
**Railway applications - Railway rolling stock cables having special fire performance
- Thin wall - Part 2: Single core cables**

Railway applications - Railway rolling stock cables having special fire performance - Thin wall -- Part 2: Single core cables

Bahnanwendungen - Kabel und Leitungen für Schienenfahrzeuge mit verbessertem Verhalten im Brandfall - Reduzierte Isolierwanddicken - Teil 2: Einadrige Kabel und Leitungen

Applications ferroviaires - Câbles pour matériel roulant ferroviaire ayant des performances particulières de comportement au feu - Isolation mince -- Partie 2: Câbles monoconducteurs

Ta slovenski standard je istoveten z: EN 50306-2:2002

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SIST EN 50306-2:2003**en**

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EUROPEAN STANDARD

EN 50306-2

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English version

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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 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 50306-2 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 "informative" are given for information only. In this standard, annexes A and B are informative.

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Introduction

EN 50306 covers a range of sheathed and unsheathed cables with thin wall thickness insulation, based on halogen-free materials, for use in railway rolling stock. It is divided into four 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.

Special test methods referred to in EN 50306 are given in EN 50305. A guide to use is given in EN 50355 ¹⁾.

The cables in EN 50306-2 are also required in other parts of this series of standards to build up cables with additional screening and sheathing and also in multicore and multipair combinations.

EN 50306-1, General requirements, contains a more extensive introduction to EN 50306 and should be read in conjunction with this European Standard.

1 Scope

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EN 50306-2 specifies requirements for and constructions and dimensions of, single core cables, rated 300 V to earth, of the following type:

Unscreened (0,5 mm² to 2,5 mm² single core)

All cables have stranded tinned copper conductors and thin wall thickness, halogen-free insulation. They are for use in railway rolling stock as fixed wiring, or wiring where limited flexing in operation is encountered. The requirements provide for a continuous operational life at 105 °C, and a maximum temperature for short-circuit conditions of 160 °C based on a duration of 5 seconds.

NOTE 1 Where these single core cables are used as components of sheathed cables, the temperature for continuous operational life depends upon the type of sheath system used. Sheath systems for either 90 °C for 105 °C are defined in other parts of EN 50306.

Under fire conditions the cables exhibit special performance characteristics in respect of maximum permissible flame propagation (flame spread) and maximum permissible emission of smoke and toxic gases. These requirements are specified to permit the cables to satisfy Hazard Levels 2, 3 or 4 of EN 45545-1¹⁾.

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

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

EN 50306-2 should be used in conjunction with EN 50306-1, General requirements.

¹⁾ At draft stage.

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).

EN 10002-1	Tensile testing of metallic materials - Part 1: Test at ambient temperature
EN 45545-1 ²⁾	Railway applications - Fire protection on railway vehicles Part 1: General
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 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
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 50306-1	Railway applications - Railway rolling stock cables having special fire performance - Thin wall - Part 1: General requirements
EN 50334	Marking by inscription for the identification of cores of electric cables
EN 60684-2	Flexible insulating sleeving - Part 2: Methods of test (IEC 60684-2)
EN 60811-1-4	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)
EN 60811-2-1	Insulating and sheathing materials of electric and optical cables - Common test methods - Part 2-1: Method specific to elastomeric compounds - Ozone resistance, hot set and mineral oil immersion tests (IEC 60811-2-1)

²⁾ At draft stage.

3 Single core cables

3.1 General

The cables shall conform to the applicable general requirements given in EN 50306-1 and to the specific requirements of this Part 2.

Conformity with the requirements shall be checked by inspection and by the tests given in Table 4.

3.2 Designation, marking and coding

3.2.1 Code designation

For the purpose of supplying cables to this standard, the following code designation shall be used:

- EN reference;
- number of cores and conductor size;
- identifier for the particular Hazard Level (see 3.2.2).

For example:

EN 50306-2

1x1,5

M

3.2.2 Code identities for cables suitable for use in particular hazard levels

The following letters shall be used as a code to identify the suitability of a particular cable for use under one of the Hazard Levels of EN 45545-1, and to indicate performance levels relating to low temperature and to oil and fuel resistance.

Hazard Level EN 45545-1	1	2 or 3	4
- low temperature / oil resistance	A	B	C
- extra low temperature / oil resistance	D	E	F
- low temperature / extra oil and fuel resistance	G	H	J
- extra low temperature / extra oil and fuel resistance	K	L	M

3.2.3 Marking of cable

Cables shall be marked with the following:

- manufacturer's name;
- EN reference;
- voltage rating;
- number of cores and conductor size;
- identifier for the particular Hazard Level (see 3.2.2).

For example:

XYZ EN 50306-2 300 V 1x1,5 M

The marking shall conform to the requirements of clause 5 of EN 50306-1.

3.3 Core identification

3.3.1 Single core cables

The colour of the cores shall be white unless otherwise specified in the particular sections.

The colour shall be clearly identifiable and durable. Durability shall be checked by the test given in 10.1 of EN 50305.

Conformity with these requirements shall be verified by visual examination.

3.3.2 Multicore/multipair cables

Cores complying with EN 50306-2 are used as components of multicore and multipair cables, e.g. in EN 50306-3 or EN 50306-4. In such cases the identification of the individual core in a cable or a pair shall be by numbers.

The numbers shall be printed in a colour which contrasts with the core colour. The numbers on individual cores shall be spaced at a maximum of 25 mm apart.

The marking by numbers shall conform to EN 50334, unless otherwise specified, and conformity shall be checked by visual examination and measurement.

3.4 Rated voltage

The rated voltage recognised for the purposes of this standard shall be 300 V to earth.

NOTE See EN 50355 for further information. [SIST EN 50306-2:2003
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3.5 Construction

3.5.1 Conductor

The conductor shall conform to the requirements given in Table 1. The wires shall be tin coated annealed copper.

When tested in accordance with EN 10002-1 the minimum elongation of conductors shall be 10 %.

3.5.2 Insulation system

The insulation system shall be manufactured from material as defined in 3.1 of EN 50306-1 and shall meet the requirements of clause 4 of this Part 2. The insulation shall be applied by extrusion. The insulation thickness shall conform to the specified value given in Table 1.