

ELEKTRIKAABLIID. KAITSMATA ELEKTRIKAABLI (P-LIIGITUS) TULEKINDLUSKATSETUS

Electric cables - Fire resistance test for unprotected electric cables (P classification)

EESTI STANDARDI EESSÕNA**NATIONAL FOREWORD**

| | |
|---|--|
| See Eesti standard EVS-EN 50577:2015 sisaldab Euroopa standardi EN 50577:2015 ingliskeelset teksti. | This Estonian standard EVS-EN 50577:2015 consists of the English text of the European standard EN 50577:2015. |
| Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas. | This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation. |
| Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 18.12.2015. | Date of Availability of the European standard is 18.12.2015. |
| Standard on kättesaadav Eesti Standardikeskusest. | The standard is available from the Estonian Centre for Standardisation. |

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 13.220.50, 29.060.20

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:

Aru 10, 10317 Tallinn, Eesti; koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Aru 10, 10317 Tallinn, Estonia; homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

ICS 13.220.50; 29.060.20

English Version

Electric cables - Fire resistance test for unprotected electric cables (P classification)

Câbles électriques - Essai de résistance au feu des câbles électriques non protégés (Classification P)

Kabel und Leitungen - Feuerwiderstandsprüfung an ungeschützten Kabeln und Leitungen (P-Klassifikation)

This European Standard was approved by CENELEC on 2015-11-02. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

| | |
|---|-----------|
| European foreword | 4 |
| Introduction..... | 5 |
| 1 Scope | 6 |
| 2 Normative references | 6 |
| 3 Terms and definitions | 7 |
| 4 Test equipment | 7 |
| 4.1 Test furnace | 7 |
| 4.2 Continuity and voltage withstand checking arrangement | 7 |
| 4.3 Fuse | 8 |
| 4.4 Standardized representative installation | 8 |
| 4.5 Installation of standardized representative installation | 11 |
| 5 Test conditions | 16 |
| 5.1 Environmental conditions | 16 |
| 5.2 Furnace control | 16 |
| 6 Test specimen..... | 16 |
| 6.1 Length of test specimen..... | 16 |
| 6.2 Number of test specimens | 17 |
| 6.3 Conditioning | 17 |
| 6.4 Specimen preparation | 17 |
| 6.5 Mounting of test specimens..... | 17 |
| 7 Test procedure | 18 |
| 7.1 General | 18 |
| 7.2 Measuring temperature | 18 |
| 7.3 Applying the voltage | 20 |
| 7.4 Starting the test..... | 21 |
| 8 Duration of survival..... | 21 |
| 8.1 Point of failure..... | 21 |
| 9 Test report | 22 |
| Annex A (normative) Field of direct application | 23 |
| A.1 Definitions | 23 |
| A.2 Cable Management System | 23 |
| A.3 Orientation | 23 |
| A.4 Bending radius | 23 |
| Annex B (normative) Extended application of test results | 24 |
| B.1 Definitions | 24 |
| B.2 Product families for EXAP | 24 |
| B.3 EXAP procedure | 25 |
| Bibliography..... | 27 |

Figures

| | |
|---|-----------|
| Figure 1 — Plan view of “U” bend arrangement incorporating straight or curved corners in both horizontal and vertical furnaces | 10 |
| Figure 2 — End elevation of “U” bend arrangement in both horizontal and vertical furnaces | 10 |
| Figure 3 — Plan view of “S” bend arrangement in horizontal furnace only | 11 |
| Figure 4 — End elevation of “S” bend arrangement in horizontal furnace only | 11 |
| Figure 5 — Plan view of “U” bend standardized installation with curved or straight corners | 12 |
| Figure 6 — End elevation of “U” bend standardized installation | 12 |
| Figure 7 — Plan view of “S” bend standardized representative installation with curved and straight corners | 13 |
| Figure 8 — End elevation of “S” bend standardized representative installation..... | 14 |
| Figure 9 — Exit in the furnace wall of the “U” bend installation | 15 |
| Figure 10 — Exit in the furnace wall of the “S” bend installation..... | 16 |
| Figure 11 — Arrangement of test specimens in “U” bend installation..... | 17 |
| Figure 12 — Arrangement of a test specimen in “S” bend installation | 18 |
| Figure 13 — Locations of plate thermometers in “U” bend installation..... | 19 |
| Figure 14 — Locations of plate thermometers in “S” bend installation..... | 19 |
| Figure 15 — Basic circuit diagram — Electric power and control cables with rated voltage up to and including 600/1 000V | 21 |

European foreword

This document (EN 50577:2015) has been prepared by CLC/TC 20 "Electric cables".

The following dates are fixed:

- latest date by which this document has (dop) 2016-11-02
to be implemented at national level by
publication of an identical national
standard or by endorsement
- latest date by which the national (dow) 2018-11-02
standards conflicting with this
document have to be withdrawn

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

The cables are tested in a standardized representative installation, under conditions of minimum bending radius and subject to exposure to fire under conditions of the EN 1363-1 standard time/temperature curve which satisfies the requirements of Mandate M/117 for the P classification.

NOTE The test method in EN 50200 includes exposure to fire under specified conditions of constant temperature attack and satisfies the requirements of Mandate M/117 for the PH classification.

Introduction

The purpose of this test is to evaluate the ability of an electric cable to maintain electrical circuit integrity during a defined time whilst exposed to fire under conditions of the EN 1363-1 standard time/temperature curve and when installed in a standardized representative condition.

The fire exposure conditions and general arrangement in this European Standard are similar to those given in prEN 1366-11 [1], developed by CEN/TC 127, and a future document on Cable management systems (CMS) for fire resistant installations, to be developed by CLC/TC 213 [2]. Each of these standards has been developed under a Mode 4 co-operation between CEN/TC 127, CLC/TC 213 and CLC/TC 20.

The test installation has been designed such that vertical and horizontal furnaces can be used to carry out the test.

The standardized representative condition can be arranged in the following configurations:

- a) a “U” or “S” in the horizontal furnace;
- b) a “U” and “S” in the horizontal furnace and
- c) a “U” in the vertical furnace.

Caution — The attention of all persons concerned with managing and carrying out this fire resistance test is drawn to the fact that fire testing may be hazardous and that there is a possibility that toxic and/or harmful smoke and gases may be evolved during the test. Mechanical, electrical and operational hazards may also arise during the construction of the test elements or structures, their testing and the disposal of test residues.

An assessment of all potential hazards and risks to health should be made and safety precautions should be identified and provided. Written safety instructions should be issued. Appropriate training should be given to relevant personnel. Laboratory personnel should ensure that they follow written safety instructions at all times.

1 Scope

This European Standard specifies a test method to evaluate the maintenance of circuit integrity of electric cables which have intrinsic resistance to fire under fire conditions, in order to classify the electric cable according to EN 13501-3.

The test determines the survival time for circuit integrity of the electric cable when exposed to fire under the conditions of the EN 1363-1 standard time/temperature curve.

This European Standard is used in conjunction with EN 1363-1.

This European Standard applies to electric power and control cables with rated voltage up to and including 600/1 000 V.

The cable is tested in a standardized representative installation condition.

The test does not assess the performance of the cable management system.

NOTE Optical fibre cables and copper communication cables could be tested using this test method, however verification procedures for such cables were still under development when this document has been circulated for vote (2015-07-24).

This European Standard includes field of direct application (Annex A) and rules for extended application of test results (EXAP) (Annex B).

The selection of cables to be tested for classification of a family is given in Annex B. In case the selection of the cables does not comply with Annex B, the test results are only applicable to the tested cables.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1363-1, *Fire resistance tests — Part 1: General requirements*

EN 13501-3, *Fire classification of construction products and building elements — Part 3: Classification using data from fire resistance tests on products and elements used in building service installations: fire resisting ducts and fire dampers*¹⁾

EN 50200, *Method of test for resistance to fire of unprotected small cables for use in emergency circuits*

EN 61537, *Cable management — Cable tray systems and cable ladder systems (IEC 61537)*

EN ISO 13943, *Fire safety — Vocabulary (ISO 13943)*

¹⁾ EN 13501-3 will be amended to include cables

IEC 60269-3, *Low voltage fuses — Part 3: Supplementary requirements for fuses for use by unskilled persons (fuses mainly for household or similar applications) – Examples of standardized systems of fuses A to F*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1363-1 and EN ISO 13943 and the following apply.

3.1

circuit integrity

ability of an electric cable to continue to operate in a designated manner whilst subjected to a specific source of heat for a specified period of time under specified conditions

3.2

standardized representative installation

cable management system based on perforated trays and perforated suspension supports

3.3

cable with intrinsic fire resistance

electric cable designed to continue to operate in a designated manner whilst subjected to a specific source of heat for a specified period of time under specified conditions

3.4

rated voltage

reference voltage for which the cable is designed

4 Test equipment

4.1 Test furnace

The test furnace shall be capable of subjecting the electric cable when installed to the standard heating and pressure conditions specified in EN 1363-1.

The internal dimensions of the test furnace shall be able to accommodate the standardized representative installation as specified in 4.4.

NOTE 1 Furnaces of the following minimum internal dimensions have been found to be suitable:

- 3 m long;
- 1,5 m deep;
- 2,5 m high.

It is acceptable to extend the vertical furnace to achieve the above minimum internal dimensions that have been found to be suitable.

NOTE 2 The typical dimensions of a horizontal furnace is 4 m (length) x 3 m (width) x 2,5 m (height) and of a vertical furnace, including any necessary extensions, 3 m (length) x 1,5 m (depth) x 2,5 m (height)

The centreline of burners shall be at least 500 mm away from the closest portion of the standardized representative installation.

4.2 Continuity and voltage withstand checking arrangement (See Figure 15)

The arrangement for checking continuity and voltage withstand shall comprise a three-phase star-connected or single-phase transformer(s).