
Measurement of smoke density of electric cables burning under defined conditions - Part 2: Test procedures and requirements (IEC 1034-2:1991, modified)

Measurement of smoke density of electric cables burning under defined conditions -- Part 2: Test procedure and requirements

Messung der Rauchdichte elektrischer Kabel beim Brennen unter definierten Bedingungen -- Teil 2: Prüfablauf und Anforderungen

Mesure de la densité de fumées dégagées par des câbles électriques brûlant dans des conditions définies -- Partie 2: Procédure d'essai et prescriptions

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Ta slovenski standard je istoveten z: HD 606.2 S1:1992

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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HARMONIZATION DOCUMENT

HD 606.2 S1

DOCUMENT D'HARMONISATION

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ENGLISH VERSION

Measurement of smoke density of electric cables
burning under defined conditions
Part 2: Test procedure and requirements
(IEC 1034-2:1991, modified)



REPUBLIKA SLOVENIJA
MINISTRSTVO ZA ZNANOST IN TEHNOLOGIJO
Urad RS za standardizacijo in meroslovje
LJUBLJANA

SIST. HD. 606.2. S1

PREVZET PO METODI RAZGLASITVE

-02-1998

Mesure de la densité de fumées
dégagées par des câbles
électriques brûlant dans des
conditions définies
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This Harmonization Document was approved by CENELEC on 1992-03-24. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for implementation of this Harmonization Document on a national level.

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

This Harmonization Document exists in three official versions (English, French, German).

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

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FOREWORD

Following the decision taken by CENELEC Technical Committee TC 20 at their meeting in Vienna in November 1990, the draft Harmonization Document prHD 606.2 S1 was submitted to the CENELEC Unique Acceptance Procedure (UAP) in June 1991.

The text of the draft was approved by CENELEC as HD 606.2 S1 on 24 March 1992.

The following dates were fixed:

- latest date of announcement
of the HD at national level (doa) 1992-12-01
- latest date of publication of
a harmonized national standard (dop) 1993-12-01
- latest date of withdrawal of
conflicting national standards (dow) 1993-12-01

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For products which have complied with the relevant national standard before 1993-12-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1994-12-01.

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MEASUREMENT OF SMOKE DENSITY OF ELECTRIC CABLES
BURNING UNDER DEFINED CONDITIONS

PART 2 : TEST PROCEDURE AND REQUIREMENTS

1. INTRODUCTION

Part 1 of this HD gives details of the test apparatus and verification procedure to be used for the measurement of smoke density of the products of combustion of electric cables burned under defined conditions. It includes details of a test cube of 27m³ volume, a photometric system for light measurement, a qualification procedure which also defines the fire source, and a smoke mixing method.

The test procedure defined in this Part of the HD shall be carried out using the apparatus and procedures given in Part 1.

The requirements of this Part in respect of smoke density are expressed in terms of minimum levels of light transmittance. These levels are similar to those required by Mass Transit Authorities.

2. SCOPE

This is the second part of a two-part HD. It provides details of the test procedure to be employed for measurement of the density smoke emitted from cables burning under defined conditions. It describes the means of preparing and assembling for test cables having an overall diameter from 2mm upwards, the method of burning the cables, and gives the requirements for evaluating test results.

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NOTE: Requirements for evaluating test results for cable above 70mm diameter will be the subject of further review.

3. FIRE SOURCE

The fire source shall be as specified in Part 1, Clause 4.1.1.

4. TEST ASSEMBLY

4.1 Cable Samples

These shall consist of straight samples of cable 1 ± 0.05 m which shall be carefully straightened and then conditioned for at least 16 hours at $23 \pm 5^{\circ}\text{C}$.

4.2 Cable Selection and Assembly4.2.1 Selection of Number of Test Pieces

The number of test pieces shall be selected in accordance with the table below:

Overall Diameter (D) of the Cable (mm)	Number of Test Pieces	
	Cables	Bundles*
D > 40	1	-
20 < D ≤ 40	2	-
10 < D ≤ 20	3	-
5 < D ≤ 10	N ₁	-
2 < D ≤ 5	-	N ₂

where:

$$N_1 = \frac{45}{D} \text{ cables}$$

$$N_2 = \frac{45}{3D} \text{ bundles}$$

D = overall diameter of cable (mm)

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The value of N₁ or N₂ shall be rounded downwards to the integer to give the number of cables or bundles.

*Each bundle shall consist of seven cables twisted together with a lay between 20 and 30D, and bound with two turns of approximately 0.5mm diameter wire in the centre and at every 100mm each side from the centre (see Figure 1).

4.2.2 Assembly of Test Pieces

The test pieces shall remain in situ during the test by means of the following.

Cables shall be laid touching and shall be bound together at the ends and at 300mm from each end, and here the cables shall be clasped to the support by means of wire binders.

Bundles shall be tensioned at one or both ends by means of an appropriate device, e.g. a spring or weight.

4.3 Positioning of Cable Samples

The tray containing the alcohol shall be raised above the ground surface to permit air circulation. The test pieces (cables or bundles) shall be laid touching in a horizontal position and centred above the tray so that the distance between the underneath of the cable samples and the bottom of the tray is 150 ± 5mm (see Figure 2).

5. TEST PROCEDURE

- 5.1 Maintain the test cube in external environment, the temperature of which is $20 \pm 10^\circ\text{C}$. The temperature within the cube prior to starting a test should be in the range of $25 \pm 5^\circ\text{C}$.
- 5.2 Before a test or a series of tests, carry out one blank test by burning 1 ± 0.01 litre of the test fuel (as defined in Clause 4.1.1 of Part 1).
- 5.3 After each test it may be necessary to clean the window of the photometric system to regain 100% light transmission after stabilisation of the voltage. (See also clause A.2 of Annex A, Part 1.)
- 5.4 With the test samples supported above the tray, start the air circulation and ignite the alcohol. Ensure that all persons leave the cube immediately and that the door is closed.
- 5.5 The test is considered as ended when there is no decreases in light transmittance for five minutes during the period after the fire source has extinguished or when the test duration reaches 40 minutes.
- 5.6 Record the minimum light transmittance.
- 5.7 Extract the combustion products at the end of each test.

6. EVALUATION OF TEST RESULTS

Unless otherwise specified in the relevant product specification the test is satisfactory if the following levels of light transmittance are exceeded throughout the test.

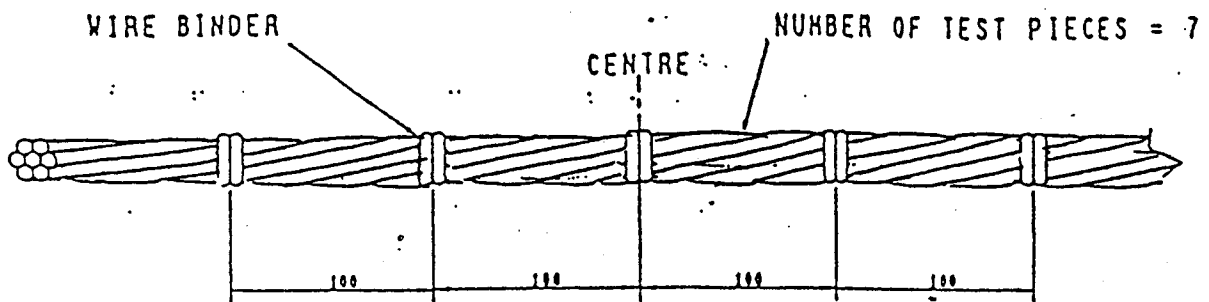
1 cable	70%
2 cables	60%
3 cables	60%
N ₁ cables	50%
N ₂ bundles	50%

These are provisional values, especially for cables having diameters $D > 70\text{mm}$.

7. RETEST PROCEDURE

In the event of a failure being recorded, a further two tests should be undertaken using similar cables.

Both test results should comply with Clause 6.



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FIGURE 1. METHOD OF BINDING FOR CABLE BUNDLES
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