

# SVENSK STANDARD

## SS-EN 13146-2:2012



Fastställt/Approved: 2012-04-06  
Publicerad/Published: 2012-04-12  
Utgåva/Edition: 2  
Språk/Language: engelska/English  
ICS: 93.100

---

### **Järnvägar – Spår – Provningsmetoder för befästningssystem – Del 2: Bestämning av vridstyvhet**

### **Railway applications – Track – Test methods for fastening systems – Part 2: Determination of torsional resistance**

This preview is downloaded from [www.sis.se](http://www.sis.se). Buy the entire standard via <https://www.sis.se/std-85968>

# Standarder får världen att fungera

*SIS (Swedish Standards Institute) är en fristående ideell förening med medlemmar från både privat och offentlig sektor. Vi är en del av det europeiska och globala nätverk som utarbetar internationella standarder. Standarder är dokumenterad kunskap utvecklad av framstående aktörer inom industri, näringsliv och samhälle och befrämjar handel över gränser, bidrar till att processer och produkter blir säkrare samt effektiviserar din verksamhet.*

## Delta och påverka

Som medlem i SIS har du möjlighet att påverka framtida standarder inom ditt område på nationell, europeisk och global nivå. Du får samtidigt tillgång till tidig information om utvecklingen inom din bransch.

## Ta del av det färdiga arbetet

Vi erbjuder våra kunder allt som rör standarder och deras tillämpning. Hos oss kan du köpa alla publikationer du behöver – allt från enskilda standarder, tekniska rapporter och standardpaket till handböcker och onlinetjänster. Genom vår webbtjänst e-nav får du tillgång till ett lättnavigerat bibliotek där alla standarder som är aktuella för ditt företag finns tillgängliga. Standarder och handböcker är källor till kunskap. Vi säljer dem.

## Utveckla din kompetens och lyckas bättre i ditt arbete

Hos SIS kan du gå öppna eller företagsinterna utbildningar kring innehåll och tillämpning av standarder. Genom vår närhet till den internationella utvecklingen och ISO får du rätt kunskap i rätt tid, direkt från källan. Med vår kunskap om standarders möjligheter hjälper vi våra kunder att skapa verklig nytta och lönsamhet i sina verksamheter.

**Vill du veta mer om SIS eller hur standarder kan effektivisera din verksamhet är du välkommen in på [www.sis.se](http://www.sis.se) eller ta kontakt med oss på tel 08-555 523 00.**



# Standards make the world go round

*SIS (Swedish Standards Institute) is an independent non-profit organisation with members from both the private and public sectors. We are part of the European and global network that draws up international standards. Standards consist of documented knowledge developed by prominent actors within the industry, business world and society. They promote cross-border trade, they help to make processes and products safer and they streamline your organisation.*

## Take part and have influence

As a member of SIS you will have the possibility to participate in standardization activities on national, European and global level. The membership in SIS will give you the opportunity to influence future standards and gain access to early stage information about developments within your field.

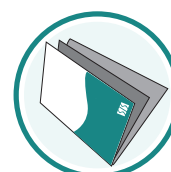
## Get to know the finished work

We offer our customers everything in connection with standards and their application. You can purchase all the publications you need from us - everything from individual standards, technical reports and standard packages through to manuals and online services. Our web service e-nav gives you access to an easy-to-navigate library where all standards that are relevant to your company are available. Standards and manuals are sources of knowledge. We sell them.

## Increase understanding and improve perception

With SIS you can undergo either shared or in-house training in the content and application of standards. Thanks to our proximity to international development and ISO you receive the right knowledge at the right time, direct from the source. With our knowledge about the potential of standards, we assist our customers in creating tangible benefit and profitability in their organisations.

**If you want to know more about SIS, or how standards can streamline your organisation, please visit [www.sis.se](http://www.sis.se) or contact us on phone +46 (0)8-555 523 00**



Europastandarden EN 13146-2:2012 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 13146-2:2012.

Denna standard ersätter SS-EN 13146-2, utgåva 1.

The European Standard EN 13146-2:2012 has the status of a Swedish Standard. This document contains the official version of EN 13146-2:2012.

This standard supersedes the Swedish Standard SS-EN 13146-2, edition 1.

© Copyright/Upphovsrätten till denna produkt tillhör SIS, Swedish Standards Institute, Stockholm, Sverige. Användningen av denna produkt regleras av slutanvändarlicensen som återfinns i denna produkt, se standardens sista sidor.

© Copyright SIS, Swedish Standards Institute, Stockholm, Sweden. All rights reserved. The use of this product is governed by the end-user licence for this product. You will find the licence in the end of this document.

*Uppllysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna uppllysningar om svensk och utländsk standard.*

*Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS Förlag AB, who can also provide general information about Swedish and foreign standards.*

Denna standard är framtagen av kommittén för Järnvägar, SIS/TK 254.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på [www.sis.se](http://www.sis.se) - där hittar du mer information.



EUROPEAN STANDARD

**EN 13146-2**

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2012

ICS 93.100

Supersedes EN 13146-2:2002

English Version

## Railway applications - Track - Test methods for fastening systems - Part 2: Determination of torsional resistance

Applications ferroviaires - Voie - Méthodes d'essai pour les systèmes de fixation - Partie 2: Détermination du couple d'encastrement

Bahnanwendungen - Oberbau - Prüfverfahren für Schienenbefestigungssysteme - Teil 2: Ermittlung des Verdrehwiderstandes

This European Standard was approved by CEN on 26 November 2011.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

**Management Centre: Avenue Marnix 17, B-1000 Brussels**

<b>Contents</b>		Page
<b>Foreword</b> .....		<b>3</b>
<b>1</b>	<b>Scope</b> .....	<b>4</b>
<b>2</b>	<b>Normative references</b> .....	<b>4</b>
<b>3</b>	<b>Terms and definitions</b> .....	<b>4</b>
<b>4</b>	<b>Principle</b> .....	<b>4</b>
<b>5</b>	<b>Apparatus</b> .....	<b>4</b>
<b>5.1</b>	<b>Rail</b> .....	<b>4</b>
<b>5.2</b>	<b>Actuator</b> .....	<b>4</b>
<b>5.3</b>	<b>Displacement measuring instruments</b> .....	<b>5</b>
<b>5.4</b>	<b>Force measuring instruments</b> .....	<b>5</b>
<b>5.5</b>	<b>Verification of calibration</b> .....	<b>5</b>
<b>6</b>	<b>Test specimens</b> .....	<b>5</b>
<b>6.1</b>	<b>Rail support</b> .....	<b>5</b>
<b>6.2</b>	<b>Fastening</b> .....	<b>5</b>
<b>7</b>	<b>Procedure</b> .....	<b>6</b>
<b>7.1</b>	<b>Preparation for test</b> .....	<b>6</b>
<b>7.2</b>	<b>Loading and measurement with fastenings in line</b> .....	<b>6</b>
<b>7.3</b>	<b>Loading and measurement when fastenings offset</b> .....	<b>6</b>
<b>7.4</b>	<b>Moment of load-displacement graph</b> .....	<b>7</b>
<b>8</b>	<b>Test report</b> .....	<b>7</b>
<b>Annex A (informative) Moment of load-displacement graph</b> .....		<b>8</b>

## Foreword

This document (EN 13146-2:2012) 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 October 2012, and conflicting national standards shall be withdrawn at the latest by October 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 13146-2:2002.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

Detailed changes only have been made in this revision of EN 13146-2:2002. The procedure is not applicable to embedded rail.

This European Standard is one of the series EN 13146 "*Railway applications — Track — Test methods for fastening systems*" which consists of the following parts:

- *Part 1: Determination of longitudinal rail restraint;*
- *Part 2: Determination of torsional resistance;*
- *Part 3: Determination of attenuation of impact loads;*
- *Part 4: Effect of repeated loading;*
- *Part 5: Determination of electrical resistance;*
- *Part 6: Effect of severe environmental conditions;*
- *Part 7: Determination of clamping force;*
- *Part 8: In service testing;*
- *Part 9: Determination of stiffness.*

These support the requirements in the series EN 13481 "*Railway applications — Track — Performance requirements 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, 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 a laboratory test procedure to determine the moment necessary to rotate a rail, secured to a sleeper by a rail fastening assembly, through 1° in a plane parallel to the base of the rail. The value obtained can be used in track stability calculations.

The test is not applicable to embedded rails.

This test procedure applies to a complete fastening assembly.

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

EN ISO 7500-1:2004, *Metallic materials — Verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Verification and calibration of the force-measuring system (ISO 7500-1:2004)*

EN ISO 9513:2002, *Metallic materials — Calibration of extensometers used in uniaxial testing (ISO 9513:1999)*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13481-1:2012 apply.

## 4 Principle

A transverse load is applied to the foot of a rail fixed to a single rail seat of a sleeper whilst the sleeper is restrained. Movement of the rail relative to the sleeper is recorded and the load increased until the rail has rotated through a minimum of 1,5°. The moment to cause a displacement of 1° is then determined from a plot of moment of load against displacement.

## 5 Apparatus

### 5.1 Rail

A short length of rail of the section for which the fastening assembly under test is designed. The rail shall be unlaminated and have neither loose rust on the surface nor be polished on the foot by repeated testing.

### 5.2 Actuator

Actuator capable of applying a force, of at least 25 kN, to the edge of the foot of the rail, normal to the rail and parallel to the plane of the foot of the rail, at a controlled rate of  $(2 \pm 1)$  kN/min as shown in Figure 1.