



SLOVENSKI STANDARD
SIST EN 13481-7:2004
01-marec-2004

Železniške aplikacije - Steza - Zahtevi za delovanje za sistem za pritrditev - Del 7:
Posebni sistemi pritrditve za preklopne in križne in kontrolne tirnice

Railway applications - Track - Performance requirements for fastening systems - Part 7:
Special fastening systems for switches and crossing and check rails

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

(standards.iteh.ai)

Applications ferroviaires - Voie - Prescriptions de performance pour les systemes de
fixation - Partie 7 : Systemes de fixation pour les appareils de voie et contre-rails

Ta slovenski standard je istoveten z: **EN 13481-7:2003**

ICS:

93.100 Gradnja železnic Construction of railways

SIST EN 13481-7:2004 en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 13481-7:2004](#)

<https://standards.iteh.ai/catalog/standards/sist/a9822dfc-4e96-4879-9950-6878966faa84/sist-en-13481-7-2004>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 13481-7

May 2003

ICS 93.100

English version

**Railway applications - Track - Performance requirements for
fastening systems - Part 7: Special fastening systems for
switches and crossing and check rails**

Applications ferroviaires - Voie - Prescriptions de
performance pour les systèmes de fixation - Partie 7:
Systèmes de fixation pour appareils de voie, contre-rails et
rails de sécurité

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

This European Standard was approved by CEN on 17 March 2003.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies 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.



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

	Page
Foreword.....	3
Introduction	4
1 Scope	4
2 Normative references	4
3 Terms and definitions.....	5
4 Requirements	5
4.1 General.....	5
4.2 Longitudinal rail restraint.....	5
4.3 Torsional resistance	6
4.4 Effect of repeated loading.....	6
4.5 Attenuation of impact loads.....	9
4.6 Electrical resistance of fastening system and sleeper	9
4.7 Effect of exposure to severe environmental conditions.....	9
4.8 Effect of fastening system tolerances on track gauge	9
4.9 Clamping force.....	9
4.10 Cast-in and glued-in fastening components.....	9
4.11 In-service testing	9
5 Sampling	10
6 Classification.....	10
7 Fitness for purpose	10
8 Marking, labelling and packaging	10
Bibliography	11

Ifeh STANDARD PREVIEW
(standards.ifeh.ai)

[SIST EN 13481-7:2004](https://standards.ifeh.ai/catalog/standards/sist/a6822dfc-4c96-4879-9950-6878966faa84/sist-en-13481-7-2004)

[https://standards.ifeh.ai/catalog/standards/sist/a6822dfc-4c96-4879-9950-](https://standards.ifeh.ai/catalog/standards/sist/a6822dfc-4c96-4879-9950-6878966faa84/sist-en-13481-7-2004)

[6878966faa84/sist-en-13481-7-2004](https://standards.ifeh.ai/catalog/standards/sist/a6822dfc-4c96-4879-9950-6878966faa84/sist-en-13481-7-2004)

Foreword

This document (EN 13481-7:2003) 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 November 2003, and conflicting national standards shall be withdrawn at the latest by November 2003.

This European Standard has been prepared under a mandate (M/024¹) given to CEN by the European Commission and the European Free Trade Association. No existing European Standard is superseded.

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;
- Part 3: Fastening systems for wood sleepers;
- Part 4: Fastening systems for steel sleepers;
- Part 5: Fastening systems for slab track;
- Part 6: Special fastening systems for attenuation of vibration;
- Part 7: Special fastening systems for switches and crossings and check rails.
- Part 8: Fastening systems for track with heavy axle loads.

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

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

1) Railway Equipment

EN 13481-7:2003 (E)**Introduction**

A requirement for longitudinal rail restraint is included to control rail creep.

The laboratory test for the effect of repeated loading is the means of assessing potential long term performance of the fastening in track.

The test for clamping force is only suitable for laboratory use. Measurement of clamping force in track can be used to monitor long term performance but the method of measurement used should be suitable for the design of the particular fastening system.

1 Scope

This European Standard specifies performance requirements for special fastening systems for switches and crossings and for check rails connected to running rails (not independently fixed to the bearers) on wood, concrete and steel bearers in ballasted track and on slab track. It applies to switches and crossings as follows:

- in main lines having a radius of curvature in divergent track greater than 150 m and subject to a maximum axle load of 260 kN;
- in light rail systems having a radius of curvature in divergent track greater than 80 m and subject to a maximum axle load of 130 kN.

The requirements apply to fastening systems which incorporate a resilient element and are intended for use with stock rail sections in prEN 13674-1. This European Standard is not applicable to rigid fastening systems.

This European Standard is for type approval of a complete fastening assembly only. Requirements for quality control are included in standards applicable to individual components.

2 Normative references

This European Standard incorporates by dated or undated references, 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 any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publications referred to applies (including amendments).

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

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

EN 13146-3, *Railway applications - Track - Test methods for fastening systems - Part 3: Determination of attenuation of impact loads.*

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

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

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

EN 13146-7, *Railway applications - Track - Test methods for fastening systems - Part 7: Determination of clamping force.*

EN 13146-8, *Railway applications - Track - Test methods for fastening systems - Part 8: In service testing.*

EN 13232-1:2003, *Railway applications - Track - Switches and crossings, performance and acceptance - Part 1: Definitions.*

EN 13481-1:2002, *Railway applications - Track - Performance requirements for fastening systems – Part 1: Definitions.*

EN 13481-2:2002, *Railway applications - Track - Performance requirements for fastening systems – Part 2: Fastening systems for concrete sleepers.*

EN 13481-3, *Railway applications - Track - Performance requirements for fastening systems – Part 3: Fastening systems for wood sleepers.*

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

EN 13481-5:2002, *Railway applications - Track - Performance requirements for fastening systems - Part 5: Fastening systems for slab track.*

prEN 13674-1, *Railway applications - Track - Rail - Part 1: Flat bottom symmetrical railway rails 46 kg/m and above.*

iTeh STANDARD PREVIEW (standards.iteh.ai)

3 Terms and definitions

For the purposes of this European Standard the terms and definitions given in EN 13232-1:2003 and EN 13481-1:2002 apply.

<https://standards.iteh.ai/catalog/standards/sist/a9822dfc-4e96-4879-9950-6878966faa84/sist-en-13481-7-2004>

4 Requirements

4.1 General

The fastening systems used for the following parts of switches and crossings:

- closure rails,
- rails supporting check rails,
- crossings,
- switch heels

shall comply with the requirements for fastening systems for plain line track in EN 13481-2, EN 13481-3, EN 13481-4 and EN 13481-5 as appropriate to the type of support. Torsional resistance shall be measured for closure rail fastening systems only.

The requirements in 4.2 to 4.12 apply to the fastening systems for stock rails in slide baseplates, check rails fixed to running rails and check rails fixed to bearers and sleepers.

4.2 Longitudinal rail restraint

When measured by the procedure in EN 13146-1, the longitudinal rail restraint shall be not less than 7 kN when anti-creep pads are used under stock rails. When no pads are used the longitudinal rail restraint shall be not less than 5 kN.

EN 13481-7:2003 (E)**4.3 Torsional resistance**

The torsional resistance shall be measured by the procedure in EN 13146-2 and the result reported.

4.4 Effect of repeated loading**4.4.1 General**

For check rail assemblies this shall be determined by the procedure in EN 13146-4, but with a vertical load applied to crown of the running rail and a horizontal load applied through the centre of the load bearing face of the check rail (Figures 1 to 3). Two actuators will be necessary to apply these loads. For slide chair assemblies (Figure 4) the same procedure will apply but only one actuator will be necessary to apply the required load.

4.4.2 Dynamic stiffness of rail pad and assembly

The vertical dynamic stiffness of the rail pad, or the assembly, shall be determined using the methods described in EN 13481-2:2002, annex B or EN 13481-5:2002, annex B respectively.

4.4.3 Test loads**4.4.3.1 Check rail assemblies (Figures 1 to 3)**

The maximum load ($P_V/\cos \alpha$) kN for the appropriate pad, or system, dynamic stiffness shall be determined from EN 13481-2:2002, Table 2. From this value calculate P_V . The vertical load applied to the crown of the rail shall be (5 to P_V) kN, applied in phase with the horizontal load.

For main line assemblies the horizontal load shall be (5 to 50) kN, applied to the centre of the load bearing face of the check rail in phase with the vertical load. For light rail assemblies this horizontal load shall be (5 to 30) kN.

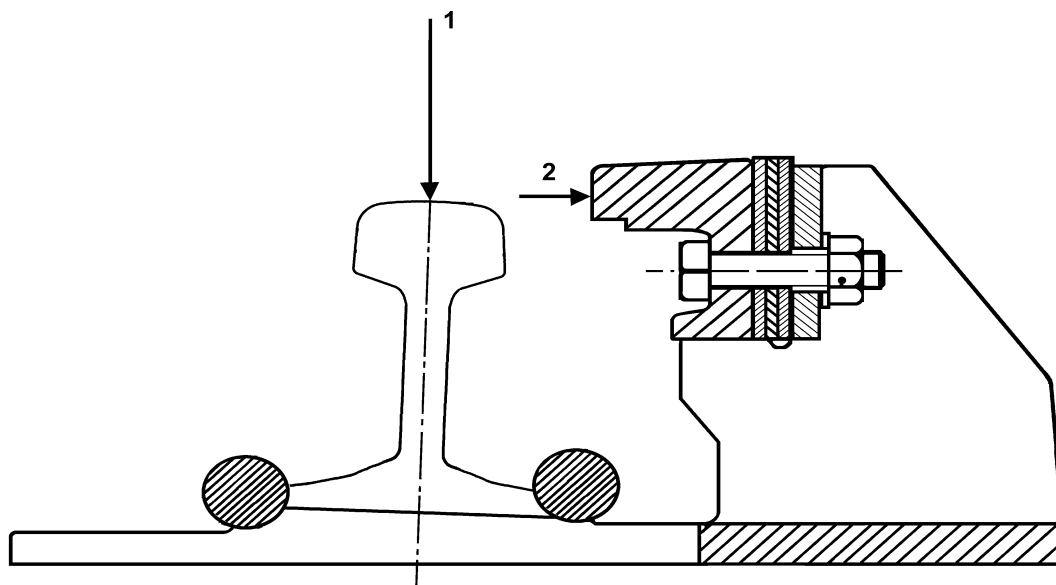
4.4.3.2 Slide chair assemblies (Figure 4)

The maximum applied load ($P_V/\cos \alpha$) kN and values of X and α shall be determined from EN 13481-2:2002, Table 2 for the appropriate pad or assembly dynamic stiffness.

4.4.4 Evaluation of test performance

The following measurements shall be performed before and after repeated loading. The change in performance shall not exceed the values shown.

- | | |
|---|--------------------|
| — Longitudinal rail restraint (EN 13146-1) | change \leq 20%; |
| — Pad stiffness (EN 13481-2:2002, annex B) | change \leq 25%; |
| — Assembly stiffness (EN 13481-5:2002, annex B) | change \leq 25%; |
| — Clamping force (EN 13146-7) | change \leq 20%. |

**Key**

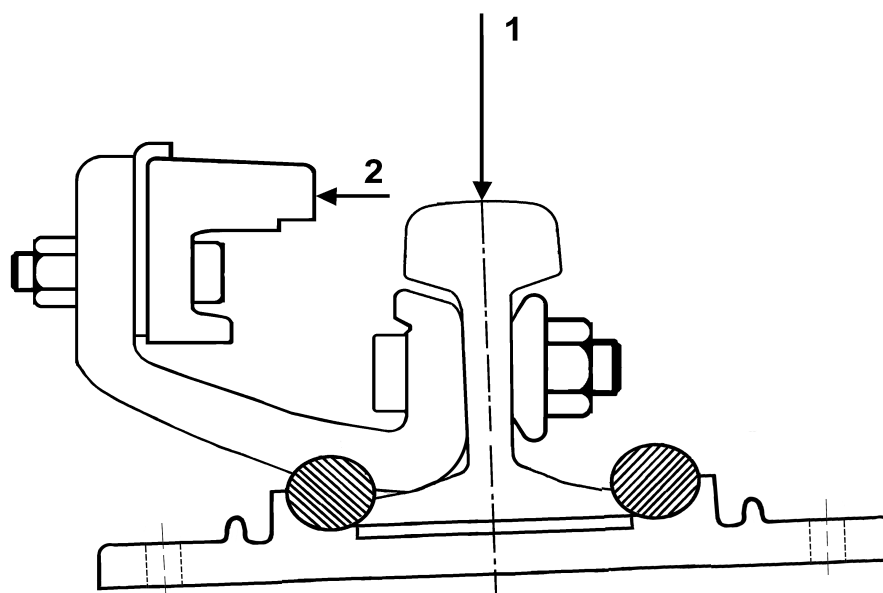
1 Line of vertical load application

2 Line of horizontal load application

Figure 1 — Load application to check rail fixed to fastening assembly baseplate
 (standards.iteh.ai)

SIST EN 13481-7:2004

<https://standards.iteh.ai/catalog/standards/sist/a9822dfc-4e96-4879-9950-6878966faa84/sist-en-13481-7-2004>

**Key**

1 Line of vertical load application

2 Line of horizontal load application

Figure 2 — Load application to check rail fixed to running rail