



# SLOVENSKI STANDARD

## SIST EN 50264-1:2003

01-februar-2003

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

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

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

Applications ferroviaires - Câbles pour matériel roulant ferroviaire ayant des  
performances particulières de comportement au feu - Câbles à isolation d'épaisseur  
normale -- Partie 1: Prescriptions générales

Ta slovenski standard je istoveten z: **EN 50264-1:2002**

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29.060.20	Kabli	Cables
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**en**

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EUROPEAN STANDARD

**EN 50264-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2002

ICS 13.220.20; 29.060.20; 45.060.01

English version

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

Applications ferroviaires -  
Câbles pour matériel roulant ferroviaire  
ayant des performances particulières  
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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat 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 Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

# 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 for Technical Committee CENELEC TC 20 “Electric cables” by Working Group 12 “Railway 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 formal vote and was approved by CENELEC as EN 50264-1 on 2002-03-01.

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

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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 minimize 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.

European Standard EN 50264 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 standard wall thickness of insulation, both sheathed and unsheathed, 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 minimize loss of visibility in the event of a fire and will aid reduced evacuation times.

The objects of this standard are

- to standardize 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 3 parts:

Part 1: General requirements,

Part 2: Single core cables;

Part 3: Multicore cables.

These cables are intended for a limited number of applications. Further information on these applications is given in the guide to use (EN 50355 – under development).

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

A separate European Standard, EN 50306 covers cables for similar applications but with thin wall insulation, restricted to 300 V rating and a maximum conductor size of 2,5 mm<sup>2</sup>.

## 1 Scope

Part 1 of EN 50264 specifies the general requirements applicable to the cables given in part 2 and part 3 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 which enable the cables to satisfy Hazard Levels 2, 3 and 4 of EN 45545-1.

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

NOTE 2 EN 45545-1 is still under development and should be consulted.

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 temperature of 90 °C. The maximum temperature for short circuit conditions is 200 °C based on a duration of 5 seconds.

This part 1 should be used in conjunction with the other parts of EN 50264.

## 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.

<u>SIST EN 50264-1:2003</u>	
<a href="https://standards.iteh.ai/catalog/standards/sist/c0f612b6-2466-4b4e-b028-270e90900000/en-50264-1-2002">https://standards.iteh.ai/catalog/standards/sist/c0f612b6-2466-4b4e-b028-270e90900000/en-50264-1-2002</a>	
EN 10002-1	Tensile testing of metallic materials - Method of test at ambient temperature
EN 45545-1 <sup>1)</sup>	Railway applications - Fire protection of railway vehicles - Part 1: General
EN 50264-2	Railway applications - Railway rolling stock cables having special fire performance - Standard wall - Part 2: Single core cables
EN 50264-3	Railway rolling stock cables having special fire performance - Standard wall - Part 3: Multicore cables
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 gasses evolved during combustion of materials from cables - Part 2-1: Procedures - Determination of the amount of halogen acid gas

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<sup>1)</sup> At draft stage.

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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 50334	Marking by inscription for the identification of cores of electric cables
EN 60684-2	Flexible insulating sleeving - Part 2: Methods of test
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
EN 60811-1-2	Insulating and sheathing materials of electric cables - Common test methods - Part 1-2: General application - Thermal ageing methods
EN 60811-1-3	Insulating and sheathing materials of electric cables - Common test methods - Part 1-3: General application - Methods for determining the density - Water absorption tests - Shrinkage test
EN 60811-1-4	Insulating and sheathing materials of electric cables - Common test methods - Part 1-4: General application - Tests at low temperature
EN 60811-2-1	Insulating and sheathing materials of electric cables - Common test methods - Part 2-1: Methods specific to elastomeric compounds - Ozone resistance test - Hot set test - Mineral oil immersion test
HD 383	Conductors of insulated cables - First supplement: Guide to the dimensional limits of circular conductors

### 3 Definitions

For the purposes of all parts of EN 50264, the following 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)**

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

#### 3.2

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

a 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 specifications



**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.

**3.4****halogen-free material**

combustible material which, when tested in accordance with the designated method, conforms to the following:

maximum evolution of HCl	-	0,5 % to EN 50267-2-1
minimum pH	-	4,3 to EN 50267-2-2
maximum conductivity	-	10,0 $\mu$ S/mm to EN 50267-2-2

NOTE This value of maximum conductivity is subject to further consideration and review.

maximum fluorine content	-	0,1 % to EN 60684-2
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**3.5****type tests (Symbol T)**

tests required to be made before supplying a type of cable covered by this standard on a general commercial basis in order to demonstrate satisfactory performance characteristics to meet the intended application. These tests are of such a nature that, after they have been made, they need not be repeated unless changes are made in the cable materials, design or type of manufacturing process which might change the performance characteristics

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**3.6****sample tests (Symbol S)**

tests made on samples of completed cable, or components taken from a completed cable adequate to verify that the finished product meets the design specification

**3.7****routine tests (Symbol R)**

tests made on all complete cable lengths to demonstrate their integrity

**4 Rated voltage**

The rated voltage of a cable is the reference voltage for which the cable is designed, and which serves to define the electrical tests.

The rated voltage  $V$  is expressed by the combination of the following values (in volts):

$U_o/U(U_m)$

- $U_o$  is the r.m.s. value between any insulated conductor and earth, i.e. metal covering of the cable or the surrounding medium, e.g.  $U_o = 600$  V;
- $U$  is the r.m.s. value between any two phase-conductors of a multicore cable or of a system of single-core cables, e.g.  $U = 1\ 000$  V;
- $U_m$  is the maximum r.m.s. value of the "highest system voltage" for which the equipment may be used, e.g.  $U_m = 1\ 200$  V.

In an alternating current system, the rated voltage of a cable shall be at least equal to the nominal voltage of the system for which it is intended.

In a direct current system, the cables shall have a maximum voltage against earth ( $V_o$ ) not exceeding 1,5 times the rated voltage ( $U_o$ ) of the cable, where

$V_o$  is the d.c. value between any insulated conductor and earth, i.e. metal covering of the cable or the surrounding medium, e.g.  $V_o = 900$  V.

The rated voltage recognized for the purposes of all parts of EN 50264 shall be as given in Table 1.

NOTE In the railway industry it is common practice to identify cables and systems by the value of  $U_o$ , not the more usual normal practice of  $U$ .

**Table 1 - Rated voltages**

Rated voltage V All values are in volts			
$U_o$	$U$	$U_m$	$V_o$
* 300	* 500	* 600	* 450
600	1 000	1 200	900
1 800	3 000	3 600	2 700
3 600	6 000	7 200	5 400
* Multicore cables only.			

NOTE See Guide to Use (EN 50355 under development) for further information.

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## 5 Marking

### 5.1 Indication of origin

Cables shall be provided with an identification of origin consisting of the continuous marking of either the manufacturer's name or trademark or registered identification number, by one of the following methods:

- 1) a printed tape within the cable;
- 2) printing, indenting or embossing on the outer surface of sheathed cable;
- 3) printing on the outer surface of single core cables;
- 4) printing on the insulation of at least one core.

NOTE Additional markings may be specified in EN 50264-2 or EN 50264-3.

### 5.2 Continuity of marks

Each specified mark shall be regarded as continuous if the distance between the end of the mark and the beginning of the next identical mark does not exceed

- a) 550 mm if the marking is on the outer surface of the cable;
- b) 275 mm if the marking is on the insulation or on a tape.

NOTE 1 A "specified mark" is any mandatory mark covered by this part of EN 50264 or by the particular requirements of part 2 or 3.

NOTE 2 An example of marking on the outer surface of the cable is given in Figure 1.

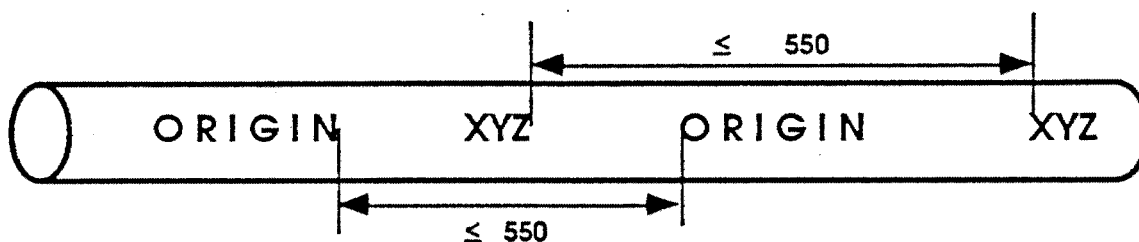


Figure 1 - Example of marking

Conformity shall be checked by visual examination and measurement.

### 5.3 Durability

Printed markings shall be durable. Compliance shall be checked by the test given in 10.1 of EN 50305.

### 5.4 Legibility

All markings shall be legible.

Printed markings shall be in contrasting colours.

### 5.5 Additional marking

Additional marking, specific to the individual cable type, shall be given in the particular specification.

### 5.6 Use of the name CENELEC

The name CENELEC, in full or abbreviated, shall not be directly marked on, or in, the cables.

## 6 General requirements for the construction of cables

### 6.1 Conductors

#### 6.1.1 Material

The conductors shall be tin-coated annealed copper.

When tested in accordance with EN 10002-1 the minimum average elongation of the wires from the conductors shall be 15 %, with a minimum value of 10 % for an individual wire.