UL 1425

STANDARD FOR SAFETY

Cables for Non-Power-Limited Fire-Alarm Circuits

UL Standard for Safety for Cables for Non-Power-Limited Fire-Alarm Circuits, UL 1425

Third Edition, Dated January 26, 2015

Summary of Topics

This revision of ANSI/UL 1425 dated January 14, 2022 includes the introduction of optional suffixes HF, LSHF and ST1 and deletion of limited combustible; 25.1, Section 38, 41.1(m)

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 revised requirements are substantially in accordance with Proposal(s) on this subject dated November 5, 2021.

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UL 1425

Standard for Cables for Non-Power-Limited Fire-Alarm Circuits

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Third Edition

January 26, 2015

This ANSI/UL Standard for Safety consists of the Third Edition including revisions through January 14, 2022.

The most recent designation of ANSI/UL 1425 as an American National Standard (ANSI) occurred on January 14, 2022. 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 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.

No Text on This Page

CONTENTS

INTRODUCTION

CONSTRUCTION

PERFORMANCE

MARKINGS

INTRODUCTION

1 Scope

1.1 This Standard states the construction, test, and marking requirements covering the safety of electrical and electrical/optical-fiber cables rated 60°C to 250°C and intended for 150-volt and lower-potential non-power-limited circuits that are controlled and powered by a fire-alarm system. These cables are for installation in buildings as specified in Article 760 and other applicable parts of the National Electrical Code (NEC), NFPA 70. Cables covered by these requirements are:

a) Type NPLFP – These cables are for installation in "other spaces used for environmental air" [See NEC 300-22(c)].

b) Type NPLFR – These cables are for installation in vertical runs in a shaft or for installation in vertical runs that penetrate more than one floor.

c) Type NPLF – These cables are for general-purpose fire-alarm use in buildings. General purpose does not include use as plenum or riser cable.

1.2 These cables contain two or more insulated circuit conductors with or without one or more insulated or bare equipment-grounding conductor(s). Each insulated circuit and grounding conductor is rated for 600 volts. These cables do not contain any coaxial members. These cables are rated for 150 volts and are so marked.

1.3 Armored cables are covered by interlocked metal strip or a smooth or corrugated metal sheath with or without a jacket over the armor. Cables for encasement in concrete, mortar, other masonry, plaster, or similar construction have metal armor and a jacket over the armor. Cables for direct burial in the earth (see markings in 1.8) are subject to a 1000-pound crushing test. Cables for direct burial are not required to be armored. Cables for direct burial that are armored have a jacket over the armor. All other cables (unarmored, flat or round) have an overall jacket.

1.4 Cables of materials that qualify for temperatures above 60°C (140°F) are marked with a temperature rating. Temperature marking is not required for cables that qualify for a temperature rating of 60°C (140°F).

1.5 Cables that contain one or more electromagnetic shields (see 8.1 – 8.3 regarding constructions) are not required to be marked to indicate the presence of the shielding. A shielded cable that is marked has "shielded" on the tag and either on the overall cable jacket or legible through the jacket.

1.6 Cables that qualify for exposure to sunlight (720-hour sunlight-resistance test – see 25.1) have "sun res" or "sunlight resistant" on the tag and either on the overall cable jacket or legible through the jacket.

1.7 Cables that qualify for burial directly in the earth (1000-pound crushing test – see 29.1) have "dir bur", "direct burial", or "for direct burial" on the tag and either on the overall cable jacket or legible through the jacket. Each insulated circuit and grounding conductor in direct-burial cables is insulated for wet locations (see 7.3.1 and 30.1 – 30.8).

1.8 A cable that contains one or more optical-fiber members has “OF “ supplementing the type letters and is marked in accordance with 42.1(c).

1.9 These requirements do not cover cables that contain only optical fibers. Optical-fiber cables without electrical conductors are covered in the Standard for Optical Fiber Cable, UL 1651.

1.10 These requirements do not cover cables for electric-light, power, control, Class 1, Class 2, or Class 3 circuits.

1.11 These requirements do not cover cables for power-limited fire-alarm circuits (see UL 1424).

1.12 Smoke and flame tests are as follows for the cables covered in these requirements:

a) PLENUM CABLES – All Type NPLFP cables are tested for smoke and flame characteristics as specified in Smoke and Flame Testing of Plenum Cables, Section 22, which references the National Fire Protection Association Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces, ANSI/NFPA 262. A cable that complies exhibits a maximum flame-propagation distance that is not greater than 5 ft, 0 inch or 152 cm, a peak optical density of smoke produced of 0.50 or less (32 percent light transmission), and an average optical density of smoke produced of 0.15 or less.

b) RISER CABLES – Jacketed Type NPLFR cables are tested for flame-propagation characteristics as specified in Flame Testing of Riser Cables, Section 23, which references the Standard Test for Flame-Propagation Height of Electrical and Optical-Fiber Cables Installed Vertically in Shafts, UL 1666. A cable that complies exhibits a flame-propagation height under 12 ft, 0 inch or 366 cm and attains a temperature no higher than 850.0°F (454.4°C) at a height of 12 ft, 0 inch or 366 cm.

c) GENERAL-PURPOSE CABLES – Jacketed Type NPLF cables comply with one of the two 70,000 Btu/h (20.5 kW) vertical-tray flame tests specified in Alternative Vertical-Tray Flame Tests of General-Purpose Cables, Section 24. The cable manufacturer chooses one of the following tests:

1) The UL test referenced in 24.1.2 – 24.3.3. 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.

2) The FT4/IEEE 1202 test referenced in 24.1.2 and 24.4.1. These paragraphs apply the test method described as the FT4/IEEE 1202 Type of 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. This test differs from the UL test in loading (a greater number of cable lengths are used, with small cables bundled, and the spacing between cables or bundles is limited), burner angle, and failure criterion. A cable that complies is eligible to be marked "FT4/IEEE 1202" or "FT4" on the surface or on a marker tape as indicated in 41.1(i).

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 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 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 wire standard, reference is to be made to the designated part(s) of the Reference Standard for Electrical Wires, Cables, and Flexible Cords, UL 1581.

3.2 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.

CONSTRUCTION

4 Materials

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

4.2 Cables for non-power-limited fire-alarm circuits shall comply in all respects with the applicable requirements for construction details, test performance, and markings.

5 Circuit and Grounding Conductors

5.1 Each circuit and grounding conductor shall be of soft-annealed copper that complies with the American Society for Testing and Materials Standard Specification for Soft or Annealed Copper Wire, ASTM B 3. See Electromagnetic Shields, Section 8, concerning drain wires (copper).

5.2 Each circuit and grounding conductor shall be round.

5.3 Each circuit and grounding conductor shall be solid or stranded. A stranded conductor shall consist of round strands with a right- or left-hand direction of lay. The length of lay of the wires (strands) of a stranded conductor shall not exceed 20 times the calculated diameter over the assembled conductor. Seven strands, concentric, is the stranding assumed in these requirements; however, individual strand diameter, any mix of different strand diameters, the number of strands, and the stranding type are not specified. See Metal Coating of Conductors, Section 6.

5.4 Circuit and grounding conductors shall be of standard 18 – 12 AWG sizes. See the final sentence of 12.2 regarding grounding conductor size relative to the size(s) of the circuit conductors.

5.5 All solid and stranded circuit conductors are to be identified as a particular AWG size in the marking [see 41.1(b)] on or in the cable and on the tag, reel, or carton. The size of a solid conductor shall be verified either by determination of the d-c resistance or, as described in 5.6, by determination of the diameter. The size of a stranded conductor shall be verified either by determination of the d-c resistance or by determination of the cross-sectional area as described in 5.7. Determination of the conductor size by measurement of the d-c resistance as described in D-C Resistance Test of a Conductor, Section 17, is the referee method in all cases.

5.6 Where measured as the means of size verification (see 5.5), the diameter of a solid circuit or grounding conductor shall not be smaller than the minimum diameter indicated for the size in Table 5.1 when the diameter of the conductor is determined from measurements made as follows:

a) Measurements of the diameter of a solid conductor are to be made over the metal-coated or uncoated conductor by optical means or by means of a machinist's micrometer caliper having flat surfaces both on the anvil and on the end of the spindle. In either case, the equipment is to be calibrated to read directly to at least 0.001 inch or 0.01 mm, with each division of a width that facilitates estimation of each measurement to 0.0001 inch or 0.001 mm. The maximum and minimum diameters at a given point on the solid conductor are each to be recorded to the nearest 0.0001 inch (0.1 mil) or 0.001 mm, added together, and divided by 2 without any rounding of the sum or resulting average.

b) Each minimum diameter indicated in Table 5.1 is an absolute minimum. The unrounded average of the two diameter readings is therefore to be compared directly with the minimum in the table for the purpose of determining whether the solid conductor does or does not comply with the diameter requirement.