

# Railway applications — Track — Switches and crossings —

## Part 9: Layouts

ICS 45.080

# National foreword

This British Standard is the UK implementation of EN 13232-9:2006+A1:2011. It supersedes BS EN 13232-9:2006, which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by A1 A1.

The UK participation in its preparation was entrusted to Technical Committee RAE/2, Railway Applications - Track.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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## Railway applications - Track - Switches and crossings - Part 9: Layouts

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9: Ensemble de l'appareil

Bahnanwendungen - Oberbau - Weichen und Kreuzungen -  
Teil 9: Weichenanlagen

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## Foreword

This document (EN 13232-9:2006+A1:2011) 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of an identical text or by endorsement, at the latest by April 2012, and conflicting national standards shall be withdrawn at the latest by April 2012.

 This document has been prepared under a mandate given to CEN/CENELEC/ETSI by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 2008/57/EC.

For relationship with EU Directive 2008/57/EC, see informative Annex ZA, which is an integral part of this document. 

This document includes Amendment 1, approved by CEN on 2011-09-13.

This document supersedes EN 13232-9:2006.

The start and finish of text introduced or altered by amendment is indicated in the text by tags  .

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 series of standards “Railway applications — Track — Switches and crossings” covers the design and quality of switches and crossings in flat bottom rails. 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 the standard.

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 functional and geometrical dimensions and tolerances for layout assembly.

The following terms are used within to define the parties involved in using the EN as the technical basis for a transaction:

**CUSTOMER** The operator or user of the equipment, or the purchaser of the equipment on the user's behalf.

**SUPPLIER** The body responsible for the use of the EN in response to the customer's requirements.

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 and United Kingdom.

## **1 Scope**

The scope of this part is:

- to describe the design process of switches and crossings, and the use of the other parts of this standard;
- to define the main criteria to be taken into account during the design of the layout, including the safety and functional dimensions as well as geometrical and material aspects;
- to define the main criteria to be verified during the design approval;
- to define the geometrical and non-geometrical acceptance criteria for inspection of layouts assembled both in the fabrication plant and at track site in case of layouts that are delivered non or partially assembled or in a “kit” form;
- to determine the limits of supply;
- to define the minimum requirements for traceability.

This European Standard applies only to layouts that are assembled in the manufacturing plant or that are assembled for the first time at trackside.

Other aspects such as installation and maintenance also influence performance; these are not considered as part of this European Standard.

## **2 Normative references**

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

EN 13145, *Railway applications — Track — Wood sleepers and bearers*

EN 13230-4, *Railway applications — Track — Concrete sleepers and bearers — Part 4: Prestressed bearers for switches and crossings*

EN 13232-2, *Railway applications — Track — Switches and crossings — Part 2: Requirements for geometric design*

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

EN 13232-4, *Railway applications — Track — Switches and crossings — Part 4: Actuation, locking and detection*

EN 13232-5, *Railway applications — Track — Switches and crossings — Part 5: Switches*

EN 13232-6, *Railway applications — Track — Switches and crossings — Part 6: Fixed common and obtuse crossings*

EN 13232-7, *Railway applications — Track — Switches and crossings — Part 7: Crossings with moveable parts*

prEN 13232-8, *Railway applications — Track — Switches and crossings — Part 8: Expansion devices*

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



EN 13674-1, *Railway applications — Track — Rail — Part 1: Vignole railway rails 46 kg/m and above*

EN 13674-2, *Railway applications — Track — Rail — Part 2: Switch and crossing rails used in conjunction with Vignole railway rails 46 kg/m and above*

EN 13674-3, *Railway applications — Track — Rail — Part 3: Check rails*

EN 13674-4, *Railway applications — Track — Rail — Part 4: Vignole railway rails from 27 kg/m to, but excluding 46 kg/m*

EN 13715, *Railway applications — Wheelsets and bogies — Wheels — Tread profile*

prEN 13803-2, *Railway applications — Track alignment design parameters — Track gauges 1 435 mm and wider — Part 2: Switches and crossings and comparable alignment design situations with abrupt changes of curvature*

prEN 14730 (all parts), *Railway applications — Track — Aluminothermic welding of rails*

UIC 505-1, *Railway transport stock — Rolling stock construction gauge*

UIC 505-4, *Effects of the application of the kinematic gauges defined in the 505 series of leaflets on the positioning of structures in relation to the tracks and of the tracks in relation to each other*

UIC 510-2, *Trailing stock — Conditions concerning the use of wheels of various diameters with running gear of different types*

### 3 Terms and definitions

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

#### 3.1

##### **guiding force $Y$**

lateral force, acting parallel to the running surface, between the wheel and the relevant track component (usually a rail)

#### 3.2

##### **wheel load $Q$**

force, acting perpendicular to the running surface, between the wheel on one hand and the relevant track component (rail)

#### 3.3

##### **contact angle $\gamma_A$**

angle of the contact plane, measured at the contact point A between the wheel and the track component. In the case of a two-point contact, the one nearest the wheel flange will be considered.