Australian/New Zealand Standard™

Measurement of smoke density of cables burning under defined conditions

Part 1: Test apparatus

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Australian Cablemakers Association
Australian Industry Group
Electrical Compliance Testing Association
Electrical Contractors Association of New Zealand
Electrical Regulatory Authorities Council
Institute of Electrical Inspectors
National Electrical and Communications Association
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Part 1: Test apparatus

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Preface

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee, EL-003 Electric Wires and Cables, to supersede, in part, AS/NZS 1660.5.2:2006, Test methods for electric cables, cords and conductors, Method 5.2: Fire tests—Measurement of smoke density of cables burning under defined conditions.

The objective of this Standard is to provide 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.

This Standard is identical with, and has been reproduced from IEC 61034-1:2005+AMD1:2013 CSV (ED. 3.1), Measurement of smoke density of cables burning under defined conditions, Part 1: Test apparatus.

As this Standard is reproduced from an International Standard, the following applies:

(a) In the source text 'this part of IEC 61034' should read 'this Australian/New Zealand Standard'.

(b) A full point substitutes for a comma when referring to a decimal marker.

None of the normative references in the source document have been adopted as Australian or Australian/New Zealand Standards.

NOTES

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

MEASUREMENT OF SMOKE DENSITY OF CABLES BURNING UNDER DEFINED CONDITIONS –

Part 1: Test apparatus

FOREWORD

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This consolidated version of IEC 61034-1 consists of the third edition (2005) [documents 20/754/FDIS and 20/766/RVD] and its amendment 1 (2013) [documents 20/1428/FDIS and 20/1443/RVD]. It bears the edition number 3.1.

The technical content is therefore identical to the base edition and its amendment and has been prepared for user convenience. A vertical line in the margin shows where the base publication has been modified by amendment 1. Additions and deletions are displayed in red, with deletions being struck through.

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

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.

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 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

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

IMPORTANT – The "colour inside" logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this publication using a colour printer.

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*

IEC Guide 104:1997, *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.