BS EN 13481-3:2022

BSI Standards Publication

Railway applications — Track — Performance requirements for fastening systems

Part 3: Fastening systems for wood and polymeric composite sleepers

Documents
Document Sharing Hub

Full document details: BS EN 13481-3:2022

National foreword

This British Standard is the UK implementation of EN 13481-3:2022. It supersedes BS EN 13481-3:2012, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee RAE/2, Railway Applications - Track.

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

Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

© The British Standards Institution 2022
Published by BSI Standards Limited 2022

ISBN 978 0 539 12952 6

ICS 93.100

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 August 2022.

Amendments/corrigenda issued since publication

Date	Text affected

AVA Documents
Document Sharing Hub

Full document details: BS EN 13481-3:2022

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 13481-3

July 2022

ICS 93.100

Supersedes EN 13481-3:2012

English Version

Railway applications - Track - Performance requirements for fastening systems - Part 3: Fastening systems for wood and polymeric composite sleepers

Applications ferroviaires - Voie - Exigences de performance pour les systèmes de fixation - Partie 3 : Systèmes de fixation pour traverses en bois et en composite à matrice polymère

Bahnanwendungen - Oberbau - Leistungsanforderungen für Schienenbefestigungssysteme - Teil 3: Befestigungssysteme für Holz- und Polymerverbundschwellen

This European Standard was approved by CEN on 8 May 2022.

CEN 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 CEN 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 CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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

© 2022 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. EN 13481-3:2022 E

Documents
Document Sharing Hub

Full document details: BS EN 13481-3:2022

Contents

Page

European foreword ... 3
Introduction ... 3
1 Scope ... 6
2 Normative references ... 6
3 Terms and definitions ... 7
4 Symbols ... 9
5 Requirements determined by laboratory testing ... 9
5.1 Specimens used for laboratory testing ... 9
5.2 Longitudinal rail restraint ... 10
5.2.1 General case ... 10
5.2.2 Special case for long structures ... 10
5.3 Torsional resistance ... 10
5.4 Clamping force and uplift stiffness ... 10
5.5 Vertical stiffness ... 10
5.6 Effect of repeated loading ... 11
5.7 Effect of exposure to severe environmental conditions ... 12
5.8 Electrical resistance of fastening system and sleeper ... 12
5.9 Pull-out resistance of embedded fastening components (polymeric composite sleepers only) ... 12
6 Other requirements ... 12
6.1 Dimensions ... 12
6.2 Effect of the fastening system tolerances on track gauge ... 13
6.3 In-service testing ... 14
6.4 Attenuation of noise and vibration ... 14
7 Fitness for purpose ... 15
8 Marking, labelling and packaging ... 15
Annex A (informative) Vibration and noise ... 16
A.1 General ... 16
A.2 Symbols ... 16
A.3 Parameters for environmental vibration calculations ... 16
A.4 Calculating the vibration attenuation ... 17
A.5 Environmental noise ... 17
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive (EU) 2016/797 aimed to be covered ... 18
Bibliography ... 20

Documents
Document Sharing Hub
Full document details: BS EN 13481-3:2022

European foreword

This document (EN 13481-3:2022) has been prepared by Technical Committee CEN/TC 256 "Railway applications", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2023, and conflicting national standards shall be withdrawn at the latest by January 2023.

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

This document supersedes EN 13481-3:2012.

The main changes compared to the previous edition are as follows:

a) introduction of the application for fastenings on polymeric composite sleepers;

b) inclusion of tests for fastenings with very low stiffness;

c) changes to the loading conditions for Category B fastenings;

d) inclusion of details of in-service testing, replacing the reference to EN 13146-8, which is to be withdrawn;

e) editorial changes to make clear which requirements are based on laboratory testing.

This European Standard is one of the series EN 13481 "*Railway applications — Track — Performance requirements for fastening systems*", which consists of the following parts:

— *Part 1: Definitions*

— *Part 2: Fastening systems for concrete sleepers in ballast*

— *Part 3: Fastening systems for wood and polymeric composite sleepers*

— *Part 4: Fastening systems for steel sleepers*

— *Part 5: Fastening systems for ballastless tracks*

— *Part 7: Fastening systems for switches and crossings, check rails, insulated rail joints and rail expansion devices*

NOTE Part 6 does not exist in this series.

These European Standards are supported by the test methods in the series EN 13146 "*Railway applications — Track — Test methods for fastening systems*".

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

For relationship with EU Directive(s) / Regulation(s), see informative Annex ZA, which is an integral part of this document.

AVA Documents
Document Sharing Hub

Full document details: BS EN 13481-3:2022

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Documents
Document Sharing Hub

Full document details: BS EN 13481-3:2022

Introduction

A series of tests is used to assess the suitability of fastening systems for use in railway track, i.e. for type approval of complete fastening systems. This document only sets requirements considered relevant to ensure the safe, long-term operation of the track systems. The test methods are described in other associated standards.

The various categories of rail fastenings used in this document are defined in EN 13481-1:2012.

Documents
Document Sharing Hub

Full document details: BS EN 13481-3:2022

1 Scope

This document is applicable to fastening systems, in Categories A – E as specified in EN 13481-1:2012, 3.1 for use on wood or polymeric composite sleepers in ballasted or ballastless track, including track on open deck bridges, with respective maximum axle loads and minimum curve radii as shown in Table 1.

Table 1 — Fastening category criteria

Category	Maximum design axle load kN	Minimum curve radius m
A	130	40
B	180	80
C	260	150
D	260	400
E	350	150
NOTE The maximum axle load for Categories A and B does not apply to maintenance vehicles.		

The requirements apply to:

— fastening systems that act on the foot and/or web of the rail including direct fastening systems and indirect fastening systems;

— fastening systems for rail sections included in EN 13674-1:2011+A1:2017 (excluding 49E4) or EN 13674-4:2019.

This document is not applicable to fastening systems for other rail sections, rigid fastening systems, special fastening systems used at bolted joints or glued joints or special low clamping force fastenings used to mitigate track-bridge interaction effects.

This document is for type approval of complete fastening systems.

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 13145:2001+A1:2011, *Railway applications — Track — Wood sleepers and bearers*

EN 13146-1:2019, *Railway applications — Track — Test methods for fastening systems — Part 1: Determination of longitudinal rail restraint*

EN 13146-2:2012, *Railway applications — Track — Test methods for fastening systems — Part 2: Determination of torsional resistance*

EN 13146-4:2020, *Railway applications — Track — Test methods for fastening systems — Part 4: Effect of repeated loading*

Documents
Document Sharing Hub
Full document details: BS EN 13481-3:2022