

# SVENSK STANDARD

## SS-EN 13231-1:2013



Fastställt/Approved: 2013-05-05  
Publicerad/Published: 2013-05-06  
Utgåva/Edition: 2  
Språk/Language: engelska/English  
ICS: 45.080; 93.100

---

### **Järnvägar – Spår – Godkännande av arbeten – Del 1: Arbeten i ballasterade spår – Spår, spårväxlar och spårkorsningar**

### **Railway applications – Track – Acceptance of works – Part 1: Works on ballasted track – Plain line, switches and crossings**

This preview is downloaded from [www.sis.se](http://www.sis.se). Buy the entire standard via <https://www.sis.se/std-90012>

# 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.

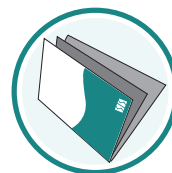
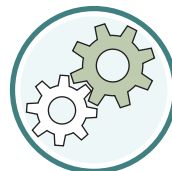
## Ta del av det färdiga arbetet

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 13231-1:2013 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 13231-1:2013.

Denna standard ersätter SS-EN 13231-1:2006, utgåva 1 och SS-EN 13231-2:2006, utgåva 1.

The European Standard EN 13231-1:2013 has the status of a Swedish Standard. This document contains the official version of EN 13231-1:2013.

This standard supersedes the Swedish Standard SS-EN 13231-1:2006, edition 1 and SS-EN 13231-2:2006, 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.

*Upplysningar 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 upplysningar 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 13231-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2013

ICS 93.100

Supersedes EN 13231-1:2006, EN 13231-2:2006

English Version

## Railway applications - Track - Acceptance of works - Part 1: Works on ballasted track - Plain line, switches and crossings

Applications ferroviaires - Voie - Réception des travaux -  
Partie 1: Travaux de voie ballastée - Voie courante et  
appareils de voie

Bahnanwendungen - Oberbau - Abnahme von Arbeiten -  
Teil 1: Arbeiten im Schotteroberbau - Gleise, Weichen und  
Kreuzungen

This European Standard was approved by CEN on 14 March 2013.

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, 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**

## Contents

Page

|   |           |
|---|-----------|
| Foreword.....   | 3         |
| <b>1 Scope.....</b>   | <b>4</b>  |
| <b>2 Normative references.....</b>  | <b>4</b>  |
| <b>3 Terms and definitions .....</b>  | <b>4</b>  |
| <b>4 Acceptance of works on plain line and on switches and crossings and rail expansion devices .....</b> | <b>6</b>  |
| 4.1 General .....   | 6         |
| 4.2 Acceptance deadlines.....   | 6         |
| 4.3 Acceptance measurements, checks and related documentation .....                                       | 7         |
| 4.4 Relative track geometry .....   | 8         |
| 4.5 Absolute track position.....  | 11        |
| 4.6 Other parameters and verifications for plain line and switches and crossings.....                     | 12        |
| 4.7 Specific measurements for switches and crossings and rail expansion devices.....                      | 15        |
| 4.8 Specific quality checks for switches and crossings and rail expansion devices .....                   | 16        |
| <b>5 Working parameters.....</b>  | <b>17</b> |
| 5.1 General .....   | 17        |
| 5.2 Tamping working parameters.....   | 17        |
| 5.3 Dynamic stabilising working parameters.....   | 18        |
| 5.4 Ballast compaction working parameters .....   | 19        |
| 5.5 Ballast replacement/cleaning working parameters .....   | 19        |
| <b>6 Acceptance responsibilities .....</b>  | <b>20</b> |
| 6.1 Preliminary procedure to acceptance .....   | 20        |
| 6.2 Consequences of the preliminary procedure to the acceptance .....                                     | 21        |
| <b>7 Warranty .....</b>   | <b>21</b> |
| <b>Annex A (informative) Guidelines for specification of requirements of geodetic measurements.....</b>   | <b>22</b> |
| <b>Annex B (informative) Switches and crossings measurements and checks.....</b>                          | <b>23</b> |
| <b>Bibliography.....</b>  | <b>30</b> |

## Foreword

This document (EN 13231-1:2013) 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 2013, and conflicting national standards shall be withdrawn at the latest by November 2013.

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 13231-1:2006, EN 13231-2:2006.

This European Standard is one of the series EN 13231 "*Railway applications – Track – Acceptance of works*" as listed below:

- *Part 1: Works on ballasted track – Plain line, switches and crossings* (the present document)
- *Part 3: Acceptance of reprofiling rails in track*
- *Part 4: Acceptance of reprofiling rails in switches and crossings*
- *Part 5: Procedures for rail reprofiling in plain line, switches, crossings and expansion devices*

NOTE Part 2 does not exist in this series.

The following technical modifications have been introduced during the revision:

- merging of EN 13231-1:2006 and EN 13231-2:2006, taking into account the similarities between them;
- definition of the absent tolerances for some existing parameters;
- revision of the tolerances already set up on the former version;
- definition of new parameters and the respective tolerances.

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, Former Yugoslav Republic of Macedonia, 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.

## SS-EN 13231-1:2013 (E)

### 1 Scope

This European Standard specifies the minimum technical requirements and the tolerances for the acceptance of works on ballasted track situated on plain line and on switches and crossings and rail expansion devices, as part of the track, for 1 435 mm and wider track gauge railways, concerning construction of new track, track renewal and track maintenance. More particularly, this standard gives the requirements for the documentation of work parameters, for the tolerances for relative track geometry and absolute track position and for the acceptance procedures.

This standard does not deal with contractual and legal aspects and it does not cover either works related to reprofiling the railhead nor the associated measurements, except for some measurements related to safety, since these works are covered by other parts of EN 13231 series.

Related works, e.g. platform reconstruction, formation, drainage, level crossings are not covered by this standard.

### 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 13450, *Aggregates for railway ballast*

EN 13848-1, *Railway applications — Track — Track geometry quality — Part 1: Characterisation of track geometry*

EN 13848-2, *Railway applications — Track — Track geometry quality — Part 2: Measuring systems — Track recording vehicles*

EN 13848-3, *Railway applications — Track — Track geometry quality — Part 3: Measuring systems — Track construction and maintenance machines*

EN 13848-4, *Railway applications — Track — Track geometry quality — Part 4: Measuring systems — Manual and lightweight devices*

EN 13848-5, *Railway applications — Track — Track geometry quality — Part 5: Geometric quality levels — Plain line*

EN 14587 (series), *Railway applications — Track — Flash butt welding of rails*

EN 14730 (series), *Railway applications — Track — Aluminothermic welding of rails*

### 3 Terms and definitions

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

#### 3.1

##### **works on ballasted track (including switches and crossings)**

works on ballasted track cover:

- construction of new track;
- renewal or partial renewal and maintenance of rails, sleepers, ballast and other components;



- removing and relaying existing track because of works on substructure (e.g. bridges, tunnels, earthworks, etc.);
- renewal or partial renewal and maintenance of switches and crossings (switch rail/stock rail, crossing, etc.), bearers and ballast;
- works to correct track geometry, e.g. track tamping/levelling/lining;
- dynamic stabilising;
- ballast cleaning;
- stressing work;
- welding

### **3.2**

#### **plain line**

any section of ballasted track excluding switches and crossings

### **3.3**

#### **acceptance**

declaration of the customer to the contractor that the work has been achieved in accordance with the contract

### **3.4**

#### **tolerance**

permissible deviation from reference or designed value

### **3.5**

#### **relative track geometry**

group of parameters defining the position of the rails, usually comprising the following: track gauge, alignment, longitudinal level, twist and cross level

Note 1 to entry: These parameters are described in EN 13848 series.

### **3.6**

#### **design track position**

position of the track defined in the track design process

Note 1 to entry: The design position is defined in the geodetic reference system.

Note 2 to entry: The control of the design studies and layouts for new or upgraded tracks according to EN 13803-1 and EN 13803-2 or other regulations is not part of this standard.

### **3.7**

#### **actual track position**

position of the track when measured from external absolute references

EXAMPLE Network of geodetic reference points.

### **3.8**

#### **deviation from design track position**

vertical and lateral difference between the design track position and the actual track position

### **3.9**

#### **nominal track gauge**

single value which identifies the track gauge but may differ from the design track gauge

## SS-EN 13231-1:2013 (E)

### 3.10

#### **design track gauge**

single value which is obtained when all the components of the track conform precisely to their design dimensions, or their median design dimension, when there is range

Note 1 to entry: It may differ from nominal track gauge. The design track gauge is specified by the customer taking into account the materials, the method of measurement and whether the application is on plain line or in switches and crossings.

### 3.11

#### **new track**

new constructed track applying new materials, including formation

### 3.12

#### **renewal**

complete replacement of all the components of the track (rails, sleepers, fastenings, switches and crossings, rail expansion devices and ballast) applying new materials, including the formation if necessary

### 3.13

#### **partial renewal**

replacement of one or more (but not all) track components in a track section

### 3.14

#### **maintenance**

all other works than design track gauge, new track and renewal

### 3.15

#### **bearer**

sleeper for switches and crossings

### 3.16

#### **stagger**

deviation in longitudinal relative position between the rail joints in the left and the right rails

## **4 Acceptance of works on plain line and on switches and crossings and rail expansion devices**

### **4.1 General**

The requirements of this European Standard apply to works as defined in 3.1, to the extent that they are within the scope of the work.

An acceptance form shall be prepared for each item of work outlining the results achieved.

Acceptance is not given until the work is completed in accordance with the requirements of the contract.

### **4.2 Acceptance deadlines**

Acceptance shall not be carried out until the track has been subjected to an appropriate passing tonnage described and defined by the customer. However, acceptance should occur within a period not exceeding six weeks or after the passage of a maximum of 1,500 000 tonnes after the completion of the works, although the customer may extend this timescale to permit any follow-up tamping to be carried out.

### **4.3 Acceptance measurements, checks and related documentation**

Before acceptance, the following measurements or checks shall be carried out when applicable (manually or by automatic means), and shall be documented:

- relative track geometry of plain line, switches and crossings as specified in 4.4;
- absolute track position of plain line, switches and crossings as specified in 4.5;
- sleeper or bearer position, voiding of sleepers or bearers as specified in 4.6.2, 4.6.3, 4.6.4 and 4.6.5;
- correct assembly and integrity of the rail fastenings, pads and insulators as specified in 4.6.6;
- welds as specified in 4.6.7 (running surface and running edge);
- joint gaps, dips and staggers as specified in 4.6.8;
- insulated joints as specified in 4.6.9;
- ballast cross section as specified in 4.6.10;
- stressing work as specified in 4.6.11;
- specific measurements or checks for switches and crossings and rail expansion devices as specified in 4.7 and 4.8;
- tamping work as specified in 5.2;
- dynamic stabilising work as specified in 5.3;
- ballast compaction as specified in 5.4;
- ballast replacement / cleaning work as specified in 5.5;
- damage caused to rails, sleepers, bearers, fastenings, cables and other equipment, or where the work process has displaced the sleepers, the bearers or the rail pads;
- all track materials compliance with the customer's relevant acceptance criteria or specifications, in particular acceptance of associated works as well as approval and acceptance of the material provided by the supplier.

The customer may request additional documented measurements or checks if contractually agreed.

The customer may also restrict the choice of measuring devices if contractually agreed.

Relative track geometry shall be measured by a track recording vehicle or by a track construction and maintenance machine fitted with measuring equipment, both in accordance with series EN 13848. If the measuring equipment fails, or is not available, corresponding light weight or manual devices measurements shall be taken and documented. Other use of light weight or manual devices measurements shall be in accordance with series EN 13848.

If track works affect track geometry, measurement of relative track geometry according to series EN 13848 shall be performed before allowing commercial trains to run.

For the purpose of acceptance, every section and switch and crossing shall be inspected by the experts as nominated by the customer and the contractor.