Railway applications - Railway rolling stock cables having special fire performance - Thin wall - Part 1: General requirements

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 50306-1:2003 sisaldab Euroopa standardi EN 50306-1:2002 ingliskeelset teksti. Käesolev dokument on jõustatud 15.01.2003 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 50306-1:2003 consists of the English text of the European standard EN 50306-1:2002. This document is endorsed on 15.01.2003 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: EN 50306-1 specifies the general requirements applicable to the cables given EN 50306-2, EN 50306-3 and EN 50306-4. It includes the detailed requirements for S1 and S2 sheathing materials and other components called up in the separate Parts.	**Scope:** EN 50306-1 specifies the general requirements applicable to the cables given EN 50306-2, EN 50306-3 and EN 50306-4. It includes the detailed requirements for S1 and S2 sheathing materials and other components called up in the separate Parts.

ICS 13.220.40, 45.060.01

Võtmesõnad: electric locomo, electrically-opera, flame propagation, protectors, railroad vehicles, rol, safety, safety engineering, safety requirements, sheaths, specification (approval), specifications, surface spread of flame, testing, traffic vehicles, wall thicknesses

EUROPEAN STANDARD **EN 50306-1**

NORME EUROPÉENNE

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ICS 13.220.40; 45.060.01

English version

Railway applications - Railway rolling stock cables having special fire performance - Thin wall Part 1: General requirements

Applications ferroviaires - Câbles pour matériel roulant ferroviaire ayant des performances particulières de comportement au feu - Isolation mince Partie 1: Prescriptions générales

Bahnanwendungen - Kabel und Leitungen für Schienenfahrzeuge mit verbessertem Verhalten im Brandfall - Reduzierte Isolierwanddicken Teil 1: Allgemeine Anforderungen

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CENELEC

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

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Foreword

This European Standard was prepared by Working Group 12, Railway cables, of Technical Committee CENELEC TC 20, Electric cables, as part of the overall programme of work in CENELEC TC 9X, Electrical and electronic applications for railways.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50306-1 on 2002-06-01.

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) 2003-07-01

- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2008-07-01

Annexes designated “normative” are part of the body of the standard.
Annexes designated “informative” are given for information only.
In this standard, annex A is normative and annex B is informative.

Contents

Introduction

The railway industry is generally concerned with the movement of people as well as goods. It is therefore essential that a high level of safety is achieved, even when failures occur which may involve fire, howsoever caused, affecting railway rolling stock.

Hence it is necessary to provide cables for use in railway environments which minimise the hazard to people when a fire may damage the cable, irrespective of whether the fire is caused by an external source or from within the electrical system.

EN 50306 specifies cables which, in the event of fire will limit the risk to people and improve the safety on railways in general. It covers cables with thin wall thickness of both insulation and sheath, based on halogen free materials, for use in railway rolling stock. There is provision for screening in some of the parts and also for a standard wall thickness sheath. In the event of a fire affecting cables to EN 50306 they will have a limited flame spread and limited emission of toxic gases. In addition these cables when burnt, produce limited amounts of smoke. This last characteristic will minimise loss of visibility in the event of a fire and will aid reduced evacuation times.

The objects of this standard are

- to standardise cables that are safe and reliable when properly used,
- to state the characteristics, performance, and construction requirements directly or indirectly bearing on safety,
- to specify methods for checking conformity with these requirements.

EN 50306, which covers a range of cables rated at 300 V to earth with conductor sizes 0,5 mm^2 up to 2,5 mm^2, is divided into 4 parts:

Part 1: General requirements;
Part 2 : Single core cables;
Part 3: Single core and multicore cables (pairs, triples and quads) screened and thin wall sheathed;
Part 4: Multicore and multipair cables standard wall sheathed.

These cables are intended for a limited number of applications. Further information on these applications is given in EN 50355 [1)].

Special test methods referred to in EN 50306 are given in EN 50305.

A separate European Standard, EN 50264 covers cables for similar applications up to 3,6 kV/6 kV rating, but with standard wall thickness of both insulation and sheath, and provides for a maximum conductor size of 400 mm^2.

1) At draft stage.

1 Scope

EN 50306-1 specifies the general requirements applicable to the cables given EN 50306-2, EN 50306-3 and EN 50306-4. It includes the detailed requirements for S1 and S2 sheathing materials and other components called up in the separate Parts.

NOTE 1 Detailed requirements for insulation systems are given in EN 50306-2.

In particular EN 50306-1 specifies those requirements relating to fire safety which enable the cables to satisfy Hazard Levels 2, 3 or 4 of EN 45545-1 [2)].

NOTE 2 Requirements for the emission of smoke and gases are not specified for Hazard Level 1 of EN 45545-1.

NOTE 3 EN 45545-1 is still under development and should be consulted.

These cables are rated for occasional thermal stresses causing ageing equivalent to continuous operational life at temperatures of 90 °C or 105 °C dependent upon the sheath system type. These temperatures are based upon an acceptance test, using long-term thermal endurance ageing at 110 °C and 125 °C respectively, and extrapolation of data to 20 000 h. The maximum temperature for short circuit conditions is 160 °C based on a duration of 5 s.

EN 50306-1 should be used in conjunction with one or more of the other parts of EN 50306.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of these references apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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EN 45545-1 [2)]	Railway applications - Fire protection of railway vehicles Part 1: General
EN 50264-1	Railway applications - Railway rolling stock cables having special fire performance - Standard wall - Part 1: General requirements
EN 50265-2-1	Common test methods for cables under fire conditions - Test for resistance to vertical flame propagation for a single insulated conductor or cable - Part 2-1: Procedures - 1 kW pre-mixed flame
EN 50266-2-4	Common test methods for cables under fire conditions - Test for vertical flame spread of vertically-mounted bunched wires or cables Part 2-4: Procedures - Category C
EN 50267-2-1	Common test methods for cables under fire conditions - Tests on gases evolved during combustion of materials from cables Part 2-1: Procedures - Determination of the amount of halogen acid gas

[2)] At draft stage.

EN 50267-2-2	Common test methods for cables under fire conditions - Tests on gases evolved during combustion of materials from cables Part 2-2: Procedures - Determination of degree of acidity of gases for materials by measuring pH and conductivity
EN 50268-2	Common test methods for cables under fire conditions - Measurement of smoke density of cables burning under defined conditions Part 2: Procedure
EN 50305	Railway applications - Railway rolling stock cables having special fire performance - Test methods
EN 50306-2	Railway applications - Railway rolling stock cables having special fire performance - Thin wall - Part 2: Single core cables
EN 60811-1-1	Insulating and sheathing materials of electric and optical cables - Common test methods - Part 1-1: General application - Measurement of thickness and overall dimensions - Tests for determining the mechanical properties (IEC 60811-1-1)
EN 60811-1-2	Insulating and sheathing materials of electric cables - Common test methods - Part 1-2: General application - Thermal ageing methods (IEC 60811-1-2)
EN 60811-1-3	Insulating and sheathing materials of electric and optical cables - Common test methods - Part 1-3: General application - Methods for determining the density - Water absorption tests - Shrinkage test (IEC 60811-1-3)
EN 60811-1-4	Insulating and sheathing materials of electric and optical cables - Common test methods - Part 1-4: General application - Test at low temperature (IEC 60811-1-4)
EN 60811-2-1	Insulating and sheathing materials of electric and optical cables – Common test methods - Part 2-1: Methods specific to elastomeric compounds - Ozone resistance, hot set and mineral oil immersion tests (IEC 60811-2-1)
EN 60684-2	Flexible insulating sleeving - Part 2 - Methods of test (IEC 60684-2)

3 Definitions

For the purpose of all parts of EN 50306 the following definitions apply.

3.1
insulation system
insulation

- polymers, copolymers or alloys which contain aromatic groups and heteroelements such as N, O or Si in the main chain of the polymer molecules;
- polymers, copolymers or alloys of olefinic type, crosslinked if necessary