UL 60335-1

STANDARD FOR SAFETY

Safety of Household and Similar Electrical Appliances, Part 1: General Requirements

UL Standard for Safety for Safety of Household and Similar Electrical Appliances, Part 1: General Requirements, UL 60335-1

Sixth Edition, Dated October 31, 2016

Summary of Topics

UL 60335-1 is an adoption of IEC 60335-1, Safety Standard for of Household and Similar Electrical Appliances, Part 1: General Requirements, (Edition 5.1, Issued by the IEC April, 2014). Please note that the national difference document incorporates all of the U.S. national differences for UL 60335-1.

The new and revised requirements are substantially in accordance with Proposal(s) on this subject dated February 5, 2016 and July 15, 2016.

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Second Edition

Underwriters Laboratories Inc.
UL 60335-1
Sixth Edition

Safety of Household and Similar Appliances, Part 1: General Requirements

October 31, 2016

This national standard is based on publication IEC 60335-1, Edition 5.1 (Edition 5:2010 including corrigendum 1:2010, corrigendum 2:2011, and amendment 1:2013) issued April 2014.

ANSI/UL 60335-1-2016

Approved by

Standards Council of Canada
Conseil canadien des normes

Commitment for Amendments

This standard is issued jointly by the Canadian Standards Association (operating as "CSA Group") and Underwriters Laboratories Inc. (UL). Comments or proposals for revisions on any part of the standard may be submitted to CSA Group or UL at anytime. Revisions to this standard will be made only after processing according to the standards development procedures of CSA Group and UL. CSA Group and UL will issue revisions to this standard by means of a new edition or revised or additional pages bearing their date of issue.

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This Standard is subject to review five years from the date of publication, and suggestions for its improvement will be referred to the appropriate committee. To submit a proposal for change, please send the following information to inquires@csagroup.org and include ″Proposal for change″ in the subject line: Standard designation (number); relevant clause, table, and/or figure number; wording of the proposed change; and rationale for the change.

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This ANSI/UL Standard for Safety consists of the Sixth Edition. The most recent designation of ANSI/UL 60335-1 as an American National Standard (ANSI) occurred on October 31, 2016. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page (front and back), or the Preface. The National Difference Page and IEC Foreword are also excluded from the ANSI approval of IEC-based standards. Any other portions of this ANSI/UL standard that were not processed in accordance with ANSI/UL requirements are noted at the beginning of the impacted sections.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at https://csds.ul.com.

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Preface

This is the harmonized CSA Group and UL standard for general requirements for safety of household and similar appliances. It is the second edition of CAN/CSA C22.2 No. 60335-1, and the sixth edition of UL 60335-1. This edition of CAN/CSA-C22.2 No. 60335-1 coexists with the previous edition(s) published on October 31, 2011. This edition of UL 60335-1 supersedes the previous edition(s) published on October, 31, 2011.

This harmonized standard is based on IEC Publication 60335-1: edition 5.1 Standard for Safety of Household and Similar Appliances, Part 1: General Requirements issued April, 2014, including corrigendum 1 (2010), corrigendum 2 (2011) and its amendment 1 (2013). IEC publication 60335-1 is copyrighted by the IEC.

This harmonized standard was prepared by CSA Group and Underwriters Laboratories Inc. (UL). The efforts and support of Industry Associations [Cámara Nacional de Manufacturas Eléctricas (CANAME), the Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI), the Air-Conditioning, Heating, and Refrigeration Institute (AHRI), and the Association of Home Appliance Manufacturers (AHAM)], and of the Technical Harmonization Sub-Committee (THSC 61D WG1) of the Council on the Harmonization of Electrotechnical Standards of the Nations of the Americas (CANENA), are gratefully acknowledged.

This standard is considered suitable for use for conformity assessment within the stated scope of the standard.

This standard was reviewed by the CSA Subcommittee on Safety of Household Electrical Appliances, under the jurisdiction of the CSA Technical Committee on Consumer and Commercial Products and the CSA Strategic Steering Committee on Requirements for Electrical Safety, and has been formally approved by the CSA Technical Committee.

This standard has been approved by the Standards Council of Canada (SCC) as a National Standard of Canada.

This Standard has been approved by the American National Standards Institute (ANSI) as an American National Standard.

Application of Standard

Where reference is made to a specific number of samples to be tested, the specified number is to be considered a minimum quantity.

Note: Although the intended primary application of this standard is stated in its scope, it is important to note that it remains the responsibility of the users of the standard to judge its suitability for their particular purpose.

This is the CAN/CSA-C22.2 No. 60335-1 Standard for Safety of Household and Similar Appliances, Part 1: General Requirements. This CSA Group Part 1 is to be used in conjunction with the appropriate CSA Group Part 2 Standard, which contains clauses to supplement or modify the corresponding clauses in the Part 1, to provide relevant requirements for each type of product.

This is the UL Standard forSafety of Household and Similar Appliances, Part 1: General Requirements. This UL Part 1 is to be used in conjunction with the appropriate UL Part 2 Standard, which contains clauses to supplement or modify the corresponding clauses in the Part 1, to provide relevant requirements for each type of product.

Level of harmonization

This standard adopts the IEC text with national differences.

This standard is published as an equivalent standard for CSA Group and UL.

An equivalent standard is a standard that is substantially the same in technical content, except as follows: Technical national differences are allowed for codes and governmental regulations as well as those recognized as being in accordance with NAFTA Article 905, for example, because of fundamental climatic, geographical, technological, or infrastructural factors, scientific justification, or the level of protection that the country considers appropriate. Presentation is word for word except for editorial changes.

All national differences from the IEC text are included in the CSA Group and UL versions of the standard. While the technical content is the same in each organization's version, the format and presentation may differ.

Reasons for differences from IEC

National Differences from the IEC are being added in order to address regulatory and safety situations present in Canada and the US.

Interpretations

The interpretation by the standards development organization of an identical or equivalent standard is based on the literal text to determine compliance with the standard in accordance with the procedural rules of the standards development organization. If more than one interpretation of the literal text has been identified, a revision is to be proposed as soon as possible to each of the standards development organizations to more accurately reflect the intent.

IEC Copyright

For CSA Group, the text, figures, and tables of International Electrotechnical Commission Publication 60335-1, Standard for Safety of Household and Similar Appliances, Part 1: General Requirements, edition 5.1, copyright 2014, are used in this standard with the consent of the International Electrotechnical Commission. The IEC Foreword and Introduction are not a part of the requirements of this standard but are included for information purposes only.

For UL, the text, figures and tables of IEC Publication 60335-1, Standard for Safety of Household and Similar Appliances, Part 1: General Requirements, edition 5.1, copyright 2014, are used in this standard with the consent of the IEC and the American National Standards Institute (ANSI). The IEC copyrighted material has been reproduced with permission from ANSI. ANSI should be contacted regarding the reproduction of any portion of the IEC material. The IEC Foreword and Introduction are not a part of the requirements of this standard but are included for information purposes only. Copies of IEC Publication IEC 60335-1 may be purchased from ANSI, 25 West 43rd Street, 4th Floor, New York, New York, 10036, (212) 642- 4900.

NATIONAL DIFFERENCES

GENERAL

National Differences from the text of International Electrotechnical Commission (IEC) Publication 60335-1, Safety of Household and Similar Appliances, Part 1: General Requirements copyright 2014 are indicated by notations (differences) and are presented in bold text.

There are five types of National Differences as noted below. The difference type is noted on the first line of the National Difference in the standard. The standard may not include all types of these National Differences.

DR – These are National Differences based on the **national regulatory requirements**.

D1 – These are National Differences which are based on **basic safety principles and requirements**, elimination of which would compromise safety for consumers and users of products.

D2 – These are national differences from IEC requirements based on existing **safety practices**. These requirements reflect national safety practices, where empirical substantiation (for the IEC or national requirement) is not available or the text has not been included in the IEC standard.

DC – These are National Differences based on the **component standards** and will not be deleted until a particular component standard is harmonized with the IEC component standard.

DE – These are National Differences based on **editorial comments or corrections**.

Each national difference contains a description of what the national difference entails. Typically one of the following words is used to explain how the text of the national difference is to be applied to the base IEC text:

Addition / Add - An addition entails adding a complete new numbered clause, subclause, table, figure, or annex. Addition is not meant to include adding select words to the base IEC text.

Modification / Modify - A modification is an altering of the existing base IEC text such as the addition, replacement or deletion of certain words or the replacement of an entire clause, subclause, table, figure, or annex of the base IEC text.

Deletion / Delete - A deletion entails complete deletion of an entire numbered clause, subclause, table, figure, or annex without any replacement text.

INTERNATIONAL ELECTROTECHNICAL COMMISSION

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY – Part 1: General requirements

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 nongovernmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.

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4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.

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6) All users should ensure that they have the latest edition of this publication.

7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.

8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.

9) 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 Consolidated version of IEC 60335-1 bears the edition number 5.1. It consists of the fifth edition (2010) [documents 61/3974/FDIS and 61/4014/RVD], its corrigendum 1 (2010), its corrigendum 2 (2011) and its amendment 1 (2013) [documents 61/4639/FDIS and 61/4675/RVD]. The technical content is identical to the base edition and its amendment.

This Final version does not show where the technical content is modified by amendment 1. A separate Redline version with all changes highlighted is available in this publication.

This publication has been prepared for user convenience.

International Standard IEC 60335-1 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances.

The principal changes in this edition as compared with the fourth edition of IEC 60335-1 are as follows (minor changes are not listed):

– updated the text of the standard to align with the most recent editions of the dated normative references;

– modified the functional safety requirements using programmable electronic circuits including software validation requirements;

– updated Clause 29 to cover insulation requirements subjected to high frequency voltages as in switch mode power supply circuits;

– updated Subclause 30.2 to further align the pre-selection option with the end-product test option;

– deleted some notes and converted many other notes to normative text;

– clarified requirements for class III appliances and class III constructions.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

This part is to be used in conjunction with the appropriate part 2 of IEC 60335. The parts 2 contain clauses to supplement or modify the corresponding clauses in this part to provide the relevant requirements for each type of appliance.

NOTE 1 The following annexes contain provisions suitably modified from other IEC standards:

– Annex E	Needle-flame test	IEC 60695-11-5
– Annex F	Capacitors	IEC 60384-14
– Annex G	Safety isolating transformers	IEC 61558-1 and IEC 61558-2-6
– Annex H	Switches	IEC 61058-1
– Annex J	Coated printed circuit boards	IEC 60664-3
– Annex N	Proof tracking test	IEC 60112
– Annex R	Software evaluation	IEC 60730-1

NOTE 2 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 associated noun are also in bold.

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.

The committee has decided that the contents of the base publication and its amendment will remain unchanged until the stability date indicated on the IEC web site under ″http://webstore.iec.ch″ in the data related to the specific publication. At this date, the publication will be

• reconfirmed,

• withdrawn,

• replaced by a revised edition, or

• amended.

NOTE 3 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.

– Introduction: The Part 1 standard (UL60335-1) is only used in combination with a part 2 (UL60335-2-x). National differences are specified in these standards (USA).

– 5.7: The ambient temperature is 25 °C ± 10 °C (Japan).

– 5.7: The ambient temperature is 27 °C ± 5 °C (India).

– 6.1: Class 0 appliances and class 0I appliances are not allowed (Australia, Austria, Belgium, Czech Republic, Finland, France, Germany, Greece, Hungary, India, Israel, Ireland, Italy, Netherlands, New Zealand, Norway, Poland, Singapore, Slovakia, Sweden, Switzerland, United Kingdom).

– 7.12.2: The requirements for full disconnection do not apply (Japan).

– 13.2: The test circuit and some leakage current limits are different (India).

– 22.2: The second paragraph of this subclause dealing with single-phase class I appliances with heating elements cannot be complied with because of the supply system (France and Norway).

– 22.2: Double-pole switches or protective devices are required (Norway).

– 22.35 Accessible metal parts separated from live parts by earthed metal parts are not regarded as likely to become live in the event of an insulation fault (USA).

– 24.1: IEC component standard requirements are replaced by the relevant requirements of component standards specified in UL60335-1 and parts 2 (UL60335-2-x) (USA).

– 25.3: A set of supply leads is not permitted (Norway, Denmark, Finland, Netherlands).

– 25.8: 0,5 mm^2 supply cords are not allowed for class I appliances (Australia and New Zealand).

– 26.6: Conductor cross-sectional areas are different (USA).

– 29.1: Different rated impulse voltages are used between 50 V and 150 V (Japan).

The contents of the corrigenda of January 2014 and April 2014 have been included in this copy.

DV.1 DE *Modification to replace the second paragraph following item (9) of the IEC Foreword with the following:*

This Final version does not show where the technical content is modified by amendment 1. A separate redline version with all changes highlighted is not available in this publication.

DV.2 DE *Modification to add the following dashed items to fifth paragraph following item (9) of the IEC Foreword to describe principal changes (deviations) to the North American harmonized version of this standard (minor changes are not listed):*

– Modified and updated Annex DVA to eliminate unnecessary component standards references and to clarify where there are additional requirements for components;

– Added deviation wording throughout the standard to better reflect when the additional component requirements of Annex DVA apply;

– Added deviations that include certain additional requirements of the national electrical codes or laws that have been applicable;

– Updated Scope to enable use of this standard for pre-selection of components and sub-assemblies, as appropriate;

– Added deviation in Clause 11 to apply the relative thermal index to polymeric materials;

– Added deviation in Clause 11 to permit certain single components considered to be reliable to serve as protective impedance;

– Updated Clauses 13 and 16 to more closely align with the IEC standard;

– Added deviation to Clause 22 clarifying for Canada where a varistor may be connected between live parts and accessible metal parts;

– Added deviation to Clause 24 to clarify that a portable GFCI may be used;

– Added new Annex DVD and relocated adhesive deviations from elsewhere in this standard to the Annex.

DV.3 DE *Modification of Note 2 to replace the last item with the following:*

Words in SMALL ROMAN CAPS in the text are defined in Clause 3.

DV.4 DE *Modification to add the following after Note 2:*

The numbering system in the standard uses a space instead of a comma to indicate thousands and uses a comma instead of a period to indicate a decimal point. For example, 1 000 means 1,000 and 1,01 means 1.01.

DV.5 D2 *Deletion of the country deviations in the 10th paragraph following item (9) of the IEC Foreword:*

Delete all dashed items

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.

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.

NOTE 1 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 2 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 3 Horizontal and generic standards 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. For example, in the case of temperature requirements for surfaces on many appliances, generic standards, such as ISO 13732-1 for hot surfaces, are not applicable in addition to Part 1 or part 2 standards.

Individual countries may wish to consider the application of the standard, as far as is reasonable, to appliances not mentioned in a part 2, and to appliances designed on new principles.

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 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 the standard.

NOTE 4 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, IEC 61000-3-2 and IEC 61000-3-3 concerning electromagnetic emissions;

– CISPR 14-2 concerning electromagnetic immunity;

– IEC standards published by TC 111 concerning environmental matters.

DV.6 D2 *Modification to add the following after the fourth paragraph of the introduction:*

The Part 1 standard is only used in conjunction with a nationally adopted IEC 60335-2-x Part 2 standard. If there is neither a nationally adopted IEC Part 2, nor a national particular product safety standard, then the Part 1 may be used.

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY – Part 1: General requirements

1 Scope

This International Standard deals with the safety of electrical appliances for household and similar purposes, their RATED VOLTAGE being not more than 250 V for single-phase appliances and 480 V for other appliances.

NOTE 1 BATTERY-OPERATED APPLIANCES and other d.c. supplied appliances are within the scope of this standard. Dual supply appliances, either mains-supplied or battery-operated, are regarded as BATTERY-OPERATED APPLIANCES when operated in the battery mode.

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.

NOTE 2 Examples of such appliances are catering equipment, cleaning appliances for commercial use, and appliances for hairdressers.

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 3 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.

NOTE 4 This standard does not apply to

– 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);

– audio, video and similar electronic apparatus (IEC 60065);

– appliances for medical purposes (IEC 60601);

– hand-held motor-operated electric tools (IEC 60745);

– personal computers and similar equipment (IEC 60950-1);

– transportable motor-operated electric tools (IEC 61029).

1DV.1 DR *Modification to add after the first paragraph:*

This standard covers the above-noted products that are intended to be installed or used in accordance with:

– CSA C22.1, Canadian Electrical Code (CEC) Part I,

– NFPA 70, National Electrical Code (NEC), in the United States.

1DV.2 DE *Modification to add the following note:*

NOTE 5 This Part 1 may be employed for investigation of components and sub-assemblies for the purpose of their pre-selection for use in appliances. If the component or sub-assembly used complies with this standard, the tests for the component or sub-assembly specified in the particular appliance standard in some cases will not need to be made in the particular appliance or assembly. Additional testing on a component or subassembly may be required. For example, if a control system is associated with the particular appliance control system, additional tests could potentially be necessary on the final appliance.

2 Normative references

The following referenced documents are indispensable for the application 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 60065:2001, *Audio, video and similar electronic apparatus – Safety requirements*; Amendment 1 (2005)[1)]

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/TR3 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*; Amendment 1 (2009)[2)]

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 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 – Guide for installation and operation*

IEC 60309 (all parts), *Plugs, socket-outlets and couplers for industrial purposes*

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

IEC 60320-2-2, *Appliance couplers for household and similar general purposes – Part 2-2: Interconnection couplers for household and similar equipment*

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

IEC 60384-14:2005, *Fixed capacitors for use in electronic equipment – Part 14: Sectional specification: Fixed capacitors for electromagnetic interference suppression and connection to the supply mains*

IEC 60417, *Graphical symbols for use on equipment*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*; Amendment 1 (1999) [3)]

IEC 60598-1:2008, *Luminaires – Part 1: General requirements and tests*

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

IEC 60664-3:2003, *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 60695-2-11:2000, *Fire hazard testing – Part 2-11: Glowing/hot wire based test methods – Glow-wire flammability test method for end-products*

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

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

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

IEC 60695-11-5:2004, *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 60730-1:1999, *Automatic electrical controls for household and similar use – Part 1: General requirements*; Amendment 1 (2003); Amendment 2 (2007)[4)]

IEC 60730-2-8:2000, *Automatic electrical controls for household and similar use – Part 2-8: Particular requirements for electrically operated water valves, including mechanical requirements*; Amendment 1 (2002)[5)]

IEC 60730-2-9:2008, *Automatic electrical controls for household and similar use – Part 2-9: Particular requirements for temperature sensing controls*[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 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 60990:1999, *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 61000-4-11:2004, *Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests*

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*; Amendment 1 (2009)[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*; Amendment 1 (2009)

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

IEC 61058-1:2000, *Switches for appliances – Part 1: General requirements*; Amendment 1 (2001); Amendment 2 (2007)[8)]

IEC 61180-1, *High-voltage test techniques for low-voltage equipment – Part 1: Definitions, test and procedure requirements*

IEC 61180-2, *High-voltage techniques for low-voltage equipment – Part 2: Test equipment*

IEC 61558-1:2005, *Safety of power transformers, power supply units and similar products – Part 1: General requirements and tests*; Amendment 1(2009)[9)]

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

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

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

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

ISO 7000:2004, *Graphical symbols for use on equipment – Index and synopsis*

ISO 9772:2001, *Cellular plastics – Determination of horizontal burning characteristics of small specimens subjected to a small flame*; Amendment 1 (2003)

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

[1] There exists a consolidated edition 7.1 (2005) that includes edition 7 and its Amendment 1.

[2] There exists a consolidated edition 4.1 (2009) that includes edition 4 and its Amendment 1.

[3] There exists a consolidated edition 2.1 (2001) that includes edition 2 and its Amendment 1.

[4] There exists a consolidated edition 3.2 (2007) that includes edition 3 and its Amendment 1 and Amendment 2.

[5] There exists a consolidated edition 2.1 (2003) that includes edition 2 and its Amendment 1.

[6] There exists a consolidated edition 3.1 (2011) that includes edition 3:2008 and its Amendment 1:2011.

[7] There exists a consolidated edition 1.1 (2009) that includes edition 1 and its Amendment 1.

[8] There exists a consolidated edition 3.2 (2008) that includes edition 3 and its Amendment 1 and Amendment 2.

[9] There exists a consolidated edition 2.1 (2009) that includes edition 2 and its Amendment 1.

2DV.1 DR *Modification to add the following to Clause 2 (Canada only):*

CAN/CSA-C22.2 No. 0, General Requirements – Canadian Electrical Code, Part II.

2DV.2 DC *Modification to add the following:*

IEC component standard requirements are replaced by the relevant requirements of Canada and United States component standards, as cited in Annex DVA.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

NOTE 1 An Index of the defined terms is provided at the end of this publication.

NOTE 2 When the terms “voltage” and “current” are used, they are r.m.s. values, unless otherwise specified.

3.1 Definitions relating to physical characteristics

3.1.1

RATED VOLTAGE

voltage assigned to the appliance by the manufacturer

3.1.2

RATED VOLTAGE RANGE

voltage range assigned to the appliance by the manufacturer, expressed by its lower and upper limits

3.1.3

WORKING VOLTAGE

maximum voltage to which the part under consideration is subjected when the appliance is supplied at its RATED VOLTAGE and operating under NORMAL OPERATION, with controls and switching devices positioned so as to maximize the value

NOTE 1 WORKING VOLTAGE takes into account resonant voltages.

NOTE 2 When deducing the WORKING VOLTAGE, the effect of transient voltages is ignored.

3.1.4

RATED POWER INPUT

power input assigned to the appliance by the manufacturer

NOTE If no power input is assigned to the appliance, the RATED POWER INPUT for HEATING APPLIANCES and COMBINED APPLIANCES is the power input measured when the appliance is supplied at RATED VOLTAGE and operated under NORMAL OPERATION.

3.1.5

RATED POWER INPUT RANGE

power input range assigned to the appliance by the manufacturer, expressed by its lower and upper limits

3.1.6

RATED CURRENT

current assigned to the appliance by the manufacturer

NOTE If no current is assigned to the appliance, the RATED CURRENT is

– for HEATING APPLIANCES, the current calculated from the RATED POWER INPUT and the RATED VOLTAGE;

– for MOTOR-OPERATED APPLIANCES and COMBINED APPLIANCES, the current measured when the appliance is supplied at RATED VOLTAGE and operated under NORMAL OPERATION.

3.1.7

RATED FREQUENCY

frequency assigned to the appliance by the manufacturer

3.1.8

RATED FREQUENCY RANGE

frequency range assigned to the appliance by the manufacturer, expressed by its lower and upper limits

3.1.9

NORMAL OPERATION

conditions under which the appliance is operated in normal use when it is connected to the supply mains

3.1.10

RATED IMPULSE VOLTAGE

voltage derived from the RATED VOLTAGE and the overvoltage category of the appliance, characterizing the specified withstand capability of its insulation against transient overvoltages

3.1.11

DANGEROUS MALFUNCTION

unintended operation of the appliance that may impair safety

3.1.12

REMOTE OPERATION

control of an appliance by a command that can be initiated out of sight of the appliance using means such as telecommunications, sound controls or bus systems

NOTE An infra-red control by itself is not considered one used for REMOTE OPERATION. However, it may be incorporated as part of a system such as a telecommunication, sound control or bus system.

3.2 Definitions relating to means of connection

3.2.1

SUPPLY LEADS

set of wires intended for connecting the appliance to fixed wiring and accommodated in a compartment within or attached to the appliance

3.2.2

INTERCONNECTION CORD

external flexible cord between two parts of an appliance, provided as part of a complete appliance for purposes other than connection to the supply mains

NOTE In BATTERY-OPERATED APPLIANCES, if the battery is placed in a separate box, the flexible lead or flexible cord connecting the box with the appliance is considered to be an INTERCONNECTION CORD.

3.2.3

SUPPLY CORD

flexible cord, for supply purposes, that is fixed to the appliance

3.2.4

TYPE X ATTACHMENT

method of attachment of the SUPPLY CORD such that it can easily be replaced

NOTE The SUPPLY CORD may be specially prepared and only available from the manufacturer or its service agent. A specially prepared cord may include a part of the appliance.

3.2.5

TYPE Y ATTACHMENT

method of attachment of the SUPPLY CORD such that any replacement is intended to be made by the manufacturer, its service agent or similar qualified person

3.2.6

TYPE Z ATTACHMENT

method of attachment of the SUPPLY CORD such that it cannot be replaced without breaking or destroying the appliance

3.3 Definitions relating to protection against electric shock

3.3.1

BASIC INSULATION

insulation applied to LIVE PARTS to provide basic protection against electric shock

3.3.2

SUPPLEMENTARY INSULATION

independent insulation applied in addition to BASIC INSULATION, in order to provide protection against electric shock in the event of a failure of BASIC INSULATION

3.3.3

DOUBLE INSULATION

insulation system comprising both BASIC INSULATION and SUPPLEMENTARY INSULATION

3.3.4

REINFORCED INSULATION

single insulation applied to LIVE PARTS, that provides a degree of protection against electric shock equivalent to DOUBLE INSULATION under the conditions specified in this standard

NOTE It is not implied that the insulation is one homogeneous piece. The insulation may comprise several layers which cannot be tested singly as SUPPLEMENTARY INSULATION or BASIC INSULATION.

3.3.5

FUNCTIONAL INSULATION

insulation between conductive parts of different potential which is necessary only for the proper functioning of the appliance

3.3.6

PROTECTIVE IMPEDANCE

impedance connected between LIVE PARTS and ACCESSIBLE CONDUCTIVE PARTS of CLASS II CONSTRUCTIONS so that the current, in normal use and under likely fault conditions in the appliance, is limited to a safe value

3.3.7

CLASS 0 APPLIANCE

appliance in which protection against electric shock relies upon BASIC INSULATION only, there being no means for the connection of conductive ACCESSIBLE PARTS, if any, to the protective conductor in the fixed wiring of the installation, reliance in the event of a failure of the BASIC INSULATION being placed upon the environment

NOTE CLASS 0 APPLIANCE have either an enclosure of insulating material which may form a part or the whole of the BASIC INSULATION, or a metal enclosure which is separated from LIVE PARTS by an appropriate insulation. If an appliance with an enclosure of insulating material has provision for earthing internal parts, it is considered to be a CLASS I APPLIANCE or CLASS

0I APPLIANCE.

3.3.7DV D2 ***Modification to add the following after the last sentence of the definition:***

CLASS 0 appliances shall not exceed 150 V (rms) to ground.

3.3.8

CLASS 0I APPLIANCE

appliance having at least BASIC INSULATION throughout and incorporating an earthing terminal but having a SUPPLY CORD without earthing conductor and a plug without earthing contact

3.3.9

CLASS I APPLIANCE

appliance in which protection against electric shock does not rely on BASIC INSULATION only but which includes an additional safety precaution, in that conductive ACCESSIBLE PARTS are connected to the PROTECTIVE EARTHING CONDUCTOR in the fixed wiring of the installation in such a way that conductive ACCESSIBLE PARTS cannot become live in the event of a failure of the BASIC INSULATION

NOTE This provision includes a PROTECTIVE EARTHING CONDUCTOR in the SUPPLY CORD.

3.3.10

CLASS II APPLIANCE

appliance in which protection against electric shock does not rely on BASIC INSULATION only but in which additional safety precautions are provided, such as DOUBLE INSULATION or REINFORCED INSULATION, there being no provision for protective earthing or reliance upon installation conditions

NOTE 1 Such an appliance may be of one of the following types:

– an appliance having a durable and substantially continuous enclosure of insulating material which envelops all metal parts, with the exception of parts, such as nameplates, screws and rivets, which are isolated from LIVE PARTS by insulation at least equivalent to REINFORCED INSULATION; such an appliance is called an insulation-encased CLASS II APPLIANCE;

– an appliance having a substantially continuous metal enclosure, in which DOUBLE INSULATION or REINFORCED INSULATION is used throughout; such an appliance is called a metal-encased CLASS II APPLIANCE;

– an appliance which is a combination of an insulation-encased CLASS II APPLIANCE and a metal-encased CLASS II APPLIANCE.

NOTE 2 The enclosure of an insulation-encased CLASS II APPLIANCE may form a part or the whole of the SUPPLEMENTARY INSULATION or of the REINFORCED INSULATION.

3.3.11

CLASS II CONSTRUCTION

part of an appliance for which protection against electric shock relies upon DOUBLE INSULATION or REINFORCED INSULATION

3.3.12

CLASS III APPLIANCE

appliance in which protection against electric shock relies on supply at SAFETY EXTRA-LOW VOLTAGE and in which voltages higher than those of SAFETY EXTRA-LOW VOLTAGE are not generated

NOTE BASIC INSULATION may be required in addition to supply at SELV. Refer to 8.1.4.

3.3.13

CLASS III CONSTRUCTION

part of an appliance for which protection against electric shock relies upon SAFETY EXTRA-LOW VOLTAGE and in which voltages higher than those of SAFETY EXTRA-LOW VOLTAGE are not generated

NOTE 1 BASIC INSULATION may be required in addition to supply at SELV. Refer to 8.1.4.

NOTE 2 If the main part of the appliance operates at SELV and is delivered together with a DETACHABLE POWER SUPPLY UNIT then this main part of the appliance is considered to be of CLASS III CONSTRUCTION in a CLASS I APPLIANCE or CLASS II APPLIANCE as appropriate.

3.3.14

CLEARANCE

shortest distance in air between two conductive parts or between a conductive part and the ACCESSIBLE SURFACE

3.3.15

CREEPAGE DISTANCE

shortest distance along the surface of insulation between two conductive parts or between a conductive part and the ACCESSIBLE SURFACE

3.3.16

BATTERY-OPERATED APPLIANCE

appliance deriving its energy from batteries enabling the appliance to perform its intended function without a mains connection

3.4 Definitions relating to EXTRA-LOW VOLTAGE

3.4.1

EXTRA-LOW VOLTAGE

voltage supplied from a source within the appliance that does not exceed 50 V between conductors and between conductors and earth when the appliance is supplied at RATED VOLTAGE

3.4.1DV DR *Modification to replace the definition with the following:*

EXTRA-LOW VOLTAGE: voltage that does not exceed 30 V rms or 42,4 V peak ac or dc.

3.4.2

SAFETY EXTRA-LOW VOLTAGE

voltage not exceeding 42 V between conductors and between conductors and earth, the noload voltage not exceeding 50 V

When SAFETY EXTRA-LOW VOLTAGE is obtained from the supply mains, it is to be through a SAFETY ISOLATING TRANSFORMER or a convertor with separate windings, the insulation of which complies with DOUBLE INSULATION or REINFORCED INSULATION requirements.

NOTE 1 The voltage limits specified are based on the assumption that the SAFETY ISOLATING TRANSFORMER is supplied at its RATED VOLTAGE.

NOTE 2 SAFETY EXTRA-LOW VOLTAGE is also known as SELV.

3.4.2DV DR *Modification to replace the first paragraph with the following:*

SAFETY EXTRA-LOW VOLTAGE: voltage not exceeding 30 V rms or 42,4 V peak or 30 V dc between conductors and between conductors and earth. Where wet contact with the appliance is likely to occur, SAFETY EXTRA-LOW VOLTAGE is 15 V rms or 21,2 V peak or 15 V dc.

NOTE Appliances where wet contact is assumed to occur such as a wet shaver are specified in the part 2 standard.

3.4.3

SAFETY ISOLATING TRANSFORMER

transformer, the input winding of which is electrically separated from the output winding by an insulation at least equivalent to DOUBLE INSULATION or REINFORCED INSULATION, that is intended to supply an appliance or circuit at SAFETY EXTRA-LOW VOLTAGE

3.4.4

PROTECTIVE EXTRA-LOW VOLTAGE CIRCUIT

earthed circuit operating at SAFETY EXTRA-LOW VOLTAGE which is separated from other circuits by BASIC INSULATION and protective screening, DOUBLE INSULATION or REINFORCED INSULATION

NOTE 1 Protective screening is the separation of circuits from LIVE PARTS by means of an earthed screen.

NOTE 2 A PROTECTIVE EXTRA-LOW VOLTAGE CIRCUIT is also known as a PELV CIRCUIT.

3.5 Definitions relating to types of appliances

3.5.1

PORTABLE APPLIANCE

appliance that is intended to be moved while in operation or an appliance, other than a FIXED APPLIANCE, having a mass less than 18 kg

3.5.2

HAND-HELD APPLIANCE

PORTABLE APPLIANCE intended to be held in the hand during normal use

3.5.3

STATIONARY APPLIANCE

FIXED APPLIANCE or an appliance which is not a PORTABLE APPLIANCE

3.5.4

FIXED APPLIANCE

appliance that is intended to be used while fastened to a support or while secured in a specific location

3.5.5

BUILT-IN APPLIANCE

FIXED APPLIANCE intended to be installed in a cabinet, in a prepared recess in a wall or in a similar location

3.5.6

HEATING APPLIANCE

appliance incorporating heating elements but without any motor

3.5.7

MOTOR-OPERATED APPLIANCE

appliance incorporating motors but without any heating element

NOTE Magnetically driven appliances are considered to be MOTOR-OPERATED APPLIANCES.

3.5.8

COMBINED APPLIANCE

appliance incorporating heating elements and motors

3.6 Definitions relating to parts of an appliance

3.6.1

NON-DETACHABLE PART

part that can only be removed or opened with the aid of a TOOL or a part that fulfils the test of 22.11.

3.6.2

DETACHABLE PART

part that can be removed or opened without the aid of a TOOL, a part that is removed or opened in accordance with the instructions for use, even if a TOOL is needed for removal, or a part that does not fulfil the test of 22.11

NOTE 1 If for installation purposes a part has to be removed, this part is not considered to be detachable even if the instructions state that it is to be removed.

NOTE 2 Components that can be removed without the aid of a TOOL are considered to be DETACHABLE PARTS.

3.6.3

ACCESSIBLE PART

part or surface that can be touched by means of test probe B of IEC 61032, and if the part or surface is metal, any conductive part connected to it

NOTE ACCESSIBLE NON-METALLIC PARTS with conductive coatings are considered to be ACCESSIBLE METAL PARTS.

3.6.3DV D2 *Modification to replace the first sentence with the following:*

ACCESSIBLE PART : part or surface that can be touched by means of either test probe B of IEC 61032 or, when required in clause 8, 20.2 or the applicable part 2, Figure 13DV and if the part or surface is metal, any conductive part connected to it

3.6.4

LIVE PART

conductor or conductive part intended to be energized in normal use, including a neutral conductor but, by convention, not a PEN conductor

NOTE 1 Parts, accessible or not, complying with 8.1.4 are not considered to be LIVE PARTS.

NOTE 2 A PEN conductor is a protective earthed neutral conductor combining the functions of both a protective conductor and a neutral conductor.

3.6.4DV DE *Modification to add the following note:*

NOTE 3 A LIMITED POWER SOURCE is not considered to be LIVE PARTS.

3.6.5
TOOL
screwdriver, coin or any other object that may be used to operate a screw or similar fixing means

3.6.6
SMALL PART
part, where each surface lies completely within a circle of 15 mm diameter, or a part where some of the surface lies outside a 15 mm diameter circle but in such a way that it is not possible to fit a circle of 8 mm diameter on any of the surfaces

NOTE A part that is too small to grip and at the same time to be able to apply the glow-wire tip is shown in example A in Figure 5. A part that is large enough to grip but that is too small to be able to apply the glow-wire tip is shown in example B in Figure 5. A part that is not a SMALL PART is shown in example C in Figure 5.

3.6.7
BATTERY BOX
separate compartment for containing the batteries that is detachable from the appliance

3.7 Definitions relating to safety components

3.7.1
THERMOSTAT
temperature-sensing device, the operating temperature of which may be either fixed or adjustable and which during NORMAL OPERATION keeps the temperature of the controlled part between certain limits by automatically opening and closing a circuit

3.7.2
TEMPERATURE LIMITER
temperature-sensing device, the operating temperature of which may be either fixed or adjustable and which during NORMAL OPERATION operates by opening or closing a circuit when the temperature of the controlled part reaches a predetermined value

NOTE A TEMPERATURE LIMITER does not make the reverse operation during the normal duty cycle of the appliance. It may or may not require manual resetting.

3.7.3
THERMAL CUT-OUT
device which during abnormal operation limits the temperature of the controlled part by automatically opening the circuit, or by reducing the current, and is constructed so that its setting cannot be altered by the user

3.7.4
SELF-RESETTING THERMAL CUT-OUT
THERMAL CUT-OUT that automatically restores the current after the relevant part of the appliance has cooled down sufficiently

3.7.5

NON-SELF-RESETTING THERMAL CUT-OUT

THERMAL CUT-OUT that requires a manual operation for resetting, or replacement of a part, in order to restore the current

NOTE Manual operation includes disconnection of the appliance from the supply mains.

3.7.6

PROTECTIVE DEVICE

device, the operation of which prevents a hazardous situation under abnormal operation conditions

3.7.7

THERMAL LINK

THERMAL CUT-OUT which operates only once and requires partial or complete replacement

3.7.8

INTENTIONALLY WEAK PART

part intended to rupture under conditions of abnormal operation to prevent the occurrence of a condition which could impair compliance with this standard

NOTE Such a part may be a replaceable component, such as a resistor or a capacitor, or a part of a component to be replaced, such as an INACCESSIBLE THERMAL LINK incorporated in a motor.

3.8 Definitions relating to miscellaneous matters

3.8.1

ALL-POLE DISCONNECTION

disconnection of both supply conductors by a single initiating action or, for multi-phase appliances, disconnection of all supply conductors by a single initiating action

NOTE For multi-phase appliances, the neutral conductor is not considered to be a supply conductor.

3.8.2

OFF POSITION

stable position of a switching device in which the circuit controlled by the switch is disconnected from its supply or, for electronic disconnection, the circuit is de-energized

NOTE The OFF POSITION does not imply an ALL-POLE DISCONNECTION.

3.8.3

VISIBLY GLOWING HEATING ELEMENT

heating element that is partly or completely visible from the outside of the appliance and has a temperature of at least 650 °C when the appliance has been operated under NORMAL OPERATION at RATED POWER INPUT until steady conditions have been established

3.8.4

PTC HEATING ELEMENT

element intended for heating consisting mainly of positive temperature coefficient resistors that are thermally sensitive and have a rapid non-linear increase in resistance when the temperature is raised through a particular range

3.8.5

USER MAINTENANCE

any maintenance operation stated in the instructions for use, or marked on the appliance, that the user is intended to perform

3.9 Definitions relating to ELECTRONIC CIRCUITS

3.9.1

ELECTRONIC COMPONENT

part in which conduction is achieved principally by electrons moving through a vacuum, gas or semiconductor

NOTE Neon indicators are not considered to be ELECTRONIC COMPONENTS.

3.9.2

ELECTRONIC CIRCUIT

circuit incorporating at least one ELECTRONIC COMPONENT

3.9.3

PROTECTIVE ELECTRONIC CIRCUIT

ELECTRONIC CIRCUIT that prevents a hazardous situation under abnormal operating conditions

NOTE Parts of the circuit may also be used for functional purposes.

3.10DV D2 *Addition:*

LIMITED POWER SOURCE: a power source whose output voltage is SELV and the maximum output current and other parameters are limited in accordance with Table 3DV.1

Table 3DV.1 - Limits for inherently LIMITED POWER SOURCES

Output voltage[1] (U_{OC})		Output current[2] (I_{SC})	Apparent power[3] (S)
V a.c.	V d.c.	A	VA
≤ 20	≤ 20	≤ 8,0	≤ 5 × U_{OC}
20 < U_{OC} ≤ 30	20 < U_{OC} ≤ 30	≤ 8,0	≤ 100
–	30 < U_{OC} ≤ 42,4	≤ 150 /U_{OC}	≤ 100

[1] U_{OC}: Output voltage measured with all load circuits disconnected. Voltages are for substantially sinusoidal a.c. and ripple free d.c. For non-sinusoidal a.c. and d.c. with ripple greater than 10% of the peak, the peak voltage shall not exceed 42,4 V.

[2] I_{SC}: Maximum output current with any non-capacitive load, including a short circuit measured 5 s after application of the load if the limited power circuit is protected by an ELECTRONIC CIRCUIT or a PTC and 60 s if protected by an impedance.

[3] S (VA): Maximum output VA with any load. Initial transients lasting less than 5 s are permitted to exceed the limit if the limited power circuit is protected by an ELECTRONIC CIRCUIT or a PTC and 60 s if protected by an impedance.

3.11DV D2 *Addition:*

PROTECTIVE EARTHING CONDUCTOR: a conductor connecting the main protective earthing terminal or lead in the equipment to the building earth, or in the power SUPPLY CORD, connecting a main protective earthing terminal in the equipment to an earth point in the building installation

3.12DV D2 *Addition:*

PROTECTIVE BONDING CONDUCTOR: a conductor in the equipment, or a combination of conductive parts in the equipment, connecting a main protective earthing terminal to a part of the equipment that is required to be earthed

4 General requirement

Appliances shall be constructed so that in normal use, they function safely so as to cause no danger to persons or surroundings, even in the event of carelessness that may occur in normal use.

In general, this principle is achieved by fulfilling the relevant requirements specified in this standard and compliance is checked by carrying out all the relevant tests.

4DV.1 DE *Modification of the first paragraph:*

Replace "cause no danger to persons or surroundings." with "reduce the risk of fire, electric shock, and/or injury to persons."

4DV.2 DR *Modification to add the following to Clause 4 (Canada only):*

CAN/CSA-C22.2 No. 0 shall form a part of, and be read in conjunction with, this standard as far as the requirements apply, except that, where this standard contains requirements that are at variance with those of CAN/CSA-C22.2 No. 0, the requirements of this standard shall take precedence.

5 General conditions for the tests

Unless otherwise specified, the tests are carried out in accordance with this clause.

5.1 Tests according to this standard are type tests.

NOTE Routine tests are described in Annex A.

5.2 *The tests are carried out on a single appliance that shall withstand all the relevant tests. However, the tests of Clauses 20, 22 (except 22.10, 22.11 and 22.18) to 26, 28, 30 and 31 may be carried out on separate appliances. The test of 22.3 is carried out on a new appliance.*

NOTE 1 Additional samples may be required if the appliance has to be tested under different conditions, for example if it can be supplied with different voltages.

If an INTENTIONALLY WEAK PART becomes open circuit during the tests of Clause 19, an additional appliance may be needed.

The testing of components may require the submission of additional samples of these components.

If the test of Annex C has to be carried out, six samples of the motor are needed.

If the test of Annex D has to be carried out, an additional appliance may be used.

If the tests of Annex G are carried out, four additional transformers are needed.

If the tests of Annex H are carried out, three switches or three additional appliances are needed.

NOTE 2 The cumulative stress resulting from successive tests on ELECTRONIC CIRCUITS is to be avoided. It may be necessary to replace components or to use additional samples. The number of additional samples should be kept to a minimum by an evaluation of the relevant ELECTRONIC CIRCUITS.

NOTE 3 If an appliance has to be dismantled in order to carry out a test, care is to be taken to ensure that it is reassembled as originally supplied. In case of doubt, subsequent tests may be carried out on a separate sample.

5.2DV DE *Modification to replace last sentence of first paragraph to the following:*

The test of 22.3 and 22.55DV is carried out on a new appliance.

5.3 *The tests are carried out in the order of the clauses. However, the test of 22.11 on the appliance at room temperature is carried out before the tests of Clause 8. The tests of Clause 14 and 21.2 and 22.24 are carried out after the tests of Clause 29. The test of 19.14 is carried out before the tests of 19.11.*

If it is evident from the construction of the appliance that a particular test is not applicable, the test is not carried out.

5.4 *When testing appliances that are also supplied by other energies such as gas, the influence of their consumption has to be taken into account.*

5.5 *The tests are carried out with the appliance or any movable part of it placed in the most unfavourable position that may occur in normal use.*

5.6 *Appliances provided with controls or switching devices are tested with these controls or devices adjusted to their most unfavourable setting, if the setting can be altered by the user.*

NOTE 1 If the adjusting means of the control is accessible without the aid of a TOOL, this subclause applies whether the setting can be altered by hand or with the aid of a TOOL. If the adjusting means is not accessible without the aid of a TOOL and if the setting is not intended to be altered by the user, this subclause does not apply.

NOTE 2 Adequate sealing is regarded as preventing alteration of the setting by the user.

For appliances fitted with a voltage selector switch, unless otherwise specified, the tests are carried out with the switch in the position corresponding to the RATED VOLTAGE *value used for the tests.*

5.7 *The tests are carried out in a draught-free location at an ambient temperature of 20 °C ± 5 °C.*

If the temperature attained by any part is limited by a temperature sensitive device or is influenced by the temperature at which a change of state occurs, for example when water boils, the ambient temperature is maintained at 23 °C ± 2 °C in case of doubt.

5.8 *Test conditions relating to frequency and voltage*

5.8.1 *Appliances for a.c. only are tested with a.c. at* RATED FREQUENCY*, and those for a.c. and d.c. are tested at the more unfavourable supply.*

Appliances for a.c. that are not marked with RATED FREQUENCY *or are marked with a* RATED FREQUENCY RANGE *of 50 Hz to 60 Hz are tested with either 50 Hz or 60 Hz, whichever is the more unfavourable.*

5.8.2 *Appliances having more than one* RATED VOLTAGE *are tested on the basis of the most unfavourable voltage.*

For MOTOR-OPERATED APPLIANCES*, and* COMBINED APPLIANCES*, marked with a* RATED VOLTAGE RANGE*, when it is specified that the supply voltage is equal to the* RATED VOLTAGE *multiplied by a factor, the appliance is supplied at*

– the upper limit of the RATED VOLTAGE RANGE *multiplied by this factor, if greater than 1;*

– the lower limit of the RATED VOLTAGE RANGE *multiplied by this factor, if smaller than 1.*

When a factor is not specified, the supply voltage is the most unfavourable within the RATED VOLTAGE RANGE*.*

NOTE 1 If a HEATING APPLIANCE has a RATED VOLTAGE RANGE, the upper limit of the voltage range will usually be the most unfavourable voltage within the range.

NOTE 2 For MOTOR-OPERATED APPLIANCES, COMBINED APPLIANCES and appliances having more than one RATED VOLTAGE or RATED VOLTAGE RANGE, it may be necessary to make some of the tests at the minimum, the mean and the maximum values of the RATED VOLTAGE or the RATED VOLTAGE RANGE in order to establish the most unfavourable voltage.

5.8.3 *For HEATING APPLIANCES, and COMBINED APPLIANCES, marked with a RATED POWER INPUT RANGE, when it is specified that the power input is equal to the RATED POWER INPUT multiplied by a factor, the appliance is operated at*

– the upper limit of the RATED POWER INPUT RANGE multiplied by this factor, if greater than 1;

– the lower limit of the RATED POWER INPUT RANGE multiplied by this factor, if smaller than 1.

When a factor is not specified, the power input is the most unfavourable within the RATED POWER INPUT RANGE.

5.8.4 *For appliances marked with a RATED VOLTAGE RANGE and RATED POWER INPUT corresponding to the mean of the RATED VOLTAGE RANGE, when it is specified that the power input is equal to RATED POWER INPUT multiplied by a factor, the appliance is operated at*

– the calculated power input corresponding to the upper limit of the RATED VOLTAGE RANGE multiplied by this factor, if greater than 1;

– the calculated power input corresponding to the lower limit of the RATED VOLTAGE RANGE multiplied by this factor, if smaller than 1.

When a factor is not specified, the power input corresponds to the power input at the most unfavourable voltage within the RATED VOLTAGE RANGE.

5.9 *When alternative heating elements or accessories are made available by the appliance manufacturer, the appliance is tested with those elements or accessories which give the most unfavourable results.*

5.10 *The tests are carried out on the appliance as supplied. However, an appliance constructed as a single appliance but supplied in a number of units is tested after assembly in accordance with the instructions provided with the appliance.*

BUILT-IN APPLIANCES and FIXED APPLIANCES are installed in accordance with the instructions provided with the appliance before testing.

5.11 *Appliances intended to be connected to fixed wiring by means of a flexible cord are tested with the appropriate flexible cord connected to the appliance.*

5.12 *For HEATING APPLIANCES and COMBINED APPLIANCES, when it is specified that the appliance has to operate at a power input multiplied by a factor, this applies only to heating elements without appreciable positive temperature coefficient of resistance.*

For heating elements with appreciable positive temperature coefficient of resistance, other than PTC HEATING ELEMENTS, the supply voltage is determined by supplying the appliance at RATED VOLTAGE until the heating element reaches its operating temperature. The supply voltage is then rapidly increased to the value necessary to give the power input required for the relevant test, this value of the supply voltage being maintained throughout the test.

NOTE In general, the temperature coefficient is considered to be appreciable if, at RATED VOLTAGE, the power input of the appliance in cold condition differs by more than 25 % from the power input at operating temperature.

5.13 *The tests for appliances with* PTC HEATING ELEMENTS *and for* HEATING APPLIANCES *and* COMBINED APPLIANCES *where the heating elements are supplied via a switch mode power supply are carried out at a voltage corresponding to the specified power input.*

When a power input greater than the RATED POWER INPUT *is specified, the factor for multiplying the voltage is equal to the square root of the factor for multiplying the power input.*

5.14 *If* CLASS 0I APPLIANCES *or* CLASS I APPLIANCES *have* ACCESSIBLE METAL PARTS *that are not earthed and are not separated from* LIVE PARTS *by an intermediate metal part that is earthed, such parts are checked for compliance with the appropriate requirements specified for* CLASS II CONSTRUCTION.

If CLASS 0I APPLIANCES *or* CLASS I APPLIANCES *have* ACCESSIBLE NON-METALLIC PARTS, *such parts are checked for compliance with the appropriate requirements specified for* CLASS II CONSTRUCTION *unless these parts are separated from* LIVE PARTS *by an intermediate metal part that is earthed.*

NOTE Guidance is given in Annex P for enhanced requirements that may be used to ensure an acceptable level of protection against electrical and thermal hazards for particular types of appliances used in an installation without a PROTECTIVE EARTHING CONDUCTOR in countries that have warm damp equable climates.

5.15 *If appliances have parts operating at* SAFETY EXTRA-LOW VOLTAGE, *such parts are checked for compliance with the appropriate requirements specified for* CLASS III CONSTRUCTION.

5.16 *When testing* ELECTRONIC CIRCUITS, *the supply is to be free from perturbations from external sources that can influence the results of the tests.*

5.17 *Appliances powered by rechargeable batteries that are recharged in the appliance are tested in accordance with Annex B.*

BATTERY-OPERATED APPLIANCES *powered by batteries that are non-rechargeable or not recharged in the appliance are tested in accordance with Annex S.*

5.18 *If linear and angular dimensions are specified without a tolerance, ISO 2768-1 is applicable.*

5.19 *If a component or part of the appliance has both a* SELF RESETTING FEATURE *and a* NON-SELF- RESETTING FEATURE *and if the* NON-SELF-RESETTING FEATURE *is not required in order to comply with the standard, then appliances incorporating such a component or part shall be tested with the* NON-SELF-RESETTING FEATURE *rendered inoperative.*

6 Classification

6.1 Appliances shall be of one of the following classes with respect to protection against electric shock:

CLASS 0, CLASS 0I, CLASS I, CLASS II, CLASS III.

Compliance is checked by inspection and by the relevant tests.

6.1DV DR *Modification to add the following:*

CLASS 0I appliances are not allowed.

6.2 Appliances shall have the appropriate degree of protection against harmful ingress of water.

Compliance is checked by inspection and by the relevant tests.

NOTE The degrees of protection against harmful ingress of water are given in IEC 60529.

7 Marking and instructions

7.1 Appliances shall be marked with the

– RATED VOLTAGE or RATED VOLTAGE RANGE in volts;

– symbol for nature of supply, unless the RATED FREQUENCY is marked;

– RATED POWER INPUT in watts or RATED CURRENT in amperes;

– name, trade mark or identification mark of the manufacturer or responsible vendor;

– model or type reference;

– symbol IEC 60417-5172 (2003-02) for CLASS II APPLIANCES only;

– IP number according to degree of protection against ingress of water, other than IPX0;

– symbol IEC 60417-5180 (2003-02), for CLASS III APPLIANCES. This marking is not necessary for appliances that are operated only by batteries (primary batteries or secondary batteries that are recharged outside of the appliance).

NOTE 1 The first numeral of the IP number need not be marked on the appliance.

NOTE 2 Additional markings are allowed provided they do not give rise to misunderstanding.

NOTE 3 If components are marked separately, the marking of the appliance and that of the components is to be such that there can be no doubt with regard to the marking of the appliance itself.

NOTE 4 If the appliance is marked with rated pressure, the units used may be bars but only together with pascals and placed in brackets.

CLASS II APPLIANCES and CLASS III APPLIANCES incorporating a functional earth shall be marked with the symbol IEC 60417-5018 (2011-07).

The enclosure of electrically-operated water valves incorporated in external hose-sets for connection of an appliance to the water mains shall be marked with symbol IEC 60417-5036 (2002-10) if their WORKING VOLTAGE exceeds EXTRA-LOW VOLTAGE.

Compliance is checked by inspection.

7.1DV.1 D2 *Modification to add a paragraph after the seventh dashed item of Clause 7.1:*

Ingress protection markings in addition to the IP ratings are acceptable. If marked, the appliance shall also comply with the referenced standards of Annex DVA (Boxes, Conduit and Fittings). Additional markings, where used, shall be as specified in the applicable Part 2.

7.1DV.2 DR *Modification to add the following after the compliance statement of Clause 7.1:*

If the temperature rise of the insulation of the fixed wiring supplying an appliance for permanent connection to the supply mains exceeds the temperature rise specified in Table 3 during the test of Clause 11, the equipment shall be marked with the substance of the following:

″Use supply wires suitable for ____ °C″

NOTE 5 The temperature specified in the marking will be 75°C or 90°C except where another rating is permitted by national electrical installation code wiring rules.

NOTE 6 Additional information (e.g. AWG size) may be provided as part of the marking where appropriate to facilitate installation in accordance with the national electrical installation code wiring rules.

Compliance is checked by inspection and during the test of Clause 11.

7.1DV.3 DR *Modification to add the following (Canada Only):*

In Canada, warnings shall be written in English and French.

7.2 STATIONARY APPLIANCES for multiple supply shall be marked with the substance of the following:

Warning: Before obtaining access to terminals, all supply circuits must be disconnected.

This warning shall be placed in the vicinity of the terminal cover.

Compliance is checked by inspection.

7.3 Appliances having a range of rated values and which can be operated without adjustment throughout the range shall be marked with the lower and upper limits of the range separated by a hyphen.

NOTE 1 Example: 115-230 V: The appliance is suitable for any value within the marked range (a curling iron with a PTC HEATING ELEMENT or an appliance incorporating an input switch mode power supply).

Appliances having different rated values and which have to be adjusted for use at a particular value by the user or installer shall be marked with the different values separated by an oblique stroke.

NOTE 2 Example: 115/230 V: The appliance is only suitable for the marked values (a shaver with a selector switch).

NOTE 3 This requirement is also applicable to appliances with provision for connection to both single-phase and multi-phase supplies.

Example: 230 V~/400 V 3N~: The appliance is only suitable for the voltage values indicated, 230 V~ being for single-phase, a.c. operation and 400 V 3N~ for three-phase, a.c. with neutral operation (an appliance with terminals for both supplies).

Compliance is checked by inspection.

7.4 If the appliance can be adjusted for different RATED VOLTAGES or RATED FREQUENCIES, the voltage or the frequency to which the appliance is adjusted shall be clearly discernible. If frequent changes in voltage setting or frequency setting are not required, this requirement is considered to be met if the RATED VOLTAGE or RATED FREQUENCY to which the appliance is to be adjusted can be determined from a wiring diagram fixed to the appliance.

NOTE The wiring diagram may be on the inside of a cover that has to be removed to connect the supply conductors. It is not to be on a label loosely attached to the appliance.

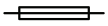
Compliance is checked by inspection.

7.5 For appliances marked with more than one RATED VOLTAGE or with one or more RATED VOLTAGE RANGES, the RATED POWER INPUT or RATED CURRENT for each of these voltages or ranges shall be marked. However, if the difference between the limits of a RATED VOLTAGE RANGE does not exceed 10 % of the arithmetic mean value of the range, the marking for RATED POWER INPUT or RATED CURRENT may be related to the arithmetic mean value of the range.

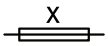
The upper and lower limits of the RATED POWER INPUT or RATED CURRENT shall be marked on the appliance so that the relation between input and voltage is clear.

Compliance is checked by inspection.

7.6 When symbols are used, they shall be as follows

	[symbol IEC 60417-5031 (2002-10)]	direct current
	[symbol IEC 60417-5032 (2002-10)]	alternating current
	[symbol IEC 60417-5032-1 (2002-10)]	three-phase alternating current
	[symbol IEC 60417-5032-2 (2002-10)]	three-phase alternating current with neutral
	[symbol IEC 60417-5016 (2002-10)]	fuse-link

NOTE 1 The **rated current** of the fuse link may be indicated in association with this symbol.

		time-lag miniature fuse-link where x is the symbol for the time/current characteristic as given in IEC 60127
	[symbol IEC 60417-5019 (2006-08)]	protective earth
	[symbol IEC 60417-5018 (2006-10)]	functional earthing
	[symbol IEC 60417-5172 (2003-02)]	class II equipment
	[symbol IEC 60417-5012 (2002-10)]	lamp

NOTE 2 The rated wattage of the lamp may be indicated in association with this symbol.

	[symbol ISO 7000-0434A (2004-01)]	caution
	[symbol ISO 7000-0790 (2004-01)]	read operator's manual
	[symbol IEC 60417-5021 (2002-10)]	equipotentiality
	[symbol IEC 60417-5036 (2002-10)]	dangerous voltage
	[symbol IEC 60417-5180 (2003-02)]	Class III appliance

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The symbol for nature of supply shall be placed next to the marking for RATED VOLTAGE.

The symbol for CLASS II APPLIANCES shall be placed so that it will be obvious that it is a part of the technical information and is unlikely to be confused with any other marking.

Units of physical quantities and their symbols shall be those of the international standardized system.

NOTE 3 Additional symbols are allowed provided that they do not give rise to misunderstanding.

NOTE 4 Symbols specified in IEC 60417 and ISO 7000 may be used.

Compliance is checked by inspection

7.7 Appliances to be connected to more than two supply conductors and appliances for multiple supply shall have a connection diagram fixed to them, unless the correct mode of connection is obvious.

Compliance is checked by inspection.

NOTE 1 The correct mode of connection for multi-phase appliances is considered to be obvious if the terminals for the supply conductors are indicated by arrows pointing towards the terminals.

NOTE 2 Marking in words is an acceptable means of indicating the correct mode of connection.

NOTE 3 The connection diagram may be the wiring diagram referred to in 7.4.

7.8 Except for TYPE Z ATTACHMENT, terminals used for connection to the supply mains shall be indicated as follows:

– terminals intended exclusively for the neutral conductor shall be indicated by the letter N;

– protective earthing terminals shall be indicated by symbol IEC 60417-5019 (2006-08).

– functional earthing terminals shall be indicated by symbol IEC 60417-5018 (2011-07).

These indications shall not be placed on screws, removable washers or other parts which can be removed when conductors are being connected.

Compliance is checked by inspection.

7.8DV DR *Modification to revise first dashed item as follows:*

– terminals used for type X attachment, intended exclusively for the neutral conductor shall be indicated by the letter N;

7.9 Unless it is obviously unnecessary, switches which may give rise to a hazard when operated shall be marked or placed so as to indicate clearly which part of the appliance they control. Indications used for this purpose shall, wherever practicable, be comprehensible without a knowledge of languages or national standards.

Compliance is checked by inspection.

7.10 The different positions of switches on STATIONARY APPLIANCES and the different positions of controls on all appliances shall be indicated by figures, letters or other visual means. This requirement also applies to switches which are part of a control.

If figures are used for indicating the different positions, the OFF POSITION shall be indicated by the figure 0 and the position for a higher value, such as output, input, speed or cooling effect, shall be indicated by a higher figure.

The figure 0 shall not be used for any other indication unless it is positioned and associated with other numbers so that it does not give rise to confusion with the indication of the OFF POSITION.

NOTE For example, figure 0 may be used on a digital programming keyboard.

Compliance is checked by inspection.

7.11 Controls intended to be adjusted during installation or in normal use shall be provided with an indication for the direction of adjustment.

NOTE An indication of + and – is considered to be sufficient.

Compliance is checked by inspection.

7.12 Instructions shall be provided with the appliance so that the appliance can be used safely.

NOTE Instructions may be marked on the appliance as long as they are visible in normal use.

If it is necessary to take precautions during USER MAINTENANCE, appropriate details shall be given.

The instructions shall state the substance of the following:

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

The instructions for appliances having a part of CLASS III CONSTRUCTION supplied from a DETACHABLE POWER SUPPLY UNIT shall state that the appliance is only to be used with the power supply unit provided with the appliance.

The instructions for CLASS III APPLIANCES shall state that it must only be supplied at safety extra low voltage corresponding to the marking on the appliance. This instruction is not necessary for BATTERY-OPERATED APPLIANCES if the battery is a primary battery or secondary battery charged outside of the appliance.

For appliances intended for use at altitudes exceeding 2 000 m, the maximum altitude of use shall be stated.

The instructions for appliances incorporating a functional earth shall state the substance of the following:

This appliance incorporates an earth connection for functional purposes only.

Compliance is checked by inspection.

7.12.1 If it is necessary to take precautions during installation of the appliance, appropriate details shall be given.

If an appliance is intended to be permanently connected to the water mains and not connected by a hose-set, this shall be stated.

For appliances marked with different RATED VOLTAGES or different RATED FREQUENCIES (separated by a /), instructions shall be included to indicate to the user or installer what action must be taken to adjust the appliance for operation at the required RATED VOLTAGE or RATED FREQUENCY.

Compliance is checked by inspection.

7.12.2 If a STATIONARY APPLIANCE is not fitted with a SUPPLY CORD and a plug, or with other means for disconnection from the supply mains having a contact separation in all poles that provide full disconnection under overvoltage category III conditions, the instructions shall state that means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.

Compliance is checked by inspection.

7.12.3 If the insulation of the fixed wiring supplying an appliance for permanent connection to the supply mains can come into contact with parts having temperature rise exceeding 50 K during the test of Clause 11, the instructions shall state that the fixed wiring insulation must be protected, for example, by insulating sleeving having an appropriate temperature rating.

Compliance is checked by inspection and during the test of Clause 11.

7.12.3DV DR *Deletion:*

Delete Clause 7.12.3.

7.12.4 The instructions for BUILT-IN APPLIANCES shall include information with regard to the following:

– dimensions of the space to be provided for the appliance;

– dimensions and position of the means for supporting and fixing the appliance within this space;

– minimum distances between the various parts of the appliance and the surrounding structure;

– minimum dimensions of ventilating openings and their correct arrangement;

– connection of the appliance to the supply mains and the interconnection of any separate components;

– necessity to allow disconnection of the appliance from the supply after installation, unless the appliance incorporates a switch complying with 24.3. The disconnection may be achieved by having the plug accessible or by incorporating a switch in the fixed wiring in accordance with the wiring rules.

Compliance is checked by inspection.

7.12.5 For appliances with TYPE X ATTACHMENT having a specially prepared cord, the instructions shall contain the substance of the following:

> If the SUPPLY CORD is damaged, it must be replaced by a special cord or assembly available from the manufacturer or its service agent.

For appliances with TYPE Y ATTACHMENT, the instructions shall contain the substance of the following.

> If the SUPPLY CORD is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

For appliances with TYPE Z ATTACHMENT, the instructions shall contain the substance of the following.

> The SUPPLY CORD cannot be replaced. If the cord is damaged the appliance should be scrapped.

Compliance is checked by inspection.

7.12.6 If a NON-SELF-RESETTING THERMAL CUT-OUT is required in order to comply with the standard then the instructions for appliances incorporating a NON-SELF-RESETTING THERMAL CUT-OUT that is reset by disconnection of the supply mains shall contain the substance of the following:

> CAUTION: In order to avoid a hazard due to inadvertent resetting of the THERMAL CUT-OUT, this appliance must not be supplied through an external switching device, such as a timer, or connected to a circuit that is regularly switched on and off by the utility.

Compliance is checked by inspection.

7.12.7 The instructions for FIXED APPLIANCES shall state how the appliance is to be fixed to its support. The method of fixing stated is not to depend on the use of adhesives since they are not considered to be a reliable fixing means.

Compliance is checked by inspection.

7.12.8 The instructions for appliances connected to the water mains shall state

– the maximum inlet water pressure, in pascals;

– the minimum inlet water pressure, in pascals, if this is necessary for the correct operation of the appliance.

The instructions for appliances connected to the water mains by DETACHABLE HOSE-SETS shall state that the new hose-sets supplied with the appliance are to be used and that old hose-sets should not be reused.

Compliance is checked by inspection.

7.13 Instructions and other text required by this standard shall be written in an official language of the country in which the appliance is to be sold.

Compliance is checked by inspection.

7.13DV DR *Modification to add the following (Canada Only):*

In Canada the French translation of the warning of Clause 7.2 is as follows: