SLOVENSKI STANDARD
oSIST prEN 15016-1:2022

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Železniške naprave - Tehnična dokumentacija - 1. del: Osnovna načela

Railway applications - Technical documents - Part 1: General principles

Bahnanwendungen - Technische Dokumente - Teil 1: Allgemeine Grundsätze

Applications ferroviaires - Documents techniques - Partie 1 : Principes généraux

Ta slovenski standard je istoveten z: **prEN 15016-1**

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01.110	Tehnična dokumentacija za izdelke	Technical product documentation
45.020	Železniška tehnika na splošno	Railway engineering in general

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EUROPEAN STANDARD

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Will supersede EN 15016-1:2004

English Version

Railway applications - Technical documents - Part 1: General principles

Applications ferroviaires - Documents techniques - Partie 1 : Principes généraux

Bahnanwendungen - Technische Dokumente - Teil 1: Allgemeine Grundsätze

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 256.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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Contents

Page

European foreword

This document (prEN 15016-1:2022) has been prepared by Technical Committee CEN/TC 256 "Railway applications", the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 15016-1:2004.

In comparison with the previous edition, the following technical modifications have been made:

The references to standards, the clause “Terms and definitions” have been updated. The clause “Symbols and abbreviated terms” and the clause “Preparation of technical documents other than drawings” have been added. Microcopying has been deleted. In Annex A references to the Data Model of Part 4 have been incorporated to show the relation between the fields of the title blocks of technical documents and the data fields for data exchange.

This document is part of the standard series “Railway applications — Technical documents” which consists of the following parts:

— EN 15016-1: General principles

— EN 15016-2: Parts lists

— EN 15016-3: Handling of modifications of technical documents

— EN 15016-4: Data exchange

The scope of Part 1 to 3 is the complete railway applications. However, the scope of part 4 is rolling stock only because this is the typical application field for the specified data exchange.

The Annexes A and B are normative.

Introduction

In railway business, the customer very often requires, as part of a contract, technical documents in a certain form. In order to support co-operation and effective exchange of information between customers, suppliers and partners, it is necessary to have the document requirements precisely defined.

This document refers to EN, ISO or IEC standards dealing with technical documents. In cases where ISO or IEC standards are not sufficiently precise, this standard gives specific details. These additions to ISO and IEC standards facilitate the exploitation and administration.

These requirements have been drawn up in order to accommodate:

— the large variety of users;

— ease of documents transfer;

— any specific series of documentation related to the railway material they define.

Special consideration has been given to those producing drawings by computer and their reproduction without loss of quality.

NOTE The range of documents covers documents such as specifications, conditions for acceptance or further technical specifications which cannot be graphically represented. This is meant to highlight the difference between "graphical representation" and "verbal description".

1 Scope

This document lays down requirements for the preparation, administration and reproduction of technical drawings for railway applications. It complies with the requirements of EN, ISO or IEC Standards for technical drawings. It applies to technical drawings for railways, irrespective of technology i.e. mechanical, pneumatic, hydraulic, electronic etc.

The document applies throughout the total life span of the drawings. It applies to all the railway organizations and parties concerned with technical drawings, and to suppliers preparing drawings for railway applications. This document does not apply to the technical contents of the document. Neither does the standard apply to building documentation.

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 17343:2020, *Railway applications — General terms and definitions*

EN 81346-1, *Industrial systems, installations and equipment and industrial products — Structuring principles and reference designations — Part 1: Basic rules (IEC 81346-1)*

EN 81346-2, *Industrial systems, installations and equipment and industrial products — Structuring principles and reference designations — Part 2: Classification of objects and codes for classes (IEC 81346-2)*

EN 61355-1, *Classification and designation of documents for plants, systems and equipment — Part 1: Rules and classification tables (IEC 61355-1)*

EN ISO 3098-1, *Technical product documentation — Lettering — Part10: General requirements (ISO 3098-1)*

EN ISO 3098-2, *Technical product documentation — Lettering — Part 2: Latin alphabet, numerals and marks (ISO 3098-2)*

EN ISO 5457:1999, *Technical product documentation — Sizes and layout of drawing sheets (ISO 5457:1999)*

EN ISO 6433, *Technical product documentation — Part references (ISO 6433)*

EN ISO 10209:2012, *Technical product documentation — Vocabulary — Terms relating to technical drawings, product definition and related documentation (ISO 10209:2012)*

EN ISO 128-2:2020, *Technical product documentation (TPD) — General principles of representation — Part 2: Basic conventions for lines (ISO 128-2:2020)*

EN ISO 128-3, *Technical product documentation (TPD) — General principles of representation — Part 3: Views, sections and cuts (ISO 128-3)*

ISO 639-1, *Codes for the representation of names of languages — Part 1: Alpha-2 code*

ISO 80000-1, *Quantities and units — Part 1: General*

ISO 7200, *Technical product documentation — Data fields in title blocks and document headers*

ISO 16016, *Technical product documentation — Protection notices for restricting the use of documents and products*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 17343:2020 and EN ISO 10209:2012 apply.

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

— IEC Electropedia: available at https://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

4 Symbols and abbreviated terms

For the purposes of this document, the following abbreviation applies.

OEM

original equipment manufacturer

5 Preparation of drawings

5.1 Layout

5.1.1 Composition

Any document shall be given an identification number.

A set of drawings describing an assembly, a product or an installation will normally by various means (drawing lists, document control lists etc.) be formed as an entity. Parts lists mainly list details of an assemblage or collective drawing at a certain level. All of these parts lists may be produced either on drawing forms or parts of drawings or as documents affiliated to the company's administrative system.

Each different part or different assembly shall have a separate identification number.

It is recommended that the parts list forms a separate document (see EN 15016-2). Alternatively, the parts list may be entered on the same sheet as the drawing above the title block.

5.1.2 Special cases

It is permissible to represent similar parts or assemblies on a drawing.

5.1.3 Applications

If required, the applications or the identification number of the document indicating the relations between the drawing and the applications should be noted in the title block of the drawing or parts list.

5.1.4 Multiple sheets

Multiple sheet drawings marked with the same registration or identification number shall be provided with a sequential sheet number. In addition, the total number of sheets shall be shown on sheet 1, for example:

“Sheet No. n/p”

where

n is the sheet number;

p is the total number of sheets

(see ISO 7200).

5.1.5 Avoiding duplicate indications

All indications relating to standards, dimensions, materials and unit mass of parts involved in the composition of an assembly should preferably be indicated on the parts lists of the parts concerned. If, for information purposes, a dimension has to be repeated on the assembly drawing, it is to be written in brackets.

This remark shall not apply to specifications.

For example: indivisible or welded assemblies can have specific dimension and tolerance at their own level even if the nominal dimension value is the same.

5.2 Characteristic features

5.2.1 General

For sizes and layout of preprinted drawing sheets EN ISO 5457 shall apply.

5.2.2 Drawing sheet or base

Drawing sheets used for the preparation or printing of drawings should have a mat surface. Drawing sheets from polyester for which ISO 9958-1 and ISO 9958-2 apply should have a minimum wideness of 50 mm. Drawing sheets from tracing paper according to ISO 9961 should have a minimum grammage of 90 g/m^2 and standardized (writing) paper according to EN ISO 216 should have a minimum grammage of 70 g/m^2.

Drawing sheets shall be chosen with a view to obtaining the best contrast between background and representation according to EN ISO 6428.

5.2.3 Drawing sheet sizes

The original drawings shall be made to a standardized drawing sheet size electing the smallest size permitting adequate legibility.

The standardized sizes of the original drawings and their reproductions shall be selected from EN ISO 5457.

5.2.4 Permanent layout features

5.2.4.1 Title block

A title block shall appear on all drawings. It shall contain the necessary headings for identification and use according to ISO 7200.

It is recommended to use the same title block on all sheets of the drawing. It is permitted to use a reduced title block on the sheets following sheet 1. This block shall, as a minimum, have the same identification zone. The compulsory part of the title block is defined in Annex A. Its location is independent of the direction of reading adopted for the drawing.

In the normal reading position, the title block is situated at the bottom right-hand corner of the frame, the drawing sheet being viewed:

— in the portrait (vertical) position for the A4 size;

— in the landscape (horizontal) position for the A3 to A0 sizes according to EN ISO 5457.

For the preparation of documents used in electrotechnology, see EN 61082-1.

5.2.4.2 Copyright and exploitation rights

The designation shall be in accordance with ISO 16016. Exploitation rights shall be indicated. The name of the legal owner or the name of the creator of the drawing shall be written in the title block. Information concerning also existing exploitation rights can be indicated inside or outside the drawing field, where appropriate.

5.2.4.3 Intellectual property

The designation shall be in accordance with ISO 16016. Protection rights should be indicated at an appropriate place inside or outside the drawing field of the drawing and/or in the parts lists.

5.3 Execution

5.3.1 Graphical representation of layout

5.3.1.1 Arrangement of the drawing sheet

The arrangement of the drawing sheet shall be in accordance with EN ISO 5457:1999, 4.1.

5.3.1.2 Presentation methods, symbols and scales

For the relative position of views, use shall be made of the First Angle projection method (earlier known as European method of representation Method E) as defined by EN ISO 128-3.

The simplified and symbolic representation specified by European or International Standards should be adopted in preference to text.

Scales according to EN ISO 5455 are recommended.

5.3.1.3 Leader line

Leader lines shall preferably be terminated by a dot or an arrow, placed on the part to be reference marked according to EN ISO 128-2.

5.3.1.4 Text on drawings

Text on drawings is not recommended, because it is language specific. If deemed to be unavoidable, it should be kept as brief as possible. With regard to lettering, see 5.3.3.

NOTE This will also be of assistance in multitranslation versions of the document if required.

5.3.2 Characteristics of lines

5.3.2.1 Optical density (contrast)

All lines, including those added in any revision of the drawing should have a contrast of at least 0,7 with respect to the drawing base (according to EN ISO 6428).

5.3.2.2 Wideness of lines, grading, choice

Line wideness should be chosen depending on the size of the drawing (the widest values of line to be used for the drawing of sizes A0 and A1, which are likely to be frequently reproduced in reduced size) and on the legibility of the drawing in the following range:

0,25 mm - 0,35 mm - 0,5 mm - 0,7 mm – 1 mm.

The ratios to be observed between the widths of narrow and wide lines of a reproduction are as follows:

— minimum ratio 1/2: 0,25/0,5 - 0,35/0,7;

— recommended ratio 1/2,8: 0,25/0,7 - 0,35/1,0.

In all cases, the choice of line wideness should take into account the scale, the nature of their execution and the legibility of the drawing and its reproduction. The line wideness should be the same for all views of a part drawn to the same scale.

5.3.2.3 Spacing between lines

For manual drawings the space between two lines should be at least equal to twice the wideness of the wider line and at least 0,7 mm. The spacing between the hatching lines should be the maximum compatible with accurate determination of the section. Contour-hatching should be used as often as possible. The gap between the “blackened” sectional areas of two thin adjacent parts should be at least 0,7 mm.

In general, EN ISO 6428 applies.

If this space cannot be kept for e.g. CAD drawings, the representation shall be according to EN ISO 128-2:2020, Table G.1, No G.1.

This is recommended if the labelling does not clearly indicate at which line the arrowhead is pointing in the case of double lining. If a particular indication needs to be clarified, an enlarged presentation is recommended.

5.3.3 Characteristics of lettering

The lettering to be used on drawings shall be vertical inscription lettering B (vertical lettering) recommended in the EN ISO 3098-1 and EN ISO 3098-2. Its contrast with the background shall be at least of 0,7, according to
EN ISO 6428.

Italic lettering B (inclined lettering) should only be used for accentuating a text. Numbered items (tolerances, explanations, indications concerning conditions of machining of surfaces and of welds, etc.) shall be in upright lettering.

The type and height of lettering to be used according to the different drawing items are specified in Table 1.