



UL 2225

STANDARD FOR SAFETY

Cables and Cable-Fittings For Use In
Hazardous (Classified) Locations

UL Standard for Safety for Cables and Cable-Fittings For Use In Hazardous (Classified) Locations, UL 2225

Fourth Edition, Dated September 30, 2013

Summary of Topics

This revision to ANSI/UL 2225 dated April 11, 2022 includes the following changes in requirements:

- Revision to Correct Cable Type from ITC-ER-HL to ITC-HL in Clause [10.2](#) Flame Test.***
- Revision to delete Rust Resistance Test Requirements in Clause 18.2.***
- Revisions to Testing Requirements in Clause [14.1](#) and Section 23; [23.3](#), [Table 23.1](#), 23.15A, 23.15B, [23.16](#), [23.17](#), and [Table 23.4](#).***

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.

The new and revised requirements are substantially in accordance with Proposal(s) on this subject dated October 15, 2021 and February 25, 2022.

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UL 2225

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Fourth Edition

September 30, 2013

This ANSI/UL Standard for Safety consists of the Fourth edition including revisions through April 11, 2022.

The most recent designation of ANSI/UL 2225 as an American National Standard (ANSI) occurred on April 11, 2022. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page.

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INTRODUCTION

1 Scope

1.1 These requirements cover Type MC-HL metal-clad cable for use in hazardous (classified) locations, Class I, Division 1, Groups A, B, C, and D; Class II, Division 1, Groups E, F, and G; Zone 1, Groups IIA, IIB, and IIC; and Zone 20, 21, and 22, Groups IIIA, IIIB and IIIC in accordance with the National Electrical Code, NFPA 70.

1.2 These requirements cover Type ITC-HL instrumentation tray cable for use in hazardous (classified) locations, Class I, Division 1, Groups A, B, C, and D, and Zone 1, Groups IIA, IIB, and IIC; and Zone 20, 21, and 22, Groups IIIA, IIIB and IIIC in accordance with the National Electrical Code, NFPA 70.

1.3 These requirements cover Type TC-ER-HL tray cable for use in hazardous (classified) locations, Class I, Division 1, Groups A, B, C, and D, Zone 1, Groups IIA, IIB, and IIC in accordance with the National Electrical Code, NFPA 70.

1.4 These requirements cover explosionproof and dust-ignitionproof cable sealing fittings for use in hazardous (classified) locations, Class I, Division 1 and 2, Groups A, B, C, and D; Class II, Division 1 and 2, Groups E, F, and G in accordance with the National Electrical Code, NFPA 70.

1.5 These requirements cover explosionproof and dust-ignitionproof cable sealing fittings for Type P cable intended for use on mobile offshore oil rigs and drilling platforms, and other marine vessels, and for use on land-based gas and oil mobile drilling rigs in accordance with the National Electrical Code, NFPA 70-2020. For offshore installations, investigations of these fittings include an evaluation for conformity to the installation and use provisions of Title 46 Code of Federal Regulations Sub-part 111.105 and Subpart 111.60 of the United States Coast Guard Electrical Engineering Regulations, Subchapter J (Parts 110 to 113 inclusive) as applied by the authority having jurisdiction.

1.6 These requirements cover increased safety "e" cable fittings and flameproof "d" cable sealing fittings for use in Zone 1 Groups IIA, IIB and IIC hazardous (classified) locations, in accordance with the National Electrical Code, NFPA 70.

1.7 These requirements cover increased safety "e" cable fittings and flameproof "d" cable sealing fittings for use in hazardous (classified) locations, Zone 1 for use on mobile offshore oil rigs and drilling platforms, and other marine vessels. Investigations of these fittings include an evaluation for conformity to the installation and use provisions of Title 46 Code of Federal Regulations Sub-part 111.105 and Subpart 111.60 of the United States Coast Guard Electrical Engineering Regulations, Subchapter J (Parts 110 to 113 inclusive) as applied by the authority having jurisdiction.

1.8 These requirements cover increased safety "e" cord connectors and flameproof "d" cord connectors for use only with extra-hard usage cord in hazardous (classified) locations, Zone 1 in accordance with the National Electrical Code, NFPA 70.

1.9 These requirements cover dust ignition protection by enclosure "t" and "tD" cable fittings for use in Zone 20, 21, and 22, Groups IIIA, IIIB and IIIC hazardous (classified) locations in accordance with the National Electrical Code, NFPA 70.

1.10 These requirements cover dust ignition protection by enclosure "t" and "tD" extra-hard usage cord connectors for use in Zone 20, 21, and 22, Groups IIIA, IIIB and IIIC in accordance with the National Electrical Code, NFPA 70.

1.11 These requirements apply to cables, cable fittings and cord connectors for hazardous locations under the following atmospheric conditions:

- a) A minimum ambient temperature of minus 60°C (minus 76°F);
- b) An oxygen concentration of not greater than 21 percent by volume; and
- c) A nominal barometric pressure of one atmosphere.

2 Units of Measurement

2.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

3 Undated References

3.1 Any undated reference to a code or standard appearing in the requirements of this standard shall be interpreted as referring to the latest edition of that code or standard.

4 Glossary

4.1 The following definitions apply in this standard.

4.2 **DUST-IGNITIONPROOF CABLE SEALING FITTING** – A cable sealing fitting capable of meeting the requirements for dust-ignitionproof construction and performance as given in this standard.

4.3 **DUST-IGNITION-PROTECTION BY ENCLOSURE FITTING** – A cable or cord fitting capable of meeting the requirements for dust-ignition-protection by enclosure construction and performance as given in this standard for use in Zone 21 or Zone 22 locations.

4.4 **EXPLOSIONPROOF CABLE SEALING FITTING** – A device or combination of devices intended to provide a means of entry of a cable into a hazardous location explosionproof enclosure and which also provides strain relief and provides required sealing characteristics, either by an integral means or when combined with a separate sealing fitting for use in Class I, Division 1 or Division 2 locations.

4.5 **FLAMEPROOF CABLE SEALING FITTING** – A cable or cord sealing fitting capable of meeting the requirements for flameproof construction and performance as given in this standard for use in Zone 1 or Zone 2 locations.

4.6 **INCREASED SAFETY CABLE FITTING** – A cable or cord fitting capable of meeting the requirements for increased safety construction and performance as given in this standard for use in Zone 1 or Zone 2 locations.

4.7 **SEALING CHARACTERISTICS** – Those characteristics necessary to minimize the migration of gases through the seal and to prevent the propagation of flame from enclosures required to be explosionproof, and/or exclude hazardous dusts or readily ignitable fibers from an enclosure required to be dust-ignitionproof.

PART I – CABLES

CONSTRUCTION

5 General

5.1 Type MC-HL, ITC-HL and TC-ER-HL cables shall comply with all construction and test requirements in the Standard for Metal-Clad Cables, UL 1569, the Standard for Instrumentation Tray Cable, UL 2250 or

the Standard for Electrical Power and Control Tray Cables with Optional Optical-Fiber Members, UL 1277, as applicable, except where modified by this standard.

5.2 *Deleted*

5.3 Type MC-HL and Type ITC-HL cables shall have the following construction features:

- a) A gas/vapor tight continuous corrugated metallic sheath; and
- b) An overall jacket of polymeric material.
- c) Type MC-HL cable shall have separate grounding conductors.

5.4 Type TC-ER-HL cable shall have the additional following construction features:

- a) Conductor insulation rating of 600 volts nominal; and
- b) *Deleted*
- c) At least one copper equipment grounding conductor. For constructions greater than 25 mm (1 inch) overall diameter, at least one ground conductor shall be bare and a metallic shield shall be provided over all conductors within the cable, under the outer jacket.

5.5 *Deleted*

PERFORMANCE

6 General

6.1 Type MC-HL, Type ITC-HL and Type TC-ER-HL cables for use in hazardous (classified) locations shall comply with all applicable performance requirements in the Standard for Metal-Clad Cables, UL 1569, or the Standard for Instrumentation Tray Cable, UL 2250, or the Standard for Electrical Power and Control Tray Cables with Optional Optical-Fiber Members, UL 1277, as applicable and also the requirements in Sections [7](#) – [10](#) of this standard.

6.2 *Deleted*

7 Impact Test – Low Temperature

7.0 The Impact Test – Low Temperature for Types TC-ER-HL, MC-HL and ITC-HL shall be conducted using cables containing 3 – 14 AWG conductors. These conductors are considered representative of the performance of finished cable of the same construction in all (18 – 4/0 AWG and 250 – 1000 kcmil) sizes.

7.1 The non-metallic components of at least eight specimens of finished cable shall not crack when the nonmetallic components of 10 specimens of finished cable are tested. The test is to consist of an impact of a 3 pound (1.36 kg) mass falling through a distance of 3 feet (0.91 m) at a temperature of minus 25 ±1°C (minus 13 ±1.8°F), or at the minimum ambient rated and marked on the cable, if rated lower than minus 25°C (minus 13°F).

7.2 The 10 specimens are to be placed in an environmental chamber and maintained at the required temperature for a period of 4 hours. Immediately following this conditioning, each of the 10 specimens are to be placed on a solid supporting surface and then subjected to the impact specified in [7.1](#) by means of a steel head. This steel head is to have an overall diameter of 1.1 inches (28.5 mm) and is to have a flat striking surface that is 1 inch (25.4 mm) in diameter with slightly rounded edges. Flat cable is to be placed such that the major cross-sectional axis is parallel with the supporting surface.