored if the sphere or square cannot fit inside.

3.6.105
transcritical refrigeration system
refrigeration system where the pressure in the high-pressure side is above the pressure where the vapour and liquid states of the refrigerant can coexist in thermodynamic equilibrium

3.6.106
gas cooler
heat exchanger in which, after compression, the refrigerant is cooled down, by transferring heat to an external cooling medium, without changing state

Note 1 to entry: A **gas cooler** is normally used in **transcritical refrigeration systems**.

3.7 Definitions relating to safety components

3.7.101
bursting disc
disc or foil which bursts at a predetermined pressure to reduce a pressure in a refrigeration system

3.7.102
pressure relief device
pressure sensing device, intended to reduce pressure automatically when pressures within the refrigeration system exceed the setting pressure of the device

3.8 Definitions relating to miscellaneous matters

3.8.101
maximum allowable pressure
PS
maximum pressure that a refrigerating circuit or a part of a refrigerating circuit or component is designed for, as specified by the manufacturer

Note 1 to entry: For example a refrigerating circuit can have the high side, low side or intermediate PS.

3.8.102
flammable refrigerant
refrigerant with a safety classification of A2L, A2 or A3 in accordance with ISO 817

Note 1 to entry: For refrigerant blends which have more than one safety classification, the most unfavourable classification is taken for the purposes of this definition.

4 General requirement

This clause of Part 1 is applicable except as follows.

Addition:

The use of **flammable refrigerants** involves additional hazards which are not associated with appliances using non-**flammable refrigerants**.

This standard addresses the hazards due to ignition of leaked **flammable refrigerant** by potential ignition sources associated with the appliance.

The hazard due to ignition of leaked **flammable refrigerant** by an external potential ignition source associated with the environment in which the appliance is installed is compensated by the low probability of ignition.

5 General conditions for the tests

This clause of Part 1 is applicable except as follows.

5.2 *Addition:*

At least one additional specially prepared sample is required for the tests of 22.107.

Unless the motor-compressor conforms to IEC 60335-2-34 and is classified as being protected by a motor-compressor protection system, at least one additional specially prepared sample is required for the test of 19.1.

At least one additional sample of the fan motor, thermal motor protector combination can be required for the test of 19.1.

The tests of 22.7 and 19.106 may be performed on separate samples.

Due to the potentially hazardous nature of the tests of 22.107, 22.108 and 22.109, special precautions shall be taken when performing the tests.