



UL 248-1

Underwriters Laboratories Inc. Standard for Safety

Low-Voltage Fuses – Part 1: General Requirements



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Low-Voltage Fuses - Part 1: General Requirements UL 248-1

Third Edition, Dated May 13, 2011

Summary of Topics

This revision is to make editorial corrections to align with the original proposal dated November 26, 2010.

Text that has been changed in any manner or impacted by UL's electronic publishing system is marked with a vertical line in the margin.

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Association of Standardization and Certification
NMX-J-009/248/1-ANCE
Second Edition



Canadian Standards Association
CSA C22.2 No. 248.1-11
Third Edition



Underwriters Laboratories Inc.
UL 248-1
Third Edition

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Preface

This is the harmonized ANCE, CSA, and UL standard for Low-Voltage Fuses – Part 1: General Requirements. It is the second edition of NMX-J-009/248/1-ANCE, the third edition of CSA C22.2 No. 248.1-11, and the third edition of UL 248-1. This edition of NMX-J-009-248/1-ANCE cancels the previous edition published in 2000. This edition of CSA C22.2 No. 248.1-11 supersedes the previous edition published in 2000.

This harmonized standard was prepared by the Association of Standardization and Certification (ANCE), the Canadian Standards Association (CSA), and Underwriters Laboratories Inc., (UL).

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

The present Mexican Standard was developed by the CT 32 from the Comité de Normalización de la Asociación de Normalización y Certificación, A.C., CONANCE, with the collaboration of the fuse manufacturers and users.

This standard was reviewed by the CSA Subcommittee on Fuses and Fuseholders, under the jurisdiction of the CSA Technical Committee on Industrial 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 American National Standards Institute (ANSI) as an American National Standard.

A UL standard is current only if it incorporates the most recently adopted revisions, all of which are itemized on the transmittal notice that accompanies the latest set of revised requirements.

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.

Level of Harmonization

This standard is published as an identical standard for ANCE, CSA, and UL. An identical standard is a standard that is exactly the same in technical content except for national differences resulting from conflicts in codes and governmental regulations. Presentation is word for word except for editorial changes.

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.

ANCE Effective Date

The effective date for ANCE will be announced through the Diario Oficial de la Federación (Official Gazette) and is indicated on the cover page.

CSA Effective Date

The effective date for CSA International will be announced through CSA Informs or a CSA certification notice.

UL Effective Date

As of August 22, 2011 all products Listed or Recognized by UL must comply with the requirements in this standard.

A UL effective date is one established by Underwriters Laboratories Inc. and is not part of the ANSI approved standard.

Low-Voltage Fuses – Part 1: General Requirements

1 General

1.1 Scope

1.1.1 This Standard applies to low-voltage fuses rated 1000 V or less, AC and/or DC, with interrupting ratings up to 300 kA (200 kA for Mexico). These fuses are intended to be used in accordance with the *Canadian Electrical Code, Part I* (CEC), and the *National Electrical Code*, NFPA 70 (NEC).

1.2 Object

1.2.1 This Standard and its subsequent Parts establish the characteristics, construction, operating conditions, markings, and test conditions for each of the fuse classes so that initial investigation and follow-up verification can be performed in an orderly manner.

2 Definitions

The following definitions apply in this Standard.

Note: The Clauses in Definitions, Clause 2, are numbered corresponding to the Clause numbers for definitions for the similar items contained in the International Electrotechnical Commission Publication 269-1: Low-voltage fuses, Part 1: General requirements. Some Clause numbers are omitted.

2.1 Fuse

2.1.3 Fuse

A protective device which opens a circuit during specified overcurrent conditions by means of a current responsive element.

2.1.3.1 Body

The part of the fuse which encloses the fuse elements and supports the contacts. Also referred to as cartridge, tube, or case.

2.1.3.2 Filler

Material used to fill a section or sections of a fuse.

2.1.4 Contacts

The external metallic parts of the fuse used to complete the circuit. Also referred to as ferrules, caps, blades, or terminals.

2.1.5 Element

The fusible portion of the fuse which acts, during an overcurrent condition, to clear the circuit; also referred to as a link.

2.1.5.1 Renewal element

The part of a renewable fuse that is replaced after interruption to restore the fuse to operating condition.

2.2 General terms

2.2.2 Current-limiting fuse

A fuse that, within a specified overcurrent range, limits the clearing time at rated voltage to an interval equal to or less than the first major or symmetrical current loop duration; and limits the peak current to a value less than the available peak current.

2.2.5.1 Ambient air temperature

The temperature of the air surrounding the fuse. Measurement of the ambient air temperature is conducted according to Clause 8.1.2.

2.2.7.1 Low melting point fuse

A fuse that will open in an ambient air temperature of 200°C when carrying 10 percent of rated current.

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2.2.7.2 Microfuse

A supplemental fuse, the body of which has no principal dimension exceeding 10 mm (0.4 in), excluding the leads or terminals.

Note: Principal dimensions are length, width, height, and diameter.

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2.2.7.3 Plug fuse

A screw-in type fuse for use in an Edison Base, Type C tamper-proof, or Type S tamper-proof fuseholder.

2.2.7.4 Renewable fuse

A fuse which can be restored for service, after interruption, by the replacement of the renewal elements.

2.2.7.5 Supplemental fuse

A fuse intended only for supplementary overcurrent protection where branch-circuit protection is not required.

2.2.7.6 Time-delay fuse

A fuse capable of carrying a specified overcurrent for a specified minimum time. Time-delay characteristics are verified by the overload and operation tests in the relevant subsequent Parts for certain fuse classes.

2.2.7.7 Branch circuit fuse

A fuse which is suitable for protection of distribution systems, wiring, or equipment. Examples of branch circuit fuses are Classes R, J, L, T, and CC. A supplemental fuse, intended to protect equipment only, is not a branch circuit fuse.

2.2.8 Body size

The specified set of dimensions of fuses within a fuse class or system. Each individual size covers a given range of rated currents for which the specified dimensions of the fuse remain unchanged.

2.2.9 Homogeneous series of fuses

A series of fuse current ratings, within a given body size and of similar construction, such that one of the ratings of the series may be taken as representative of the series itself.

2.2.13 Non-interchangeability

A condition which prevents the inadvertent interchange of fuses because of physical characteristics (slot, groove, pin, overall dimensions, and the like).

2.3 Characteristic quantities

2.3.2 Prospective current

The current that would flow in a circuit if a fuse therein were replaced by a shorting bar of negligible impedance. The prospective current is also referred to as the available current and is the quantity to which the interrupting rating, I^2t , and peak let-through current are normally referred.

2.3.4 Interrupting rating

The highest prospective rms symmetrical alternating current or direct current which a fuse will interrupt under specified conditions verified by operation at rated voltage tests.

2.3.4.1 Maximum energy

A specified test condition which causes a fuse to experience maximum arc energy during interruption within the first 1/2 cycle.

2.3.5 Current-limiting range

The range of prospective currents from the threshold current to the interrupting current rating of a fuse.

2.3.5.1 Threshold current

The lowest prospective rms symmetrical current above which a fuse is current limiting.

2.3.5.2 Threshold ratio

The threshold current divided by the fuse current rating.