

<b>STN</b>	<b>Skúšky elektrických a optovláknových káblov v podmienkach horenia</b> <b>Časť 3-21: Skúška vertikálne šíreným plameňom na vertikálne uložených vodičoch alebo kábloch vo zväzkoch</b> <b>Kategória A F/R</b>	<b>STN</b> <b>EN IEC</b> <b>60332-3-21</b>  34 7101
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Tests on electric and optical fibre cables under fire conditions - Part 3-21: Test for vertical flame spread of vertically-mounted bunched wires or cables - Category A F/R

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 01/19

Obsahuje: EN IEC 60332-3-21:2018, IEC 60332-3-21:2018

Oznámením tejto normy sa od 17.08.2021 ruší  
STN EN 60332-3-21 (34 7101) z júna 2010

**127908**

EUROPEAN STANDARD

**EN IEC 60332-3-21**

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2018

ICS 13.220.40; 29.020; 29.060.20

Supersedes EN 60332-3-21:2009

English Version

**Tests on electric and optical fibre cables under fire conditions -  
Part 3-21: Test for vertical flame spread of vertically-mounted  
bunched wires or cables - Category A F/R  
(IEC 60332-3-21:2018)**

Essais des câbles électriques et des câbles à fibres  
optiques soumis au feu - Partie 3-21: Essai de propagation  
verticale de la flamme des fils ou câbles en nappes en  
position verticale - Catégorie A F/R  
(IEC 60332-3-21:2018)

Prüfungen an Kabeln, isolierten Leitungen und  
Glasfaserkabeln im Brandfall - Teil 3-21: Prüfung der  
vertikalen Flammenausbreitung von vertikal angeordneten  
Bündeln von Kabeln und isolierten Leitungen - Prüfmethode A F/R  
(IEC 60332-3-21:2018)

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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

**EN IEC 60332-3-21:2018 (E)****European foreword**

The text of document 20/1798/FDIS, future edition 2 of IEC 60332-3-21, prepared by IEC/TC 20 "Electric cables" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60332-3-21:2018.

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) 2019-05-17
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2021-08-17

This document supersedes EN 60332-3-21:2009.

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The text of the International Standard IEC 60332-3-21:2018 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

ISO 13943:2017 NOTE Harmonized as EN ISO 13943:2017 (not modified)

## **Annex ZA** (normative)

### **Normative references to international publications with their corresponding European publications**

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60332-3-10	-	Tests on electric and optical fibre cables under fire conditions - Part 3-10: Test for vertical flame spread of vertically-mounted bunched wires or cables - Apparatus	EN IEC 60332-3-10	-
IEC 60811-606	-	Electric and optical fibre cables - Test methods for non-metallic materials - Part 606: Physical tests - Methods for determining the density	EN 60811-606	-



IEC 60332-3-21

Edition 2.0 2018-07

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

GROUP SAFETY PUBLICATION  
PUBLICATION GROUPEE DE SÉCURITÉ

**Tests on electric and optical fibre cables under fire conditions –  
Part 3-21: Test for vertical flame spread of vertically-mounted bunched wires or  
cables – Category A F/R**

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IEC 60332-3-21

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ICS 13.220.40; 29.060.20

ISBN 978-2-8322-5796-8

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

#### Part 3-21: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category A F/R

#### FOREWORD

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International Standard IEC 60332-3-21 has been prepared by IEC technical committee 20: Electric cables.

This second edition cancels and replaces the first edition published in 2000. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) adjustments have been made to the title, and elsewhere, to emphasise the standard is applicable to optical fibre cables as well as metallic conductor types;
- b) details of the way in which cables are mounted on the ladder have been better defined in order to improve repeatability and reproducibility.

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

The text of this International Standard is based on the following documents:

FDIS	Report on voting
20/1798/FDIS	20/1815/RVD

Full information on the voting for the approval of this International 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.

A list of all parts in the IEC 60332 series, published under the general title *Tests on electric and optical fibre cables under fire conditions*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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

IEC 60332-3-21 is part of a series of publications dealing with tests on electric and optical fibre cables under fire conditions.

The IEC 60332-1 and IEC 60332-2 series specify methods of test for flame spread characteristics for a single vertical insulated wire or cable. It cannot be assumed that, because a cable or wire meets the requirements of the IEC 60332-1 and IEC 60332-2 series, a vertical bunch of similar cables or wires will behave in a similar manner. This is because flame spread along a vertical bunch of cables depends on a number of features, such as

- a) the volume of combustible material exposed to the fire and to any flame which may be produced by the combustion of the cables;
- b) the geometrical configuration of the cables and their relationship to an enclosure;
- c) the temperature at which it is possible to ignite the gases emitted from the cables;
- d) the quantity of combustible gas released from the cables for a given temperature rise;
- e) the volume of air passing through the cable installation;
- f) the construction of the cable, for example armoured or unarmoured, multi- or single-core.

All of the foregoing assume that the cables are able to be ignited when involved in an external fire.

The IEC 60332-3 series gives details of a test where a number of cables are bunched together to form various test sample installations. For easier use and differentiation of the various test categories, the parts are designated as follows:

Part 3-10:	Apparatus
Part 3-21:	Category A F/R
Part 3-22:	Category A
Part 3-23:	Category B
Part 3-24:	Category C
Part 3-25:	Category D

Parts from 3-21 onwards define the various categories and the relevant procedures. The categories are distinguished by test duration, the volume of non-metallic material of the test sample and the method of mounting the sample for the test. In all categories, cables having at least one conductor of cross-sectional area greater than 35 mm<sup>2</sup> are tested in a spaced configuration, whereas cables of conductor cross-sectional area of 35 mm<sup>2</sup> or smaller and optical fibre cables are tested in a touching configuration.

The categories are not necessarily related to different safety levels in actual cable installations. The actual installed configuration of the cables may be a major determinant in the level of flame spread occurring in an actual fire.

The method of mounting described as category A F/R (Part 3-21) is intended for special cable designs used in particular installations.

Categories A, B, C and D (Part 3-22 to Part 3-25 respectively) are for general use where different non-metallic volumes are applicable.

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

### Part 3-21: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category A F/R

#### 1 Scope

This part of IEC 60332 covers category A F/R for methods of test for the assessment of vertical flame spread of vertically-mounted bunched wires or cables, under defined conditions.

This document relates only to power cables of conductor cross-sectional area greater than 35 mm<sup>2</sup> installed on the test ladder in a spaced configuration on the front and rear to achieve a nominal total volume of non-metallic material of 7 l/m of test sample. The flame application time is 40 min. This method of mounting is intended for special cable designs used in particular installations when required in the cable specification. Category A F/R is not intended for general use.

The test is intended for type approval testing. The requirements for the selection of cables for testing are given in Annex A. The flame spread is measured as the extent of damage of the cable sample. This procedure can be used to demonstrate the cable's ability to limit flame spread.

A recommended performance requirement is given in Annex B.

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

#### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60332-3-10, *Tests on electric and optical fibre cables under fire conditions – Part 3-10: Test for vertical flame spread of vertically-mounted bunched wires or cables – Apparatus*

IEC 60811-606, *Electric and optical fibre cables – Test methods for non-metallic materials – Part 606: Physical tests – Methods for determining the density*

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