



# SLOVENSKI STANDARD

## SIST EN 13232-2:2023

01-december-2023

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### Železniške naprave - Zgornji ustroj proge - Kretnice in križišča za Vignolove tirnice - 2. del: Geometrijske zahteve pri projektiranju

Railway applications - Track - Switches and crossings for Vignole rails - Part 2:  
Requirements for geometric design

Bahnanwendungen - Oberbau - Weichen und Kreuzungen für Vignolschienen - Teil 2:  
Anforderungen an den geometrischen Entwurf

Applications ferroviaires - Infrastructure - Appareils de voie - Partie 2: Exigences de la  
conception géométrique

**Ta slovenski standard je istoveten z: EN 13232-2:2023**

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## Railway applications - Track - Switches and crossings for Vignole rails - Part 2: Requirements for geometric design

Applications ferroviaires - Voie - Appareils de voie  
pour rails Vignole - Partie 2 : Exigences pour la  
conception géométrique

Bahnanwendungen - Oberbau - Weichen und  
Kreuzungen für Vignolschienen - Teil 2: Anforderungen  
an den geometrischen Entwurf

This European Standard was approved by CEN on 23 October 2022.

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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 CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
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**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

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## EN 13232-2:2023

### European foreword

This document (EN 13232-2:2023) 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of an identical text or by endorsement, at the latest by April 2024, and conflicting national standards shall be withdrawn at the latest by April 2024.

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

This document supersedes EN 13232-2:2003+A1:2011.

This series of standards “Railway applications – Track – Switches and crossings for Vignole rails” covers the design and quality of switches and crossings in flat bottomed rail. The list of Parts is as follows:

- *Part 1: Definitions*
- *Part 2: Requirements for geometric design*
- *Part 3: Requirements for wheel/rail interaction*
- *Part 4: Actuation, locking and detection*
- *Part 5: Switches*
- *Part 6: Fixed common and obtuse crossings*
- *Part 7: Crossings with moveable parts*
- *Part 8: Expansion devices*
- *Part 9: Layouts*

Part 1 contains terminology used throughout all parts of this series. Parts 2 to 4 contain basic design guides and are applicable to all switch and crossing assemblies. Parts 5 to 8 deal with particular types of equipment including their tolerances. These use Parts 1 to 4 as a basis. Part 9 defines the geometric and non-geometric acceptance criteria for inspection of layouts.

The changes introduced in this document set the geometric parameters for switch and crossing design in the context of the design process, providing more detail to the user of the standard. A number of figures have been also updated to improve clarity.

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

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

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**EN 13232-2:2023****1 Scope**

This document:

- establishes the design process for switches and crossings (S&C), and the use of the other parts of this standard;
- specifies the geometric design principles for wheel guidance;
- establishes the basic limits of supply;
- establishes the applied forces and their adequate support;
- specifies tolerance levels.

These are illustrated herein by application to a turnout. The main switch and crossing components are represented in turnouts and the principles used in turnouts apply equally to more complex layouts.

**2 Normative references**

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 13232-1:2023, *Railway applications – Track – Switches and crossings for Vignole rails – Part 1: Definitions*

EN 13232-3:2023, *Railway applications – Track – Switches and crossings for Vignole rails – Part 3: Requirements for wheel/rail interaction*

EN 13232-4:2023, *Railway applications – Track – Switches and crossings for Vignole rails – Part 4: Actuation, locking and detection*

EN 13232-5:2023, *Railway applications – Track – Switches and crossings for Vignole rails – Part 5: Switches*

EN 13232-6:2023, *Railway applications – Track – Switches and crossings for Vignole rails – Part 6: Fixed common and obtuse crossings*

EN 13232-7:2023, *Railway applications – Track – Switches and crossings for Vignole rails – Part 7: Crossings with moveable parts*

EN 13232-9:2023, *Railway applications – Track – Switches and crossings for Vignole rails – Part 9: Layouts*

EN 15273-3:2013+A1:2016, *Railway applications - Gauges - Part 3: Structure gauges*



### 3 Terms and definitions

For the purpose of this document the terms and definitions given in EN 13232-1:2023 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

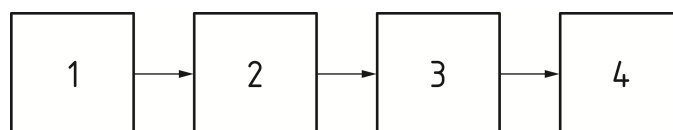
- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

## 4 Design process

### 4.1 General process

The process for designing switches and crossings is complex owing to the many requirements that apply and the different situations that may occur. Figure 1 gives a schematic representation of the general design process. It separates the whole process into four main steps:

- step 1 contains the general design of the S&C. It consists of the geometrical design, the design of the wheel-rail interaction and the design requirements for compliance with the actuation, locking and detection system. It leads to the definition of the main aspects of the S&C, respecting the main design requirements. Geometric design is defined in this part; other aspects are dealt with in parts 3 and 4;
- step 2 is the main constructional design process, which specifies the main construction of the S&C. It is based on the technology used by the supplier. It is based mainly on the suppliers' experience and expertise;
- step 3 consists of the detailed design of the individual components. It is dealt with in different standards. The design of the main components shall respect the requirements laid down in parts 5 to 8. Other components, such as fastenings, bearers, etc, are dealt with in respective ENs;
- step 4 is the product acceptance, which is described in Part 9.



#### Key

- 1 Step 1: General design
- 2 Step 2: Main constructional design
- 3 Step 3: Detailed component design
- 4 Step 4: Acceptance

**Figure 1 — General design process**

## EN 13232-2:2023

### 4.2 Design step details

- Each design step requires sufficient **input data** to enable the design to be completed.
- Input data are dealt with by the supplier through the **design rules**. The rules are defined in EN 13232, Parts 2 to 8.
- The results of the different design steps are **outputs**.

All these aspects are schematically represented for each design step in Annex A, with a reference to the different parts and clauses where these aspects are dealt with in detail.

### 4.3 Practical use of the design process

The previous section deals with the complete design process of S&C. The use of the standard is not limited to this case only.

The customer may choose to request the supplier to perform the whole design process and therefore gives all necessary input data to permit the supplier to perform the design.

The customer may also opt to request the supplier to perform only parts of the design process. In this case the customer shall deliver all inputs of the design steps he has requested the supplier to perform. This means that he has to deliver all outputs of the previous design steps.

**EXAMPLE 1** A customer requests the detailed design of an S&C layout based on the geometry of an existing design for use on a main railway line. In this case the supplier receives from the customer the outputs from geometrical requirements as well as the requirements for wheel-rail interaction, in the form of functional and safety dimensions.

Based on this information and the inputs for both conformity for actuation, locking and detection (ALD) and general requirements, the supplier performs the general and detailed component design.

**EXAMPLE 2** A customer requests a supplier to manufacture an S&C layout in accordance with an existing design. The customer delivers a set of detailed drawings to the supplier. The supplier only performs step 4 of the general design process.

## 5 General design requirements

### 5.1 Reference points

Key reference points relating to turnout geometry and the limits of supply of a turnout are illustrated in Figures 2 and 3.