



BSI Standards Publication

Railway applications — Railway rolling stock cables having special fire performance — Thin wall

Part 2: Single core cables

This is a preview of "BS EN 50306-2:2020". [Click here to purchase the full version from the ANSI store.](#)

National foreword

This British Standard is the UK implementation of EN 50306-2:2020. It supersedes BS EN 50306-2:2002, which will be withdrawn on 30 December 2022.

The UK participation in its preparation was entrusted to Technical Committee GEL/20/12, Electric Cables - Railway Applications.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2020
Published by BSI Standards Limited 2020

ISBN 978 0 580 93927 3

ICS 45.060.01; 13.220.40; 29.060.20

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 March 2020.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

This is a preview of "BS EN 50306-2:2020". [Click here to purchase the full version from the ANSI store.](#)

EUROPÄISCHE NORM

March 2020

ICS 13.220.40; 29.060.20; 45.060.01

Supersedes EN 50306-2:2002 and all of its amendments
and corrigenda (if any)

English Version

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

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

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

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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

This is a preview of "BS EN 50306-2:2020". [Click here to purchase the full version from the ANSI store.](#)

Contents	Page
European foreword	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	6
4 Single-core cables	6
4.1 General	6
4.2 Marking and code designation	6
4.2.1 Marking of cable	6
4.2.2 Code Designation	6
4.3 Core identification	7
4.3.1 Single core cables	7
4.3.2 Multicore/multipair cables	7
4.4 Rated voltage	7
4.5 Construction	7
4.5.1 Conductor	7
4.5.2 Insulation system	7
5 Tests	8
5.1 Definitions relating to tests	8
5.2 Voltage test	8
5.3 Insulation resistance	9
5.4 Dielectric strength	9
5.5 Spark test	9
5.6 DC stability	9
5.7 Strippability and adhesion of insulation to the conductor	10
5.8 Hot set test	10
5.9 Long term ageing - Thermal endurance	11
5.10 Mineral oil resistance	11
5.11 Fuel resistance	11
5.12 Acid and alkali resistance	11
5.13 Pressure test at high temperature	12
5.14 Dynamic cut through	12
5.15 Notch propagation	12
5.16 Heat Shrinkage	12
5.17 Blocking of cores	13
5.18 Bending test at low temperature	13
5.19 Abrasion resistance	13
5.20 Pliability	13
5.21 Ozone resistance	14
5.22 Stress cracking test	15
5.23 Fire performance	15
Bibliography	17

This is a preview of "BS EN 50306-2:2020". [Click here to purchase the full version from the ANSI store.](#)

European foreword

This document (EN 50306-2:2020) has been prepared by CLC/TC 20, "Electric cables".

The following dates are fixed:

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

This document supersedes EN 50306-2:2002 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.

This is a preview of "BS EN 50306-2:2020". [Click here to purchase the full version from the ANSI store.](#)

Introduction

The EN 50306 series 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 screened and thin wall sheathed;

Part 4: Multicore and multipair screened or not screened sheathed cables.

Special test methods referred to in the EN 50306 series are given in EN 50305. A guide to use is given in EN 50355 and rules for installation are given in EN 50343.

The cables in EN 50306-2:2020 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 50306-1:2020, General requirements, contains a more extensive introduction to the EN 50306 series and should be read in conjunction with this document.

This is a preview of "BS EN 50306-2:2020". [Click here to purchase the full version from the ANSI store.](#)

1 Scope

This document specifies requirements for, and constructions and dimensions of, single core cables, rated voltage $U_0 / U = 300 / 300$ V, of the following type:

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

These cables are rated for occasional thermal stresses causing ageing equivalent to continuous operational life at a temperature of 105 °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/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.

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

EN 50306-2:2020 is expected to be used in conjunction with EN 50306-1:2020, General requirements.

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 10002-1, *Metallic materials - Tensile testing - Part 1: Method of test at ambient temperature*

EN 45545-1, *Railway applications - Fire protection on railway vehicles - Part 1: General*

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

EN 50306-1:2020, *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 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 60811 (all parts), *Electric and optical fibre cables - Test methods for non-metallic materials*

EN 61034-2, *Measurement of smoke density of cables burning under defined conditions - Part 2: Test procedure and requirements*

EN 62230, *Electric cables - Spark-test method*