

SLOVENSKI STANDARD

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Varnost gospodinjskih in podobnih električnih aparatov - 2-24. del: Posebne zahteve za hladilnike, zamrzovalnike in aparate za pripravo ledu (IEC 60335-2-24:1997 + A1:1998)

iTeh STANDARD PREVIEW

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

[SIST EN 60335-2-24:2000](http://standards.iteh.ai/SIST/EN/60335-2-24:2000)

Sicherheit elektrischer Geräte für den Hausgebrauch und ähnliche Zwecke -- Teil 2-24: Besondere Anforderungen für Kühl- und Gefriergeräte und Eisbereiter

Sécurité des appareils électrodomestiques et analogues -- Partie 2-24: Règles particulières pour les appareils de réfrigération, les appareils de glaces à la crème et les fabriques de glace

Ta slovenski standard je istoveten z: EN 60335-2-24:1999

ICS:

13.120	Varnost na domu	Domestic safety
97.040.30	Hladilni aparati za dom	Domestic refrigerating appliances

SIST EN 60335-2-24:2000

en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 60335-2-24

August 1999

ICS 97.040.30

Supersedes EN 60335-2-24:1994 and its amendments

English version

Safety of household and similar electrical appliances
Part 2-24: Particular requirements for refrigerating appliances
and ice-makers
(IEC 60335-2-24:1997 + A1:1998)

Sécurité des appareils
électrodomestiques et analogues
Partie 2-24: Règles particulières pour
les appareils de réfrigération et les
fabriques de glace
(CEI 60335-2-24:1997 + A1:1998)

Sicherheit elektrischer Geräte für den
Hausgebrauch und ähnliche Zwecke
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This European Standard was approved by CENELEC on 1999-08-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 61C/96/FDIS, future 4th edition of IEC 60335-2-24 prepared by subcommittee 61C of the IEC Technical Committee 61, was submitted to the IEC-CENELEC parallel vote in March 1997 but the draft did not receive sufficient support in CENELEC. The comments were discussed during the Brussels meeting of CENELEC TC 61 in May 1998, when it was decided to submit a draft for EN 60335-2-24 consisting of IEC 60335-2-24:1997 and its future amendment 1, document 61C/135/FDIS, to the formal vote.

This draft was circulated in March 1999 and was approved by CENELEC as EN 60335-2-24 on 1999-08-01.

This European Standard replaces EN 60335-2-24:1994 and its amendments.

The following dates are applicable:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2000-05-01
- date on which national standards conflicting with the EN have to be withdrawn (dow) 2006-08-01

This standard has to be used in conjunction with EN 60335-1, Safety of household and similar electrical appliances, Part 1: General requirements. It was established on the basis of the 1994 edition of that standard. Amendments and revisions of part 1 have also to be taken into account and the dates when such changes become applicable will be stated in the relevant amendment or revision of part 1.

This part 2 supplements or modifies the corresponding clauses of EN 60335-1, so as to convert it into the European Standard Safety requirements for electric refrigerating 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 of part 1 is to be adapted accordingly.

Subclauses, notes, tables and figures which are additional to those in part 1 are numbered starting with 101. Annexes which are additional to those in part 1 are labelled AA, BB, etc.

There are no special national conditions causing a deviation from this European Standard, other than those listed in annex ZA to EN 60335-1.

There are no national deviations from this European Standard other than those listed in annex ZB of EN 60335-1.

NOTE - 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 2. When a definition of part 1 concerns an adjective, the adjective and the associated noun are also in bold.

p NOTE - In this document p is used in the margin to indicate instructions for preparing the printed version.

Introduction

An investigation by CENELEC TC 61 has concluded that all risks from products within the scope of this standard are fully covered by the Low Voltage Directive, 73/23/EEC. If the product has mechanical moving parts, a risk assessment in accordance with the Machinery Directive, 89/392/EEC, has shown that the risks are mainly of electrical origin and consequently this directive is not applicable. However, the relevant essential safety requirements of the Machinery Directive are covered by this standard together with the principal objectives of the Low Voltage Directive.

Endorsement notice

The text of the International Standard IEC 60335-2-24:1997 and its amendment 1:1998 was approved by CENELEC as a European Standard without any modification.

Annex A:

p Replace by:

Annex A
(normative)

Normative references

Addition:

<u>IEC standard</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
60079-4A	1970	Electrical apparatus for explosive gas atmospheres – Part 4: Method of test for ignition temperatures	-	-
60079-15	1987	Electrical apparatus for explosive gas atmospheres – Part 15: Electrical apparatus with type of protection "n"	-	-
60079-20	1996	Electrical apparatus for explosive gas atmospheres – Part 20: Data for flammable gases and vapours relating to the use of electrical apparatus	-	-
60335-2-34	1996	Safety of household and similar electrical appliances – Part 2: Particular requirements for motor-compressors	EN 60335-2-34	1996
<u>ISO standard</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
817	1974	Organic refrigerants – Number designation	-	-
3864	1984	Safety colours and safety signs	-	-
<u>CENELEC standard</u>	<u>Year</u>	<u>Title</u>		
EN 50054	1998	Electrical apparatus for the detection and measurement of combustible gases - General requirements and test methods		
<u>Other standard</u>	<u>Year</u>	<u>Title</u>		
ANSI/NFPA 325M	1991	Fire hazard properties of flammable liquids, gases and volatile solids		
ANSI/ASHRAE	1992	Number designation and safety classification of refrigerants		

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**NORME
INTERNATIONALE
INTERNATIONAL
STANDARD**

**CEI
IEC**

60335-2-24

Quatrième édition
Fourth edition
1997-08

**Sécurité des appareils électrodomestiques
et analogues**

**Partie 2:
Règles particulières pour les appareils
de réfrigération et les fabriques de glace**

**Safety of household and similar
electrical appliances**

**Part 2:
Particular requirements for refrigerating
appliances and ice-makers**

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International Electrotechnical Commission
Telefax: +41 22 919 0300

3, rue de Varembe Geneva, Switzerland
IEC web site <http://www.iec.ch>

e-mail: inmail@iec.ch



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE

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Pour prix, voir catalogue en vigueur
For price, see current catalogue

CONTENTS

	Page
FOREWORD	5
Clause	
1 Scope	9
2 Definitions	11
3 General requirement	13
4 General conditions for the tests	13
5 Void	15
6 Classification	15
7 Marking and instructions	15
8 Protection against access to live parts	19
9 Starting of motor-operated appliances	19
10 Power input and current	19
11 Heating	21
12 Void	29
13 Leakage current and electric strength at operating temperature	29
14 Void	29
15 Moisture resistance	29
16 Leakage current and electric strength	31
17 Overload protection of transformers and associated circuits	33
18 Endurance	33
19 Abnormal operation	33
20 Stability and mechanical hazards	37
21 Mechanical strength	37
22 Construction	39
23 Internal wiring	43
24 Components	43
25 Supply connection and external flexible cords	45
26 Terminals for external conductors	47
27 Provision for earthing	47
28 Screws and connections	47
29 Creepage distances, clearances and distances through insulation	49
30 Resistance to heat, fire and tracking	49
31 Resistance to rusting	51
32 Radiation, toxicity and similar hazards	51
Figures	53
Annexes	55

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(standards.iteh.ai)

SIST EN 60335-2-24:2000

<http://standards.iteh.ai/catalog/standards/sist/9b818d24-8f09-4ff6-9998->

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SAFETY OF HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES

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

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

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

It forms the fourth edition of IEC 60335-2-24 and replaces the third edition published in 1992.

The text of this standard is based on the following documents:

FDIS	Report on voting
61C/96/FDIS	61C/118/RVD

SIST EN 60335-2-24:2000

Full information on the voting for the approval of this standard can be found in the report of voting indicated in the above table.

Annexes AA and BB form an integral part of this standard.

Annex CC is for information only.

This Part 2 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments. It was established on the basis of the third edition (1991) of that standard.

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** and **ice-makers**.

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

NOTES

1 In this standard, the following print types are used:

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

Words in **bold** in the text are defined in clause 2. When a definition of part 1 concerns an adjective, the adjective and the associated noun are also in **bold**.

2 Subclauses, notes, tables and figures which are additional to those in part 1 are numbered starting from 101, annexes which are additional to those in part 1 are lettered AA, BB, etc.

The following additional differences exist in some countries:

- 4.7: For all appliances the tests according to clauses 10, 11, 13 and subclause 19.103 are carried out at $43\text{ °C} \pm 2\text{ °C}$ (Australia, New Zealand).
- 6.101: Only appliances of tropical class T are allowed (Israel).

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SAFETY OF HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES

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

1 Scope

This clause of part 1 is replaced by:

This standard 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 d.c. 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;
- **refrigerating appliances** and **ice-makers** for use in camping, touring caravans and boats for leisure purposes.

These appliances may be operated from the mains, from a separate battery or operated either from the mains or from a separate battery.

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

Appliances not intended for normal household use but which nevertheless may be a source of danger to the public, such as appliances intended to be used by laymen in shops, in light industry and on farms, are within the scope of this standard.

As far as is practicable, this standard deals with the common hazards presented by appliances which are encountered by all persons in and around the home.

This standard does not in general take into account

- the use of appliances by young children or infirm persons without supervision;
- playing with the appliance by young children.

NOTES

1 Attention is drawn to the fact that

- for appliances intended to be used in vehicles or on board ships or aircraft, additional requirements may 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.

2 This standard does not apply to

- appliances intended to be used in the open air;
- 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);
- ice-cream appliances with incorporated motor-compressors (IEC 60335-2-57).

2 Definitions

This clause of part 1 is applicable except as follows:

2.2.9 Replacement:

normal operation: Operation of the appliance under the following conditions:

2.2.9.1 **refrigerating appliances** are operated at an ambient temperature according to 4.7, 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.

2.2.9.2 **ice-makers** are operated at an ambient temperature according to 4.7, with the supply water at a temperature of $15\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$.

2.2.9.3 **incorporated ice-makers** are operated at the normal temperature of the frozen food storage compartment, with the supply water at a temperature of $15\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$.

2.101 **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.

2.102 **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 liquid state by mechanical compression at a higher pressure and subsequent cooling in another heat exchanger (**condenser**).

2.103 **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.

2.104 **incorporated ice-maker:** Ice-maker specially designed to be incorporated into a frozen food storage compartment and without independent means for freezing water.

2.105 **heating system:** Heating element with associated components such as timers, switches, **thermostats** and other controls.

2.106 **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**).

2.107 **condenser:** Heat exchanger in which, after compression, vaporized refrigerant is liquefied by losing heat to an external cooling medium.

2.108 **evaporator:** Heat exchanger in which, after pressure reduction, the liquid refrigerant is vaporized by absorbing heat from the medium to be refrigerated.

3 General requirement

This clause of part 1 is applicable.

4 General conditions for the tests

This clause of part 1 is applicable except as follows:

4.2 Addition:

NOTE 101 – Separate samples of the motor-compressor may be needed for the tests of 19.1.

4.3 Addition:

*Before testing, the appliance shall be operated at **rated voltage** for 24 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 15.102, 15.103 and 15.104 are carried out immediately after the test of 15.2.

4.4 Replacement:

Tests are carried out using each source of energy (electricity, gas 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.

4.7 Addition:

Tests according to clauses 10, 11, 13 and subclause 19.103 are carried out at an ambient temperature of:

32 °C ± 1 °C on appliances of extended temperate (SN) and temperate (N) classes;

38 °C ± 1 °C on appliances of subtropical (ST) class;

43 °C ± 1 °C on appliances of tropical (T) class.

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

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Other tests are carried out at an ambient temperature of 20 °C ± 5 °C.

NOTE – 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.

4.8.1 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.

4.9 Addition:

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

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

4.102 *Unless otherwise stated, **compression-type appliances with heating systems** and **Peltier-type appliances** are tested as **combined appliances**.*

5 Void**6 Classification**

This clause of part 1 is applicable except as follows:

6.101 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 ISO standards.

7 Marking and instructions

This clause of part 1 is applicable except as follows:

7.1 Addition:

Appliances shall also be marked with **SIST EN 60335-2-24:2000**

- 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**;
- the letters SN, N, ST or T indicating the climatic class of the appliance;
- the maximum rated wattage of lamps, in watts;
- 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.

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 designed for incorporating an **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.

7.10 Addition:

NOTE 101 – As an alternative, temperature values in degrees Celsius may be indicated on a control scale.

7.12 Addition:

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

- suitable for camping use;
- the appliance may be connected to more than one source of energy;

NOTE 101 – This item is not applicable to appliances which are intended to be supplied by electricity only.

- the appliance shall not be exposed to rain

NOTE 102 – 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.