UL 2250

STANDARD FOR SAFETY

Instrumentation Tray Cable

UL Standard for Safety for Instrumentation Tray Cable, UL 2250

Third Edition, Dated March 30, 2017

SUMMARY OF TOPICS

This revision of ANSI/UL 2250 dated June 12, 2025 includes ITC-ER References to the National Electrical Code (NEC); 1.1 and 43.1(g)

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

The revised requirements are substantially in accordance with Proposal(s) on this subject dated April 25, 2025.

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UL 2250

Standard for Instrumentation Tray Cable

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Second Edition – April, 2006

Third Edition

March 30, 2017

This ANSI/UL Standard for Safety consists of the Third Edition including revisions through June 12, 2025.

The most recent designation of ANSI/UL 2250 as an American National Standard (ANSI) occurred on June 12, 2025. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page.

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

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INTRODUCTION

1 Scope

1.1 These requirements cover Type ITC instrumentation control cables consisting of two or more current-carrying copper or thermocouple alloy conductors with or without either or both:

a) Grounding conductor(s), bare or insulated, and

b) One or more optical-fiber members, all under an overall jacket.

These electrical and composite electrical/optical-fiber cables are intended for use (optical and electrical functions associated in the case of a hybrid cable) on circuits rated 150 V or less and 5 A or less in accordance with Article 335 and other applicable parts of the National Electrical Code (NEC).

1.2 These cables are rated 300 V but are not so marked. Cables for direct-burial are so marked. Jacketed Type ITC cables comply with one of the following 70,000 Btu/h (20.5 kW) vertical-tray flame tests:

a) The UL test referenced in 35.2.1 – 35.2.2 of these requirements. These paragraphs apply the test method described as the UL Flame Exposure (smoke measurements are not applicable) in the Standard for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables, UL 1685.

b) The FT4/IEEE 1202 test referenced in 35.3.1 of these requirements. This paragraph applies the test method described as the FT4/IEEE 1202 Type of Flame Exposure (smoke measurements are not applicable) in UL 1685.

c) For limited-smoke cable, either the UL test or the FT4/IEEE 1202 test referenced in 35.4.1 and 35.4.2 of these requirements. These paragraphs apply the test methods described in UL 1685 with smoke measurements included.

1.3 A cable that contains one or more electromagnetic shields may be surface marked or have a marker tape to indicate that it is "shielded". A cable that contains one or more optical-fiber members has "-OF" supplementing the type letters and is limited (see 14.3) to carrying optical energy that has been ruled not hazardous to the human body.

1.4 All Type ITC cables qualify for exposure to sunlight (a 720-hour sunlight-resistance test is required – see 29.1). A marking is not required; however, where used, the marking consists of "sun res" or "sunlight resistant" on the tag and either on the overall cable jacket or legible through the jacket [see 42.1(i)].

1.5 These cables may have a metal sheath or armor over the required non/metallic jacket.

1.6 These requirements do not cover the optical or other performance of any optical-fiber member or group of such members.

1.7 The overall jacket on Type ITC cable is a "gas/vaportight continuous sheath" in the sense discussed in Sections 501.15 (D) and 501.15 (E) of the National Electrical Code, ANSI/NFPA 70, (see 16.1.1).

1.8 Cables that are surface marked "-ER" are for use as exposed runs of not more than 50 ft (15.2 m) between a cable tray and equipment where the cables are supported and secured every 6 ft (1.8 m).

2 Units of Measurement

2.1 In addition to being stated in the inch/pound units that are customary in the USA, each of the requirements in this Standard is also stated in units that make the requirement conveniently usable in countries employing the various metric systems (practical SI and customary). Equivalent – although not necessarily exactly identical – results are to be expected from applying a requirement in USA or metric terms. Equipment calibrated in metric units is to be used when a requirement is applied in metric terms.

3 References

3.1 Wherever the designation "UL 1581" is used in this Standard, reference is to be made to the designated part(s) of the Reference Standard for Electrical Wires, Cables, and Flexible Cords, UL 1581.

CONSTRUCTION

4 Materials

4.1 Each material used in a cable shall be compatible with all of the other materials used in the cable.

4.2 Instrumentation tray cable shall comply in all respects with the applicable requirements for construction details, test performance, and markings.

5 Conductors

5.1 The conductors shall be of soft-annealed copper or thermocouple alloy. Soft-annealed copper shall comply with ASTM B3. A metal coating that is provided on soft-annealed copper, in compliance with Section 8 shall be of tin complying with ASTM B33, of a tin/lead alloy complying with ASTM B189, of nickel complying with ASTM B355, of silver complying with ASTM B298 or of another metal or alloy (evaluation required). Thermocouple alloys are not specified.

5.2 Each conductor shall be continuous throughout the entire length of the finished cable – see test in 19.1 and 19.2.

6 Size, Temper, and Assembly

6.1 Conductors shall be solid or stranded 22 – 12 AWG copper or solid size 22 – 12 AWG thermocouple alloy. The sizes of thermocouple-extension wire are nominal and are intended only for use in the cable marking that is described in 42.1(g). The conductor in a thermocouple-extension wire is not required to comply with a diameter or resistance value.

7 Conductor Diameter and Cross-Sectional Area

7.1 The diameter of a solid conductor shall not be smaller than indicated in Table 20.1 of UL 1581 when determined as described in 200.1 and 200.2 of UL 1581. The cross-sectional area of a stranded conductor shall not be smaller than indicated in the 0.98X nominal column Table 20.1 of UL 1581 when determined as required in 7.2.

7.2 The cross-sectional area of a stranded conductor is to be determined either:

a) As the sum of the areas of its component strands, or

b) By the weight method outlined in 210.1 – 210.4 of UL 1581.