

**Railway applications - Railway rolling stock power and control cables having special fire performance -- Part 1: General requirements**

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## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 50264-1:2008 sisaldab Euroopa standardi EN 50264-1:2008 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 19.08.2008 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

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**Võtmesõnad:** color codes, designation, designations, electrical testing, electrical tests, equipment specifications, fire tests, marking, product specification, protectors, safety devices, sheaths, testing, tests, thickness

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English version

**Railway applications -  
Railway rolling stock power and control cables  
having special fire performance -  
Part 1: General requirements**

Applications ferroviaires -  
Câbles de puissance et de contrôle  
à comportement au feu spécifié  
pour matériel roulant ferroviaire -  
Partie 1: Prescriptions générales

Bahnanwendungen -  
Starkstrom- und Steuerleitungen  
für Schienenfahrzeuge  
mit verbessertem Verhalten im Brandfall -  
Teil 1: Allgemeine Anforderungen

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**CENELEC**

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

**Central Secretariat: rue de Stassart 35, B - 1050 Brussels**

## Foreword

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

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50264-1 on 2008-03-01.

This European Standard supersedes EN 50264-1:2002.

The following dates were fixed:

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with the EN have to be withdrawn (dow) 2011-03-01
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## 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.

The EN 50264 series specifies cables for power, control and associated circuits which, in the event of fire, will limit the risk to people and improve the safety on railways in general. It covers sheathed and unsheathed cables with insulation and sheath based on halogen free materials, for use in railway rolling stock. In the event of a fire affecting cables to EN 50264 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 50264, which covers a range of cables rated at up to 3,6/6 kV with conductor sizes 1,0 mm<sup>2</sup> up to 400 mm<sup>2</sup>, is divided into 5 parts under the generic title *“Railway applications - Railway rolling stock power and control cables having special fire performance”*.

- Part 1            General requirements;
- Part 2-1        Cables with crosslinked elastomeric insulation – Single core cables;
- Part 2-2        Cables with crosslinked elastomeric insulation – Multicore cables;
- Part 3-1        Cables with crosslinked elastomeric insulation with reduced dimensions – Single core cables;
- Part 3-2        Cables with crosslinked elastomeric insulation with reduced dimensions – Multicore cables.

These cables are intended for a limited number of applications. Further information on these applications is given in the guide to use, i.e. EN 50355.

Information regarding selection and installation of cables, including current ratings can be found in EN 50355 and EN 50343. The procedure for selection of cable cross-sectional area, including reduction factors for ambient temperature and installation type, is described in EN 50343.

Special test methods referred to in EN 50264 are given in EN 50305.

A separate European Standard, EN 50306 (series), covers cables for similar applications but with thinner wall thickness of both insulation and sheath, leading to reduced overall cable diameters. These cables are restricted to 300 V rating and a maximum conductor size of 2,5 mm<sup>2</sup>. A separate European Standard, EN 50382 (series), covers high temperature cables. The range of cables covered is rated at up to 3,6/6 kV with conductor sizes 1,5 mm<sup>2</sup> to 400 mm<sup>2</sup>.

## 1 Scope

EN 50264-1 specifies the general requirements applicable to the cables given in all other parts of EN 50264. It includes the detailed requirements for the insulating and sheathing materials and other components called up in the separate parts. In particular EN 50264-1 specifies those requirements relating to fire safety.

Based on proven experience and reliability over many years these cables are rated for occasional thermal stresses causing ageing equivalent to continuous operational life at a conductor temperature of 90 °C.

NOTE This rating is based upon the polymers defined in 3.1 and 3.2. Before these polymers had gained widespread acceptance in the cable industry, ageing performance had been assessed via long-term thermal endurance testing and had been extrapolated to 20 000 h using techniques equivalent to those in EN 60216 (series). Subsequent experience in service has demonstrated that the predicted performance levels were correct. Where extrapolated data is used to predict lifetime in service it should be confirmed with the cable manufacturer, and should be on the basis of a failure mode appropriate to the type of material or cable.

The maximum conductor temperature for short circuit conditions is 200 °C based on a duration of 5 s.

This Part 1 should be read in conjunction with the other parts of EN 50264.

## 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.

|              |  |
|--------------|--|
| EN 10002-1   | Metallic materials – Tensile testing – Methods of test at ambient temperature  |
| EN 50264-2-1 | Railway applications – Railway rolling stock power and control cables having special fire performance – Part 2-1: Cables with crosslinked elastomeric insulation – Single core cables  |
| EN 50264-2-2 | Railway applications - Railway rolling stock power and control cables having special fire performance – Part 2-2: Cables with crosslinked elastomeric insulation – Multicore cables  |
| EN 50264-3-1 | Railway applications - Railway rolling stock power and control cables having special fire performance – Part 3-1: Cables with crosslinked elastomeric insulation with reduced dimensions – Single core cables                                |
| EN 50264-3-2 | Railway applications - Railway rolling stock power and control cables having special fire performance – Part 3-2: Cables with crosslinked elastomeric insulation with reduced dimensions – Multicore cables                                  |
| 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 50266-2-5 | Common test methods for cables under fire conditions – Test for vertical flame spread of vertically-mounted bunched wires or cables – Part 2-5: Procedures – Small cables – Category D   |
| EN 50267-2-1 | Common test methods for cables under fire conditions – Tests on gasses evolved during combustion of materials from cables – Part 2-1: Procedures – Determination of the amount of halogen acid gas   |
| 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 50305:2002     | Railway applications – Railway rolling stock cables having special fire performance – Test methods   |
| EN 60228          | Conductors of insulated cables (IEC 60228)   |
| EN 60332-1-2      | Tests on electric and optical fibre cables under fire conditions – Part 1-2: Test for vertical flame propagation for a single insulated wire or cable – Procedure for 1 kW pre-mixed flame (IEC 60332-1-2)                                       |
| EN 60684-2        | Flexible insulating sleeving – Part 2: Methods of test (IEC 60684-2)   |
| EN 60811-1-1:1995 | 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 60811-1-1:1993) |
| EN 60811-1-2:1995 | Insulating and sheathing materials of electric cables – Common test methods – Part 1-2: General application – Thermal ageing methods (IEC 60811-1-2:1985 + A1:1989 + corr. May 1986)   |
| EN 60811-1-3:1995 | 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 60811-1-3:1993)                     |
| EN 60811-1-4:1995 | Insulating and sheathing materials of electric and optical cables – Common test methods – Part 1-4: General application – Tests at low temperature (IEC 60811-1-4:1985 + A1:1993 + corr. May 1986)   |
| EN 60811-2-1:1998 | 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 60811-2-1:1998)                   |
| EN 61034-2        | Measurement of smoke density of cables burning under defined conditions – Part 2: Procedure and requirements (IEC 61034-2)   |

### 3 Definitions

For the purposes of all parts of EN 50264, the following terms and definitions apply.

The types or combination of insulating and sheathing compounds covered in this EN are listed below.

#### 3.1

##### **cross-linked ethylene propylene rubber (EPR)**

compound based on ethylene propylene rubber or similar (EPM or EPDM) which when cross-linked complies with the requirements given in the particular specification

#### 3.2

##### **cross-linked ethylene copolymers**

compound in which the characteristic constituent is a copolymer of ethylene such as EVA or other, which, when cross-linked, complies with the requirements given in the particular specification

#### 3.3

##### **type of compound**

category, designated by one or several characteristics, in which a compound is placed according to its properties, as determined by specific tests

NOTE The type designation is not directly related to the composition of the compound. See also 6.2.1 and 6.6.1.