

**Electric motors and generators for use in
hazardous (classified) locations**



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Standard for Safety for Electric Motors and Generators for Use in Hazardous (Classified) Locations

Fourth Edition, Dated July 29, 2022

Summary of Topics

This new edition dated July 29, 2022 includes the following changes in requirements:

- Revisions for the use of electronic medium for required documentation.***
- Revisions to include +60 °C and -60 °C explosion testing with test factors using precompression explosion testing equipment.***
- Revisions to remove errors and omissions.***
- Revisions to replace the oxygen-bomb aging test with the air-oven aging test.***

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Underwriters Laboratories Inc.
UL 674
Sixth Edition

Electric Motors and Generators for Use in Hazardous (Classified) Locations

July 29, 2022



ANSI/UL 674-2022

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Preface

This is the harmonized ANCE, CSA Group, and UL standard for Electric Motors and Generators for Use in Hazardous (Classified) Locations. It is the second edition of NMX-J-652-ANCE, the fourth edition of CSA C22.2 No. 145, and the sixth edition of UL 674. This edition of CSA C22.2 No. 145 supersedes the previous editions published in 1972, 1986 and 2011. This edition of UL 674 supersedes the previous edition published in 2011.

This harmonized standard was prepared by the Association of Standardization and Certification (ANCE), the Canadian Standards Association (CSA), and Underwriters Laboratories Inc. (UL). The efforts and support of the CANENA Technical Harmonization Committee 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 Integrated Committee on Hazardous Location Products, 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.

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.

Level of harmonization

This standard uses the IEC format but is not based on, nor is it to be considered equivalent to, an IEC standard.

This standard is published as an equivalent standard for ANCE, 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.

Reasons for differences from IEC

This standard provides requirements for electric motors and generators in accordance with the codes of Canada, Mexico, and the US. At present there is no IEC standard for electric motors and generators for use in accordance with these codes. Therefore, this standard does not employ any IEC standard for base requirements.

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.

1 Scope

1.1 This standard applies to electric motors and generators or submersible and nonsubmersible sewage pumps and systems suitable for use in Class I, Division 1, Groups B, C and D, and Class II, Division 1, Groups E, F and G, hazardous (classified) locations as defined by CSA C22.1 *Canadian Electrical Code, Part I* (CE Code), the *National Electrical Code*, ANSI/NFPA 70 (NEC), and *NOM-001-SEDE*.

Note: In the US, the application "hazardous locations" is referred to as "hazardous (classified) locations".

1.2 This standard covers the same type of electrical equipment indicated in [1.1](#) for installation and use in Class I, Zone 1, Groups IIA and IIB, IIB+H₂, and Zone 20 and 21 hazardous locations.

1.3 This standard also covers other rotating machinery such as, but not limited to, electric brakes, tachometers, encoders, and slip rings.

1.4 This standard does not address types of protection other than explosion-proof or dust-ignition-proof.

1.5 For Canada Only – This standard does not include Canadian energy efficiency or product performance requirements. For such requirements, see Annex A, item 19. It is possible that item 19 is referenced in whole or in part in federal, provincial, territorial, or local laws or regulations relating to energy efficiency or product performance. The appropriate governmental authorities should be consulted to confirm whether item 19 has been referenced in laws or regulations.

Note: This standard also does not include U.S. energy efficiency requirements for electric motors used in hazardous (classified) locations.

2 Conditions for Use

2.1 This standard covers motors and generators intended for use under the conditions specified in [2.2](#) – [2.6](#).

2.2 Normal ambient duty conditions are defined by the following:

- a) An oxygen concentration not to exceed 21 % by volume.
- b) A nominal barometric pressure of 101.4 kPa (14.7 psia) (1 atmosphere).
- c) Temperature range of minus 25 °C to +40 °C.
- d) Altitude not exceeding 1000 m (3281 ft).

In Canada, the normal ambient temperature is minus 50 °C to +40 °C.

2.3 Low ambient duty conditions are considered to be not less than minus 70 °C.

2.4 Products intended and marked for an ambient of lower than minus 25 °C shall be tested (e.g.: explosion pressure test) at 5 °C below the marked lower temperature.

In Canada, products intended and marked for an ambient of lower than minus 50 °C shall be tested (e.g.: explosion pressure test) at 5 °C below the marked lower temperature.

2.5 High ambient duty conditions are considered to be higher than +40 °C.