SLOVENSKI STANDARD
SIST EN 13848-1:2004+A1:2008

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Železniške naprave - Zgornji ustroj - Kakovost tirne geometrije - 1. del: Karakteristike tirne geometrije

Railway applications - Track - Track geometry quality - Part 1: Characterisation of track geometry

Bahnanwendungen - Oberbau - Gleislagequalität - Teil 1: Beschreibung der Gleisgeometrie

Applications ferroviaires - Voie - Qualité géométrique de la voie - Partie 1: Caractérisation de la géométrie de voie

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45.080	Tračnice in železniški deli	Rails and railway components
93.100	Gradnja železnic	Construction of railways

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Railway applications - Track - Track geometry quality - Part 1: Characterisation of track geometry

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

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Contents

Foreword

This document (EN 13848-1:2003+A1:2008) 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of an identical text or by endorsement, at the latest by January 2009 and conflicting national standards shall be withdrawn at the latest by January 2009.

This document includes Amendment 1, approved by CEN on 2008-06-06.

This document supersedes EN 13848-1:2003.

The start and finish of text introduced or altered by amendment is indicated in the text by tags 〖A1〉 〈A1〉.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

Annex A and B are informative.

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, 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.

Introduction

This European Standard defines the minimum requirements for the principal track geometric parameters that characterise track geometry quality. Other parameters, for example, acceleration and rail characteristics, also have an important role in contributing towards ride quality. Refer to annexes A and B for further information on these parameters.

It comprises two informative annexes (annex A and annex B).

This European Standard is one of the series EN 13848 “Railway applications/Track - Track geometry quality” as listed below:

— *Part 1 : Characterization of track geometry*

— *Part 2 : Measuring devices - Track recording vehicles*

— A1 *Part 3 : Measuring systems — Track construction and maintenance machines*

— *Part 4 : Measuring systems — Manual and lightweight devices*

— *Part 5 : Geometric quality levels* A1

1 Scope

[A1] This European Standard specifies the requirements for the homologation of track geometry quality parameters as measured by various measuring devices fitted on track recording vehicles. [A1] These measuring devices are described in [A1] Part 2 [A1] of the standard. This European Standard applies to all track geometry parameters including track gauge, longitudinal level, alignment, cross level (cant / superelevation) and twist. It defines each parameter and specifies the requirements for measurement, the analysis methods and the presentation of results. [A1] Parts 3 and 4 give a description of measuring devices complying partially with this Part 1 according to the specificities of respectively track construction and maintenance machines, and manual and lightweight devices. [A1]

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

[A1] EN 13848-2, *Railway applications — Track — Track geometry quality — Part 2: Measuring systems — Track recording vehicles* [A1]

ENV 13005:1999, *Guide to the expression of uncertainty in measurement*

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply (refer also to the terms and definitions described in clause 4 of this part).

3.1.1
track geometry quality
assessment of excursions from the mean or designed geometrical characteristics of specified parameters in the vertical and lateral planes which give rise to safety concerns or have a correlation with ride quality

3.1.2
gauge face
inside face of the running rail head

3.1.3
running table
upper surface of the head of the rail

3.1.4
running surface
curved surface defined by the longitudinal displacement of a straight line perpendicular to the centre-line of the track and tangential to both running tables

3.1.5
running plane
plane tangential to the running surface at the point of measurement

3.1.6
uncertainty
refer to the definition in ENV 13005:1999

3.1.7
measured value
refer to the definition in ENV 13005:1999

3.1.8
resolution
smallest change in the value of a quantity to be measured which produces a detectable change in the indication of the measuring instrument

3.1.9
wavelength range
space domain taken by the parameters' components

3.1.10
sampling distance
travelled distance between any two consecutive measurement points on the same rail

3.1.11
range of measurement
specific domain described by its limits

3.2 Symbols and abbreviated terms

For the purposes of this standard, symbols and abbreviated terms applied are specified in the Table 1.

Table 1 — Symbols

No.	Symbol	Designation	Unit
1	G	Track gauge	mm
2	Z_p	[A1] Limit of the range below the running surface within which the gauge is measured. Z_p is always 14 mm. [A1]	mm
3	$Z_{p'1}$	Deviation in the direction of consecutive running table levels on left hand rail. Used in the measurement of Longitudinal Level.	mm
4	$Z_{p'2}$	Deviation in the direction of consecutive running table levels on right hand rail. Used in the measurement of Longitudinal Level.	mm
5	y_p	Distance between point P and a reference line. Used in the measurement of Alignment	mm
6	P	Gauge face contact point	
7	$D1, D2, D3$	Wavelength ranges	m
8	λ	Wavelength	m
9	$V1$	Amplitude from the zero line. Used in the measurement of Twist	mm/m
10	$V2$	Amplitude from the mean value. Used in the measurement of Twist	mm/m
11	ℓ	Twist base-length	m
12	X, Y, Z	Axes of a track co-ordinate system	

4 Principal track geometric parameters

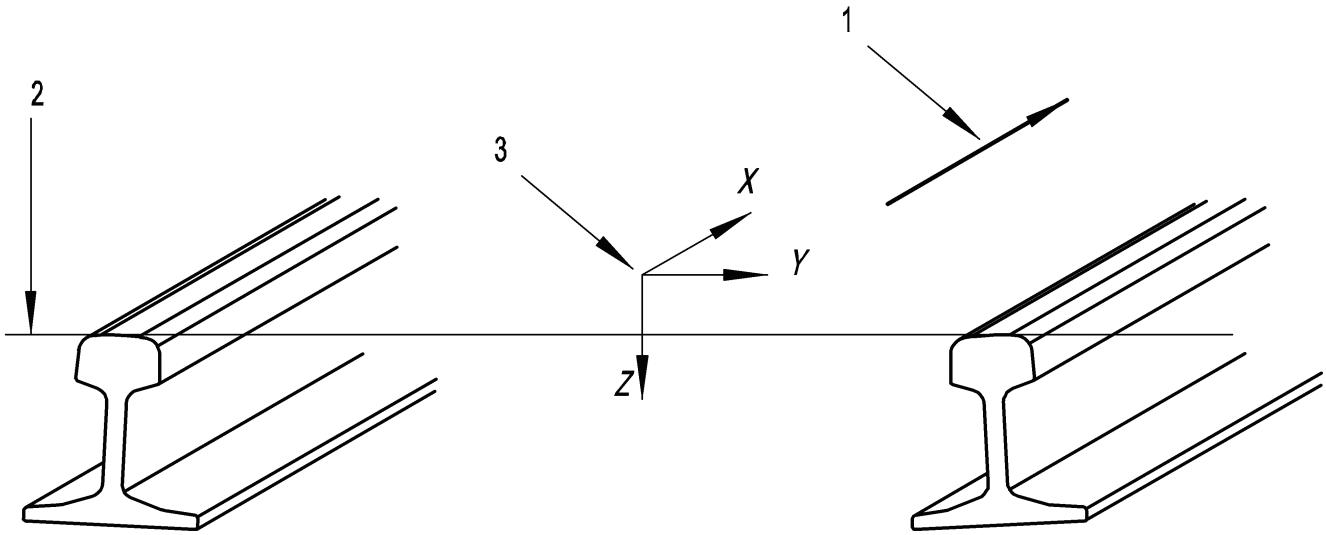
4.1 Description of the track co-ordinate system

The track geometry quality is described by means of a relative rectangular co-ordinate system centred to the track with clockwise rotation (refer to Figure 1) :

— X-axis : axis represented as an extension of the track towards the direction of running

— Y-axis : axis parallel to the running surface

— Z-axis : axis perpendicular to the running surface and pointing downwards



Key

1 running direction
2 running surface
3 track co-ordinate system

Figure 1 — Relationship between the axes of the track co-ordinate system

4.2 Track gauge

4.2.1 Definition

Track gauge, G, is the smallest distance between lines perpendicular to the running surface intersecting each rail head profile at point P in a range from 0 to Z_p below the running surface. Z_p is always 14 mm.

In the situation of new unworn rail head the point P will be at the limit Z_p below the railhead, see Figure 2.