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Railway Applications - Track - Performance
requirements for fastening systems - Part 7: Fastening
systems for switches and crossings, check rails,
insulated rail joints and rail expansion devices

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 13481-7:2022 sisaldab Euroopa standardi EN 13481-7:2022 ingliskeelset teksti.	This Estonian standard EVS-EN 13481-7:2022 consists of the English text of the European standard EN 13481-7:2022.
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English Version

**Railway applications - Track - Performance requirements
for fastening systems - Part 7: Fastening systems for
switches and crossings, check rails, insulated rail joints
and rail expansion devices**

Applications ferroviaires - Voie - Exigences de
performance pour les systèmes de fixation - Partie 7 :
Systèmes de fixation pour appareils de voie, contre-
rails, dispositifs de dilatation des rails et joints isolés

Bahnanwendungen - Oberbau -
Leistungsanforderungen für Befestigungssysteme - Teil
7: Spezielle Befestigungssysteme für Weichen und
Kreuzungen und Radlenker

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

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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 CEN 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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COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN 13481-7:2022) 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of an identical text or by endorsement, at the latest by January 2023, and conflicting national standards shall be withdrawn at the latest by January 2023.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 13481-7:2012.

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

- a) addition of requirements for fastenings for insulated joints and rail expansion devices;
- b) clarification that the full range of tests does not have to be carried out on every configuration of fastening within S&C;
- c) inclusion of details of in-service testing, replacing the reference to EN 13146-8, which is to be withdrawn;
- d) removal of Annex ZA.

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.

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.

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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 system. 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.

Annex A of this document lists the different locations in S&C and plain line which are addressed, together with cross-references to the relevant clauses and annexes for each case.

1 Scope

This document is applicable to fastening systems in Categories A – E as specified in EN 13481-1:2012, 3.1 for use in switches and crossings (S&C). It also provides guidance on evaluating fastening systems for check rails, expansion devices and insulated rail joints whether in switches and crossings or in plain line. The document applies to five categories of fastenings used in tracks 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 (plain line) m
A	130	40
B	180	80
C	260	150
D	260	400
E	350	150
NOTE 1 The maximum axle load for Categories A and B does not apply to maintenance vehicles.		
NOTE 2 The minimum curve radius is not applicable to applications in switches and crossings.		

The requirements apply to fastening systems for rail sections included in the EN 13674 series of standards (excluding 49E4).

This document is not applicable to fastening systems for other rail sections or rigid fastening systems used on running rails.

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

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

EN 13146-5:2012¹, *Railway applications — Track — Test methods for fastening systems — Part 5: Determination of electrical resistance*

EN 13146-6:2012, *Railway applications — Track — Test methods for fastening systems — Part 6: Effect of severe environmental conditions*

EN 13146-7:2019, *Railway applications — Track — Test methods for fastening systems — Part 7: Determination of clamping force and uplift stiffness*

¹ As impacted by EN 13146-5:2012/AC:2017.

EN 13146-9:2020, *Railway applications — Track — Test methods for fastening systems — Part 9: Determination of stiffness*

EN 13146-10:2017, *Railway applications — Track — Test methods for fastening systems — Part 10: Proof load test for pull-out resistance*

EN 13232-1:—², *Railway applications — Track — Switches and crossings for Vignole rails — Part 1: Definitions*

EN 13481-1:2012, *Railway applications — Track — Performance requirements for fastening systems — Part 1: Definitions*

EN 13481-2:2022, *Railway applications — Track — Performance requirements for fastening systems — Part 2: Fastening systems for concrete sleepers in ballast*

EN 13481-3:2022, *Railway applications — Track — Performance requirements for fastening systems — Part 3: Fastening systems for wood and polymeric composite sleepers*

EN 13481-4:2022, *Railway applications — Track — Performance requirements for fastening systems — Part 4: Fastening systems for steel sleepers*

EN 13481-5:2022, *Railway applications — Track — Performance requirements for fastening systems — Part 5: Fastening systems for ballastless tracks*

EN 13674-1:2011+A1:2017, *Railway applications — Track — Rail — Part 1: Vignole railway rails 46 kg/m and above*

EN 13674-4:2019, *Railway applications — Track — Rail — Part 4: Vignole railway rails from 27 kg/m to, but excluding 46 kg/m*

EN 17343:2020, *Railway applications — General terms and definitions*

3 Terms and definitions

For the purposes of this document, the following terms and definitions and the terms and definitions given in EN 13481-1:2012, EN 13232-1:—², EN 17343:2020 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

datum for applied test loads

flat bottom surface of a conventional concrete sleeper used as a datum plane to define the orientation of the applied test loads

Note 1 to entry: For fastenings on sleepers, bearers or elements of ballastless track which do not have a flat bottom surface, the orientation of the test loads is defined relative to “running surface of the rails” which is defined in EN 13848-1:2019. See Figure 1.

² Under preparation. Stage at the time of publication: FprEN 13232-1:2022.