BS EN 61034-1:2005+A2:2020

BSI Standards Publication

Measurement of smoke density of cables burning under defined conditions

Part 1: Test apparatus

bsi.

National foreword

This British Standard is the UK implementation of EN 61034-1:2005+A2:2020. It is identical to IEC 61034-1:2005, incorporating amendment 1:2013 and amendment 2:2019. It supersedes BS EN 61034-1:2005+A1:2014, which will be withdrawn on 27 December 2022.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment A1 is indicated by ⟨A1⟩ ⟨A1⟩.

The UK participation in its preparation was entrusted to Technical Committee GEL/20/18, Electric Cables - Fire testing.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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Amendments/corrigenda issued since publication

Date	Text affected
31 May 2014	Implementation of IEC amendment 1:2013 with CENELEC endorsement A1:2014
31 March 2020	Implementation of IEC amendment 2:2019 with CENELEC endorsement A2:2020

EUROPEAN STANDARD **EN 61034-1:2005+A2**

NORME EUROPÉENNE

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ICS 13.220.40; 29.20; 29.060.20 Supersedes EN 50268-1:1999

English version

Measurement of smoke density of cables burning under defined conditions Part 1: Test apparatus
(IEC 61034-1:2005)

Mesure de la densité de fumées dégagées par des câbles brûlant dans des conditions définies
Partie 1: Appareillage d'essai
(CEI 61034-1:2005)

Messung der Rauchdichte von Kabeln und isolierten Leitungen beim Brennen unter definierten Bedingungen
Teil 1: Prüfeinrichtung
(IEC 61034-1:2005)

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

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EN 61034-1:2005+A2:2020

Foreword

The text of document 20/754/FDIS, future edition 3 of IEC 61034-1, prepared by IEC TC 20, Electric cables, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61034-1 on 2005-06-01.

The principal change with respect to EN 50268-1 is a closer definition of the support for the cable(s) under test.

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)	2006-03-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2008-06-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61034-1:2005 was approved by CENELEC as a European Standard without any modification.

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European foreword to amendment A1

The text of document 20/1428/FDIS, future IEC 61034-1:2005/A1, prepared by IEC/TC 20 "Electric cables" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61034-1:2005/A1:2014.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2014-10-04
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This standard covers the Principle Elements of the Safety Objectives for Electrical Equipment Designed for Use within Certain Voltage Limits (LVD - 2006/95/EC).

Endorsement notice

The text of the International Standard IEC 61034-1:2005/A1:2013 was approved by CENELEC as a European Standard without any modification.

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European foreword to amendment A2

The text of document 20/1885/FDIS, future IEC 61034-1/A2, prepared by IEC/TC 20 "Electric cables" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61034-1:2005/A2:2020.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2020-09-27
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-12-27

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Endorsement notice

The text of the International Standard IEC 61034-1:2005/A2:2019 was approved by CENELEC as a European Standard without any modification.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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International Standard IEC 61034-1 has been prepared by IEC technical committee 20: Electric cables.

This third edition cancels and replaces the second edition published in 1997 and constitutes a technical revision.

The principal changes with respect to the previous edition are as follows:

a) closer definition of the draught screen and the chamber orifices;
b) closer definition of the support for the cable(s) under test;
c) removal of minor differences with equivalent CENELEC work to allow parallel voting with that body.

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

The text of this standard is based on the following documents:

FDIS	Report on voting
20/754/FDIS	20/766/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

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

IEC 61034 consists of the following parts, under the general title *Measurement of smoke density of cables burning under defined conditions*,

Part 1: Test apparatus

Part 2: Test procedure and requirements

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

The measurement of smoke density is an important aspect in the evaluation of the burning performance of cables as it is related to the evacuation of persons and accessibility for firefighting.

IEC 61034 is published in two parts, which together specify a method of test for measurement of smoke density of cables burning under defined conditions. Users of this test are reminded that the configurations of cable in the test (i.e. as test pieces or bundles of test pieces) may not represent actual installation conditions.

This Part 1 gives details of the test apparatus and verification procedure to be used for the measurement of smoke density of the products of combustion of cables burnt under defined conditions. It includes details of a test enclosure of 27m^3 volume, a photometric system for light measurement, the fire source, smoke mixing method and a qualification procedure. Annex A gives guidance on various aspects of the test apparatus which may be useful when first constructing the test enclosure.

Part 2 gives the test procedure, together with an informative annex giving recommended requirements for compliance where no specified requirement is given in the particular cable standard or specification.

MEASUREMENT OF SMOKE DENSITY OF CABLES BURNING UNDER DEFINED CONDITIONS –

Part 1: Test apparatus

1 Scope

This part of IEC 61034 provides details of the test apparatus to be used for measuring smoke emission when electric or optical fibre cables are burnt under defined conditions, for example, a few cables burnt horizontally. The light transmittance (l_t) under flaming combustion and smouldering conditions can be used as a means of comparing different cables or complying with specific requirements.

NOTE For the purposes of this standard, the term "electric cable" covers all insulated metallic conductor cables used for the conveyance of energy or signals.

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*

〖A2〗 IEC Guide 104 〈A2〉, *The preparation of safety publications and the use of basic safety publications and group safety publications*

ISO/IEC 13943:2000, *Fire safety – Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions in IEC 60695-4 apply, or if a term is not defined in IEC 60695-4 then the definition in ISO/IEC 13943 applies.

4 Details of test enclosure

The equipment shall comprise a cubic enclosure with inside dimensions of 3 000 mm ± 30 mm and constructed of a suitable material fixed on to a steel angle frame. One side shall have a door, with a glass inspection window. Transparent sealed windows (minimum size 100 mm × 100 mm) shall be provided on two opposite sides to permit the transmission of a beam of light from the horizontal photometric system. The distance from the floor to the centre of these windows shall be 2 150 mm ± 100 mm (see Figure 1 for plan view).

The walls of the enclosure shall include orifices at ground level (i.e. not greater than 100 mm above the level of the chamber floor) for the passage of cables, etc., and to permit the enclosure to be at atmospheric pressure.

No orifice shall be directly behind the fire source or on the same wall. A minimum of two orifices shall be provided and the total area of the orifices open during the test shall be 50 cm^2 ± 10 cm^2.

NOTE 1 Two orifices, each with an area of 25 cm^2 ± 5 cm^2, and located on two opposite walls, one under the light source and one under the receiver have been found to be suitable.