

INTERNATIONAL STANDARD

NORME INTERNATIONALE



GROUP SAFETY PUBLICATION
PUBLICATION GROUPEE DE SÉCURITÉ

**Tests on electric and optical fibre cables under fire conditions –
Part 1-1: Test for vertical flame propagation for a single insulated wire or cable –
Apparatus**

**Essais des câbles électriques et à fibres optiques soumis au feu –
Partie 1-1: Essai de propagation verticale de la flamme sur conducteur ou câble
isolé – Appareillage d'essai**

[IEC 60332-1-1:2004](#)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**TESTS ON ELECTRIC AND OPTICAL FIBRE CABLES
UNDER FIRE CONDITIONS –**

**Part 1-1: Test for vertical flame propagation
for a single insulated wire or cable – Apparatus**

FOREWORD

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IEC 60332-1-1 edition 1.1 contains the first edition (2004-07) [documents 20/696/FDIS and 20/710/RVD] and its amendment 1 (2015-07) [documents 20/1590/FDIS and 20/1597/RVD].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions and deletions are displayed in red, with deletions being struck through. A separate Final version with all changes accepted is available in this publication.

International Standard IEC 60332-1-1 has been prepared by IEC technical committee 20: Electric cables.

It has the status of a group safety publication in accordance with IEC Guide 104.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

IEC 60332 consists of the following parts, under the general title *Tests on electric and optical fibre cables under fire conditions*:

Part 1-1: Test for vertical flame propagation for a single insulated wire or cable – Apparatus

Part 1-2: Test for vertical flame propagation for a single insulated wire or cable – Procedure for 1kW pre-mixed flame

Part 1-3: Test for vertical flame propagation for a single insulated wire or cable – Procedure for determination of flaming droplets/particles

Part 2-1: Test for vertical flame propagation for a single small insulated wire or cable – Apparatus

Part 2-2: Test for vertical flame propagation for a single small insulated wire or cable - Procedure for diffusion flame

The committee has decided that the contents of the base publication and its amendment will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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TESTS ON ELECTRIC AND OPTICAL FIBRE CABLES UNDER FIRE CONDITIONS –

Part 1-1: Test for vertical flame propagation for a single insulated wire or cable – Apparatus

1 Scope

This part of IEC 60332 specifies the test apparatus for testing the resistance to vertical flame propagation for a single vertical electrical insulated conductor or cable, or optical fibre cable, under fire conditions.

The procedure, together with an informative annex of recommended requirements for performance, is given in IEC 60332-1-2.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60695-4, *Fire hazard testing – Part 4: Terminology concerning fire tests*

IEC 60695-11-2, *Fire hazard testing – Part 11-2: Test flames – 1 kW nominal pre-mixed flame – Apparatus, confirmatory test arrangement and guidance*

IEC Guide 104, *The preparation of safety publications and the use of basic safety publications and group safety publications*

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3 Terms and definitions

For the purposes of this document, the following definition applies. The definition is taken from IEC 60695-4.

3.1

ignition source

source of energy that initiates combustion

[~~IEC 60695-4:1993, definition 2.76~~ SOURCE: ISO 13943:2008, 4.189]

4 Test apparatus

4.1 Components

The test apparatus shall comprise the following:

- a) a ~~metallic screen~~ metal enclosure (4.2);
- b) an ignition source (4.3);
- c) a suitable chamber (4.4).

4.2 ~~Metallic screen~~ Metal enclosure

A ~~metallic screen metal enclosure~~ (1 200 ± 25) mm high, (300 ± 25) mm wide and (450 ± 25) mm deep with open front and closed top and bottom, (see Figure 1), shall be used, ~~in order to protect the test sample from draughts. It shall be constructed of rigid sheet metal.~~

4.3 Ignition source

The ignition source shall comply with IEC 60695-11-2, which includes a method of confirmation of the test flame, except that ~~the burner shall be fed with technical grade propane of greater than 95 % purity~~ the laboratory fumehood/chamber shall comply with 4.4.

~~NOTE IEC 60695-11-2 specifically refers to the need to study also IEC 60695-2-4/0.~~

4.4 Chamber

The ~~metallic screen metal enclosure~~ and ignition source shall be contained within a suitable chamber, substantially free from draughts during the test duration, but with facilities for disposing of noxious gases resulting from burning. The chamber shall be maintained at a temperature of (23 ± 10) °C.

NOTE 1 If the requirement for the draught-free closed area is met by the use of a standard fume cupboard, it must be capable of independent operator-control of the extractor fan such as to permit operation with the extractor "OFF". Some fume cupboards may not be supplied with this facility.

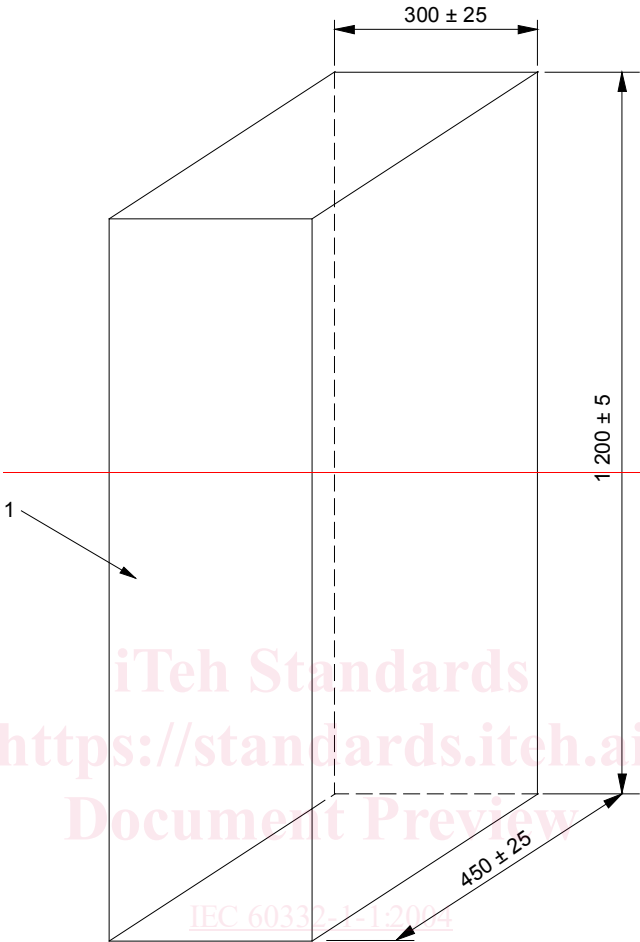
NOTE 2 If a fume cupboard is used as the draught-free test area, the following safe operating practice is recommended:

- a) turn off extractor fan, seal the outlet;
- b) pull down front door of fume cupboard to leave a gap sufficient to manipulate burner into position;
- c) ensure operator is protected;
- d) do not move the door of the fume cupboard during the test;
- e) at the end of the test evacuate the fume cupboard fully before opening the door.

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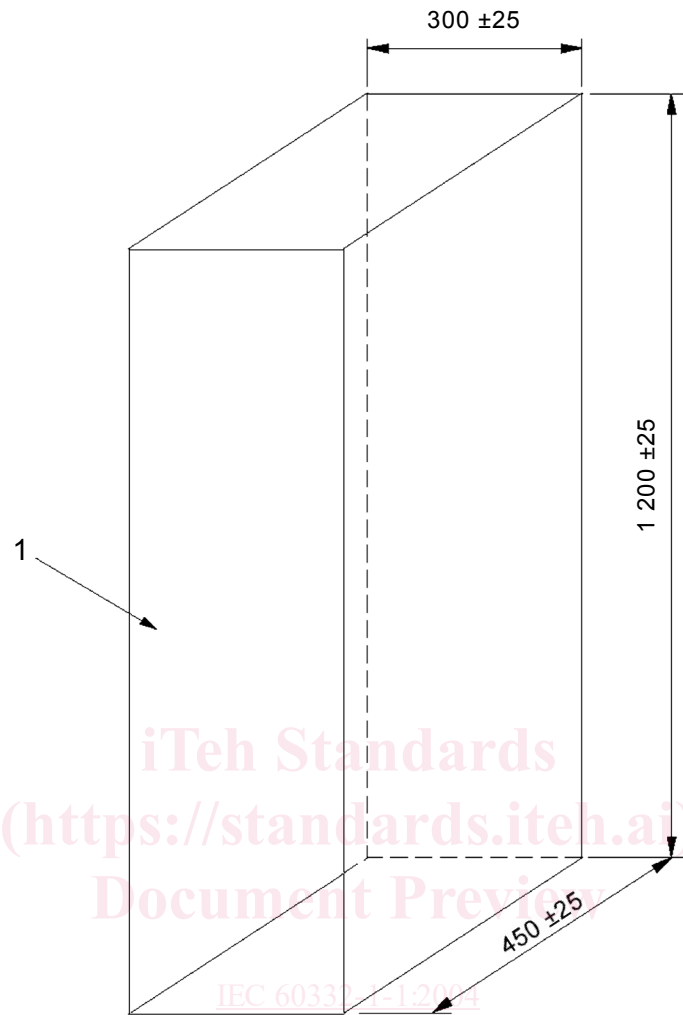
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Key

- 1 front open space (all other sides closed)

Figure 1 – Test apparatus – ~~Metallic screen~~ Metal enclosure