

UL 1685

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Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables

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Underwriters Laboratories Inc. (UL)
333 Pfingsten Road
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UL Standard for Safety for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables, UL 1685

Third Edition, Dated April 25, 2007

SUMMARY OF TOPICS:

This new edition of UL 1685 is being issued to ensure that UL's Standards remain up-to-date with regard to format and editorial issues. This new edition also includes revised requirements for the following:

Revised Test Procedures and Equipment for the UL and FT4/IEEE 1202 Type Flame Tests in UL 1685 and Replacement of Cable Damage with Char Height as Product Evaluation Criteria

The new and/or revised requirements are substantially in accordance with UL's Proposal(s) on this subject dated December 1, 2006 and January 24, 2007.

The UL Foreword is no longer located within the UL Standard. For information concerning the use and application of the requirements contained in this Standard, the current version of the UL Foreword is located on ULStandardsInfoNet at: <http://ulstandardsinfo.net/ul.com/ulforeword.html>

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This Standard consists of pages dated as shown in the following checklist:

Page	Date
1-32	April 25, 2007

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UL 1685

**Standard for Vertical-Tray Fire-Propagation and Smoke-Release Test for
Electrical and Optical-Fiber Cables**

First Edition – July, 1992
Second Edition – February, 1997

Third Edition

April 25, 2007

An effective date included as a note immediately following certain requirements is one established by Underwriters Laboratories Inc.

Revisions of this Standard will be made by issuing revised or additional pages bearing their date of issue. 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. 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 <http://csds.ul.com>.

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INTRODUCTION

1 Choice of Test

1.1 Limits are specified for each fire test to make the tests equally acceptable for the purpose of quantifying the smoke. The cable manufacturer is to specify, for testing each limited-smoke cable construction, either the UL vertical-tray flame exposure described in Sections 4 – 11 or the FT4/IEEE 1202 type of flame exposure described in Sections 12 – 19. The same test need not be specified for all constructions. Sections 20 – 25 provide for the collection of certain optional additional data, which may be requested by the cable manufacturer (see list in 25.1).

1.2 For cables that are subject to a vertical-tray flame test without the cable manufacturer requesting the rating for limited smoke, the end-product wire Standard specifies that smoke measurements are not applicable. In the UL or FT4/IEEE 1202 test for these cables, only the flame height and cable damage height are of interest unless the manufacturer requests that the smoke data and results also be reported.

2 Units of Measurement

2.1 If a value for measurement is followed by a value in other units either in parentheses or in square brackets [], the second value may be only approximate. The first-stated value is the requirement.

3 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.

UL FLAME EXPOSURE

4 Scope

4.1 The UL flame exposure is a vertical-tray fire test for determining values of cable damage height and smoke release from electrical and optical-fiber cables when the cables are subjected to a flaming ignition source. For a cable to be acceptable under the UL test procedure, each of the following is to be exhibited (see 10.1 and 10.2):

- a) The cable char height is to be less than 8 ft, 0 inch (244 cm) when measured from the bottom of the cable tray in accordance with Section 8.
- b) The total smoke released is to be 95 m² or less.
- c) The peak smoke release rate is to be 0.25 m²/s or less.

4.2 The purpose of this test is to determine flame propagation and smoke characteristics of these cables to qualify the cables for the limited smoke marking.

4.3 This test does not investigate the toxicity of the products of combustion or decomposition.

4.4 This test does not cover the constructional requirements for the cable or any electrical, optical, or other performance requirements for the cable.

5 Apparatus

5.1 General

5.1.1 The test apparatus is to include the following main components:

- a) Ignition source.
- b) Collection hood and exhaust duct.
- c) Velocity-measuring instrumentation.
- d) Smoke-measuring instruments.
- e) Data-acquisition system.

5.1.2 The cable test enclosure is to be located in a test building that has vents for the discharge of the combustion products and also has provisions for fresh-air intake.

5.2 Cable test enclosure and exhaust duct

5.2.1 The enclosure in which the cables are tested is to be as shown in Figure 5.1. Other enclosures may be used if they are shown to provide equivalent results and are of a size [such as an 8-ft cube (2.4-m cube) or the 3-m cube] such that the internal volume of the enclosure, exclusive of the pyramidal hood, is not less than 14.5 m³ (512 ft³) or greater than 36 m³ (1272 ft³), the floor area is not smaller than 6 m² (64 ft²) or larger than 9 m² (97 ft²), and the maximum air movement within the enclosure complies with 5.3.4.

5.2.2 The walls of the enclosure shall be constructed of concrete masonry units complying with ASTM C 90, Standard Specification for Loadbearing Concrete Masonry Units. The interior surface of the walls shall be painted flat black. The walls are to contain window(s) as shown in Figure 5.1 for observation of the fire test. Alternate construction materials are acceptable for the enclosure walls provided the construction materials are capable of withstanding the high temperatures and open flame in the test enclosure.

5.2.3 The enclosure is to contain an access door, typically constructed of steel. The door is to be provided with a wired-glass window and is to be located as shown in Figure 5.1.

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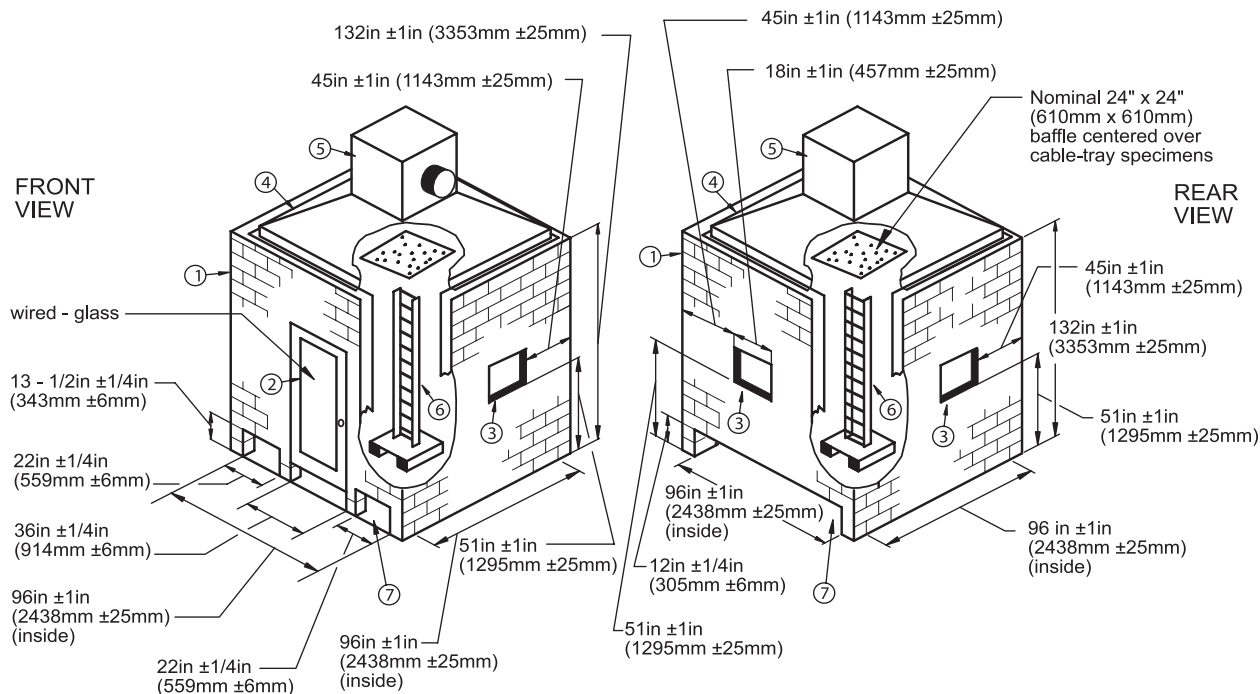
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Figure 5.1
Cable test enclosure



SM201M

NOTES –

- 1) Enclosure constructed of concrete blocks laid up with mortar. The blocks are to be nominally 8 inches high by 16 inches long by 6 inches thick (203 mm × 406 mm × 152 mm).
- 2) Steel-framed wired-glass door for access and observation. The overall size of the door is to be nominally 36 inches wide by 84 inches high (0.9 m × 2.1 m).
- 3) Square steel-framed wired-glass observation window(s) nominally 18 inches (457 mm) on a side.
- 4) Truncated-pyramid stainless-steel hood. Each side is to be sloped 40°.
- 5) Collection box with exhaust duct centered in one side. The box is to be a cube with each face a 36-inches (914-mm) square.
- 6) Cable tray mounted vertically in the center of the enclosure. The tray base (stand) is optional and is not to be higher than 6 inches (152 mm).
- 7) Air-intake openings.