IEC 60335-2-118

Edition 2.0 2025-04
EXTENDED VERSION

INTERNATIONAL STANDARD

Corrected version
2026-01

This full version of IEC 60335-2-118:2025 includes the content of the references made to IEC 60335-1:2020

Household and similar electrical appliances – Safety – Part 2-118: Particular requirements for professional ice-cream makers



IEC 60335-2-118:2025-04 EXV(en)

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Household and similar electrical appliances – Safety – Part 2-118: Particular requirements for professional ice-cream makers

INTERNATIONAL
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IEC 60335-1
Edition 6.0 2020-09

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 1: General requirements

INTERPRETATION SHEET 1

This interpretation sheet has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances.

The text of this Interpretation Sheet is based on the following documents:

Draft	Report on voting
61/5999/DISH	61/6009/RVDISH

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

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INTRODUCTION

Edition 6 of IEC 60335-1:2020 defines and introduces requirements for a detachable power supply part of an appliance. In the document, 24.2 prohibits the use of a power supply in a flexible cord.

QUESTION:

Does Subclause 24.2 prohibit the use of a detachable power supply part?

ANSWER

No, a "detachable power supply part" is a defined term and is not captured by the term "power supply" as used in Subclause 24.2.

NOTE A detachable power supply part is captured by the defined term when the output of the power supply part is detachable from the class III construction part of the appliance at:

– the power supply part, or

– the class III construction part of the appliance.

However, the supply cord (if any) does not have to be detachable from the detachable power supply part.

IEC 60335-1:2020-09/ISH1:2021-11(en)

ICS 13.120; 97.030

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-118: Particular requirements for professional ice-cream makers

FOREWORD

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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 extended version (EXV) of the official IEC Standard provides the user with the full content of the Standard.

IEC 60335-2-118:2025 EXV includes the content of IEC 60335-2-118:2025, and the references made to IEC 60335-1:2020.

The specific content of IEC 60335-2-118:2025 is displayed on a blue background.

IEC 60335-2-118 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 second edition cancels and replaces the first 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) the text has been aligned with IEC 60335-1:2020;

b) scope has been revised (Clause 1);

c) requirements for appliances employing R-744 system have been added (7.1, 7.12.1, 22.7, 22.111);

d) additional requirements for appliances employing flammable refrigerant have been added (7.1, 7.6, 7.12, 7.15, 21.105, 22.110, 22.112, 22.113, 22.114, 22.115, 22.116, 22.117, 22.118, 22.119, 22.120, 22.121, 22.122, 22.123, Annex CC);

e) definition of hermetically sealed system has been revised (3.6.113);

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

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

h) compatibility tests for winding insulation of motor-compressors used with different types of refrigerants and oils have been introduced (22.9);

i) Annex AA has been modified to cover motors that are supplied at a voltage that is different from the rated voltage of the appliance;

j) Annex BB has been updated to align with the latest edition of IEC 60079-15;

k) text in 3.1.9.101, 3.1.9.102 and 3.1.9.103 has been cancelled and the text copied in 5.102;

l) new informative tightness routine test has been added (Annex A).

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

Draft	Report on voting
61C/928/FDIS	61C/932/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: Particular requirements **for professional ice-cream 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 webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

The content of the corrigendum 1 (2026-01) has been included in this copy.

INTRODUCTION to IEC 60335-1:2020

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 –

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 the functions of an appliance are covered by different parts 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.

Throughout this publication, when "part 2" is mentioned, it refers to the relevant part of IEC 60335.

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.

Individual countries may wish to consider the application of this standard, as far as is reasonable, to appliances not mentioned in a part 2, and to appliances designed on new principles. In this case, consideration should be given to defining normal operation, specifying the classification of the appliance according to Clause 6 and specifying whether the appliance is operated attended or unattended. Consideration should also be given to particular categories of likely users and to related specific risks such as access to live parts, hot surfaces or hazardous moving parts.

An appliance that complies with the text of this standard will not necessarily be considered to comply with the safety principles of this standard if, when examined and tested, it is found to have other features which 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 this standard.

NOTE 3 Standards dealing with non-safety aspects of household appliances are:

– IEC standards published by TC 59 concerning methods of measuring performance;
– CISPR 11, CISPR 14-1 and relevant IEC 61000-3 series standards concerning electromagnetic emissions;
– CISPR 14-2 concerning electromagnetic immunity;
– IEC standards published by TC 111 concerning environmental matters.

INTRODUCTION to IEC 60335-2-118:2025

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.

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– 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 2-118: Particular requirements for professional ice-cream makers

1 Scope

This part of IEC 60335 deals with the safety of appliances for making ice cream and artisan gelato exclusively operated by professional users.

Ice cream makers intended for professional use are employed in commercial environments, such as restaurants, hotels, supermarkets, shops, as well as in preparation areas of bars, bakeries, ice cream shops, institutional catering, and other similar professional settings.

Appliances taken into account are those intended for commercial use and similar appliances not intended for normal household use but which can nevertheless be a source of danger to the public, such as appliances intended to be used by laymen in shops, stores, by artisans or on farms, which **rated voltage** is not more than 250 V for single-phase appliances and 480 V for other appliances.

Appliances covered by this standard are provided with a refrigerant condensing unit which is usually incorporated, but for some appliances can be remote.

As far as is practicable, this standard deals with the common hazards presented by these types of appliances including those that use **flammable refrigerants** and appliances employing R-744 refrigerant.

This standard is not applicable to appliances with a mass of **flammable refrigerant** exceeding the limits specified in 22.112 or to appliances with that use refrigerants with a toxicity classification of B according to ISO 817.

It does not cover those features of construction and operation of refrigerating appliances that are dealt with in ISO standards.

This standard also applies to following types of appliances:

– mixers to make ice cream and similar pastry products in which, for the preparation of the product, heating process is made within the appliance before the cooling process;
– appliances for storing whipping cream mix in a refrigerated tank and for whipping the cream for the delivery process;
– freezers designed to produce soft ice cream and dispense it directly into containers;
– machines for soft-serve ice cream;
– batch dispensing freezers.

Attention is drawn to the fact that:

– countries can have additional requirements for appliances incorporating pressure vessels;
– 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;
– for appliances or parts of appliances intended to be used outdoors, additional requirements can be necessary.

This standard does not apply to:

– split systems having a **refrigerant charge** of **flammable refrigerant** exceeding 150 g in any **refrigerating circuit**;
– ice cream appliances for household use (IEC 60335-2-24);
– appliances intended 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).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60034-1, *Rotating electrical machines – Part 1: Rating and performance*

IEC 60061-1, *Lamp caps and holders together with gauges for the control of interchangeability and safety – Part 1: Lamp caps*

IEC 60065:2014, *Audio, video and similar electronic apparatus – Safety requirements*

IEC 60068-2-2, *Environmental testing – Part 2-2: Tests – Test B: Dry heat*

IEC 60068-2-31, *Environmental testing – Part 2-31: Tests – Test Ec: Rough handling shocks, primarily for equipment-type specimens*

IEC 60068-2-75, *Environmental testing – Part 2-75: Tests – Test Eh: Hammer tests*

IEC 60068-2-78, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

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 60079-29-1:2016, *Explosive atmospheres – Part 29-1: Gas detectors – Performance requirements of detectors for flammable gases*
IEC 60079-29-1:2016/AMD1:2020

IEC TR 60083, *Plugs and socket-outlets for domestic and similar general use standardized in member countries of IEC*

IEC 60085:2007, *Electrical insulation – Thermal evaluation and designation*

IEC 60112:2003, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*
IEC 60112:2003/AMD1:2009[1]

IEC 60127 (all parts), *Miniature fuses*

IEC 60227 (all parts), *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V*

IEC 60227-5:2011, *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V – Part 5: Flexible cables (cords)*

IEC 60238, *Edison screw lampholders*

IEC 60245 (all parts), *Rubber insulated cables – Rated voltages up to and including 450/750 V*

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[2]

IEC 60309-2, *Plugs, socket-outlets and couplers for industrial purposes – Part 2: Dimensional interchangeability requirements for pin and contact-tube accessories*

IEC 60320 (all parts), *Appliance couplers for household and similar general purposes*

IEC 60320-1, *Appliance couplers for household and similar general purposes – Part 1: General requirements*

IEC 60320-2-3, *Appliance couplers for household and similar general purposes – Part 2-3: Appliance couplers with a degree of protection higher than IPX0*

IEC 60320-3, *Appliance couplers for household and similar general purposes – Part 3: Standard sheets and gauges*

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

IEC 60335-2-40:2024, *Household and similar electrical appliances – Safety – Part 2-40: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers*

IEC 60384-14:2013, *Fixed capacitors for use in electronic equipment – Part 14: Sectional specification – Fixed capacitors for electromagnetic interference suppression and connection to the supply mains*
IEC 60384-14:2013/AMD1:2016[3]

IEC 60417, *Graphical symbols for use on equipment*

IEC 60445:2017, *Basic and safety principles for man-machine interface, marking and identification – Identification of equipment terminals, conductor terminations and conductors*

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1 There exists a consolidated edition 4.1:2009 that includes edition 4 and its Amendment 1.

2 There exists a consolidated edition 2.1:2013 that includes edition 2 and its Amendment 1.

3 There exists a consolidated edition 4.1:2016 that includes edition 4 and its Amendment 1.

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*
IEC 60529:1989/AMD1:1999
IEC 60529:1989/AMD2:2013[4]

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

IEC 60603-11, *Connectors for frequencies below 3 MHz for use with printed boards – Part 11: Detail specification for concentric connectors (dimensions for free connectors and fixed connectors)*

IEC 60664-1:2007, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60664-3:2016, *Insulation coordination for equipment within low-voltage systems – Part 3: Use of coating, potting or moulding for protection against pollution*

IEC 60664-4:2005, *Insulation coordination for equipment within low-voltage systems – Part 4: Consideration of high-frequency voltage stress*

IEC 60691, *Thermal-links – Requirements and application guide*

IEC 60695-2-11:2014, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end-products (GWEPT)*

IEC 60695-2-12, *Fire hazard testing – Part 2-12: Glowing/hot-wire based test methods – Glow-wire flammability index (GWFI) test method for materials*

IEC 60695-2-13, *Fire hazard testing – Part 2-13: Glowing/hot-wire based test methods – Glow-wire ignition temperature (GWIT) test method for materials*

IEC 60695-10-2, *Fire hazard testing – Part 10-2: Abnormal heat – Ball pressure test*

IEC 60695-11-5:2016, *Fire hazard testing – Part 11-5: Test flames – Needle-flame test method – Apparatus, confirmatory test arrangement and guidance*

IEC 60695-11-10, *Fire hazard testing – Part 11-10: Test flames – 50 W horizontal and vertical flame test methods*

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

IEC 60730-1:2013, *Automatic electrical controls – Part 1: General requirements*
IEC 60730-1:2013/AMD1:2015[5]

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

IEC 60730-2-8:2018, *Automatic electrical controls – Part 2-8: Particular requirements for electrically operated water valves, including mechanical requirements*

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4 There exists a consolidated edition 2.2:2013 that includes edition 2 and its Amendment 1 and Amendment 2.

5 There exists a consolidated edition 5.1:2015 that includes edition 5 and its Amendment 1.

IEC 60730-2-9:2015, *Automatic electrical controls – Part 2-9: Particular requirements for temperature sensing controls*
IEC 60730-2-9:2015/AMD1:2018[6]

IEC 60730-2-10, *Automatic electrical controls for household and similar use – Part 2-10: Particular requirements for motor-starting relays*

IEC 60738-1, *Thermistors – Directly heated positive temperature coefficient – Part 1: Generic specification*

IEC 60799, *Electrical accessories – Cord sets and interconnection cord sets*

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

IEC 60906-1, *IEC system of plugs and socket-outlets for household and similar purposes – Part 1: Plugs and socket-outlets 16 A 250 V a.c.*

IEC 60934, *Circuit-breakers for equipment (CBE)*

IEC 60947-5-1:2024, *Low-voltage switchgear and controlgear – Part 5-1: Control circuit devices and switching elements – Electromechanical control circuit devices*

IEC 60990:2016, *Methods of measurement of touch current and protective conductor current*

IEC 60999-1:1999, *Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units – Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm^2 up to 35 mm^2 (included)*

IEC 61000-4-2, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*

IEC 61000-4-3, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*

IEC 61000-4-4, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test*

IEC 61000-4-5, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*

IEC 61000-4-6, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*

IEC 61000-4-11:2020, *Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests for equipment with input current up to 16 A per phase*

IEC 61000-4-13:2002, *Electromagnetic compatibility (EMC) – Part 4-13: Testing and measurement techniques – Harmonics and interharmonics including mains signalling at a.c. power port, low frequency immunity tests*

---

6 There exists a consolidated edition 4.1:2018 that includes edition 4 and its Amendment 1.

IEC 61000-4-13:2002/AMD1:2009
IEC 61000-4-13:2002/AMD2:2015[7]

IEC 61000-4-34:2005, *Electromagnetic compatibility (EMC) – Part 4-34: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests for equipment with input current more than 16 A per phase*
IEC 61000-4-34:2005/AMD1:2009[8]

IEC 61032:1997, *Protection of persons and equipment by enclosures – Probes for verification*

IEC 61058-1:2016, *Switches for appliances – Part 1: General requirements*

IEC 61058-1-1:2016, *Switches for appliances – Part 1-1: Requirements for mechanical switches*

IEC 61058-1-2:2016, *Switches for appliances – Part 1-2: Requirements for electronic switches*

IEC 61180, *High-voltage test techniques for low-voltage equipment – Definitions, test and procedure requirements, test equipment*

IEC 61210, *Connecting devices – Flat quick-connect terminations for electrical copper conductors – Safety requirements*

IEC 61558-1:2017, *Safety of transformers, reactors, power supply units and combinations thereof – Part 1: General requirements and tests*

IEC 61558-2-6:2009, *Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V – Part 2-6: Particular requirements and tests for safety isolating transformers and power supply units incorporating safety isolating transformers*

IEC 61558-2-16:2009, *Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V – Part 2-16: Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units*
IEC 61558-2-16:2009/AMD1:2013[9]

IEC 61770, *Electric appliances connected to the water mains – Avoidance of backsiphonage and failure of hose-sets*

IEC 62133-1:2017, *Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications – Part 1: Nickel systems*

IEC 62133-2:2017, *Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications – Part 2: Lithium systems*

IEC 62151, *Safety of equipment electrically connected to a telecommunication network*

IEC 62471:2006, *Photobiological safety of lamps and lamp systems*

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7 There exists a consolidated edition 1.2:2015 that includes edition 1 and its Amendment 1 and Amendment 2.

8 There exists a consolidated edition 1.1:2009 that includes edition 1 and its Amendment 1.

9 There exists a consolidated edition 1.1:2013 that includes edition 1 and its Amendment 1.

IEC 62477-1, *Safety requirements for power electronic converter systems and equipment – Part 1: General*

IEC 62821 (all parts), *Electric cables – Halogen-free, low smoke, thermoplastic insulated and sheathed cables of rated voltages up to and including 450/750 V*

ISO 178, *Plastics – Determination of flexural properties*

ISO 179-1, *Plastics – Determination of Charpy impact properties – Part 1: Non-instrumented impact test*

ISO 180, *Plastics – Determination of Izod impact strength*

ISO 527 (all parts), *Plastics – Determination of tensile properties*

ISO 817, *Refrigerants – Designation and safety classification*

ISO 1463, *Metallic and oxide coatings – Measurement of coating thickness – Microscopical method*

ISO 2178, *Non-magnetic coatings on magnetic substrates – Measurement of coating thickness – Magnetic method*

ISO 2768-1, *General tolerances – Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*

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

ISO 4892-1:2016, *Plastics – Methods of exposure to laboratory light sources – Part 1: General guidance*

ISO 4892-2: 2013, *Plastics – Methods of exposure to laboratory light sources – Part 2: Xenon-arc lamps*

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

ISO 7000, *Graphical symbols for use on equipment – Registered symbols*

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

ISO 8256, *Plastics – Determination of tensile-impact strength*

ISO 9772, *Cellular plastics – Determination of horizontal burning characteristics of small specimens subjected to a small flame*

ISO 9773, *Plastics – Determination of burning behaviour of thin flexible vertical specimens in contact with a small-flame ignition source*

ISO 14903, *Refrigerating systems and heat pumps – Qualification of tightness of components and joints*

Bibliography

IEC 60050-482:2004, *International Electrotechnical Vocabulary (IEV) – Part 482: Primary and secondary cells and batteries*

IEC 60086-1, *Primary batteries – Part 1: General*

IEC 60086-2, *Primary batteries – Part 2: Physical and electrical specifications*

IEC 60335-2-24, *Household and similar electrical appliances – Safety – Part 2-24: Particular requirements for refrigerating appliances, ice-cream appliances and ice-makers*

IEC 60335-2-29, *Household and similar electrical appliances – Safety – Part 2-29: Particular requirements for battery chargers*

IEC 60364 (all parts), *Low voltage electrical installations*

IEC 60601 (all parts), *Medical electrical equipment*

IEC 60721-2-1, *Classification of environmental conditions – Part 2-1: Environmental conditions appearing in nature – Temperature and humidity*

IEC 60730 (all parts), *Deleted*

IEC 60745 (all parts), *Hand-held motor-operated electric tools – Safety*

IEC 60950-1, *Information technology equipment – Safety – Part 1: General requirements*

IEC 60998-2-1, *Connecting devices for low-voltage circuits for household and similar purposes – Part 2-1: Particular requirements for connecting devices as separate entities with screw-type clamping units*

IEC 60998-2-2, *Connecting devices for low-voltage circuits for household and similar purposes – Part 2-2: Particular requirements for connecting devices as separate entities with screwless-type clamping units*

IEC 61000-3-2, *Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤16 A per phase)*

IEC 61000-3-3, *Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤16 A per phase and not subject to conditional connection*

IEC 61029 (all parts), *Safety of transportable motor-operated electric tools*

IEC 61508-3:2010, *Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 3: Software requirements*

IEC 61508-7:2010, *Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 7: Overview of techniques and measures*

IEC 62552-1:2015, *Household refrigerating appliances – Characteristics and test methods – Part 1: General requirements*

IEC 62280, *Railway applications – Communication, signalling and processing systems – Safety related communication in transmission systems*

IEC 62368-1, *Audio/video, information and communication technology equipment – Part 1: Safety requirements*

IEC 62841 (all parts), *Electric motor-operated hand-held tools, transportable tools and lawn and garden machinery – Safety*

CISPR 11, *Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement*

CISPR 14-1, *Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus – Part 1: Emission*

CISPR 14-2, *Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus – Part 2: Immunity – Product family standard*

ISO/IEC 9796 (all parts), *Information technology – Security techniques – Digital signature scheme giving message recovery*

ISO/IEC 9797 (all parts), *Information technology – Security techniques – Message Authentication Codes (MACs)*

ISO/IEC 9798 (all parts), *IT Security techniques – Entity authentication*

ISO/IEC 10118 (all parts), *IT Security techniques – Hash-functions*

ISO/IEC 11770 (all parts), *IT Security techniques – Key management*

ISO/IEC 14888 (all parts), *IT Security techniques – Digital signatures with appendix*

ISO/IEC 15946 (all parts), *Information technology – Security techniques – Cryptographic techniques based on elliptic curves*

ISO/IEC 18033 (all parts), *Information technology – Security techniques – Encryption algorithms*

ISO/IEC 19772 (all parts), *Information technology – Security techniques – Authenticated encryption*

ISO/IEC 29192 (all parts), *Information technology – Security techniques – Lightweight cryptography*

IEC Guide 104, *The preparation of safety publications and the use of basic safety publications and group safety publications*

IEC Guide 108, *Guidelines for ensuring the coherence of IEC publications – Horizontal functions, horizontal publications and their application*

IEC Guide 110, *Home control systems – Guidelines relating to safety*

IEC Guide 117, *Electrotechnical equipment – Temperatures of touchable hot surfaces*

ISO/IEC Guide 14, *Products and related services – Information for consumers*

ISO/IEC Guide 37, *Instructions for use of products by consumers*

ISO/IEC Guide 50, *Safety aspects – Guidelines for child safety in standards and other specifications*

ISO/IEC Guide 51, *Safety aspects – Guidelines for their inclusion in standards*

ISO/IEC Guide 71, *Guide for addressing accessibility in standards*