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Interested committees:

Title: BS EN IEC 60335-2-24 Household and similar electrical appliances - Safety

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

Please notify the secretary if you are aware of any keywords that might assist in classifying or identifying the standard or if the content of this standard

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- ii) affects other national standard(s)
- iii) requires additional national guidance or information

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
- All comments should be submitted online at <https://standardsdevelopment.bsigroup.com/>. You will need to register in order to comment.

Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



61C/888/CD

COMMITTEE DRAFT (CD)

PROJECT NUMBER: IEC 60335-2-24 ED9	
DATE OF CIRCULATION: 2022-05-13	CLOSING DATE FOR COMMENTS: 2022-08-05
SUPERSEDES DOCUMENTS:	

IEC SC 61C : SAFETY OF REFRIGERATION APPLIANCES FOR HOUSEHOLD AND COMMERCIAL USE	
SECRETARIAT: Germany	SECRETARY: Mr Dario Perroni
OF INTEREST TO THE FOLLOWING COMMITTEES: TC 61	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CD to the secretary.
FUNCTIONS CONCERNED: ☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☒ SAFETY	

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:

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

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –
SAFETY –****Part 2-24: Particular requirements for refrigerating appliances,
ice-cream appliances and ice-makers****FOREWORD**

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

This part of IEC 60335 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.

This ninth edition cancels and replaces the eighth edition published in 2020, and its corrigendum 1(2020-09). This edition constitutes a technical revision.

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

- aligns the text with IEC 60335-1, Ed 6;
- new probe 19 has been introduced (Cl. 8.1.1, 8.1.3, 20.2);

- new exception for components inside the thermal insulation has been introduced (Cl. 22.117);
- 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 (Cl. 1, 3.5.107, 3.5.108, 7.1, 7.6, 7.12, 7.14, Annex FF);
- new requirement for the evaluation of non-dangerous moving parts has been introduced (cl. 20.2);
- new abnormal test has been introduced (cl. 19.106).

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

FDIS	Report on voting
61C/XXX/FDIS	61C/XXX/RVD

Full information on the voting for the approval of this International Standard 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 has been drafted in accordance with the 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 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.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "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.

The National Committees are requested to note that for this publication the stability date is 202X.

THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED AT THE PUBLICATION STAGE.

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.

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).

Note of the Secretary: National Committees are asked to reconfirm their in some countries notes. They will be deleted unless reconfirmed.

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 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 use in camping, touring caravans and boats for leisure purposes.~~
- 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 may be operated from the mains, from a separate battery or operated either from the mains or from a separate 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 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 may 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 (including children) whose
 - physical, sensory or mental capabilities or
 - lack of experience and knowledge
 prevents them from using the appliance safely without supervision or instruction;
- children playing with the appliance.

NOTE 1 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;~~
- ~~– 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 to be used in the open air; except 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 60068-2-11:1981, *Basic environmental testing procedures – Part 2-11: Tests – Test Ka: Salt mist*

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 60079-7:2015/AMD1:2017¹

¹ There exists a consolidated edition 5.1:2017 that includes edition 5 and its Amendment 1

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 60335-2-34:20~~21~~¹², *Household and similar electrical appliances – Safety – Part 2-34: Particular requirements for motor-compressors*

~~IEC 60335-2-34:2012/AMD1:2015~~

~~IEC 60335-2-34:2012/AMD2:2016²~~

IEC 60598-1:2014, *Luminaires – Part 1: General requirements and tests*
IEC 60598-1:2014/AMD1:2017³

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/AMD1:2019⁴

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

ISO 209:2007, *Aluminium and aluminium alloys – Chemical composition*

ISO 817:2014, *Refrigerants – Designation and safety classification*
ISO 817:2014/AMD1:2017

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

ISO 5149-1:2014, *Refrigerating systems and heat pumps – Safety and environmental requirements – Part 1: Definitions, classification and selection criteria*
ISO 5149-1:2014/AMD1:2015

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

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

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)*

ISO 7000:2019, *Graphical symbols for use on equipment*

² ~~There exists a consolidated edition 5.2:2016 that includes edition 5 and its Amendment 1 and Amendment 2.~~

³ There exists a consolidated edition 8.1:2017 that includes edition 8 and its Amendment 1

⁴ There exists a consolidated edition 3.1:2019 that includes edition 3 and its Amendment 1

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 from 3.1.9.101 to 3.1.9.104.

3.1.9.101

normal operation of a refrigerating appliance

operation at an ambient temperature in accordance with 5.7, empty, with the doors and lids closed. User-adjustable temperature control devices which control the operation of the motor-compressor in **compression-type appliances** are short-circuited or otherwise rendered inoperative

3.1.9.102

normal operation of an ice-maker

operation at an ambient temperature in accordance with 5.7, with the supply water at a temperature of $15\text{ °C} \pm 2\text{ °C}$

3.1.9.103

normal operation of an incorporated ice-maker

operation at the normal temperature of the frozen food storage compartment, with the supply water at a temperature of $15\text{ °C} \pm 2\text{ °C}$

3.1.9.104

normal operation of an ice-cream appliance

operation of the appliance using the maximum quantity of the mixture of ingredients indicated in the instructions; the mixture used being that which gives the most unfavourable results, the mixture being at an initial temperature of $23\text{ °C} \pm 2\text{ °C}$

3.5 Definitions relating to types of appliances

3.5.101

refrigerating appliance

enclosed thermally insulated appliance of suitable volume for household use, 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, other than a **fixed appliance**, that is intended to be moved while in operation or operated on various areas

3.5.108**leisure accommodation vehicle**

unit of living accommodation for temporary or seasonal occupation that may meet requirements for construction and use of road vehicles

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 ± 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****design pressure****DP**

gauge pressure that has been assigned to the high-pressure side of a **transcritical refrigeration system**

3.8.102**flammable refrigerant**

refrigerant with a flammability classification of A2L, A2 or A3 in accordance with ISO 817

Note 1 to entry: For refrigerant blends which have more than one flammability 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, 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 may be required for the test of 19.1.

The test of 22.7 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 may need to be taken when performing the tests.

5.3 Addition:

Before starting the tests,

- **ice-cream appliances** are operated empty at **rated voltage** for 1 h, or for the maximum setting of an incorporated timer, whichever is shorter;
- other **compression-type appliances** shall be operated at **rated voltage** for at least 24 h, then switched off and left to stand for at least 12 h.

The test of 11.102 is carried out immediately after the tests of Clause 13.

The test of 15.105 is carried out immediately after the test of 11.102.

The tests of 15.101.1, 15.101.2, 15.103 and 15.104 are carried out immediately after the test of 15.2.

5.4 Replacement:

Tests are carried out using each source of energy (electricity, gas, liquid and solid fuel ~~or other fuel~~) in turn. Gas appliances are supplied at the appropriate rated pressure.

Tests are additionally carried out with all combinations of energy sources supplied simultaneously unless this is prevented by interlocking devices.

5.7 Addition:

For **ice-cream appliances**, tests specified in Clauses 10, 11 and 13 are carried out at an ambient temperature of $23\text{ °C} \pm 2\text{ °C}$.

For other appliances, tests specified in Clauses 10, 11, 13 and Subclause 19.103 are carried out at an ambient temperature of

- $32\text{ °C} \pm 1\text{ °C}$ on appliances of extended temperate (SN) and temperate (N) classes;
- $38\text{ °C} \pm 1\text{ °C}$ on appliances of subtropical (ST) class;
- $43\text{ °C} \pm 1\text{ °C}$ on appliances of tropical (T) class.

Before starting these tests, the appliance with the doors or lids open is brought to within 2 K of the ambient temperature specified.

Appliances classified for several climatic classes are tested at the ambient temperature relevant to the highest climatic class.

Other tests are carried out at an ambient temperature of $20\text{ °C} \pm 5\text{ °C}$.

Steady conditions are considered to be established when three successive readings of the temperature, taken at approximately 60 min intervals, at the same point of any operating cycle, do not differ by more than 1 K.

5.8.1 Addition:

Appliances which can be battery operated are tested at the more unfavourable polarity when the supply terminals or terminations for the connection of the battery have no indication for polarity.

5.9 Addition:

*Appliances incorporating an **ice-maker** are tested with the **ice-maker** operating to give the most unfavourable results.*

5.10 Addition:

For the tests of 22.107, 22.108 and 22.109, the appliance is empty and installed as outlined below:

Built-in appliances are installed in accordance with the instructions for installation.

Other appliances are placed in a test enclosure, the walls enclosing the appliance as near to all its sides and the top of the appliance as possible, unless the manufacturer indicates in the instructions for installation that a free distance shall be observed from the walls or the ceiling, in which case this distance is observed during the test.

NOTE 101 Commonly available fixing hardware, such as screws and bolts, need not be delivered with a fixed appliance.

5.101 Appliances which are constructed so that an **ice-maker** may be incorporated are tested with the intended **ice-maker**.

5.102 Compression-type appliances with **heating systems** and **Peltier-type appliances** are tested as **combined appliances**.

5.103 Compression-type appliances which use **flammable refrigerants** and which, according to the instructions, may be used with other electrical appliances inside a food storage compartment are tested with such recommended appliances incorporated and being operated as in normal use.

NOTE Examples of such electrical appliances are ice-cream makers and deodorizers.

6 Classification

This clause of Part 1 is applicable except as follows.

6.101 Appliances, other than **ice-cream appliances**, shall be of one or more of the following climatic classes:

- appliances of extended temperate class (SN);
- appliances of temperate class (N);
- appliances of subtropical class (ST);
- appliances of tropical class (T).

Compliance is checked by inspection.

NOTE The climatic classes are specified in IEC 62552-1:2015.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 Addition:

Appliances shall also be marked with

- the power input, in watts, of **heating systems**, if greater than 100 W;
- the defrosting input, in watts, if greater than the input corresponding to the **rated power input**;
- **rated power input** in watts or **rated current** in amperes, except that **compression-type appliances**, other than **ice-cream appliances**, shall be marked with the **rated current** in amperes;
- the letters SN, N, ST or T indicating the climatic class of the appliance;
- the maximum rated wattage of lamps, in watts (not applicable if the lamps can only be replaced by the manufacturer or its service agent, together with a part of the appliance);
- the total mass of the refrigerant;

NOTE 101 For **absorption-type appliances** using ammonia, the total mass of the refrigerant is considered to be the mass of ammonia used.

- for a single component refrigerant, at least one of the following:
 - the chemical name;
 - the chemical formula;
 - the refrigerant number;
- for a blended refrigerant, at least one of the following:
 - the chemical name and nominal proportion of each of the components;
 - the chemical formula and nominal proportion of each of the components;
 - the refrigerant number and nominal proportion of each of the components;
 - the refrigerant number of the refrigerant blend;
- the chemical name or refrigerant number of the principal component of the insulation blowing gas.

Refrigerant numbers are given in ISO 817.

For **compression-type appliances**, the defrosting power input in watts shall be marked separately if the current corresponding to the defrosting power input is greater than the **rated current** of the appliance.

Appliances which can be mains and battery operated shall be marked with the battery voltage.

Appliances which can be battery operated shall be marked with the type of battery, distinguishing between rechargeable and non-rechargeable batteries, if necessary, unless the type is irrelevant for the operation of the appliance.

The means provided for connection of any additional electrical supply shall be marked with the voltage and nature of the supply.

Appliances having provision for an **incorporated ice-maker** shall be marked with the maximum power input for an **incorporated ice-maker**, if greater than 100 W.

Ice-makers without automatic water level control shall be marked with the maximum permissible water level.

Appliances shall be marked with details of the source of supply other than electrical, if any.

For **compression-type refrigerating systems**, the appliance shall also be marked with the mass of the refrigerant for each separate refrigerant circuit.

Compression-type appliances which use **flammable refrigerants** shall be marked with the symbol ISO 7010 W021 ~~(2019-07)~~ (2011-05).

Appliances employing R-744 in a **transcritical refrigeration system** shall be marked with the substance of the following:

WARNING: System contains refrigerant under high pressure. Do not tamper with the system. It must be serviced by qualified persons only.

Appliances employing R-744 in a **transcritical refrigeration system** shall be marked with symbol ISO 7000- 1701 (2004-01).

Portable appliances and mobile refrigerating appliances, except for appliances with a degree of protection against harmful ingress of water of at least IPX4 or higher, shall be marked with symbol ISO 7000-0626 (2014-06).

7.6 Addition:



[symbol IEC 60417-5005 (2002-10)]

Plus; Positive polarity



[symbol IEC 60417-5006 (2002-10)]

Minus; Negative polarity



[symbol ISO 7010 W021 ~~(2019-07)~~ (2011-05).]

Warning; Risk of fire / Flammable materials



[symbol ISO 7000-1701 (2004-01)]

Pressure



[symbol ISO 7000-0626 (2014-06)]

Keep away from rain

7.12 Addition:

~~The instructions for refrigerating appliances and ice-makers for camping or similar use shall include the substance of the following:~~

The instructions for **mobile refrigerating appliances, 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 shall include the substance of the following:

- suitable for camping use;
- the appliance may be connected to more than one source of energy ~~(not applicable to appliances which are intended to be supplied by electricity only);~~
This item is not applicable to appliances which are intended to be supplied by electricity only;
- ~~— the appliance shall not be exposed to rain (not applicable to appliances with a degree of protection against harmful ingress of water of at least IPX4).~~
This item is not applicable to appliances with a degree of protection against harmful ingress of water of at least IPX4.

The instructions for **ice-makers** not intended to be connected to the water supply shall state the substance of the following warning:

WARNING: fill with potable water only.

For **compression-type appliances** which use **flammable refrigerants**, the instructions shall include information pertaining to the installation, handling, servicing and disposal of the appliance.

The instructions for **compression-type appliances** that use **flammable refrigerants** shall additionally include the substance of the warnings listed below:

- WARNING: Keep ventilation openings, in the appliance enclosure or in the built-in structure, clear of obstruction.
- WARNING: Do not use mechanical devices or other means to accelerate the defrosting process, other than those recommended by the manufacturer.
- WARNING: Do not damage the refrigerant circuit.

~~This warning is only applicable for appliances with refrigerating circuits which are accessible by the user.~~

This item is not applicable to appliances with refrigerating circuits which are not accessible to the user

- WARNING: Do not use electrical appliances inside the food storage compartments of the appliance, unless they are of the type recommended by the manufacturer.

For appliances which use flammable insulation blowing gases, the instructions shall include information regarding disposal of the appliance.

The instructions for **ice-cream appliances** shall include the ingredients and maximum quantity of mixtures that can be used in the appliance.

The instructions shall state the substance of the following.

Do not store explosive substances such as aerosol cans with a flammable propellant in this appliance.

If symbol ISO 7000-1701 (2004-01) is used, its meaning shall be explained.

The instructions shall include the substance of the following:

This appliance is intended to be used in household and similar applications such as

- 655 – staff kitchen areas in shops, offices and other working environments;
- 656 – farm houses and by clients in hotels, motels and other residential type environments;
- 657 – bed and breakfast type environments;
- 658 – catering and similar non-retail applications.

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

661 If symbol ISO 7010 W021 ~~(2019-07)~~ (2011-05) is used, its meaning shall be explained.

662 The instructions for **refrigerating appliances** and **ice-makers** shall include the substance of
663 the following:

664 WARNING: When positioning the appliance, ensure the supply cord is not trapped or
665 damaged.

666 WARNING: Do not locate multiple portable socket-outlets or portable power supplies at the
667 rear of the appliance.

668 If symbol ISO 7000-0626 (2014-06) is used, its meaning shall be explained.

669 **7.12.1 Addition:**

670 Instructions shall include the method for replacing illuminating lamps, if the lamps can be
671 replaced by the user.

672 For appliances designed for incorporating **ice-makers**, the instructions shall include the types
673 of **ice-makers** which can be incorporated.

674 The instructions shall include information on the installation of **incorporated ice-makers**
675 which are available as optional accessories and intended to be installed by the user. If it is
676 intended that **incorporated ice-makers** are to be installed only by the manufacturer or its
677 service agent, this shall be stated.

678 The instructions for **ice-makers** intended to be connected to the water supply shall state the
679 substance of the following warning:

680 WARNING: Connect to potable water supply only.

681 The instructions for **fixed appliances** shall include the substance of the following warning:

682 WARNING: To avoid a hazard due to instability of the appliance, it must be fixed in
683 accordance with the instructions.

684 In appliances employing R-744 in a **transcritical refrigeration system**, the instructions shall
685 include the substance of the following:

686 WARNING: The refrigeration system is under high pressure. Do not tamper with it.
687 Contact qualified service personal before disposal.

688 **7.12.4 Modification:**

689 This subclause is also applicable to **fixed appliances**.

690 **7.14 Addition:**