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SIST EN 13481-1:2004
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Železniške naprave - Zgornji ustroj - Zahteve za izdelavo pritrdilnih sistemov - 1. del: Definicije

Railway applications - Track - Performance requirements for fastening systems - Part 1: Definitions

Bahnanwendungen - Oberbau - Leistungsanforderungen für Schienenbefestigungssysteme - Teil 1: Definitionen

Applications ferroviaires - Voie - Exigences de performance pour les systèmes de fixation - Partie 1: Définitions

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EUROPEAN STANDARD

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English Version

Railway applications - Track - Performance requirements for fastening systems - Part 1: Definitions

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This European Standard was approved by CEN on 27 April 2012.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This document (EN 13481-1:2012) 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of an identical text or by endorsement, at the latest by November 2012, and conflicting national standards shall be withdrawn at the latest by November 2012.

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 supersedes EN 13481-1:2002.

In this revision of EN 13481-1:2002 the main changes are as follows:

a) A range of categories of fastening systems have been included in 3.1;

b) the definition of embedded rail (3.12) has been extended;

c) definitions of low and high frequency dynamic stiffness have been added (3.25).

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(s).

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies the definitions of the terms used in the EN 13146 series and in the EN 13481 series.

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 rail restraint*

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

EN 13146-3:2012, *Railway applications – Track – Test methods for fastening systems – Part 3: Determination of attenuation of impact loads*

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

EN 13146-5:2012, *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 13146-7:2012, *Railway applications – Track – Test methods for fastening systems – Part 7: Determination of clamping force*

EN 13146-8:2012, *Railway applications – Track – Test methods for fastening systems – Part 8: In service testing*

EN 13146-9:2009+A1:2011, *Railway applications – Track – Test methods for fastening systems – Part 9: Determination of stiffness*

EN 13232-1, *Railway applications – Track – Switches and crossings – Part 1: Definitions*

EN 13481 (all parts), *Railway applications – Track – Performance requirements for fastening systems*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
categories of fastening system
typical types of fastening system related to speed and axle load of trains on tracks, for which they are designed, and the rail section used

3.1.1
category A fastening system
fastening system designed for urban light rail and some industrial tracks, with a typical axle load of 100 kN, a typical curve radius of 80 m, a typical maximum speed of 100 km/h, a typical rail section of 40E1 and a typical sleeper or support spacing of 800 mm

Note 1 to entry: Rail sections are specified in the EN 13674 series.

3.1.2
category B fastening system
fastening system designed for urban light rail and some industrial tracks, with a typical axle load of 160 kN, a typical curve radius of 100 m, a typical maximum speed of 140 km/h, a typical rail section of 54E1 and a typical sleeper or support spacing of 600 mm

Note 1 to entry: Rail sections are specified in the EN 13674 series.

3.1.3
category C fastening system
fastening system designed for conventional main line railways, with a typical axle load of 225 kN, a typical curve radius of 400 m, a typical maximum speed of 250 km/h, a typical rail section of 60E1 and a typical sleeper or support spacing of 600 mm

Note 1 to entry: Rail sections are specified in the EN 13674 series.

3.1.4
category D fastening system
fastening system designed for lines with large radius curves, often used for high speed trains and having a typical axle load of 180 kN, a typical curve radius of 800 m, a typical rail section of 60E1, a typical sleeper or support spacing of 600 mm and any typical maximum speed

Note 1 to entry: Rail sections are specified in the EN 13674 series.

3.1.5
category E fastening system
fastening system designed for mixed traffic line carrying heavy freight trains, with a typical axle load of 300 kN, a typical curve radius of 150 m, a typical maximum speed of 200 km/h, a typical rail section of 60E1 and a typical sleeper or support spacing of 600 mm

Note 1 to entry: Rail sections are specified in the EN 13674 series.

3.2
ballasted track
track in which the sleepers are supported in ballast

3.3
slab track
track in which the structure supporting the rails and transmitting the track forces into the sub-base consists of a slab supported directly on a formation without ballast

Note 1 to entry: The slab may be an asphalt or reinforced concrete pavement laid *in situ*, precast concrete units or a combination of precast concrete and *in situ* concrete or asphalt.

3.4
sleeper
beam, which may be composite in construction, which supports running rails, guard rails and check rails at right angles to its axis

Note 1 to entry: Normally the beam supports two running rails to form one track.

3.5
bearer
beam, which may be composite in construction, which supports running rails, guard rails and check rails which may not be at right angles to its axis

Note 1 to entry: The beam may support up to six running rails and other components used in switches and crossings.

3.6
baseplate
non-elastic component which supports the rail and is secured to the supporting structure

3.7
baseplate pad
non-metallic pad placed between baseplate and sleeper

3.8
rail pad
non-metallic pad placed between rail and baseplate or rail and sleeper, bearer or slab

3.9
anti-creep rail pad
rail pad which provides increased longitudinal rail restraint

3.10
active area of a rail pad
area of the pad surface that is in contact with a rail

3.11
running rail
rail which supports the wheels of vehicles moving along the track

3.12
embedded rail
rail which is contained within a channel, filled with inert material, up to the running surface and which is at approximately at the same level as the surrounding surface

Note 1 to entry: A flange way is maintained alongside the gauge face of the rail and the rail is secured by adhesion of the surrounding material or by mechanical fastenings.

3.13
check rail
rail laid close to the gauge face of a running rail which takes part in lateral guidance of the wheel and prevents derailment in small radius curved track and switches and crossings

3.14
guard rail
rail, laid parallel to a running rail, which is intended to control the lateral movement of derailed wheels

3.15
running surface
curved surface defined by the longitudinal displacement of a straight line perpendicular to the centre line of the track and tangential to both running tables

[SOURCE: EN 13848-1:2003+A1:2008]

3.16
fastening system
assembly of components which secures a rail to the supporting structure and retains it in the required position whilst permitting any necessary vertical, lateral and longitudinal movement

Note 1 to entry: Such an assembly includes components to distribute the loads from the rail into the supporting structure, and where necessary to prevent wear of the contact surfaces on the supporting structure and to electrically insulate the rail from the supporting structure.

3.17
direct fastening system
assembly in which a rail is directly secured to the supporting structure with or without a baseplate

3.18
indirect fastening system
assembly in which a rail is secured to a baseplate independently of the fastening of the baseplate to the supporting structure

3.19
web support fastening system
assembly in which the principal means of securing the rail to its support is by action on the web of the rail and under the head of the rail

3.20
rigid fastening system
assembly which is designed to clamp the rail tightly to the sleeper and does not incorporate a resilient component apart from any rail pad

Note 1 to entry: A fully compressed spring washer is not a resilient component.

3.21
reference fastening system
assembly which complies with this series and has a record of satisfactory performance in the user's track

3.22
clamping force
vertical force applied to the upper surface of one rail foot by the fastening assembly clips

3.23
static stiffness
force per unit deflection measured under a uniaxial static force

3.24
vertical stiffness
force per unit vertical deflection measured normal to the running surface between specified minimum and maximum applied loads

3.25
dynamic stiffness
force per unit deflection measured under a cyclic uniaxial force

3.25.1
low frequency dynamic stiffness
stiffness measured within the frequency range 3 Hz to 30 Hz

3.25.2
high frequency dynamic stiffness
stiffness measured within the frequency range 20 Hz to 450 Hz