
Common tests methods for cables under fire conditions - Test for resistance to vertical flame propagation for a single insulated conductor or cable -- Part 2-2: Procedures - Diffusion flame

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Allgemeine Prüfverfahren für das Verhalten von Kabeln und isolierten Leitungen im Brandfall - Prüfung der vertikalen Flammenausbreitung an einer Ader oder einem Kabel - Teil 2-2: Prüfverfahren - Leuchtende Flamme

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Méthodes d'essai communes aux câbles soumis au feu - Essai de résistance à la propagation verticale de la flamme sur un conducteur ou câble isolé -- Partie 2-2: Procédures - Flamme de type à diffusion

Ta slovenski standard je istoveten z: EN 50265-2-2:1998

ICS:

13.220.40	Sposobnost vžiga in obnašanje materialov in proizvodov pri gorenju	Ignitability and burning behaviour of materials and products
29.060.20	Kabli	Cables

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EUROPEAN STANDARD
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Descriptors: Electrical installation, electrical cables, insulated conductors, insulated cables, fire tests, flammability tests, flame propagation, testing conditions, procedures

English version

**Common tests methods for cables under fire conditions - Test for resistance to vertical flame propagation for a single insulated conductor or cable
Part 2-2: Procedures - Diffusion flame**

Méthodes d'essai communes aux câbles soumis au feu - Essai de résistance à la propagation verticale de la flamme sur un conducteur ou câble isolé
Partie 2-2: Procédures - Flamme de type à diffusion

Allgemeine Prüfverfahren für das Verhalten von Kabeln und isolierten Leitungen im Brandfall - Prüfung der vertikalen Flammenausbreitung an einer Ader oder einem Kabel
Teil 2-2: Prüfverfahren - Leuchtende Flamme

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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FOREWORD

This European Standard was prepared by the Technical Committee CENELEC TC 20, Electric Cables.

When used in conjunction with EN 50265-1 this European Standard supersedes HD 405.2 S1.

Significant technical differences are:

- a) improved arrangements for support and testing of optical fibre cables;
- b) transfer of requirements to an informative annex, as recommendations only.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50265-2-2 on 1998-04-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1999-03-01
- latest date by which national standards conflicting with the EN have to be withdrawn (dow) 2000-03-01

Annexes designated "informative" are given for information only. In this standard annexes A and B are informative.

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1 Scope

EN 50265 specifies a method of test for resistance to vertical flame propagation for a single electrical insulated conductor or cable, or optical cable, under fire conditions. Part 1 specifies the test apparatus, and Part 2 specifies various test methods and procedures.

EN 50265-2-2 specifies the procedure for testing small optical fibre cables or a small insulated conductor or cable when the method specified in EN 50265-2-1 is not suitable because some small fibre cables may break or small conductors may melt during the application of the flame. The recommended range of application is for the testing of single insulated conductors or cables of less than 0,5 mm² cross-section.

This standard includes an informative annex of recommended requirements for conformity.

NOTE: Since the use of insulated conductor or cable which retards flame propagation and complies with the recommended requirements of this standard is not sufficient by itself to prevent propagation of fire under all conditions of installation, it is recommended that wherever the risk of propagation is high, for example in long vertical runs of bunches of cables, special installation precautions should also be taken. It cannot be assumed that because the sample of cable complies with the performance requirements recommended in this standard a bunch of cables will behave in a similar manner. (See EN 50266 - under preparation.)

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

- EN 50265-1 Common test methods for cables under fire conditions - Test for resistance to vertical flame propagation for a single insulated conductor or cable -- Part 1: Apparatus
- EN 60695-4 Fire hazard testing -- Part 4: Terminology concerning fire tests

NOTE: IEC 60695 is in the course of re-numbering its Parts and Sections. This will also affect the equivalent ENs.

3 Definitions

For the purposes of EN 50265-2-2 the following definitions apply. The definitions are taken from EN 60695-4.

- 3.1 ignition source:** A source of energy that initiates combustion.
- 3.2 char:** Carbonaceous residue resulting from pyrolysis or incomplete combustion.

4 Test apparatus

4.1 General

The apparatus specified in EN 50265-1 shall be used.

4.2 Ignition source

The ignition source shall be a diffusion flame propane burner complying with EN 50265-1, subclause 4.3.3.

5 Procedure

5.1 Sample

The test sample shall be a piece of the insulated conductor or cable (600 ± 25) mm long.

5.2 Conditioning

Before testing, all test pieces shall be conditioned at $(23 \pm 5)^\circ\text{C}$ for not less than 16 h at a relative humidity of $(50 \pm 20)\%$.

In the case of an insulated conductor or cable with a finish of paint or lacquer, this conditioning shall follow an initial period where the test piece shall be kept at a temperature of $(60 \pm 2)^\circ\text{C}$ for 4 h.

5.3 Positioning of test piece

5.3.1 *Cables with metallic conductors*

The test piece shall be straightened and fixed in a vertical position in the centre of the metal screen described in 4.2 of EN 50265-1. A load of 5 N/mm^2 of conductor area shall be attached to the lower part of the sample so that the distance between the point where the load is attached and the lower edge of the top support measures (550 ± 5) mm. (See Figure 1.)

The vertical axis of the test piece shall be arranged centrally within the screen (i.e. 150 mm from each side and 225 mm from the rear).

5.3.2 *Optical cables*

The test piece shall be secured to two horizontal supports by means of a suitable size of metallic wire so that the distance between the bottom of the upper support and the top of the lower support is (550 ± 5) mm. In addition the test piece shall be positioned so that the bottom of the specimen is approximately 50 mm from the base of the screen. (See Figure 2.)

The vertical axis of the test piece shall be arranged centrally within the screen (i.e. 150 mm from each side and 225 mm from the rear).

5.4 Flame application

5.4.1 Safety warning

Precautions shall be taken to safeguard personnel against the following when conducting tests:

- a) the risk of fire or explosion;
- b) the inhalation of smoke and/or noxious products, particularly when halogenated materials are burned;
- c) harmful residues.

5.4.2 Positioning of flame

5.4.2.1 Cables with metallic conductors

The burner shall be arranged as shown in Figure 3. The centre-line of the burner shall be at an angle of 45° to the centre-line of the sample. The horizontal distance between the centre line of the burner orifice and the surface of the sample shall be (10 ± 1) mm. The distance between the point at which the burner centre-line and sample centre-line intersect and the point where the load of 5 N/mm^2 is applied shall be (100 ± 10) mm. The distance between the point at which the burner and sample centre-lines intersect and the lower edge of the top support shall not exceed 465 mm.

The flame shall be applied so that it envelops the sample.

5.4.2.2 Optical fibre cables

The burner shall be arranged as shown in Figure 4. The centre-line of the burner shall be at an angle of 45° to the centre-line of the sample. The horizontal distance between the centre line of the burner orifice and the surface of the sample shall be (10 ± 1) mm. The distance between the point at which the burner centre-line and sample centre-line intersect and the top edge of the lower support shall be (100 ± 10) mm. The distance between the point at which the burner and sample centre-lines intersect and the lower edge of the upper horizontal support shall not exceed 465 mm.

The flame shall be applied so that it envelops the sample.

5.4.3 Test duration

5.4.3.1 Cables with metallic conductors

The flame shall be applied to the sample for a duration of (20 ± 1) s. If the sample is intact, i.e. no melting of conductor, the test shall be evaluated in accordance with clause 6. Should the metallic conductor prematurely melt, at a time T less than (20 ± 1) s, the test shall be repeated on a further sample for a duration of $(T - 2)$ s. The assessment shall then be based only on the further sample.

5.4.3.2 Optical fibre cables

The flame shall be applied to the sample for a duration of (20 ± 1) s.

6 Evaluation of test results

After all burning has ceased, the test piece shall be wiped clean.

All soot shall be ignored if, when wiped off, the original surface is undamaged. Softening or any deformation of the non-metallic materials shall also be ignored. The distance from the lower edge of the top support to the upper and lower onset of charring shall be measured to the nearest millimetre.

The onset of char shall be determined as follows:

Press against the cable surface with a sharp object, e.g. a knife blade. Where the surface changes from a resilient to a brittle (crumbling) surface indicates the onset of charring.

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