



# SLOVENSKI STANDARD

SIST EN 13231-2:2006

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Železniške aplikacije - Prosti prehod - Sprejem del - Del 2: Dela na balastiranih prostopicah in križanjih

Railway applications - Track - Acceptance of works - Part 2: Works on ballasted track - Switches and crossings

Bahnanwendungen - Oberbau - Abnahme von Arbeiten - Teil 2: Arbeiten im Schotteroberbau - Weichen und Kreuzungen

**ITeh STANDARD PREVIEW**

Applications ferroviaires - Voie (Réception des travaux) Partie 2 : Travaux de voie ballastée - Appareils de voie

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**ICS:**

45.080      Vlakovi in železniški sestavi      RAILS AND RAILWAY COMPONENTS

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ICS 45.080

English Version

## Railway applications - Track - Acceptance of works - Part 2: Works on ballasted track - Switches and crossings

Applications ferroviaires - Voie - Réception des travaux -  
Partie 2 : Travaux de voie ballastée - Appareils de voie

Bahnanwendungen - Oberbau - Abnahme von Arbeiten -  
Teil 2: Arbeiten im Schotteroberbau - Weichen und  
Kreuzungen

This European Standard was approved by CEN on 13 April 2006.

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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 Central Secretariat has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
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EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document (EN 13231-2:2006) 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of an identical text or by endorsement, at the latest by November 2006, and conflicting national standards shall be withdrawn at the latest by November 2006.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*
- *Part 2: Works on ballasted track - Switches and crossings*
- *Part 3: Acceptance of rail grinding, milling and planing work in track*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, 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 and United Kingdom. (standards.iteh.ai)

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## 1 Scope

This European Standard specifies the requirements and tolerances for the acceptance of track work associated with switch and crossing layouts (also includes work on expansion devices) on ballasted track for 1 435 mm and wider gauge railways.

## 2 Normative references

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

EN 13232-9, *Railway applications – Track – Switches and crossings – Part 9: Layouts*

EN 13848 (series), *Railway applications – Track – Track geometry quality*

prEN 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.

- iTeh STANDARD PREVIEW**  
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- 3.1**  
**absolute track position**  
position of the track in reference to an external coordinated system
- 3.2**  
**acceptance**  
acceptance is the declaration of the customer to the contractor that the work has been achieved in accordance with the contract
- [SIST EN 13231-2:2006](https://standards.iteh.ai/catalog/standards/sist/c5c51160-e7aa-4865-9c2e-69a901f320bf/sist-en-13231-2-2006)  
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- 3.3**  
**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. 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
- 3.4**  
**design track geometry**  
calculated values of track geometric parameters

**3.5****loaded and unloaded measurements**

loaded and unloaded conditions for measurements are defined in Clause 5 of EN 13848-1:2003

**3.6****nominal track gauge**

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

**3.7****relative track geometry**

track parameters measured on the track by a moving system

**3.8****tolerance**

permissible deviation from reference or designed value

**3.9****track geometry**

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

**3.10****works on switches and crossings**

works on switches and crossings cover:

- initial construction;
- simultaneous or separated replacement of parts of turnouts (switch rail/stock rail, crossing, etc.), bearers and ballast;
- tamping / levelling / lining / dynamic track stabiliser (DTS) work to correct track geometry;
- other works on switches and crossings, excluding works covered by EN 13231-3;
- welding.

**4 Acceptance of works on switches and crossings****4.1 General**

The requirements under this clause apply to works as defined in 3.10.

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

The acceptance of welding work in conjunction with switch and crossing works is covered by prEN 14730 (series) when available.

An acceptance form shall be prepared for each item of work outlining the results achieved (see an example of this type of form in Annex B).

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, including the mechanically simulated loading (e.g. by a DTS), which shall be defined by the customer that permits clearance of the track for the maximum permitted speed. It is permitted for acceptance to occur within a period after the completion of the works as defined by the customer (i.e. after receipt of the application from the contractor), even if the appropriate passing tonnage has not been achieved.

## 4.3 Acceptance measurements and checks

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

- relative switch and crossing geometry in the switch and crossing layout;
- absolute switch and crossing position. Comparison of the actual switch and crossing position with the design position, as defined by the customer;
- weld measurements (running surface and running edge);
- measurement of joint gaps and dips;
- measurement of joint staggers;
- check of insulated joints;
- bearer position, voiding of bearers, correct assembly and integrity of the rail fastenings, pads and insulators;
- check of ballast profile;
- damage caused to rails, bearers, fastenings, cables and other equipment, or where the work process has displaced the bearers or the rail pads;
- measurement of geometrical relationship of diverging track to through track;
- measurement of track gauge and of gauge between the crossing nose and the check rail;
- measurement of flangeway;
- measurement of check rail to check rail at Diamond Crossing;
- measurement of switch squareness;
- measurement of longitudinal relationship of switch tip to stock rail mark;
- distance between switch rail and stock rail both in closed and open positions.

Additional measurements shall be taken for expansion joints:

- gap and switch position in relation to mark on stock rail;
- verification of free movement of switches;
- squareness of switch / stockrails.

The customer may also request additional measurements or checks if previously agreed.



Track geometry shall be measured by a track recording vehicle or where this is not available by a track maintenance machine fitted with measuring equipment, both in accordance with series EN 13848 when available. If the measuring equipment fails, or is not available, corresponding hand or light devices measurements shall be taken and documented. Other use of hand or light devices measurements shall be previously defined by the customer.

The customer shall previously agree all measuring equipment in track recording vehicles, maintenance machines and hand or light devices measurements.

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

The contract shall define who should perform the measurements.

#### 4.4 Acceptance documents

All measurements and checks carried out in accordance with 4.3 shall be documented.

In addition, the following documents shall be made available when applicable:

- record of measurements of the switch and crossing geometry;
- record of the switch and crossing installation (design/actual comparison) compared with the switch and crossing workshop drawing, and according to the layout acceptance form as described in prEN 13232-9;
- record of measurements in relation to the setting out drawing (scheme drawing);
- reports of welding and stressing of switches and crossings (including that of all immediately adjoining track);
- verification of proper tightening and fitting of rail fasteners;
- proof of acceptance of associated works;
- proof of approval and acceptance of the material provided by the supplier;
- approval of prefabrication according to Quality system;
- list of joint-gap measurements;
- report of the installation of expansion joints;
- switches and crossings workshop drawing;
- setting out drawing (scheme drawing).

NOTE The customer may also request additional documentation if previously agreed.

#### 4.5 Relative track geometry

##### 4.5.1 Tolerances

Accepted track shall comply with the relevant tolerances shown in Tables 1 and 2. The applicable parameters shall be nominated by the customer, according to the scope of the work.

The tolerances in Tables 1 and 2 are for loaded measurements. For unloaded measurements of track gauge the customer shall define the value for the design track gauge.

Concerning the longitudinal level and alignment:

- the methods « mean-to-peak » and « peak-to-peak » are alternative. The customer and the contractor shall agree on the method to be used;
- for the method « mean-to-peak », the sliding mean, i.e. the mean for each point, shall be taken in a length of 40 m to 100 m considering a symmetric interval (the considered point being the « zero », i.e.  $\pm$  half of the length from the point) with a maximum sampling distance of 1 m;
- for measurements made by a chord system with base lengths other than 10 m or by an inertial system, the results shall be converted to 10 m chord with measurement in the middle;
- for measurements in accordance with EN 13848-1 with wavelengths  $D1$ ,  $D2$  or  $D3$ , the tolerances shall be defined by the customer.

For alignment, when using the method « mean-to-peak », the corridor as defined by the mean and the tolerances shall include the calculated value, if not the defect shall be taken between the calculated value and the peak.

In transition curves with construction twist, the tolerances shall be considered from the construction twist, but not from the zero line.

For switch and crossing layouts with second-hand materials, the tolerance limits for the parameters shall be specified by the customer.

Depending on the measuring system used, non-typical high reading may be recorded at the crossing gap and switch toe position.

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Table 1 — Acceptance tolerances (renewals and new switch and crossing)

Type class	I	II	III	IV	V
Speed range (km/h)	$V \leq 80$	$80 < V \leq 120$	$120 < V \leq 160$	$160 < V \leq 220$	$V > 220$
<b>Parameters</b>					
Track gauge (mm) (designed/measured value)	$\pm 3$	$\pm 3$	$\pm 2$	$\pm 2$	$\pm 2$
Cross level (mm) (designed/measured value)	$\pm 3$	$\pm 3$	$\pm 3$	$\pm 2$	$\pm 2$
Longitudinal level (mm) (mean-to-peak) Symmetrical chord of 10 m	$\pm 6$	$\pm 5$	$\pm 4$	$\pm 4$	$\pm 3$
Longitudinal level (mm) (peak-to-peak) Symmetrical chord of 10 m	6	5	5	4	4
Alignment (mm) (mean-to-peak) Symmetrical chord of 10 m	$\pm 5$	$\pm 4$	$\pm 4$	$\pm 3$	$\pm 3$
Alignment (mm) (peak-to-peak) Symmetrical chord of 10 m	6	5	5	4	4
Twist (mm/m) (zero line to peak calculated in a 3 m basis)	$\pm 1,5$	$\pm 1$	$\pm 1$	$\pm 1$	$\pm 1$