



**NSAI**  
Standards

Irish Standard  
I.S. EN 50306-1:2020

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

**I.S. EN 50306-1:2020**

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

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## National Foreword

I.S. EN 50306-1:2020 is the adopted Irish version of the European Document EN 50306-1:2020, Railway applications - Railway rolling stock cables having special fire performance - Thin wall - Part 1: General requirements

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EUROPEAN STANDARD

**EN 50306-1**

NORME EUROPÉENNE

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Supersedes EN 50306-1:2002 and all of its amendments  
and corrigenda (if any)

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: Exigences  
générales

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

This European Standard was approved by CENELEC on 2019-12-30. 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.

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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.

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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

**EN 50306-1:2020 (E)**

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## **EN 50306-1:2020 (E)**

### **European foreword**

This document (EN 50306-1:2020) has been prepared by CLC/TC 20, “Electric cables”.

The following dates are fixed:

- latest date by which this document has (dop) 2020-12-30  
to be implemented at national level by  
publication of an identical national  
standard or by endorsement
- latest date by which the national (dow) 2022-12-30  
standards conflicting with this document  
have to be withdrawn

This document supersedes EN 50306-1:2002 and all of its amendments and corrigenda (if any).

This edition includes the following significant technical changes with respect to the previous edition:

- the documents have been updated to reflect the changes in the test standard EN 50305;
- the range of the conductor cross sections has been extended;
- the reference to cited standards (e.g. 60811 series) has been updated.

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



## 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 could 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 could damage the cable, irrespective of whether the fire is caused by an external source or from within the electrical system.

The EN 50306 series 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 the EN 50306 series 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 objectives 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.

The EN 50306 series, which covers a range of cables of rated voltage  $U_0 = 300\text{V}$  with conductor sizes  $0,5\text{ mm}^2$  up to  $2,5\text{ mm}^2$ , is divided into 4 parts:

- Part 1: General requirements;
- Part 2: Single core cables;
- Part 3: Single core and multicore cables screened and thin wall sheathed;
- Part 4: Multicore and multipair screened or not screened sheathed cables.

These cables are intended for a limited number of applications. Further information on these applications is given in EN 50355 and EN 50343.

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

A separate European Standard, the EN 50264 series covers cables for similar applications up to 3,6/6 kV rating with a conductor temperature at  $90^\circ\text{C}$ , but with standard wall and medium wall thicknesses of both insulation and sheath, and provides for a maximum conductor size of  $400\text{ mm}^2$ .

A separate European Standard, the EN 50382 series covers cables for similar applications up to 3,6/6 kV rating with a conductor temperature at  $120^\circ\text{C}$  and  $150^\circ\text{C}$ , and provides for a maximum conductor size of  $400\text{ mm}^2$ .

**EN 50306-1:2020 (E)****1 Scope**

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

NOTE 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 Level 3 of EN 45545-1 and EN 45545-2.

These cables are rated for occasional thermal stresses which causes ageing equivalent to continuous operational life at a temperature of 105 °C or 90 °C. For standard cables, this is determined by the acceptance test defined in EN 50305, using accelerated long-term (5 000 h) thermal ageing indicating a 125 °C or 110 °C /20 000 h temperature index. If the customer were to require lifetime predictions, this would be demonstrated based on the temperature index of the product as supplied by the manufacturer. The maximum temperature for short circuit conditions is 160 °C based on duration of 5 s.

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

**2 Normative references**

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 50264-1, *Railway applications — Railway rolling stock power and control cables having special fire performance — Part 1: General requirements*

EN 50305:2020, *Railway applications — Railway rolling stock cables having special fire performance - Test methods*

EN 50306-2:2020, *Railway applications — Railway rolling stock cables having special fire performance — Thin wall — Part 2: Single core cables*

EN 50306-3:2020, *Railway applications — Railway rolling stock cables having special fire performance — Thin wall — Part 3: Single core and multicore cables screened and thin wall sheathed*

EN 50306-4:2020, *Railway applications — Railway rolling stock cables having special fire performance — Thin wall — Part 4: Multicore and multipair screened or not screened sheathed cables*

EN 50355, *Railway applications — Railway rolling stock cables having special fire performance — Guide to use*

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*

EN IEC 60332-3-24:2018, *Tests on electric and optical fibre cables under fire conditions — Part 3-24: Test for vertical flame spread of vertically-mounted bunched wires or cables — Category C*

EN 60332-3-25, *Tests on electric and optical fibre cables under fire conditions — Part 3-25: Test for vertical flame spread of vertically-mounted bunched wires or cables — Category D*

EN 60754-1, *Test on gases evolved during combustion of materials from cables — Part 1: Determination of the halogen acid gas content*

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