

ILNAS

Institut luxembourgeois de la normalisation
de l'accréditation, de la sécurité et qualité
des produits et services

ILNAS-EN 13481-5:2012+A1:2017

**Railway applications - Track -
Performance requirements for
fastening systems - Part 5: Fastening
systems for slab track with rail on the**

Bahnanwendungen - Oberbau -
Leistungsanforderungen für
Schienenbefestigungssysteme - Teil 5:
Befestigungssysteme für feste Fahrbahn

Applications ferroviaires - Voie -
Exigences de performance pour les
systèmes de fixation - Partie 5: Systèmes
de fixations des voies sans ballast ou

01/2017



National Foreword

This European Standard EN 13481-5:2012+A1:2017 was adopted as Luxembourgish Standard ILNAS-EN 13481-5:2012+A1:2017.

Every interested party, which is member of an organization based in Luxembourg, can participate for FREE in the development of Luxembourgish (ILNAS), European (CEN, CENELEC) and International (ISO, IEC) standards:

- Participate in the design of standards
- Foresee future developments
- Participate in technical committee meetings

<https://portail-qualite.public.lu/fr/normes-normalisation/participer-normalisation.html>

THIS PUBLICATION IS COPYRIGHT PROTECTED

Nothing from this publication may be reproduced or utilized in any form or by any mean - electronic, mechanical, photocopying or any other data carries without prior permission!

ILNAS-EN 13481-5:2012+A1:2017
EUROPEAN STANDARD **EN 13481-5:2012+A1**
NORME EUROPÉENNE
EUROPÄISCHE NORM

January 2017

ICS 93.100

Supersedes EN 13481-5:2012

English Version

**Railway applications - Track - Performance requirements
for fastening systems - Part 5: Fastening systems for slab
track with rail on the surface or rail embedded in a
channel**

Applications ferroviaires - Voie - Exigences de
performance pour les systèmes de fixation - Partie 5:
Systèmes de fixations des voies sans ballast ou voies
avec rails enrobés

Bahnanwendungen - Oberbau -
Leistungsanforderungen für
Schienenbefestigungssysteme - Teil 5:
Befestigungssysteme für feste Fahrbahn mit
aufgesetzten oder in Kanälen eingebetteten Schienen

This European Standard was approved by CEN on 27 April 2012 and includes Amendment 1 approved by CEN on 5 June 2016.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, 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: Avenue Marnix 17, B-1000 Brussels

Contents	Page
European foreword.....	3
Introduction	5
1 Scope	6
2 Normative references.....	6
3 Terms and definitions	7
4 Symbols.....	7
5 Requirements	9
5.1 Longitudinal rail restraint or longitudinal stiffness	9
5.2 Assembly and pad stiffness.....	9
5.3 Effect of repeated loading	10
5.4 Electrical resistance of the fastening system and slab track elements	11
5.5 Effect of exposure to severe environmental conditions.....	11
5.6 Dimensions.....	12
5.7 Effect of fastening system tolerances on track gauge	12
5.8 Cast-in and glued-in fastening components	13
5.9 In-service testing.....	13
5.10 Attenuation of noise and vibration.....	13
6 Test specimens.....	13
7 Fitness for purpose.....	13
8 Marking, labelling and packaging	14
Annex A (informative) Vibration and noise.....	15
A.1 General.....	15
A.2 Symbols.....	15
A.3 Parameters for environmental vibration calculations.....	15
A.4 Calculating the vibration attenuation.....	15
A.5 Environmental noise.....	16
Annex ZA ^{A1} (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2008/57/EC	17
Bibliography.....	19

European foreword

This document (EN 13481-5:2012+A1:2017) 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 July 2017, and conflicting national standards shall be withdrawn at the latest by July 2017.

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

This document includes Amendment 1 approved by CEN on 2016-06-05.

This document supersedes A1 EN 13481-5:2002 A1.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

The main changes in this revision of EN 13481-5:2002 are as follows:

- a) the scope has been extended to include fastening systems for embedded rail (Clause 1);
- b) new categories of fastening systems have been introduced (Clause 1, Table 1);
- c) the ranges of test loads have been extended to cover the new categories of fastening systems (5.2, Table 2 and 5.3, Table 3);
- d) advice on attenuation of noise and vibration has been added in a new annex (Annex A).

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 with rail on the surface or rail embedded in a channel
- Part 7: Special fastening systems for switches and crossings and check rails

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 mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 2008/57/EC.

For relationship with EU Directive 2008/57/EC, see informative Annex ZA, which is an integral part of this document.

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

Introduction

Various tests are necessary to assess the performance of fastening systems of railway tracks. In this European Standard, a requirement for longitudinal rail restraint is included to control rail creep and pull apart in the event of a broken rail. The relationship between longitudinal rail restraint and the overall design of the track slab requires consideration.

No satisfactory test is available to determine the attenuation of impact loads on slab track. The relative performance may be assessed by the procedure in EN 13146-3:2012 with the fastening system on a concrete sleeper.

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

For systems in which the rail is continuously supported, test procedures are modified to take account of the change from discrete support.

1 Scope

A1 This European Standard is applicable to fastening systems in Categories A–D as specified in EN 13481-1:2012, 3.1, for attaching rails to the uppermost surface of concrete or asphalt slabs and for embedded rails in non-ballasted tracks with maximum axle loads and minimum curve radii in accordance with 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

NOTE The maximum axle load for Categories A and B does not apply to maintenance vehicles.

The requirements apply to:

- fastening systems which act on the foot and/or web of the rail including direct fastening systems and indirect fastening systems;
- adhesive and mechanical fastening systems for embedded rail, but excluding rail cast into road pavements.

In track forms in which there are resiliently supported concrete elements with only one supporting element per rail (e.g. rail seat blocks or sleepers mounted in elastomeric “boots”) the concrete element and its resilient support are considered to be parts of the elastic fastening system. If the track form includes resiliently supported concrete elements with more than one supporting element per rail (e.g. floating slabs) those concrete elements and their resilient supports are considered to be parts of the slab and not of the fastening system.

This standard is only applicable to fastening systems for rail sections in EN 13674-1 (excluding 49E4) or EN 13674-4. It is not applicable to fastening systems for other rail sections, rigid fastening systems or special fastening systems used at bolted joints or glued joints.

This standard should only be used for type approval of complete fastening systems. **A1**

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 13146-1:2012, *Railway applications — Track — Test methods for fastening systems — Part 1: Determination of longitudinal restraint*

EN 13146-4:2012, *Railway applications — Track — Test methods for fastening systems — Part 4: Effect of repeated loading*