

FSF - Richtlinie zur Erstellung technischer Dokumentation

FSF - Guideline for drawing up of technical documentation

34. Lieferung

FSF-Richtlinie



Änderungen

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neuer Normen

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Code number 010

Change Notification

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1 Change notification

Significant changes since the last delivery:

Table 1 — Significant changes since the last delivery

All code numbers	All code numbers has a stand (updating) in the footer.
Startpage	Information about issue updated
Code number 001	Coversheet revised
	FSF contact person added
Code number 003	FSF contact person added
Code number 010	Change notification and editorial deadline updated
Code number 020	Structure updated
Code number 060	Verband Deutscher Verkehrsunternehmen e. V. (VDV) added
Code number 350	Figure 4 - Outline character represented by a normal dot (.)
Code number 400	In the foreword, reference is made to ISO 16729 with regard to 3D representations and the following is added: "For 3D representations, the specifications in accordance with ISO 16792 must be contractually agreed.
	4.1.7 Field 7: Name of the creator, inspector and approver (the person who issues the approval) adapted with EN 15016-1.
	4.1.22 Block 22: Geometric tolerances - use of ISO 2768-2:1989 permitted
	Dated specification ISO 1302:2002
	ISO 1302 was withdrawn in 2021 with replacement. ISO 21920-1:2021 replaces ISO 1302:2002 and redefines the basic symbol, see Annex D. The graphic symbols according to ISO 1302 may be used if the last valid version is specified, example ISO 1302:2002.
	Annex D Comparison of symbols ISO 1302:2002 and ISO 21920-1:2021 newly included
Code number 450	Transition periods in Note 1 and Note 3 deleted
	Table 4, case 1, lines 1 and 3 exchanged
	6.2.12 Field 12: Name of the creator, inspector and approver (the person who issues the approval) adapted with EN 15016-1.
Code number 460	In the foreword, the use of the data model according to EN 15016-4:2006 is specified and a new sentence added: "The new data model from 2023 according to EN 15016-4 shall be contractually agreed. For differences, see EN 15016-4:2023, Annex C."
Code number 650	Clause 4: Reference to update of Excel file newly included.
	An example of the design of an amendment form has been added in an informative Annex A.
Code number 700	4.2.3 References to field 3 and field 3a corrected
	4.2.7 Field 7 Name of the creator, inspector and approver (the person who issues the approval) adapted with EN 15016-1.

Code number 710	Figure 7b) Illustration: "Sheet with title block" replaced by "simple frame"; Figure 7b) replaced.
	Location identification: thick dot outline symbol replaced by narrow dot in Figures 1, 12, 13, 14, 15
Code number 720	4.2.7 Field 7 Name of the creator, inspector / approver adapted with EN 15016-1
Code number 900	EN ISO 2768-2 and EN ISO 1302 marked as withdrawn
	EN ISO 21920-1 and EN ISO 22081 newly included and renumbered

2 Status of the FSF-Guideline Code numbers

Table 2 — Status of the FSF-Guideline Code numbers

Code number	Designation	Version	Date of modification Editorial deadline
Code number 000	Title/start page	34	2025-06-30
Code number 001	Cover page	34	2025-11-07
Code number 002	Preface of the FSF-Guideline	33	2020-09-30
Code number 003	Copyright -License - Disclaimer	34	2025-11-07
Code number 010	Change Notification	34	2025-11-07
Code number 020	Structure	33	2020-12-31
Code number 040	Preface of the FSF-Guideline	33	2020-12-31
Code number 060	This guideline is a cooperation of	34	2025-06-30
Code number 100	Scope and application	22	2007-12-31
Code number 300	Technical Product Documentation	27	2012-12-31
Code number 350	Designation of technical documents	27	2012-12-31
Code number 400	Drawings	34	2025-06-30
Code number 410	Computer Aided Transmission of Drawings	33	2020-12-31
Code number 450	Parts lists	34	2025-06-30
Code number 460	Computer-based parts list transfer	34	2025-06-30
Code number 500	FSF directive for appropriate writing of technical documentation	32	2018-12-31
Code number 600	Microfilming of drawings, parts lists and circuit documents	21	2006-12-31
Code number 650	Changes of Drawings, Parts Lists and Wiring Documents, Company Codes	34	2025-11-07
	Company Codes Excel-file	34	2025-07-02
Code number 700	Circuit documentation for electrical, pneumatic and hydraulic installations	34	2025-11-07

Code number	Designation	Version	Date of modification Editorial deadline
Code number 710	Circuit documentation for electrical installations - circuit diagrams	34	2025-11-07
Code number 720	Circuit documentation for electrical installations - Wiring documentation	34	2025-06-30
Code number 730	Equipment list (BMV, de: Betriebsmittelverzeichnis)	33	2020-12-31
Code number 750	Table of technical documents	33	2020-12-31
Code number 760	Electronic delivery of technical documents	33	2020-12-31
Code number 900	List of the technical rules specified in the guideline	34	2025-06-30
	Bibliography (Excel file)	34	2025-06-30
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CCS-S	Classification manual - short version	19	2004-03-16
CCS-Key	Keyword catalogue (Excel file)	19	2004-03-16
CCS-E	Business (Company) classification (Excel file)	19	2004-03-16

Code number 020

Structure

Code number 020

Structure

Code number

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Company Classification System

Classification manual.....	CCS
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Company Classification.....	CCS-Class
Keyword catalog.....	CCS-Keyword
Excel-file FSF- Company Classification	CCS-Excel

Code number 100

Scope and application

Code number 100

Scope and application

Issue of the cooperation of the railway industry and third parties is the “FSF guideline for drawing up of technical documentation”. It doesn’t define additional standards but it is a guideline for a harmonized preparation of drawings and part lists for railway vehicles by providing a selection of interpretation variants resp. use interpretations of existing standards. At the same time, it takes into account the effects of technical changes in consensus between manufacturers and operators / institutions.

It is the scope of this guideline to define a standardised set of technical documentation which is neutral in view of specific manufacturing preferences and economically proper for the interface between manufacturers and suppliers among each other but also in direction to the customers.

This set of documentation should be used for production, maintenance and replacement purchase. Documentation prepared in accordance with this guideline shouldn’t show any restrictive information in view of a generous constructional use.

Intellectual property rights are not affected.

This guideline is not applicable for

- preliminary drawings;
- sketches;
- arrangements of function tests;
- general calculation documents;
- test reports.

The different code numbers contain examples for entries (title block Code 400, parts list Code 450 etc.). In each case a form is shown with completely filled in data fields.

The selection of the filled in data fields and the relevant entries may vary.

FSF - Guideline for drawing up of technical documentation

Code number 300

Technical Product Documentation

FSF - Guideline for drawing up of technical documentation
Version: 34th updating

State of revision: 27th updating
Document language: en

Code number 300

Technical Product Documentation

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Foreword

The publication of the standards EN 61355 and EN 81346-1 and the railway vehicle specific standards series EN 15380 respectively DIN 25002-3 based thereon, made it necessary to change the code number 300 and to adapt it to EN 15380 respectively to DIN 25002-3. The former designation of code number 300 "Composition of the set of drawings with set of parts list" had to be adapted to new cognitions. The standard series EN 15380 respectively DIN 25002-3 (Classification of documents) is the basis for the content of this standard.

EN 15380 *Railway applications – Designation systematic for rail vehicles*, consisting of:

- *Part 1: General (former DIN 25002-1)*
- *Part 2: Product groups (former DIN 25002-2)*
- *Part 3: Designation of installation sites and locations (former DIN 25002-4)*
- *Part 4: Functions groups (draft standard, in preparation)*

Standards generally are cited in its general form like "EN 15380", even though the standards are officially accepted in Germany as DIN EN like "DIN EN 15380".

Introduction

For the designation of systems, products and locations the prescriptions of EN 81346-1 have been taken into account.

These designations have been structured according to the following criteria.

- function-related structure (=)
- product-related structure (-)
- location-related structure (+)

The structures are equal and independent from one another. The designation is done according to the task. The designation can be used either individually or in combination. It is not necessary to apply all designation possibilities.

1 Scope of application

In this code number the documents required for the technical product documentation are determined and classified. It is part of the complete product documentation according to EN 15380, EN 61355 respectively DIN 25002-3.

2 Normativ References

Cited standards see code number 900

3 Terms and Definition

The following terms and definitions apply for the use of this code number:

3.1

Documentation

Collection of concretely dedicated documents

[SOURCE: EN 61082-1]

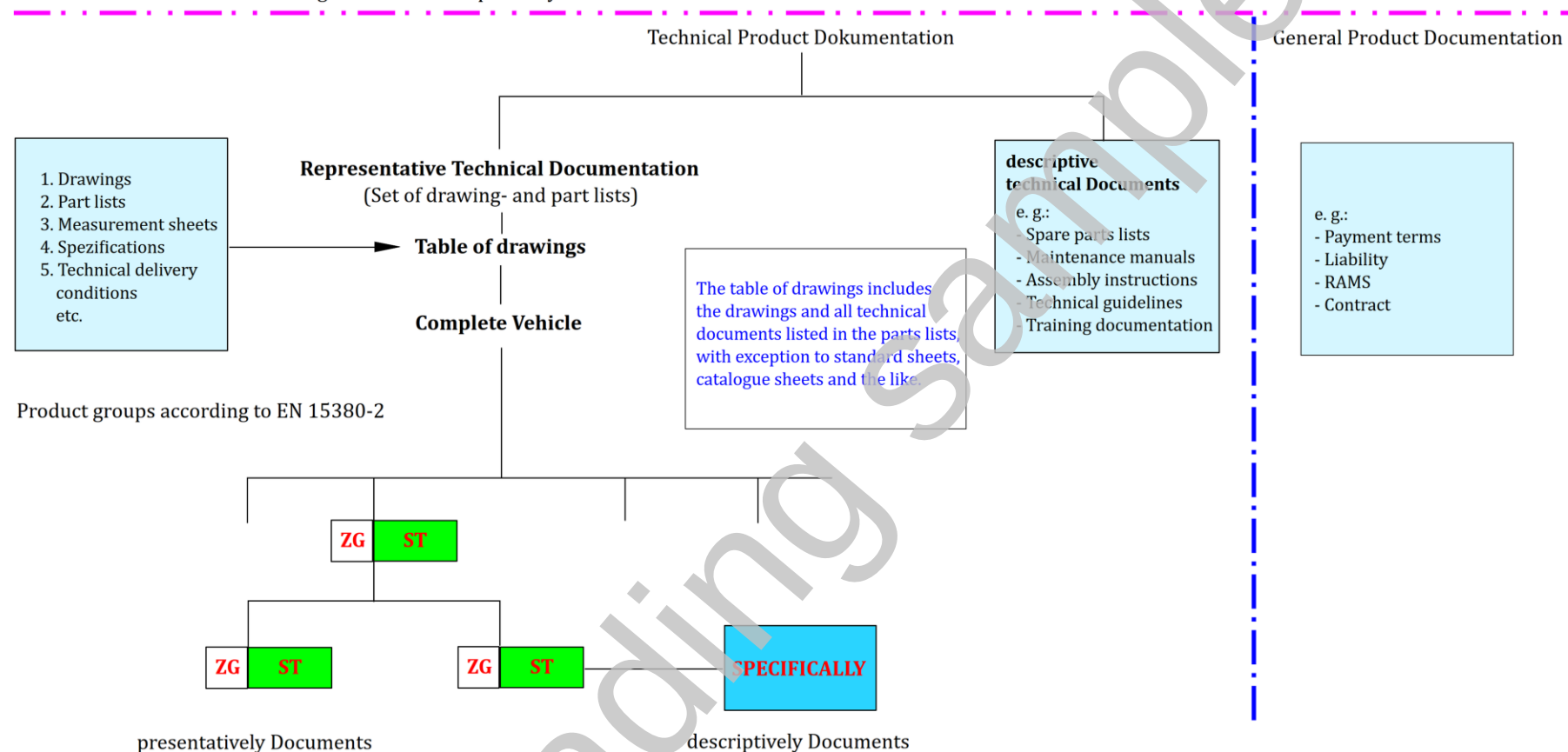
3.2

Technical Product Documentation

A technical product documentation is the total of the "Technical Documentation" prepared during the lifetime of a product

Note 1 to Entry: A technical product documentation consists of technical documents, describing a product, which are necessary for the manufacture, installation, maintenance, use or purchase of the product. In explicit cases – particularly in word combinations – the designation "product documentation" may be used in spite of the designation "technical product documentation".

Product Documentation according to EN 61355 respectively DIN 25002-3



NOTE: A table of drawings includes more than a list of drawings. See code number 750.

Figure 1 — Product documentation

Code number 350

Designation of Technical Documents

Code number 350

Designation of Technical Documents

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Foreword

After publishing EN 61355 and EN 81346-1 and the railway specific standards series EN 15380 (former DIN 25002), it has become necessary to revise the Code number 350 and adapt it to EN 15380 and DIN 25002-3. The former title of the Code number 350 "Numbering of drawings" had to be updated. The content of this Code number is based on EN 15380 series and DIN 25002-3.

EN 15380 *Railway applications – Designation systematic for rail vehicles*, consisting of:

- *Part 1: General*
- *Part 2: Product groups*
- *Part 3: Designation of installation sites and locations*
- *Part 4: Functions groups*

This standard series is completed by DIN 25002-3 Classification of documents.

Introduction

For the identification of functions, products and locations of rail vehicles and their components, the requirements of EN 81346-1 were considered. For the related documentation, the requirements of EN 61355 were considered.

These identifications are structured according to the following aspects:

- function-related structure (=)
- product-related structure (-)
- location-related structure (+)
- technical documentation (&)

The structures are equally valid and independent from each other. The identification is done according to the task requirements. The identification can be used in combination but also individually. It is not necessary, however, to use all possible combinations in every case.

1 Designation of Technical Documents

1.1 General

The identification is done, according to the underlying aspect, individually or as a combination of the designation blocks:

- product groups according to EN 15380-2;
- technical documentation according to DIN 25002-3(former DIN 25202-2);
- installation site / location according to EN 15380-3(former DIN 25202-4).

The extent of the technical documentation concerned is shown in Code number 300, clause 4.

1.2 Identification of products

This designation block is used for the designation of products, equipment and technical devices.

- Product group according to EN 15380-2
- Running gear -EA: the - mark is used to identify the running gear as a product.

1.3 Identification of installation sites / locations

1.3.1 Identification of the installation site

This identification block is used for the identification of the relative location. It is only necessary if vehicles are operated in a fixed train consist.

- Installation site according to EN 15380-3
- Vehicle ++: the ++ mark is used to identify the installation site of the vehicle in the train consist.

1.3.2 Identification of the location

This identification block is used for the identification of the locations of technical products (combined groups, components, equipment).

- Location according to EN 15380-3
- Running gear +72: the + mark is used to identify the location of the running gear within the vehicle.

1.4 Identification of functional assemblies

This identification block is used for the identification of functional correlations between functional assemblies in a rail vehicle; a new draft is under preparation.

- Functional assembly according to EN 15380-4
- Running gear =EA: the = mark is used to identify one of the functions of the running gear, e. g.: bearing, guiding, driving etc.

1.5 Identification of documents

The identification of documents according to DIN 25002-3 relates to the Document kind Classification Code (DCC) according to EN 61355. This DCC is independent; it may be used as such or in combination with an Object Designation (OKZ).

EXAMPLE Document design drawing of a running gear:

- EA & TB design drawing; the items shown on the constructional drawing are allocated via the OKZ.

NOTE The data of the OKZ and of the DCC should be written in separate data fields; using the same field can lead to avoidable failures.

2 Application of the identification types

2.1 General

The document number (formerly called drawing number) can be freely structured concerning form and type.

The object designation (OKZ) must always be recorded in a separate field, separated from other classifying systems. Confer to the (drafted) standards series IEC 82045 of which part 1 has been published as EN 82045-1:2002-11.

The product group may be contained in the drawing number additionally to the identification number.

NOTE This is especially applicable if the product group was designated according to DIN 25002:1988 but if the separate identification is done according to EN 15380-2.

2.2 Identification types of product groups

The object designation is used for the identification of drawings, parts lists, parts, equipment, components and related documents in addition to the identifier. The parts list generally has its own identifier. The identification number of the drawing must, in the case of different identification numbers, also be listed in the master data of the parts list and must be printed out.

a) Object designation (OKZ) and Document kind Classification Code (DCC) and identifier;
OKZ and DCC amended by non-standardised information

b) Object designation (OKZ) and Document kind Classification Code (DCC)
and a classifying drawing number

Zeichnung darf nur im CAD-System geändert werden									
Verwendbar für: BR 185.0				Tolerierung ISO 8015					
01	-	02-01-13	Gbr.	Allgemeintoleranzen: ISO 2768-c				& TB	
								-BB	
				Urspr.		Ers.f.		Ers.d.	
				Kunde		01			
						02-01			
Index	Änderungsnummer		Datum	Name					
Maßstab: 1:1	Erstellt	2000-09		Fuchs		Querträger transverse girder			
	Geprüft	2002-01-13		Klein					
	Freigegeben	2002-01-13		Mitter					
rechtlicher Eigentümer	Datum		Name						
	de/en								
1Ftl185.0.03.002.051						01		01 / 01	

c) Object Designation (OKZ) and Document kind Classification Code (DCC)
and a drawing number with the constructional assembly according to DIN 25002:1988

Figure 1 — Examples for Object designation (OKZ) and Document kind Classification Code (DCC)

2.3 Identification types of documents

This identification is used to identify Document kind Classification Codes (DCC) in order to differentiate them according to their information (e. g. circuit diagram, dimension drawing, painting instruction, parts list, drawing, etc.), not depending on which information medium the documents are stored on.

DIN 25002-3 lists the mostly used Document kind Classification Codes and the relevant document kinds according to EN 61355 for rail vehicles.

The combination of OKZ and DCC is usually used for documentations within the FSF. General documents for tender specifications etc. can also be classified without OKZ.

EXAMPLE see DIN 25002-3, Annex A, Table A.1.

Table 1 shows a selection of often used document kind classification codes.

Table 1 — Identification letters of document types for rail vehicles

A2 Main class			
		A3 Sub class	
		Document kind class	Examples of document kinds
A		Documents providing information about documentation itself	
A	B	Lists regarding information compilation	List of contents List of documents List of drawings
B		Management documents	
B	H	Documents regarding changes	Change request Change statement Change notification Change protocol
E		Technical requirements and dimensioning documents	
E	C	Technical specification / requirement documents	Outline dimensions of the vehicle Visual range from the driver's cab Test specification Technical terms of delivery Manufacturer's instructions Painting specification / Colour concept
F		Function-describing documents	
F	A	Functional overview documents	Overview command level Block diagram Diagram onboard network Braking diagram Overview for heating / ventilation / air conditioning
F	B	Flow diagrams	Process flow diagram
F	F	Function diagrams	Pneumatic / hydraulic scheme Logic-function sequence plan
F	S	Circuitry documents	Circuit diagram
F	T	Software specific documents	Program sequence plan Program description Code list Test methods
L		Location documents	
L	D	Location documents for the whole equipment	Arrangement drawing Installation drawing Reservation plan Installation instruction Attachment instruction

2.4 Identification types of locations

2.4.1 General

This designation determines the installation sites of vehicles within a train or the location of technical products (combined assemblies, components, equipment, etc.).

The location designation can never be part of the document number.

Examples: See also EN 15380-3 and Code number 300.

2.4.2 Installation site

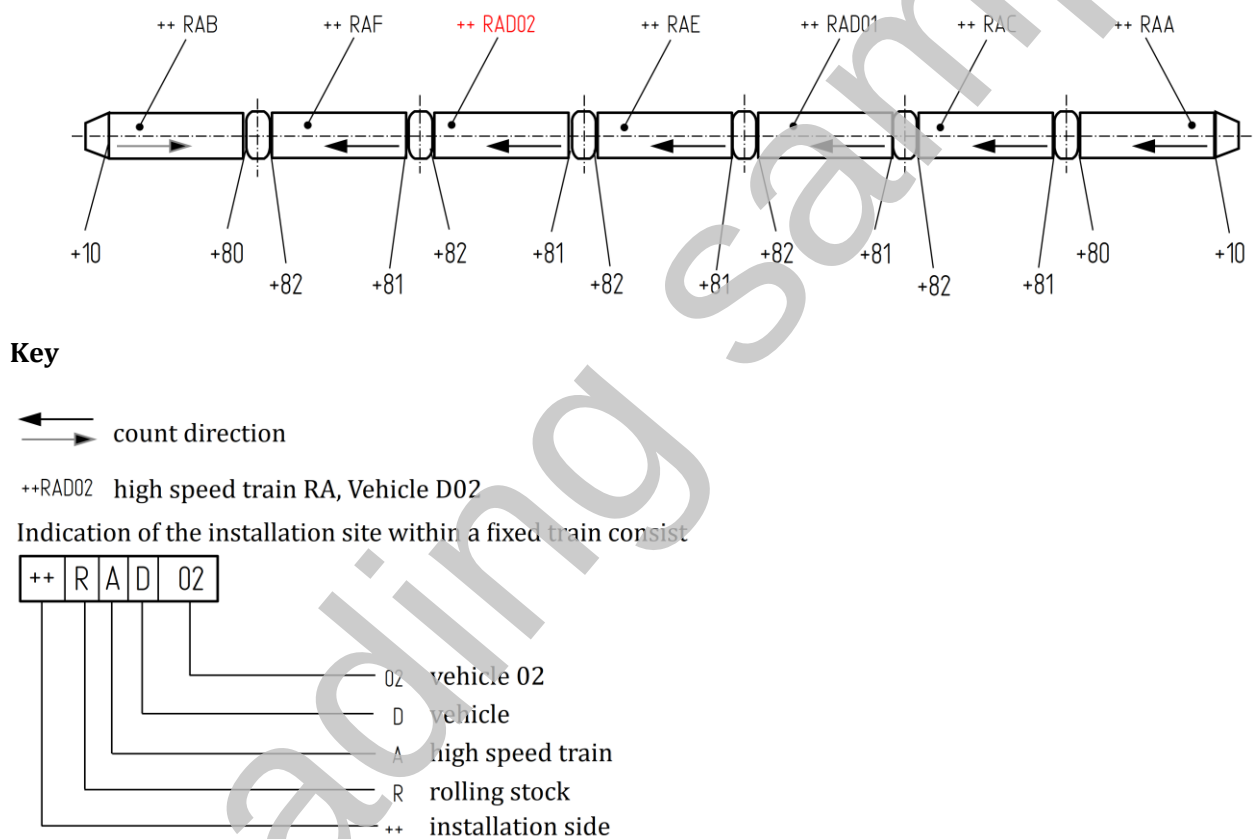


Figure 2 — Installation site - Example high speed train (ICE T)

2.4.3 Location

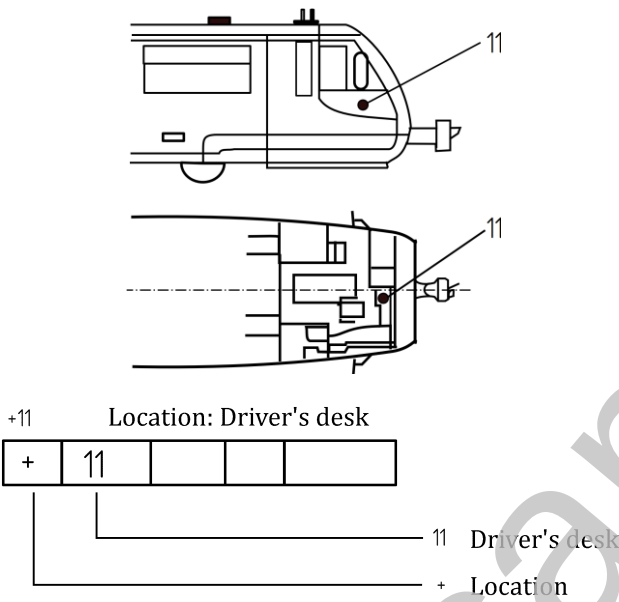


Figure 3 — Indication of location site - Example driver's desk

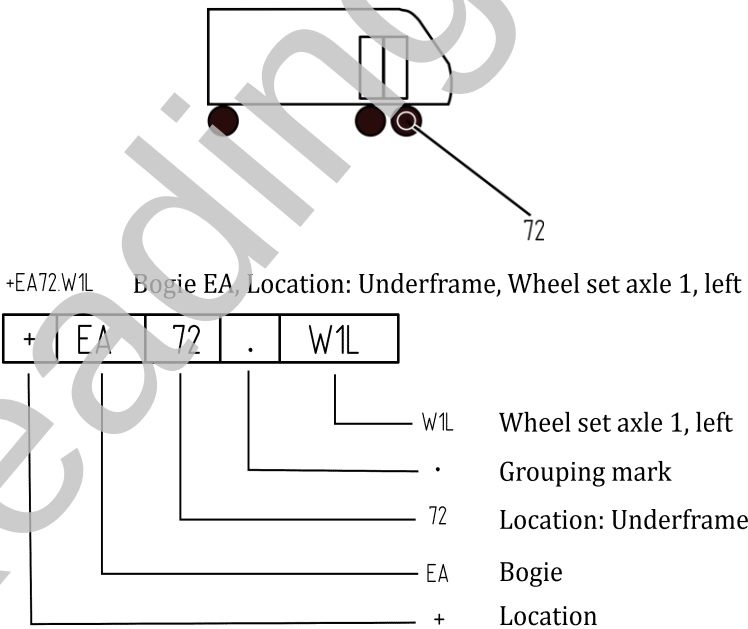


Figure 4 — Indication of location site - Example Wheel set on underframe

2.5 Identification types of functions

This identification block is used for the designation of functional connections between functional parts of a rail vehicle.

The functional designation cannot be part of the document number and can also not be used for the classification of parts.

NOTE 1 Concerning rail vehicles, the designation of functions is mostly used for the field of Reliability, Availability, Maintainability, Safety (RAMS), especially for the field data evaluation of the life cycle costs (LCC).

NOTE 2 Concerning rail vehicles, the designation of functions differs from the designation of products; both aspects must always be considered independent from each other.

2.6 Identification types of electrical/diesel multiple units, locomotives, trams, metros, etc.

Complete systems (e.g.: electrical/diesel multiple units, locomotives, trams, metros, etc.) according to EN 81346-1 cannot be designated according to EN 15380 series.

For rolling stock, the letter “R” is used as first designator (see also CLC/R 009-003:1998-04-01 *Railway applications - Guide to the specification of a guided transport system*).

DIN 25003 shall be observed for the installation types.

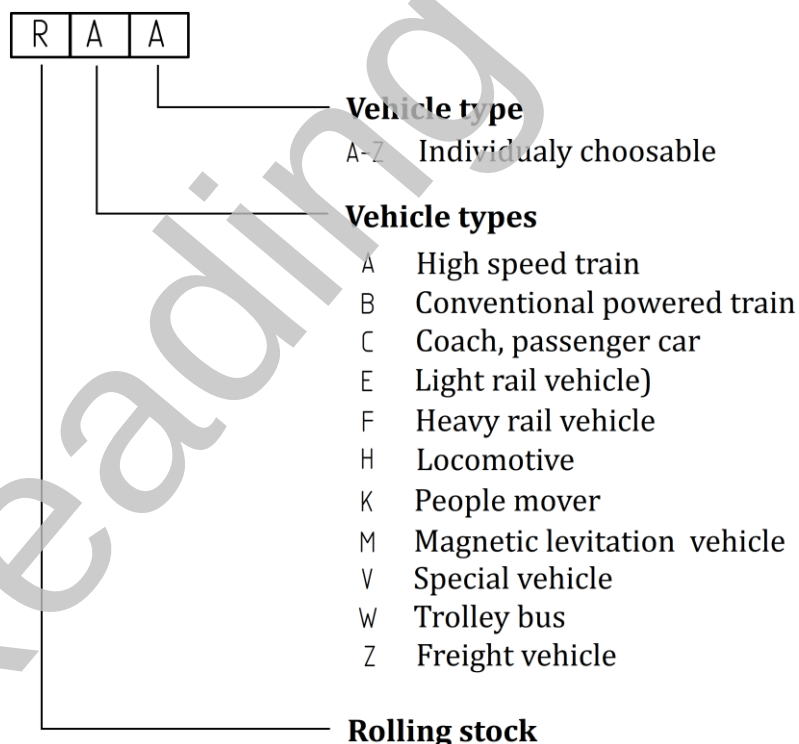


Figure 5 — Installation types - Structure of rail vehicles - Example

Annex A (informative)

Allocation of principal and secondary product assemblies to the numbering system for constructional assemblies according DIN 25002

Table A.1 allows to compare the assemblies according DIN 25002:1988 with the new product orientated structure. This is to support the transfer of old assemblies into the new structure.

The assembly "00 Technical documents" is replaced by DIN 25002-3. The assemblies "01 General layout" and "19 Vehicle Body" are not covered by the concept of the European Standards EN 81346-1 and EN 61355. The assembly "01" is mostly grouped to AA according EN 15380-1; documents are covered by DIN 25002-3.

Assembly "19" described a status of manufacturing which usually was not performed in this manner. This assembly was deleted.

Table A.1 — Allocation of product assemblies to the numbering system for constructional assemblies according DIN 25002:1988

new EN 15380-2 (DIN 25002-2:2000)			old DIN 25002:1988	
HPG	UPG	Designation	Assembly no.	Designation
B	A	Vehicle body	20	rough bodywork
	B	Underframe	03	underframe
	C	Side walls	20	rough bodywork
	D	Roof	20	rough bodywork
	E	Head of vehicle	20	rough bodywork
	F	End walls	20	rough bodywork
	G	Weld-on/ add-on parts	03	underframe
			10	steps, handles, signal-lamp brackets, signs, handrails
			12	accessory parts
			20	rough bodywork
	H	Intermediate ceilings	20	rough bodywork
	J	Structural partitions	20	rough bodywork

FSF- Guideline for drawing up technical documentation

Code number 400

Drawings

FSF- Guideline for drawing up technical documentation
Version: 34th updating

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Document language: en

Code number 400

Drawings

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Foreword

During the past decades industry has performed a thoroughgoing change from manual operation of technical documents to the use of data processing systems for the preparation and exchange of information.

For 3D representations, the specifications in accordance with ISO 16792 shall be contractually agreed.¹

The variety of international and national norms needs a focussing and simplification of their contents for the railway vehicle manufacturer and operators, especially for the data exchange.

Standards generally are cited in its general form like "EN 15380", even though the standards are officially accepted in Germany as DIN EN like "DIN EN 15380".

¹ At the time of going to press: ISO 16792, Technical product documentation - Technical product documentation – Digital product definition data practices (ISO/CD 16792:2021);

Introduction

The bulky variation possibilities of drawing preparation in accordance with valid national and international norms complicate the uniform preparation, readability and the document exchange amongst partners, manufacturers and orderers as well as joint ventures (ARGE). For simplified communication's sake the working group NA 087-00-09 AA of the Rail Vehicles Standard Committee "Fahrweg und Schienenfahrzeuge" (FSF) has reduced the number of possibilities to their absolute necessary.

The potential benefits are:

- Uniform presentation, tolerance indication and dimensioning of the drawing contents;
- Uniformed entries in the title blocks;
- As its consequence facilitation of document communication by hand and electronically.

1 Size (paper size)

In the field of railway vehicle, the sizes of series A according ISO 216 in the dimensions A4 to A0 are permitted. Elongated sizes should be avoided.

Table 1 — Elongated sizes (portrait) - in substantiate exceptions

Size height	Length
A3	A2
	(A1)
A2	A1

2 Forms and title block

2.1 Forms

Forms shall be in accordance with EN ISO 5457.

2.2 Title block

The title block according EN 15016-1 is permitted only.

The diagram illustrates the EN 15016-1 title block layout. It features a large rectangular area for drawing content, with a title block at the bottom. The title block is divided into several sections: a top section for drawing data (fields 14-29), a middle section for revision history (fields 15-17), a bottom-left section for approval signatures (fields 18-26), and a bottom-right section for drawing data (fields 1-5). A circled area labeled 'Z' highlights the fields 3, 23, 23a, 9, 10, and 4, which are part of the approval and revision history section. The title block also includes a section for drawing data (fields 14-29) and a section for drawing data (fields 1-5).

Figure 1 — Title block according EN 15016-1

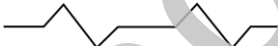
NOTE 1 The title block in accordance with EN 15016-1 shall be used for newly created drawings. For existing drawings, it is agreed that they operate in non-compliance under a variance or continuation permit even in case of their modification. In this case the use of the new title block is optional. A comparison of the title blocks according to DIN 6771 and EN 15016-1 is given in Annex C.

3.2 Lines

3.2.1 Line types and line widths

Line types and line widths, in accordance with ISO 128-20, ISO 128-24, ISO 128-25, and corresponding to Table 2.

Table 2 — Line types and line widths

Line types according ISO 128-24			Line width according ISO 5457, line width groups 0,5, for drawing sizes A4, A3, A2, A1, A0
No	Line representation Line description	Application examples	Line width in mm
01.1	 Continuous narrow line	— dimension lines, — extension lines, — leader lines and reference lines, — hatching, — outlines of revolved sections, — thread ground ... Figured application examples in ISO 128-22, ISO 128-40, ISO 128-50, ISO 129, ISO 3040, ISO 6410-1	0,25
01.1	 freehand line, narrow	— preferably manually represented termination of partial or interrupted views and — cuts and sections, if the limit is not a line of symmetry or a centre line	—
01.1	 Zigzag line, narrow	— mechanically represented termination of partial or interrupted views and — cuts and sections, if the limit is not a line of symmetry or a centre line	—
01.2	 Continuous line, wide	— visible edges, — visible outlines Figured application examples in ISO 128-24, ISO 128-30, ISO 128-40, ISO 5261, ISO 6410-1, ISO 10135	0,5
02.1	 Dashed line, narrow	— hidden edges, — hidden outlines Figured application examples in ISO 128-30	0,25

3.4.6.2 Copyright

The designation shall be in accordance with ISO 16016.

Exploitation rights shall be indicated. It is entered on the left drawing margin in the area C/D outside the drawing space.

3.4.6.3 Exploitation rights

In agreement between orderer and contractor, the exploitation right is entered in a vertical position outside the drawing space at the left margin.

3.4.6.4 Legal ownership

The name of the legal owner shall be entered into the title block.

4 Entries in the title block

4.1 Description of the title block

The numbers of the drawing title blocks refer to Figure 3 (see also Figure 1 and Figure 2).

The image shows a technical drawing template for a drawing sheet. It includes a title block with fields for Index, Revision Index, Date, and Name. There is a section for Tolerance ISO 8015 General Tolerances, a section for Prepared, Checked, and Approved signatures, and a section for Date and Name. The drawing area is a large rectangle with a dashed border. A watermark 'Drawing' is visible across the center.

Numbered callouts (1-29) identify specific features and fields:

- 1: Drawing area (dashed border)
- 2: Large rectangular area for drawing
- 3: Index field
- 3a: Revision Index field
- 4: Date field
- 5: Name field
- 6: Prepared field
- 7: Checked field
- 8: Approved field
- 9: Date field
- 10: Name field
- 11: Tolerance ISO 8015 General Tolerances
- 12: Tolerance ISO 8015 General Tolerances
- 13: Tolerance ISO 8015 General Tolerances
- 14: Tolerance ISO 8015 General Tolerances
- 15: Tolerance ISO 8015 General Tolerances
- 16: Tolerance ISO 8015 General Tolerances
- 17: Tolerance ISO 8015 General Tolerances
- 18: Tolerance ISO 8015 General Tolerances
- 19: Tolerance ISO 8015 General Tolerances
- 20: Tolerance ISO 8015 General Tolerances
- 21: Tolerance ISO 8015 General Tolerances
- 22: Tolerance ISO 8015 General Tolerances
- 23: Tolerance ISO 8015 General Tolerances
- 23a: Tolerance ISO 8015 General Tolerances
- 24: Tolerance ISO 8015 General Tolerances
- 25: Tolerance ISO 8015 General Tolerances
- 26: Tolerance ISO 8015 General Tolerances
- 27: Tolerance ISO 8015 General Tolerances
- 28: Tolerance ISO 8015 General Tolerances
- 29: Tolerance ISO 8015 General Tolerances

Figure 3 — Fields of the title block

A CAD indication close to the title block is permitted.

4.1.1 Field 1: Drawing identification number

The drawing identification number, as determined by the owner of the property, shall be placed in this field. For sequential sheets the inscriptions are to be taken over unaltered from the main sheet.

4.1.2 Field 2: Title, description

The title of the drawing shall describe the object shown in function (for example: designation of the item or assembly depicted). It shall always be in the singular independent of the quantity. The designation shall not exceed two lines.

The item designation should be chosen according to its kind and/or shape as defined.

It shall always be in the singular independent of the quantity.

For each language there are two lines = 50 positions available.

4.1.3 Field 3 (3a): Revision index

4.1.3.1 Field 3: Revision index

For any revision of a drawing, the revision index shall be entered. For further details see EN 15016-3.

At each revision in a drawing the revision index will be entered in an alphabetical order starting from the top with A - the letters "I" and "O" may not be used - and short explanations or entering the revision notification number (see also Code Number 650) with date and name. If all available lines are filled the upper lines are to be arranged to be free for further entries. The earlier entries are separated against the latest entry by an empty line.

Continuation pages see sub-clause 4.1.1

NOTE: See also Code 450, paragraph 6.1).

4.1.3.2 Field 3a: Revision index

The piece of data of the revision index in this field has to correspond with the current revision index in field 3 (on the left next to field 23).

4.1.4 Field 4: Name of the legal owner of the drawing

The name of the legal owner of the drawing (firm, company, enterprise, etc.) may be the official owner's name, an abridged trade name or an emblem.

4.1.5 Field 5: Sheet number / number of sheets

Sheet number: indicates the relevant sheet number.

number of sheets: indicates the total number of sheets of the drawing.

In general, the entry is minimum 2 digits long, e. g. 01, 02. For single sheets the entry is 01 for sheet and 01 for sheets. This information is valid for fields Field 1 and Field 19.

4.1.28 Field 28: Responsible company site

Name of the responsible company site for design and approval.

4.1.29 Field 29: Responsible company department

Name or code of the company/department responsible for the design of the drawing.

4.2 Font sizes

The font sizes shall be chosen according Table 4.

Table 4 — Font sizes according EN 15016-1 (excerpt)

No. ^a	Field	Size of characters (ISO 3098-1 and ISO 3098-2) ^{b, c}
1	Drawing identification number	5 N
2	Main title, subtitle 2 lines per language	5 S
3	Revision index	2,5 N
3a	Revision index	3,5 N
4	The name of the legal owner of the drawing	undefined
5	Sheet number /number of sheets	3,5 N
6	Dates prepared, checked and approved (company responsible)	2,5 S
7	Names prep/, check/ app. of those who prepared, checked and approved	2,5 S or individual handwriting
8	Language code(s)	2,5 N
9	Symbol of presentation method	—
10	Scale	3,5 N
11	Dimensions without tolerance indication	2,5 N
12	Document kind classification code	2,5 N
13	Classification objects / codes class	2,5 S
14	Weight	2,5 S
15	Material, semi-finished parts	2,5 N
16	Replacement for	2,5 S
17	Replaced by	2,5 S
18	Name and / or logo customer	undefined

No. ^a	Field	Size of characters (ISO 3098-1 and ISO 3098-2) ^{b, c}
19	Customer's reference number	2,5 S
20	Customer revision index	2,5 N
21	Parts list yes or no	2,5 N
22	Geometrical tolerances	2,5 N
23	Revision detail information	2,5 N
24	Based on	2,5 S
25	Application	2,5 N
26	Approved by customer	undefined
27	Size	2,5 S
28	Responsible site	2,5 S
29	Responsible company department	2,5 S
a Refers to field number in Table A.1 b The indicated sizes of characters refer to series b given in Table 1. c N refers to lettering type B vertical, S refers to lettering type A vertical.		

5 Details

5.1 Permitted simplified presentations of threads according ISO 6410-3

Examples of simplified presentations of threads according ISO 6410-3.

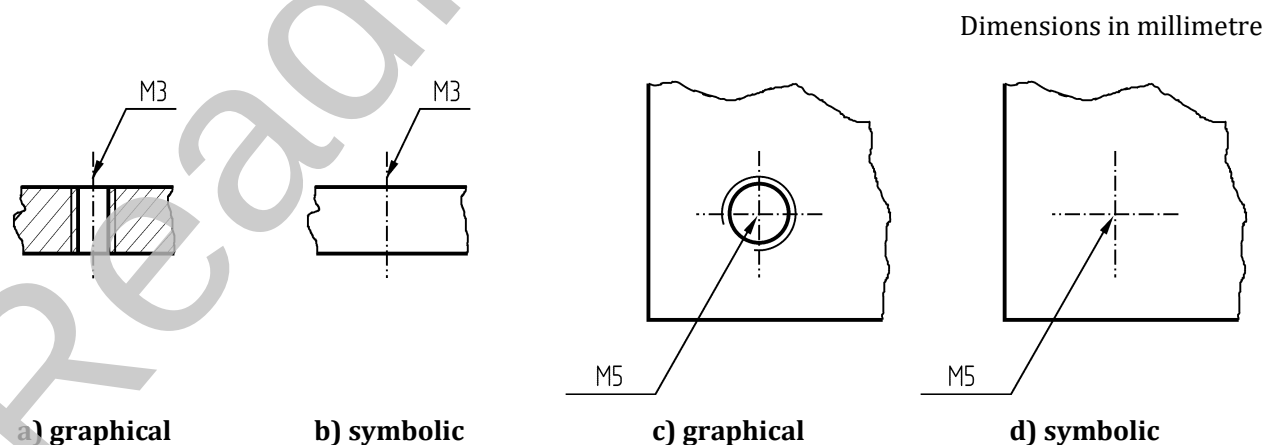


Figure 4 — Examples of simplified presentations of threads according ISO 6410-3

5.2 Dimensioning and presentation rules according DIN 406

5.2.1 General

The standards DIN 406-10 to DIN 406-12 show the rules for dimensioning and presentation in technical drawings. These rules widely follow the rules according ISO 129-1.

5.2.2 Permitted dimensioning

5.2.2.1 General

For application area of FSF the following restrictions are defined in case of provided several possibilities.

5.2.2.2 Permitted arrows

From the variants in DIN 406-10, 3.2.1 it is allowed:

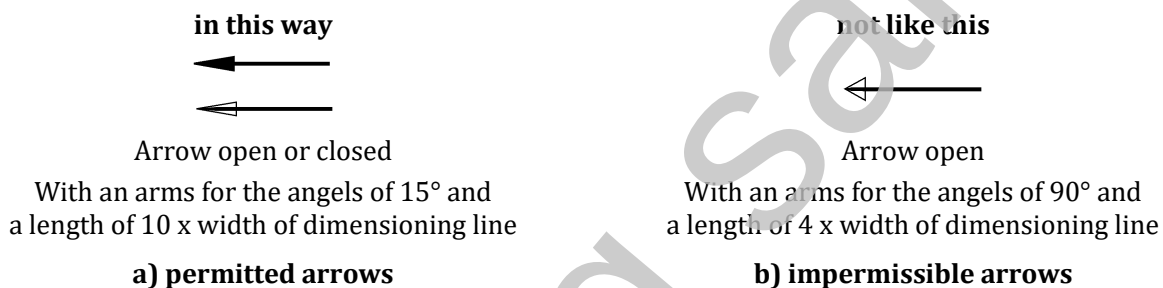


Figure 5 — Arrows

5.2.3 Permitted presentations

5.2.3.1 Dimension line termination

Termination according DIN 406-11, clause 3.4

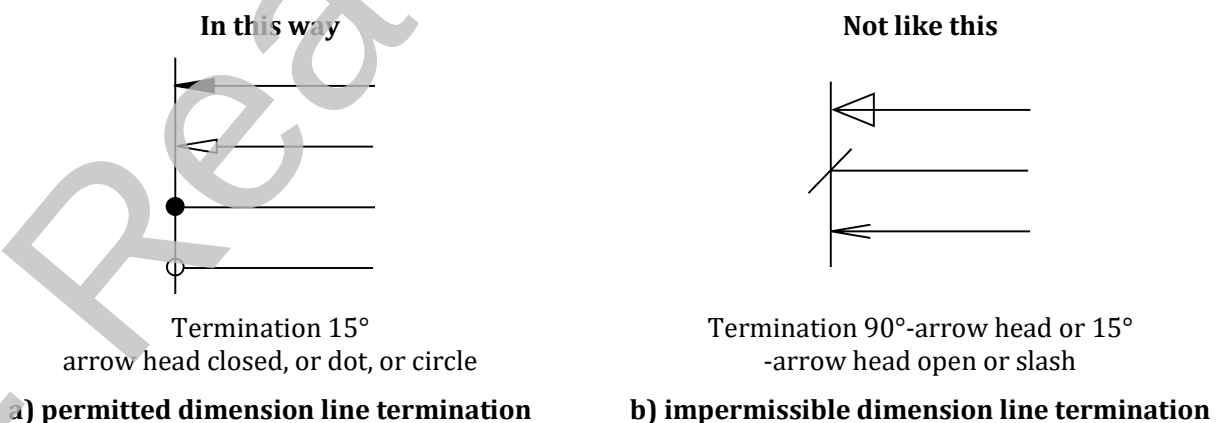


Figure 6 — Dimension line termination

5.2.3.2 Dimension lines

Dimension lines according DIN 406-11.

Deviating from DIN 406-11, 3.4, Figure 27, closely located lines do not have to be interrupted (see Figure 7b)).

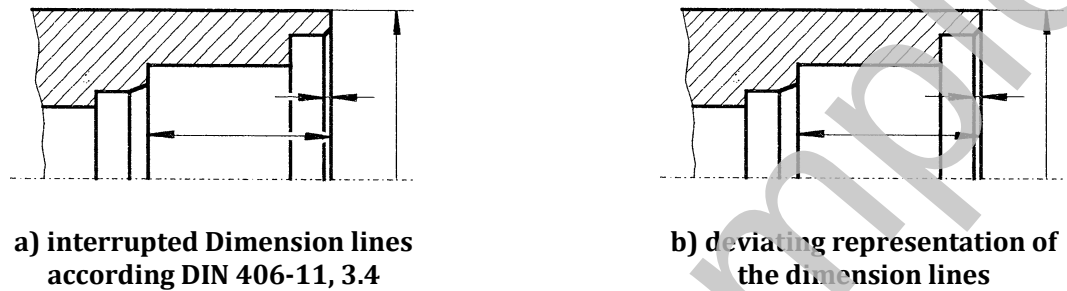


Figure 7 — Dimension lines DIN 406-11,3.4

5.2.4 Dimension values

5.2.4.1 Entry of dimension values (methods 1 and 2)

The difference between method 1 and method 2 according DIN 406-11 clause 3.5.2 is the main reading position of the dimension values.

Method 1 defines the reading position from the bottom and from the right - only this method is permitted (see Figure 8a)).

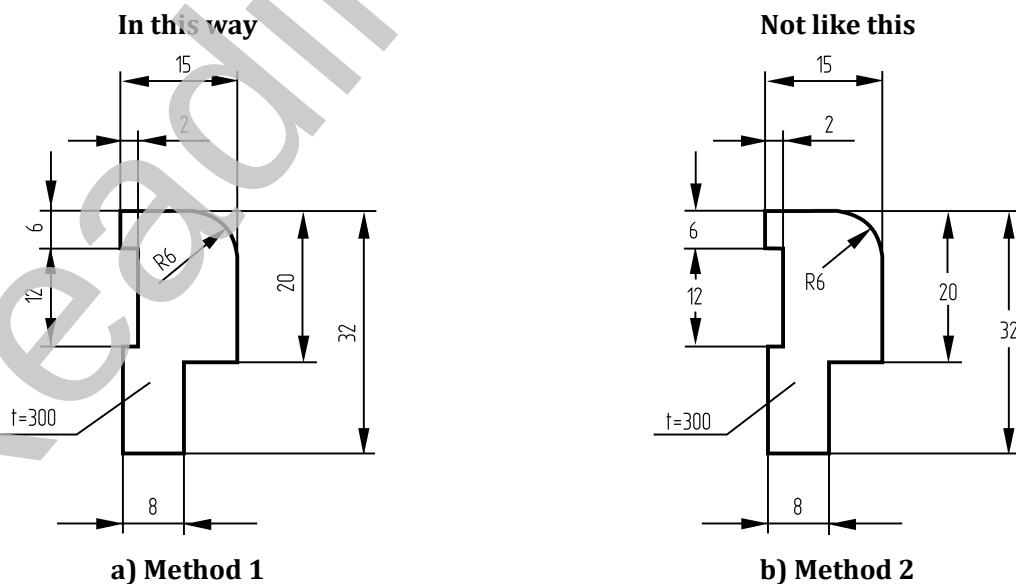


Figure 8 — Entry of dimension values

5.2.5.1.2 Deviation values

Together with the nominal dimension values the limit deviation values are inscribed.

Limit dimension values indicating maximum dimension and minimum dimension must not be used in the application area of FSF.



Figure 12 — Deviation values

5.2.5.2 Inscription of tolerances of together joined parts

In the application area of FSF, only the left illustration (Figure 13a)) with position no. and the dimensions above the dimension auxiliary line is permissible from the following illustrations.

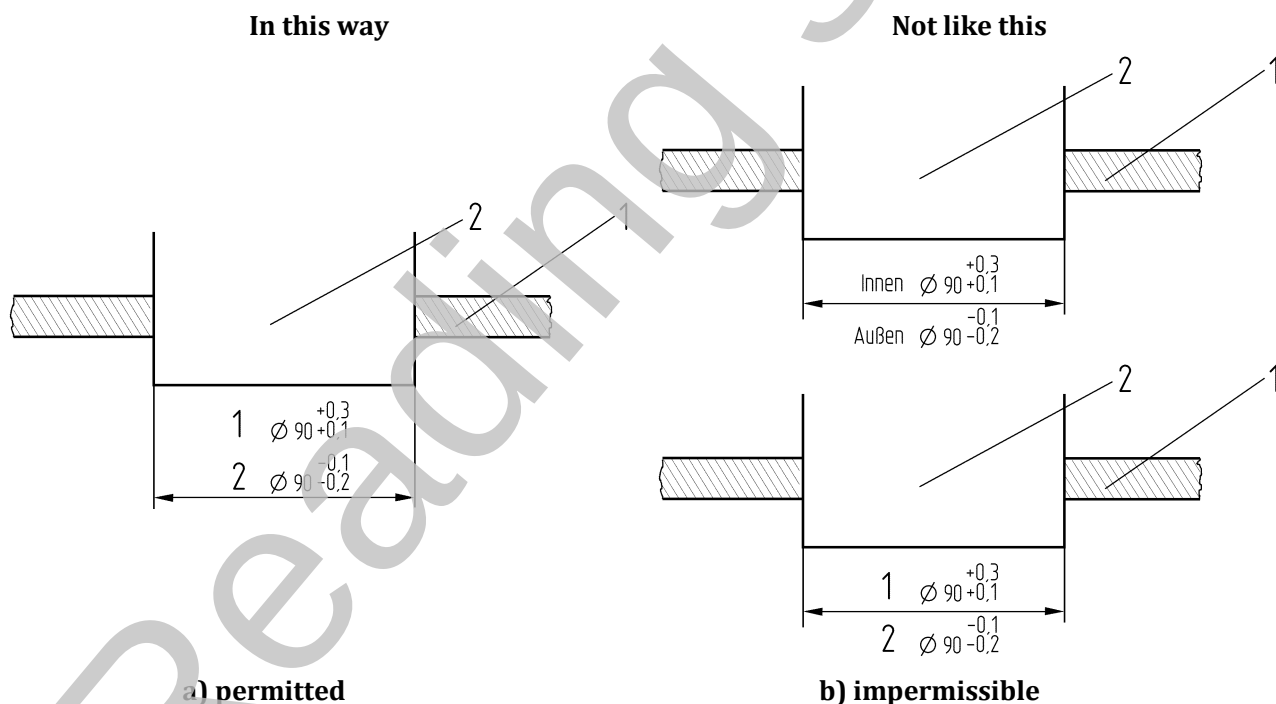


Figure 13 — Inscription of tolerances of together joined parts

5.2.5.3 Inscription of tolerances of angular dimensions

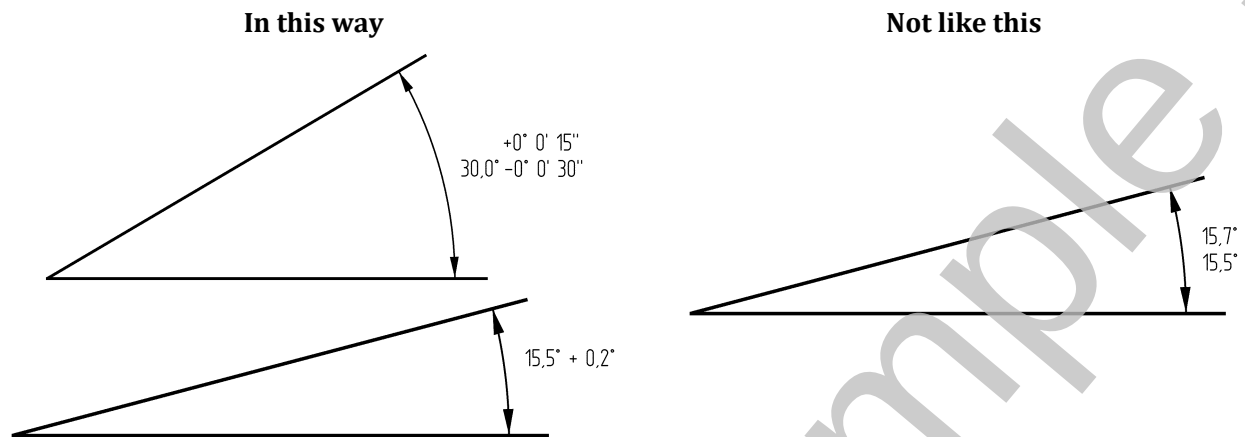


Figure 14 — Inscription of tolerances of angular dimensions

5.3 Indication of surface texture

5.3.1 Commitments for railway applications - Extract and explanations to EN ISO 1302

5.3.1.1 Basic graphical symbol



Figure 15 — Basic graphical symbol

The Basic graphical symbol should not be used without any complementary information.

NOTE: ISO 1302 was withdrawn with replacement in 2021. ISO 21920-1 is the replacement for ISO 1302 and redefines the basic symbol, see Annex D. The graphical symbols according ISO 1302 may be used with reference to the last valid version, example: ISO 1302:2002.

5.3.1.2 Expanded graphical symbols and indications in written text

Table 5 — Expanded graphical symbols and indications in written text

Indication on Drawings	Indication in written text	
	APA	Any Process Allowed
	MRR	Material Removal Required
	NMR	No Material Removed

5.4.2 Pipes, general

Pipes may be drawn in simplified manner with a continuous wide line of 0,5 mm width.

The necessary views shall be shown according ISO 128-30, projection method 1 (former method E).

It is not necessary to be in scale.

Dimensioning shall be given according DIN 406-11.

The presentation and dimensioning of the pipe start at a pipe end with point 1 and the coordinates:

— $X1=0$;

— $Y1=0$;

— $Z1=0$.

The individual points the pipe orientation changes are given a consecutive number 2, 3, 4... as well as pipe end.

The coordinates may be of positive and negative values.

Each pipe shall be created on a separate drawing.

If an allowance (adaptation allowance respectively manufacturing allowance) is necessary either at one end or both ends of the pipe it shall be covered by the manufacturing dimension (see subclause 5.5.4)

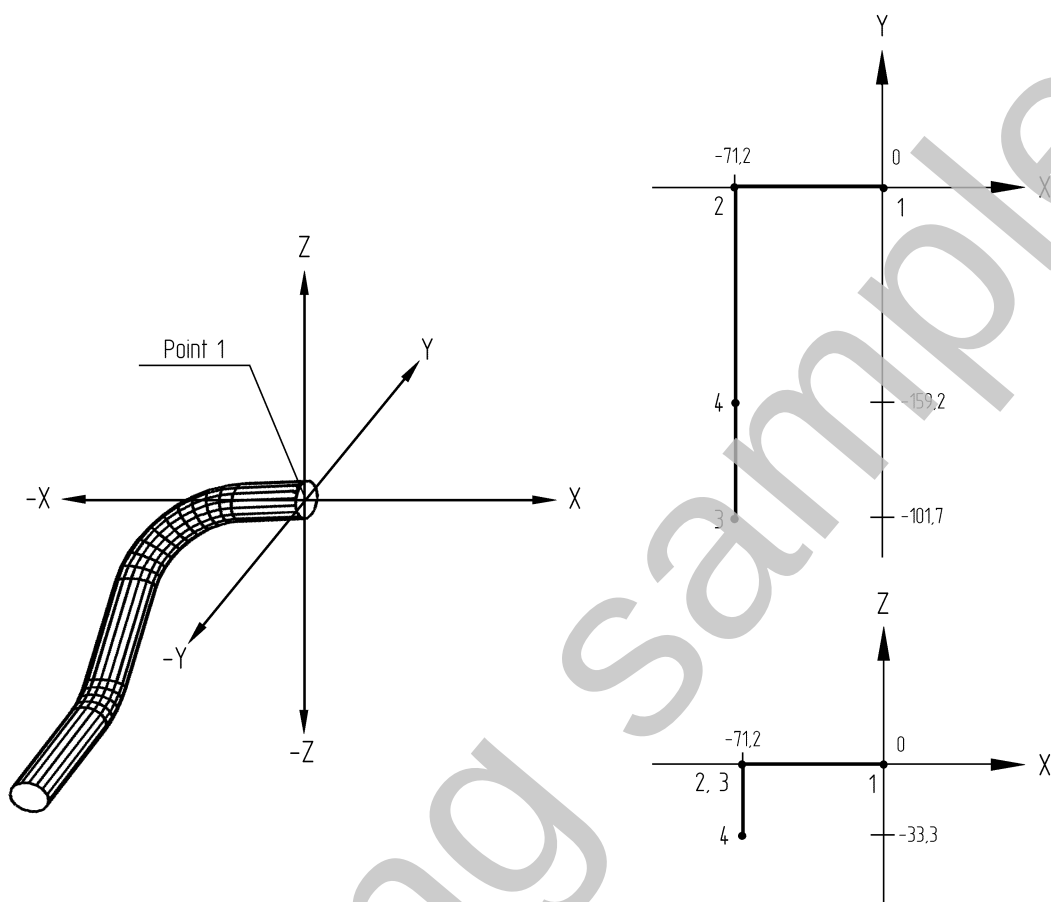
Manufacturing information like bend radii, thread descriptions allowance etc. shall be given above the table, see subclause 5.5.5.

5.4.3 Table form

Pattern: Line spacing (a) x character spacing (b): 4,23 mm x 2,54 mm according ISO 4882.

Pipe $\varnothing$	①	P1	2	3	4	5	6	7	8	9	10	11	12	5 x 1,5 a
Pipe thread	②	x 0												
Allowance (included)	P1	③ y 0				⑤								
	Pipe end	z 0												
Bend radius "R" DIN 25570	④				④a									
4 b 2 b 7 b 4 b														

5.4.5.3 Example 3



Exact shape and length shall determined on the 1 st wagon										cutting length: 221,7 mm			
The points of the pipe bends correspond to the intersection points of the pipe centre.													
Pipe Ø	18 x 1,5	P1	2	3	4	5	6	7	8	9	10	11	12
Pipe thread		x	0	-71,2	-71,2	-71,2	-	-					
Allowance (included)	P1	y	0	0	-101,7	-159,2	-	-					
	Pipe end	z	0	0	0	-33,3	-	-					
Bend radius "R" DIN 25570	40			40	40	-	-	-					

Figure 37 — Example 3 - 3D-presentation and simplified presentation of pipes with table form (according to ISO 4882)

Annex A

(informative)

Conforming to standards preparation of drawings by machining, according to FSF-Guideline, code number 400

The Figure A.1 shows the conforming to standards preparation of drawings by machining, according to FSF-Guideline, code number 400.

Only one variant of the change mark is allowed (see code number 650):

— Marking with arrow

or

— Marking with circle (and additional letters).

For illustration, both options are represented in the drawing (Figure A.1).

The text blocks arranged outside the drawing frame on Figure A.1 provide more detailed explanations in the corresponding clauses of the FSF-Guideline.



Annex B

(normative)

Text on Drawings

B.1 General

EN 15016-1, clause 4.3.1.4 recommends to avoid text on drawings because it is language specific. If deemed to be unavoidable, it should be kept as brief as possible. The following clauses provide ways to realize this requirement with the aim to prepare documents as neutral as possible with regards to multiple use in different contracts.

These recommendations are applicable to other technical documents than drawings as well.

The application of the following recommendations and the choice of way of its realization is within the drawing creator's discretion.

B.2 Drawings without wording in the drawing space

B.2.1 General

The following options are identified for alternatives for indicating of text on drawings.

B.2.2 Specification

The texts are prepared in a separate document and associated to the material like a specification.

A useful term respectively an incisive description shall be chosen.

Advantage of handling of a separate document: In case of an amendment only the text and the item reference get a new revision index.

B.2.3 Parts list item reference number (text document)

In place of the text on the drawing an item reference is given which is listed in the parts list as item reference number. This parts list item reference number a document is aligned to which shows the text information referring to this item reference.

The advantage of this procedure is the possibility to update the text document at any time i.e. for a new language version, without the necessity to revise the drawing or parts list.

B.2.4 Parts list item reference number (item reference number text)

In place of the text on the drawing an item reference is given which is listed in the parts list as item reference number. This item reference number text / full text is aligned on the parts list.

In case of an amendment of the text the parts list has to be revised only.

$\langle xx \rangle$ = see additional document / siehe zusätzliches Dokument

a) Language en / de

$\langle xy \rangle$ = see additional document / voir le document supplémentaire

b) Language en / fr

Figure B.4 — System depended alternative note to "common indication" as collective indication

A change both concerning the place of the marking and text contents within the range of the explanations must lead for a version increase of the drawing.

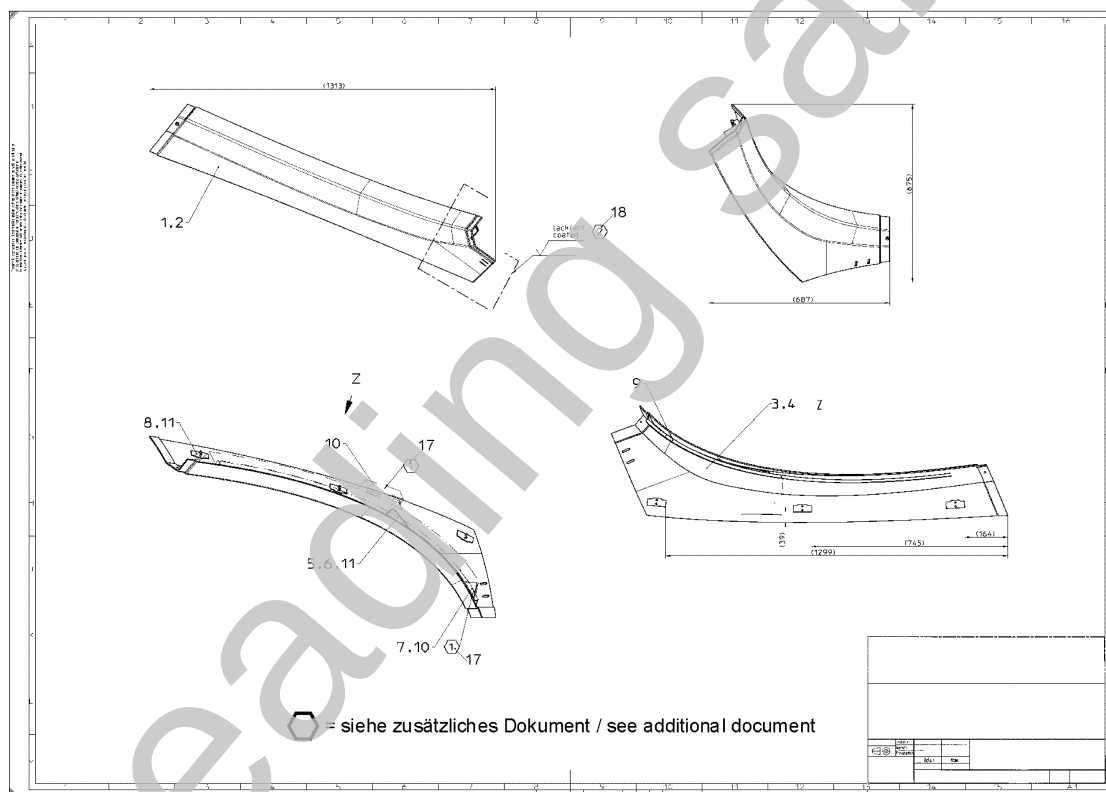


Figure B.5 — Example for the application of the symbol "common indication" in combination with an item reference

Figure B.5 shows an example for the application of the symbol "common indication" in combination with a leader line and item reference joined to the relevant item. Item reference number 17 in the parts list refers to a document which comprises specific prescriptions/ instructions related to the indicated area on the drawing.

NOTE 1 Item reference number 18 in the parts list also may refer to the same document as item reference number 17. In this case, the separate document would show 2 symbols "common indication" which contain the numerals 1 and 2. An example for such a collection of references is shown in Figure B.4.

Document creator (company) / Dokumentenersteller

“Waste water piping, in coach, AB”

„Rohrverlegung Abwasser im Wagen, AB“

- 1 Isolation plate pos. 4,7,9 cross over bonded
- 1 Dämmplatte Pos. 4,7,9 überlappend verkleben
- 2 Cut the isolation during montage and set that into position
- 2 Die Isolierung bei der Montage zuschneiden und anpassen
- 3 All seam bond with glue 520 pos. 11
- 3 Alle Nähte mit Kleber 520 Pos. 11 verkleben
- 4 Pos. 12 threat all dirty pipe surfaces by cleaner
- 4 Pos. 12 Reiniger zur Säuberung verschmutzter Rohroberflächen
- 5 According fire safety requirement must be bonded Arma Chek S pos. 13 over whole surface.
Also bond this isolation over holder clamps.
Whole seam fixed with bonding band Arma Chek S pos. 14!
- 5 Aus Brandschutztechnischen Gründen ist folgende Maßnahme zwingend erforderlich!
Nach der Isolation ist die Rohrleitungsisolierung an der gesamten Oberfläche mit Arma Chek S Pos. 13 Beschichtungsmaterial zu überkleben.
Beschichtungsmaterial bis über die Schellen ziehen.
Alle Nahtstellen des Arma Chek S Beschichtungsmateriales sind nach dem Aufkleben mit Arma Chek S band Pos. 14 zu fixieren.
- 6 Pos. 2 and 3 hot band bonds over the pipe clamps.
- 6 Pos.2 und 3 Heizband über Halterungsschelle verklebt.

Annex C

(informative)

Comparison of title block according to DIN 6771 and EN 15016-1

C.1 Background

The structure of the title block according to EN 15016-1 is determined by the requirements of ISO 7200, according to which there are three categories of liability for data in document heads. These are the minimum normative data for unambiguous identification of the document, the supplementary informative part and the part containing information whose communication is recommended.

As an additional European requirement, all language-dependent information had to be entered in two languages in order, for example, to comply with Belgian legislation.

C.2 The differences

The following table C.1 shows the differences between the old text block according to DIN 6771 and the new text block according to EN 15016-1 (the free space above the text block is normatively defined in EN 15016-1, which is why the dimensions of the text blocks appear different). Some fields have been renamed, but their meaning and the entry are retained.

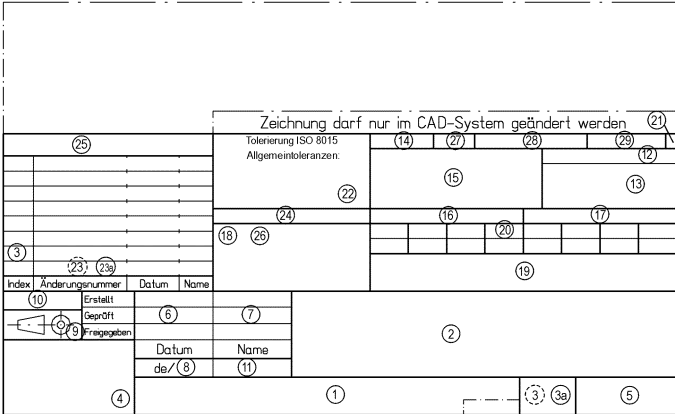
Fields for the entry of classification systems according to EN 81346, EN 15380 (previously DIN 25002-1, DIN 25002-2, DIN 25002-4) and EN 61355 or DIN 25002-3 have been added.

In EN 15016-1, the field for the entry of the change index has been changed.

Here the previous fields "Change", "Date", "Name" have been merged into one large field in order to be able to make long automatic entries according to ISO 13584 (manufacturer code). However, it is permitted to enter changes in the previously known form.

Due to the page size, the following Table C.1 is not marked above the table. Complete designation of Table C.1:

Table C.1 — Comparison of text block according to DIN 6771 and EN 15016-1

Title block		Field No.		field description
		new	old	
		1	12	Drawing identification number
		2	10	Main title, subtitle
		not applicable	–	Field "Surface finishes DIN ISO 1302"
		3	7 (partly)	Revision index
		3a	neu	Revision index
		4	11	Name of the legal owner of the drawing
		5	13	Sheet no./number of sheets
		6	8a	Creation, check and approval date (responsible company)
		7	9a	Name of the originator, inspector and approval holder
		8	new	Language code
		9	3	Symbol of the presentation method
		10	4	Scale
		11	new	Dimensions without tolerance specification
		12	new	Document type code
		13	new	Reference identifier
		14	5	weight
		15	6	Material, semi-finished product
		16	15a	Replacement for
		17	15b	Replaced by
		18	17	Name and / or logo of the customer
		19	18	Customer reference number
		20	18a	Customer change index (date entry: -YYMM)
		21	new	Parts list yes or no
		22	2	Geometric tolerances
		23	7 (partly)	Change notification number
		23a	–	Change notification number, date, name
		24	14	Based on (Origin)
		25	1	Application
		26	17	Approved by the customer
		27	new	Size (Format)
		28	new	Responsible company area
		29	new	Responsible company department
		not applicable	8	(Special notes of the drawing producer)
		not applicable	9	(Special notes of the drawing producer)

a) new title block

b) old title block

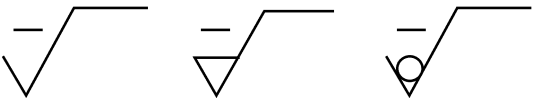
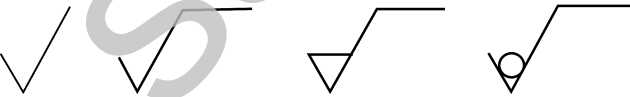
Annex D (informative)

Comparison of symbols ISO 1302:2002 and ISO 21920-1:2021

D.1 General

ISO 1302:2002 was withdrawn with replacement in 2021. The successor document is ISO 21920-1:2021. Table D.1 is a brief comparison of the two standards.

Table D.1 Comparison of symbols ISO 1302:2002 and ISO 21920-1:2021

ISO 21920-1:2021	ISO 1302:2002
A bar is added to the complete graphic symbol:  New specification elements can be specified if different from the default: a) Profile F- operator element, method and nesting index; b) Method of profile extraction; c) Profile direction; d) Symbol "OR(n)" for other requirements; e) Symbol "T16%" to specify the use of the 16 %-tolerance acceptance rule; f) Symbol "Tmed" to specify the use of the median tolerance acceptance rule; g) Most of the parameters are based on the evaluation length (except section length parameters); h) the setting class (<i>Scn</i>) can be specified; i) the section length can be different from the profile L-filter nesting index (cut-off wavelength)	The bar is missing in the symbols according to ISO 1302.  a) Not defined; b) Not defined; c) Not defined; d) Not defined; e) No symbol defined; default is the 16 %-rule; f) Not defined; g) All parameters were based on the sampling length; h) Not defined; i) General: General sampling length = cut-off wavelength.
Restrictive specifications are defined (see ISO 21920-1:2021, 9.2).	Not defined;

Code number 450

Parts lists

Code number 450

Parts lists

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Introduction

This code specifies the design parts list and describes the basic principles, its structure and the minimum requirements of a design parts list.

It eases the uniform preparation, readability and the document exchange amongst partners, manufacturers and orderers as well as joint ventures (ARGE).

The code applies throughout the total life span of the parts list.

NOTE 1 For existing parts lists it is agreed that they operate in non-compliance under a variance or continuation permit even in case of their modification. In this case the use of the new form is optional.

NOTE 2 For vehicles to be built in following orders or to be alternated respectively vehicle families the documents may show the primary layout. For details it is referred to former issues of code 450.

NOTE 3 If a different transition period will be defined in EN 15016-2 this is valid. For existent parts lists, also modifications, there is a right of continuance. In this case the application of new form is optional.

Standards generally are cited in its general form like "EN 15380-2", even though the standards are officially accepted in Germany as DIN EN like "DIN EN 15380-2".

1 Forms

1.1 General

In the field of railway vehicle, the forms according to EN 15016-2 are permitted. Separate parts list shall be of the dimension A4 in accordance with EN ISO 216 Serie A. It shall be printed on white paper with a minimum weight of 70 g/m². Other paper qualities should be agreed by the orderer.

1.2 Intellectual property

Intellectual property is protected by protection rights. The designation shall be in accordance with ISO 16016. Protection rights should be indicated at an appropriate place outside the title block and/or inside the parts list field.

1.3 Protection rights, exploitation rights and copy right

Exploitation rights shall be indicated. The name of the legal owner or creator shall be entered into the title block. If necessary, the indication of existing exploitation rights should be indicated at an appropriate place outside the parts list frame. Details of exploitation rights shall be entered inside the parts list field.

2 Parts list layout

2.1 Data fields

Columns according to EN 15016-2.

Each parts list line has 4 printing lines. The parts list lines and columns are separated from each other by a continuous line.

297

112 x 2,54

Property rights according ISO 16016

Item No.	Quantity	Unit	Title, designation Name of item	Item number Standard code	Material Technical data	Mass (kg)	Remark

Prepared:

Checked:

Approved:

Date

Name

DCC

P

T

P

T

p / n

Index

~9

32 x 4,23

210

9 x 4,23

10

Figure 1 — Parts list form

2.2 Title block

A title block according to EN 15016-2, intended for taking the necessary headings for identification and use, shall appear on all parts lists.

2.3 Inscription

For microcopying and scanning suitability separate parts lists shall be printed with lettering having height between 2,3 mm and 2,6 mm and a width of 2,5 mm to ensure microcopying and scanning legibility. The inscriptions should be done in font type “courier” in font size 11.

The line and character spacing shall be in accordance with ISO 4882.

3 Data fields

The item numbers on parts list data fields of Figure 2 refers to the parts list data fields of Table 1.

Item No.	Quantity	Unit	Title, designation Name of item	Item number Standard code	Material Technical data	Mass (kg)	Remark
①	②	③	④	⑤	⑥	⑦	⑧

Figure 2 — Parts list data fields - Section of Figure 1

Table 1 — data field

Column	Column text	Character type	Text alignment	Language dependency
1	Item number	alphanumeric	right	no
2	Quantity, number of pieces	alphanumeric	right	no
3	Unit	alphanumeric	centre	no
4	Title, designation Name of item	alphanumeric	left	yes
5	Item number, Standard code	alphanumeric	left	no
6	Material Technical data	alphanumeric	left	yes
7	Mass [kg] (Unit)	numerical	centre	no
8	Remark	alphanumeric	left	yes

4 Entries into the data fields

4.1 General

The parts list according to EN 15016-2 is described top down.

First it has to be listed the product as it is designated in the title block of the parts list without item reference number. Drawings and other documents (e. g. check instructions, circuit diagrams, etc.) have to be entered immediately under these entries.

These entries are followed by the dedicated positions with ascending number.

Identical parts shown in the same assembly should have the same position number.

When assigning item numbers, it is best to consider the order of assembly or the grouping of components according to their valence.

If possible, standard parts and welding specifications should be placed at the end of the parts list.

If drawings and other documents for a position (e.g. check instructions, circuit diagrams ...) are to be entered, they must follow immediately after the corresponding position.

In addition to material items, document items and text items are permitted in this specific order (see also Code number 400, Annex B.2.3).

For entry examples see Annex A.

4.2 Description of the data fields

4.2.1 Column 1: Item reference (Item No)

The item reference is a number which is added as a serial characteristic to objects listed in parts lists and shown on drawings. The reference number shall be rising graded.

According to ISO 6433 alpha- numerical Item references -especially for the electro-mechanical purposes- are allowed.

If a revision causes an item has to be removed from a parts list, the remaining items retain their numbers, thus reducing the need to revise the drawing and other associated documentation.

The field "Item reference" may be left empty in the parts list section for a single part.

For appropriate drawings and other documents which are indicated immediately under the item the item reference number remains empty.

4.2.2 Column 2: Quantity, number of pieces

This column shows the total number of that particular item necessary for one complete assembly (see ISO 7573).

For appropriate drawings and other documents which are indicated immediately under the item a capital cross (letter X) shall be entered.

If the product at the very beginning of the list is listed without item reference number, in the column "Quantity" may be entered a capital cross (letter X) or the required quantity.

For text and documentation items it is not necessary to indicate quantities.

4.2.3 Unit (Column 3) and their spelling

4.2.3.1 Column 3: Unit

This refers to the unit of measure for the quantity. The SI units according to ISO 80000-1 including their multiples shall be used.

For appropriate drawings and other documents indicated directly after the item number it is not necessary to indicate the unit.

For text and documentation items it is not necessary to indicate quantities.

4.2.3.2 Most common units and their spelling

Table 2 — Most common units and their spelling

Unit	common notation	also accepted capital notation
part	pc	PC
millimeter	mm	MM
meter	m	M
square meter	m ²	M ²
litres	l	L
cubic meter	m ³	M ³
gram	g	G
kilogram	kg	KG
ton	t	T

Annex A (informative)

Examples for parts list entries

A.1 Parts list - Entries on parts list form

The Figure A.1 shown the parts list entries on the part list form and Figure A.2 shows the entries on the title block of the parts list form.

Property rights according ISO 16016							
Item No.	Quantity	Unit	Title, designation Name of item	Item number Standard code	Material Technical data	Mass [kg]	Remark
	X		Vehicle, complete Fahrzeug, vollst.	A2V00001711214 1		560,000	
	X		Vehicle, complete Fahrzeug, vollst.	A6Z00002519977	&MTB		
1	2	pc	Suspension bracket Federbock	A2V00001811222 1		1,034	
	X		Suspension bracket Federbock	A6Z00003579958	&MTB		
2	1	pc	Support Stuetze	EN 485-4 10x284x332 A2V00001911111 2	EN AW-AlMg4,5Mn0,7 EN AW-5083-H111 EN 485-2	0,517	
			*) treatment: visible surface *) Behandlung: Sichtfläche nach DIN 17611	According DIN 17611			*)
	X		Support specification Spezifikation Stuetze	A6Z000055711997	&MEC		
3	10	pc	Profile Profil	EN 755-3 L=15140 A2V000001840917 3	EN AW-ALSiMg (A) EN AW-6005A-T6 EN 755-2	0,006	
Tas889, Tas892				C Revision notification 89-0980 79-04 C Änderungsmitteilung 89-0980 79-04			
customer Kunde				Untergestell, vollst.			
legal owner rechtlicher Eigentümer				Underframe, complete			
Prepared	20160718	Hase		P	A2V00002317668		03
Checked	20160720	Müller		T	A6Z00035140147		03
Approved	20160722	Lehmann		P	03.444444		C
	Date	Name		T	03.333333		E
				OCC	& PB	en/de	p/n 0001/0002 Index

a) Parts list entries Page 1 of 2 pages - Example

Annex B

(informative)

Comparison of title block according to DIN 6771 and EN 15016-2

The parts list according to EN 15016-2 has undergone many changes. The list fields according to FSF have been retained, with the option of specifying each part list item in two languages. Some columns have been adapted to the requirements of the basic ISO standards and at the same time extended to include the requirements of electromechanics; this adaptation was carried out by eliminating the quantity columns.

The title block was also adapted to the bilingual entry option. The separation into parts lists and corresponding drawings has been introduced as an essential innovation compared to the previous entries, making it possible to assign several parts lists to a drawing or different drawings to a parts list.

Table B.1 — Comparison of title block according to DIN 6771 and EN 15016-2

Field No		Field
new	old	
1	12	Identification number parts list
2	7	Revision index parts list
3	—	Identification number drawing
4	7	Revision index drawing
5	13	Sheet number / number of sheets
6	—	Language code(s)
7	—	Document classification code (DCC)
8	10	Designation of the part in language 1
9	—	Designation of the part in language 2
10	11	Name(s) of the legal owner(s)
11	—	Further subdivisions of the owner
12	9a	Names who prepared, checked and approved
13	8a	Dates prepared, checked and approved
14	18	Customer's parts list reference number
15	7	Customer's parts list revision index (Was the drawing initial)
16	—	Customer's drawing reference number
17	7	Customer's drawing revision index (Was the drawing initial)
18	17	Customer's name
19	16	Approved by the customer
20	7	Revision notification number
not applicable	6	Information on the quantity columns
not applicable	15a	Replacement for
not applicable	19	
not applicable	20	

Key:
P Parts list
T Technical drawing

a) Title block new according EN 15016-2

Information on the quantity columns		Drawing Part	Revision/Date		
Area	Quantity	Area	Quantity	Area	Quantity
A		Area	Quantity	Area	Quantity
B	6	Area	Quantity	Area	Quantity
C		Area	Quantity	Area	Quantity
D		Area	Quantity	Area	Quantity

b) Title block old according DIN 6671

Information on the quantity columns		Drawing Part	Revision/Date		
Area	Quantity	Area	Quantity	Area	Quantity
A		Area	Quantity	Area	Quantity
B	6	Area	Quantity	Area	Quantity
C		Area	Quantity	Area	Quantity
D		Area	Quantity	Area	Quantity

Code number 700

Circuit documents for electrical, pneumatic
and hydraulic installations

Code number 700

Circuit documents for electrical, pneumatic and hydraulic installations

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4.2.6 Field 6 Date prepared, checked, approved.....	9
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4.2.8 Field 8 Language code	10
4.2.9 Field 9.....	10
4.2.10 Field 10	10

	page
4.2.11 Field 11	10
4.2.12 Field 12 Document type.....	10
4.2.12.1 Field 12a Documentclassification.....	10
4.2.12.2 Feld 12b.....	10
4.2.13 Field 13 Classification code.....	10
4.2.13.1 General.....	10
4.2.13.2 Field 13a.....	10
4.2.13.3 Field 13b.....	10
4.2.14 Field 14	10
4.2.15 Field 15	11
4.2.16 Field 16 Replacement for	11
4.2.17 Field 17 Replaced by.....	11
4.2.18 Field 18 Name and / or logo of the customer.....	11
4.2.19 Field 19 Customer's reference number	11
4.2.20 Field 20 Customer's revision index.....	11
4.2.21 Field 21	12
4.2.22 Field 22	12
4.2.23 Field 23 Revision notification number	12
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1 Principles

1.1 General

Circuit documents are circuit diagrams of all kinds, tables, diagrams and descriptions. They convey details for the production, set up and maintenance of appropriate facilities.

Unless otherwise agreed with the customer, circuit documents should be created computer assisted, using the following rules (refer to FSF code number).

Circuit documents should be created according to:

- Code number 710 Circuit documents for electrical facilities / circuit diagrams
- Code number 720 Circuit documents for electrical facilities / wiring diagrams
- Code number 730 Equipment list
- Code number 740 (Circuit documents / software documentation)
- Code number 750 Table of technical documentation
- Code number 760 Electronic handover of technical documents
- Code number 780 (Circuit documents for hydraulic installations)

For the introducing of the new edition with this code number, a transition period until end of 2009 applies. Already existing documents based on earlier versions of this FSF guideline may not be changed, also when they are revised. The use of the new forms shown here is then voluntary.

In case of refurbished or subsequent deliveries of vehicles, respectively when vehicle families are planned and manufactured, the manufacturing documents may be made according to the earlier versions of the FSF documents. For this purpose, refer to the earlier versions of the FSF documents.

The short form of names of quoted standards are used in this guideline (example "EN 15380"), also when they are formally known and accepted in Germany as DIN EN (example "DIN EN 15380").

1.2 Assignment

Drawing numbers for circuit documents, parts list or equipment lists should generally be identical.

If the drawing number of circuit documents is not identical to the part lists or equipment lists, then an accordant note shall be added on the document (e.g. on the cover sheet) and in a suitable place (e.g. over the title block).

1.3 Preparation

Structure and graphical presentation of the circuit documents should act in accordance with the intended use. Circuit diagrams must be made in such way, that they represent the functional structure even in case of a subdivision or breakdown on several pages.

Documents may be prepared with or without a cover sheet (to be decided by the designer of the document).

1.4 Scope

Type and scope of the circuit documents should be agreed on between customer and supplier.

2 Formats and Forms

2.1 Formats

The format A3 (according EN ISO 216) should be preferably used.

The standard sizes A4, A2 and A1 may be used according to Code number 400.

2.2 Forms

According to section 5, the form in the format A3 should be preferred.

This form is laid out according to the following principles:

- Title block according to IEC 61082-1
- Design was modified so that the height of the block height could be kept low. Fields were placed side by side, which according to IEC 61082-1 should have been placed over each other.
- Number and contents of drawing fields provided to IEC 61082-1 were accepted. Merely the customer fields not provided by IEC 61082-1 were arranged besides or over the drawing identification number.

In addition, the fields with the revision description as well as the field "replaces by" were completed.

NOTE Examples of code numbers for circuit documents are shown in the respective appendix.

For the following code numbers 700 continuously, the single forms (e.g. section 5 of code number 700) positioning for protection remark and usage rights. The content complies with legal demands. The protection remark should be based on to the code number 400 (paragraph 3. continuously).

2.3 Title block

The form of the title block is used in circuit diagrams for place reasons according to IEC 61082-1 (refer to 2.2). The relevant fields are fixed following EN 15016-1 (refer to code number 400).

4 Entry in the title block

4.1 General

The Figure 1 applies to the following specifications:

3	23	6	7	25	18	4	2	19	12a	13b	12b	12a
D	SP081234569	06-11	Prep	Date	2006-12-12	Customer	Operator	Customer	Contractor	Designation 1	Designation 2	Designation 3
C	SP081234568	06-11	Prep	Prepared	Designer	Project designation	Based on	Repl. for	Repl. for	Repl. for	Repl. for	Repl. for
B	SP081234567	06-11	Prep	Checked	Checker	Project designation	Based on	Repl. for	Repl. for	Repl. for	Repl. for	Repl. for
Index	Revision notification no	Date	Drawn	Approved	Approver	Project designation	Based on	Repl. for	Repl. for	Repl. for	Repl. for	Repl. for
24	16	17	20	1	3a	8	5					

Figure 1 — Entry in the title block (example)

A CAD identification as well as the detail of the original size may be attached near the title block or at the binding space.

The numbers and names of the fields considered, correspond to the field number, according to EN 15016-1 and code number 400.

The paragraph numbers with an identical number mentioning and order like in the EN 15016-1 and code number 400 are correspondingly selected. In the description of the respective field contents there is a reference to the notions of IEC 61082-1.

4.2 Designation of fields and their contents

4.2.1 Field 1 Drawing identification number

The field "drawing identification number" corresponds to field "DocumentId" of IEC 61082-1:

- liberal disposal for the designer of the drawing;
- a CAD identification nearby the title block is authorized.

If it becomes required to represent an additional drawing number or pad identification in the documents, a data field can directly be produced right-aligned for this title block above.

4.2.2 Field 2 Title, description

The field "Title, description" corresponds to the field "Title" according to IEC 61082-1.

In the field "Title, Description", the represented name shall be typed in. This can be left-justified or central carried out.

The name shall be formed according the represented way in DIN 43101 and EN 15380-2. It shall always independently be indicated by the quantity and in the singular.

The length of a name cannot exceed the number of character positions per line according to paragraph 4.2.30. At most 3 lines may be used. For entry examples refer to code number 710, paragraph A.1.5.

4.2.28 Field 28

— Not used.

4.2.29 Field 29

— Not used.

4.3 Font size in relation to original format

The font sizes refer to the original format according to paragraph 2.1. and shall be used according to the following Table 1:

Table 1 — Font size in relation to original format

Field-Nr.	Metadata identifier according to EN 82045-2 respectively according IEC 61082-1 a	Marking in the title block		
		Designation	Minimum font size in mm	Number of characters (max.) ^b
1	DocumentId ^a	Drawing identification number	2,5	20
2	Title ^a	Title, description: a) Main title b) Sub-title	2,5 2,5	3 lines a 25
3	RevisionId ^a	Revision index	1,8	3
3a	RevisionId ^a	Revision index	2,5	3
4	OrganizationOwner ^a	Name of the legal owner of the drawing	not specified	not specified
5	DocumentPartId ^a RepresentationNumberOfPages ^a	Sheet number / number of sheets	2,5	3 / 3
6	ReleaseDate ^a	Dates prepared, checked and approved	individual handwriting or 1,8	10
7	CreatorName ^a ApprovByPerson ^a	Names of those who prepared, checked and approved	individual handwriting or 1,8	10
8	LanguageCode ^a	Language code	2,5	2
12a	DocumentClassIdIEC61355 ^a	Document type	1,8	10 (3) ^c
12b		At liberal disposal	1,8	10
13a	ReferenceObjectId ^a	Product group	1,8	10 (3) ^c
13b	OccurrenceIdIEC61346	Location code	1,8	10
16	SupersedingDocumentId ^a	Replacement for	1,8	20

Field-Nr.	Metadata identifier according to EN 82045-2 respectively according IEC 61082-1 a	Marking in the title block		
		Designation	Minimum font size in mm	Number of characters (max.) ^b
17	SupersededByDocumentId	Replaced by	1,8	20
18	OrganizationCustomer ^a	Name and / or logo of the customer	not specified	not specified
19	DocumentIdCustomer	Customer's reference number	2,5	20
20	DocumentVersionIdCustomer	Customer's revision index	1,8	2 / 5
23	DocumentVersionIdCustomer	Revision notification number	1,8	20
24	BasedOnDocumentId ^a	Based on	1,8	20
25	ProjectName ^a	Application	not specified	not specified
a Metadata identifier according to IEC 61082-1. b The field lengths for layout reasons are differing according to EN 15016-1 for layout reasons. c The bracket values indicate the <i>minimal</i> length of the positions to be filled according to the corresponding standard of a document type (Field 12a) and product group (Field 13a).				

5 Drawing form A3

Figure 2 shows exemplary a drawing form.

The format of the original document may be written under the title block, bottom right hand side.

Code number 710

**Circuit documentation for electrical
Installations**

— Circuit diagrams —

Code number 710

Circuit documentation for electrical Installations — Circuit diagrams —

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1 Principles

Circuit diagrams are made according to code number 710, as well as IEC 61082-1 and IEC 81346-2, if not otherwise additionally defined below.

Regarding the orientation (e.g. driving direction), DIN 25005 shall be fulfilled.

For the introducing of the new edition with this code number, a transition period until end of 2009 applies. Already existing documents based on earlier versions of this FSF guideline may not be changed, also when they are revised. The use of the new forms shown here is then voluntary.

In case of refurbished or subsequent deliveries of vehicles, respectively when vehicle families are planned and manufactured, the manufacturing documents may be made according to the earlier versions of the FSF documents. For this purpose, refer to the earlier versions of the FSF documents.

The short form of names of quoted standards are used in this guideline (example "EN 15380"), also when they are formally known and accepted in Germany as DIN EN (example "DIN EN 15380").

2 Circuit diagram of a complete electrical installation

2.1 Document structure

2.1.1 General

The complete document shall be structured according to the following order:

- cover sheet
- explanations and/or location codes
- table of contents
- circuit diagram
- revision description.

2.1.2 Cover sheet

The cover sheet respectively the explanation pages, shall comprise the superior document identification, by which the complete circuit diagram may be called, and also the formation rules for:

- drawing number
- section within a page
- equipment identifier
- wire number.

In the following code numbers 700ff, the positions for the protection notice and right of use are specified for the individual forms (e.g. section 5 of this code number 710). Their content is determined by legal requirements. The protection mark of code number 400 (Section 3.4 et seq.) should be used as a basis.

2.1.3 Table of contents

The list of drawings shall be sorted according to product groups and show all existing pages of the complete documentation including the concerned revision status.

2.1.4 Explanations and/or location codes

In this section, illustrations may follow which explain the circuit diagrams and the complete train set configuration (how to assemble a train by several singly drawn cars). Certain details needed in the circuit diagrams may be explained here, for better understanding.

When using location codes according to section 2.2.4.3, the list of location codes, the used coding system and the used abbreviations shall be explained, if they don't comply to EN 15380-3.

2.1.5 Revision description

The description of revisions shall explain the changes in the circuit diagrams in clear text, listing in alphabetic order the status of the cover sheet and the explanation/location code pages, and following the structure of the circuit diagrams. The structure of the circuit diagram set shall be used.

2.1.6 Circuit diagram

The circuit diagram should be structured by product groups (PG) according to EN 15380-2.

2.2 Formation rules

2.2.1 Reference code "product group"

The concerned product group (PG) shall be clearly indicated in the title box (field 13a, code number 700).

The following PG should be used: For cover sheet and explanation/location code pages AA, for list of contents AB, for location codes AC and for revision descriptions AD (refer to section 5).

For small plants, these may be combined, using AA.

2.2.2 Drawing identification number

The drawing identification numbers used by the customer and those used by the contractor respectively shall be distinct (field 1, code number 700).

The drawing identification numbers may contain structure elements identical to those used by the circuit diagram set (e.g. product groups).

The product group shall also be filled in into the according field (field 13a, code number 700).

2.2.3 Section within page

The indication of the section is helpful for easier finding of symbols and interrupted points when using detailed view.

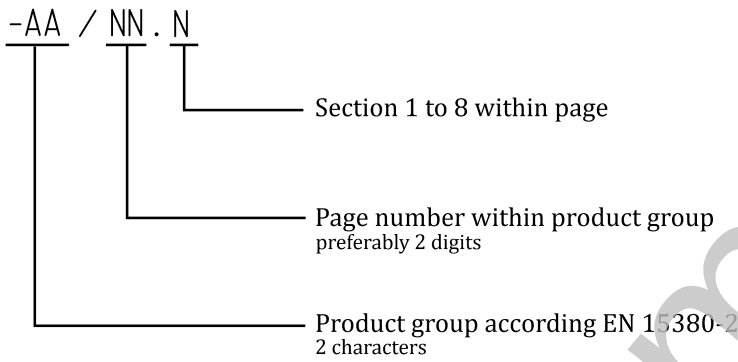


Figure 1 — Formation rule for Section within page

In cases where there is no possibility of confusion, the subdivision marks (-), (/) and (.) may be omitted according to EN 61082-1. Supplements to this shall be explained on the explanation pages.

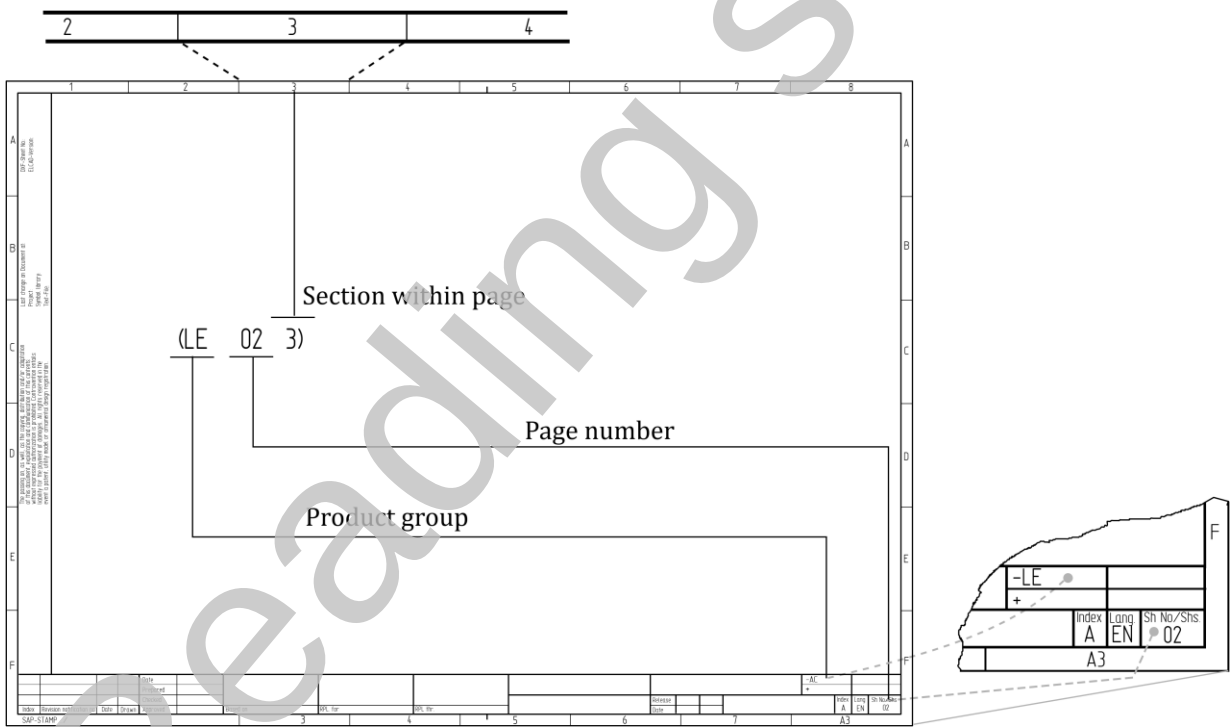


Figure 2 — Example Section within page (-LE/02.3)

2.2.4 Equipment identification

2.2.4.1 General

Equipment identifiers are formatted as follows see Figure 3:

2.2.5 Wire number

2.2.5.1 General

The used wire numbering system should be explained on the explanation page. The system should preferably allow for max. 6 data positions, when terminals are not considered. When terminals are considered, the system should preferably allow for max. 9 data positions (characters and digits).

The numbering details depicted in 2.2.5.2 and 2.2.5.3 are the standard numbering used in areas covered by FSF.

2.2.5.2 Wire number without terminal consideration

The wire numbering system should preferably have max. 6 data positions (characters and digits).

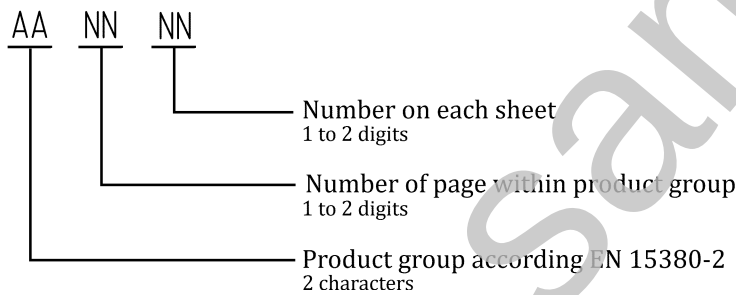


Figure 8 — Formation rule for wire number without terminal consideration

Here, the wire number consists of a page designation and a number. This is the standard numbering used in areas covered by FSF, and is the recommended way, because later moving of drawn details (caused by revisions) then have less effects on wire numbers.

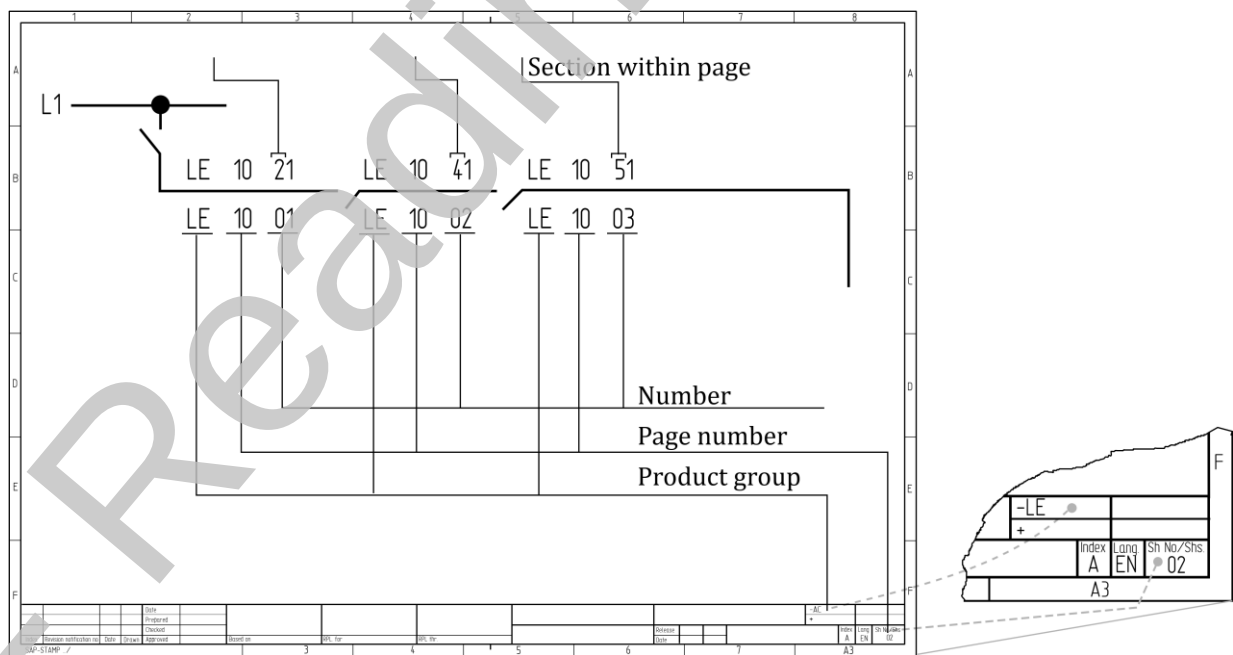


Figure 9 — Wire number without terminal consideration (Example)

2.2.5.4 Wire number with terminal consideration

Wire number and index shall be separated by (.). The wire number should have max. 9 data positions (characters and digits).

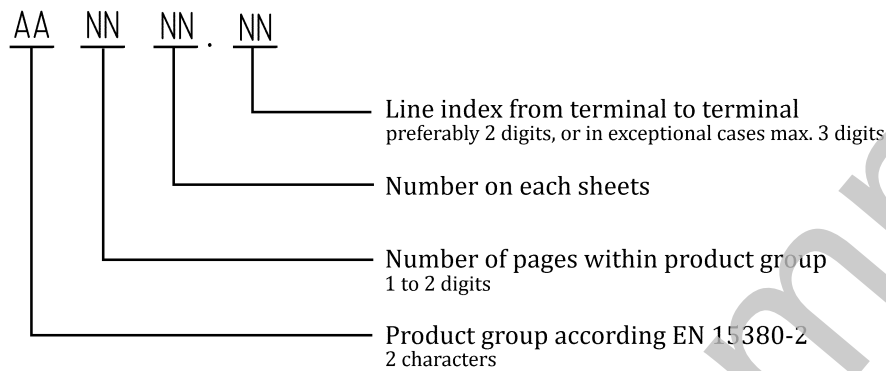


Figure 12 — Formation rule for wire number with terminal consideration

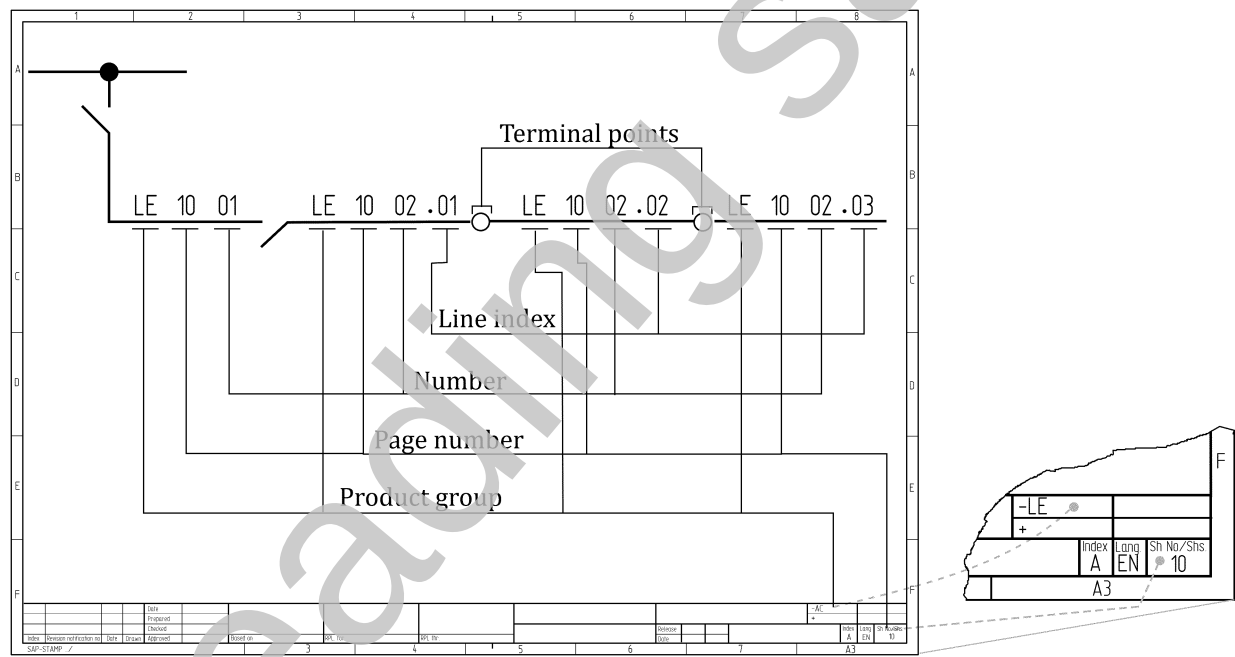


Figure 13 — Wire number with terminal consideration - Cable in general (Example 1)

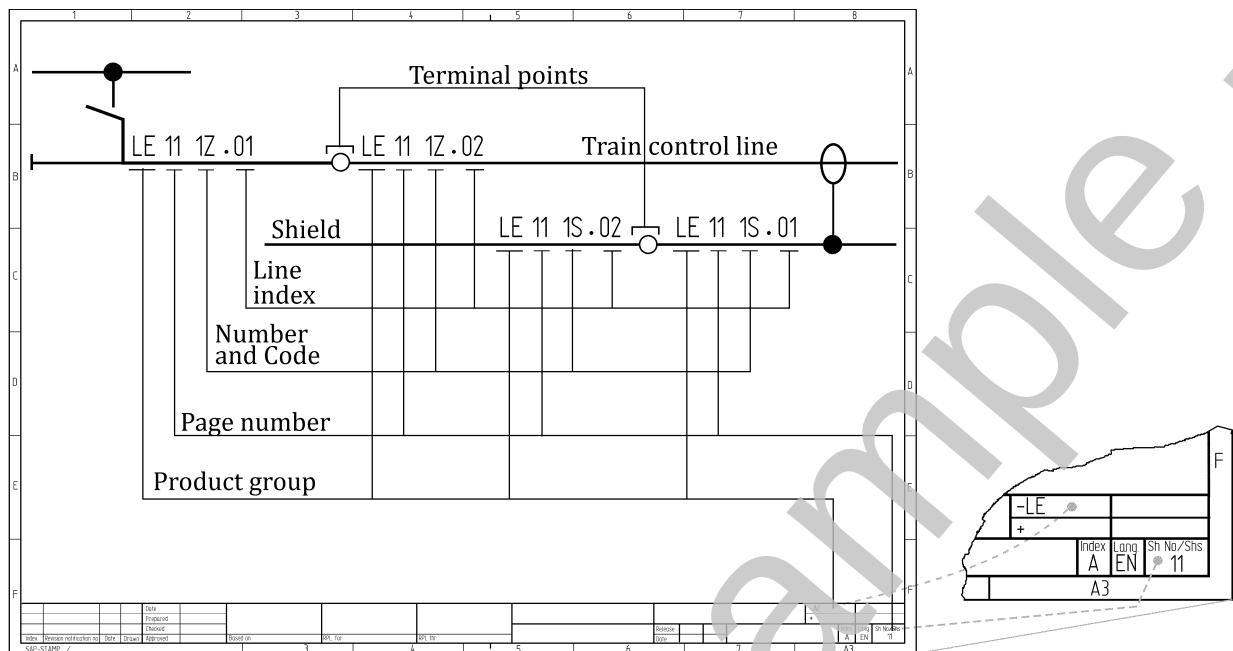


Figure 14 — Wire number with terminal consideration - Special purpose cables (Example 2)

3 Device circuit diagram

3.1 Document structure

The circuit diagram may consist of one page or several pages.

In the case of the circuit diagram consisting of several pages, the complete document should have the following structure:

- cover sheet
- explanations and/or location codes
- table of contents
- circuit diagram
- revision description

3.2 Drawing identification number

Refer to code number 700 paragraphs 4.1 and 4.19, and code number 350.

3.3 Page number

Refer to code number 700 paragraph 4.5, and code number 400.

Annex A

(informative)

Circuit diagram of a complete electrical installation examples and forms

A.1 Examples for circuit diagram of a complete electrical installation

A.1.1 General

For dimensioning standards of the A3 drawing form, refer to code number 700, paragraph 5.

The following figures are examples for

- Explanation page Figure A.1 and Figure A.2
- List of drawings Figure A.3
- Location codes Figure A.4
- Revision description Figure A.5
- Circuit diagram Figure A.6

NOTE The content of this circuit diagram is an example for information only.

Exemplary forms for circuit diagrams are presented for

- List of drawings: Figure A.7
- Location codes: Figure A.8
- Revision description: Figure A.9

A	B	C	D	E	F
DESIGNATION SYSTEMATIC FOR RAIL VEHICLES ACCORDING TO EN 15380-1 AND FSF 710					
DIAGRAM SECTION WITHIN SHEET PRODUCT GROUP OF CIRCUIT DIAGRAM (EN 15380-2, TABLE 2) SHEET NUMBER WITHIN PRODUCT GROUP SECTION 1 TO 8 WITHIN SHEET -FB -T03-B01					
SUBORDINATE EQUIPMENT					
LETTER CODE (EN 8134-6-2, TABLE 1)					
SERIAL NUMBER (IF NECESSARY)					
WIRE NUMBER					
PRODUCT GROUP OF CIRCUIT DIAGRAM (EN 15380-2, TABLE 2)					
SHEET NUMBER WITHIN PRODUCT GROUP					
SERIAL NUMBER WITHIN SHEET (01 TO 99)					
INDEX (IF NECESSARY)					
INSTALLATION SITE AND LOCATION (EN 15380-3 AND FSF 710)					
INSTALLATION SITE AND TYPE OF VEHICLE (EN 15380-1, ANNEX A)					
THIS INFORMATION GIVEN ON COVER SHEET ONLY					
LOCATION ACCORDING TO LIST OF LOCATION CODES (EN 15380-3, TABLE 1)					
EQUIPMENT IDENTIFIER					
SIGN FOR PRODUCT GROUP (EN 15380-2, 4.1)					
PRODUCT GROUP OF CIRCUIT DIAGRAM (EN 15380-2, TABLE 2)					
SIGN FOR DEVICE IEC 61002-1)					
LETTER CODE (EN 8134-6-2, TABLE 1)					
SERIAL NUMBER					
SEE LIST OF DRAWINGS					
DRAWING-NO. CONTRACTOR /					
DRAWING-NO. CUSTOMER					
SEE LIST OF EQUIPMENT					
DRAWING-NO. CONTRACTOR /					
DRAWING-NO. CUSTOMER					
INSTALLATION SITE +-RHA01					
COVER SHEET					
CONTRACTOR					
CUSTOMER					
MODEL PROJECT LOCOMOTIVE					
Date 2011-12-05					
Prepared Designer					
Checked Checker					
Approved Approver					
Revision notification no./Date					
Index/Revision notification no./Date					
SAP-STAMP-...					

Figure A.1 — Explanation page for a locomotive - Example 1

Figure A.6 — Circuit diagram - Example

Code number 900

**List of the technical rules
specified in the guideline**

Code number 900

List of the technical rules specified in the guideline

Contents

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2 Explanation of the columns A to F for Excel file	3
3 Referred standards	4
3.1 Explanation of the columns A to D.....	4
3.2 Bibliography	4

1 Overview about the kind of standards

- DIN
- DIN ISO
- ISO
- TL - Technische Lieferbedingungen der DB
- Sonstige
- DIN EN
- DIN EN ISO
- DIN IEC
- BN - Bahnnormen

All as withdrawn marked standards will be only removed from the reference list below, when the corresponding replacement and/or follow-up documents have been listed in the individual code numbers so that the replacement and/or follow-up documents can be inserted in the reference list.

2 Explanation of the columns A to F for Excel file

Table 1 — Explanation of the columns A to F for Excel file

A	B	C	D	E	F
Standard	standard quoted in (..) invalid	Substitute document	Title / description	Code number	Clause

Explanation of the columns A to F:

- A) Standardization quoted in the FSF-Guidelines
- B) standardization quoted in the FSF-Guidelines – the ones marked in No. (...) are invalid.
- C) The appropriate spare and/or follow-up document from column A for invalid.
- D) Title / description
- E) Reference to the appropriate identification number in the FSF-Guidelines
- F) Reference for the appropriate section of the identification number (D) in the FSF-Guidelines.

Following the link [KEZ 900.xlsx](#) or [KEZ 900.xlsm](#) (version with VB-macro), the list of the technical rules specified in the guidelines is available.

The KEZ 900.xlsm version allows you to search for and list the standards of the standards used via Code numbers and documents (standards).

3 Referred standards

3.1 Explanation of the columns A to D

Table 2 and the following text explain the head of Table 3 below, which contains all standards given in the FSF-Guideline.

Table 2 — Explanation of the columns A to D

A	B	C	D
Number	Standard	Title / description	Year of release / Status

- A) The numbering is only done to make the reading easier.
- B) Name of standard to which is referred in the FSF-Guideline. It should be noticed that for DIN EN, DIN ISO, or DIN EN ISO the expression DIN is not given in the list.
- C) Title of the standard
- D) The year of release and if applicable the year in which the standard was withdrawn.

3.2 Bibliography

The FSF-Guideline for drawing up of technical documentation refers normative to the standards listed in Excel Table

Table 3 — Referred standards - Bibliography

No	Standard	Title / description	Year of release
			Status
1	DIN 15556	Storage and processing of radiation sensitive films and papers; environmental influences	2004-10-01 withdrawn
2	DIN 16941	Thermoplastics extruded profiles - General tolerances of size, form and orientation	2017-04-24
3	DIN 17611	Anodized products of wrought aluminium and wrought aluminium alloys - Technical conditions of delivery	2016-06-03
4	DIN 19052-1	Microfilming of engineering drawings on microfilm 35 mm; technical proceeding, dimensions	2019-10-08
5	DIN 19052-2	Microfilming of engineering drawings on microfilm 35 mm; technical proceeding of recording	2019-10-08
6	DIN 19052-3	Microfilm technics, microfilming of engineering drawings; reduction ratios for recording on film 35 mm and reenlargement ratio	2015-11-06

FSF-Guideline for drawing up of technical documentation

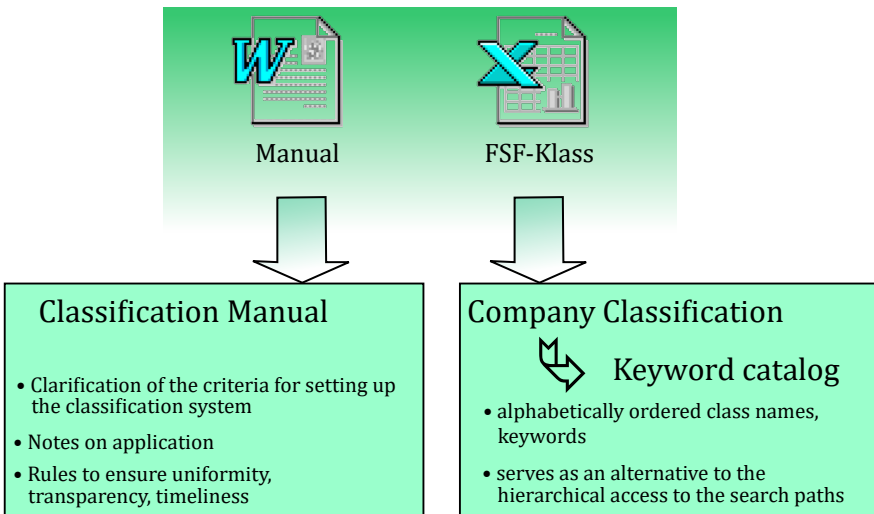
Classification Manual

short version

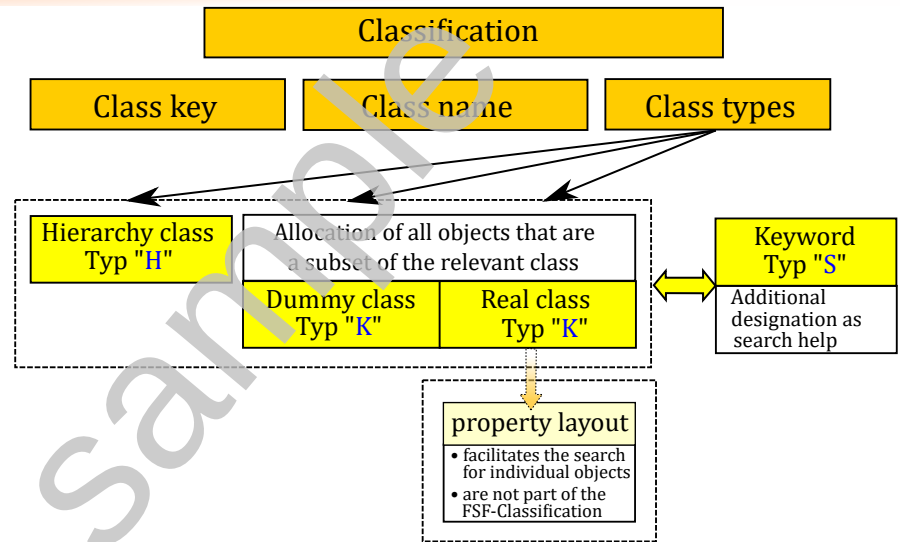
FSF-Guideline for drawing up of technical documentation
Classification Manual
Version: 34th updating

State of revision: 2004-03-23 - 21st updating
Document language: en

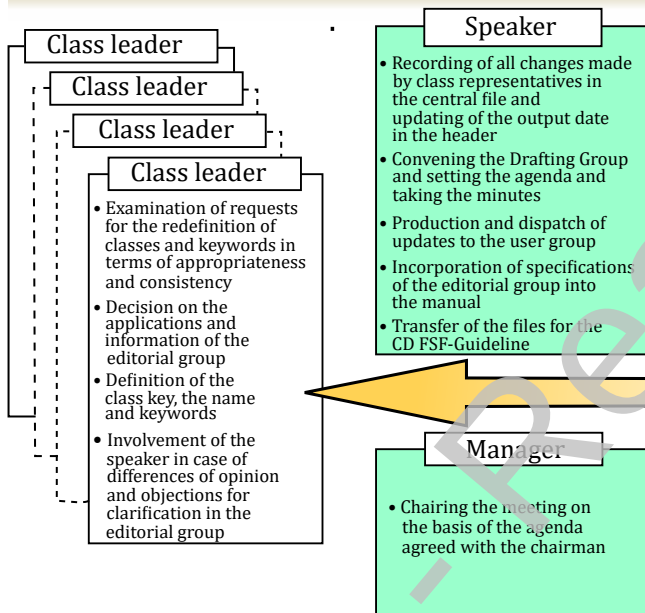
Components



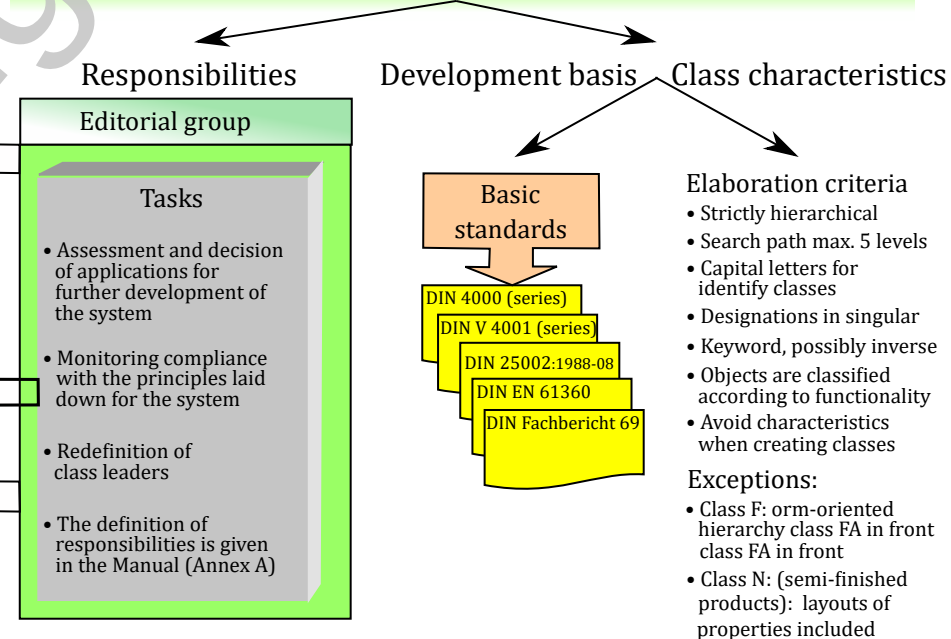
Terms



Organizational requirements



Development of the system



Class

Capital letters to identify a class

Type of modification

"+" = added
 "#" = changed
 "-" = deleted

Date of modification

Date of change of the associated class

Type

"H" = hierarchy class
 "K" = dummy class or real class
 "S" = keyword

Hierarchy level

corresponds to the class hierarchy, that is,
 Level "1" = class consists of 1 letter
 Level "2" = class consists of 2 letters etc.

- Hierarchy classes (Type H):
 Background light grey, font "bold"

Klasse	Benennung, Singular	englische Benennung, Singular	And- art	And- datum	Typ	Hiera- archie- Stufe	kein Schla- wort	SML-Nr	Begriffsherkunft/ -erläuterung
1	2	3	4	5	6	7	8	9	10
G	Maschinenelement	machine element			H	1			
GA	Verbindungselement	connection element			H	2			
GAA	Schraube	screw			H	3			
GAAA	Sechskantschraube	hexagon head cap screw			K	4		DIN4000-2-1,2	
GAAA	Schraube, Sechskant-	screw, hexagon head cap	#	12.10.1998	S	4			
GAAB	Zylinderschraube	cheese head screw			K	4		DIN4000-2-1	
GAAB	Flachkopfschraube	flat head screw			S	4			
GAAB	Linsenschraube	oval head screw			S	4			
GAAB	Schraube, Zylinder-	screw, cheese head	#	12.10.1998	S	4			
GAAC	Vierkantschraube	square-head bolt			K	4		DIN4000-2-1	
GAAC	Schraube, Vierkant-	bolt, square-head	#	12.10.1998	S	4			
GAAD	Senkschraube	counterunk screw			K	4		DIN4000-2-1	
GAAD	Linsensenkschraube	oval head counterunk screw			S	4			
GAAD	Schraube, Senk-	screw, counterunk	#	12.10.1998	S	4			
GAAE	Blechschrabe	sheet metal screw			K	4		DIN4000-2-1	
GAAE	Schraube, Blech-	screw, sheet metal	#	12.10.1998	S	4			
GAAP	Augenschraube	eye bolt			K	4		DIN4000-2-6	
GAAP	Schraube, Augen-	bolt, eye	#	12.10.1998	S	4			
GAAG	Ringschraube	lifting screw			K	4		DIN4000-2-6	
GAAG	Schraube, Ring-	screw, lifting	#	12.10.1998	S	4			
GAAH	Flügelschraube	wing screw			K	4		DIN4000-2-6	
GAAH	Schraube, Flügel-	screw, wing	#	12.10.1998	S	4			
GAAL	Rändelschraube	knurled screw			K	4		DIN4000-2-1	
GAAL	Schraube, Rändel-	screw, knurled	#	12.10.1998	S	4			
GAAL	Halbrundschrabe	half-round screw			K	4		DIN4000-2-1,2	
GAAL	Flachkopfschraube	pan-head screw			S	4			
GAAL	Flachrundschrabe	sawer-head screw			S	4			
GAAL	Schraube, Halbrund-	screw, half-round	#	12.10.1998	S	4			
GAAL	Hammerschraube	hammer-head bolt			K	4		DIN4000-2-1	
GAAL	Flutschraube	cap bolt			S	4			
GAAL	Schraube, Hammer-	bolt, hammer-head	#	12.10.1998	S	4			
GAAM	Stiftschraube	stud			K	4		DIN4000-2-1	
GAAM	Gewindestift	headless set screw			S	4			
GAAM	Gewindestiftschraube	headless set screw			S	4			
GAAM	Schaftschraube	set screw			S	4			
GAAM	Schraube, Stift-	stud	#	12.10.1998	S	4			
GAAN	Holzschraube	wood screw			K	4		DIN4000-2-1	
GAAN	Schraube, Holz-	screw, wood	#	12.10.1998	S	4			
GAAN	Spanplattenschraube	chip board screw			S	4			
GAAN	Spaxschraube	Spax screw			S	4			

Class table
 (Excel-Table)

SML-Nr.

Tabular Layouts of properties
 (de: SachMerkmal Leiste)

no catchword

keyword does not appear in the alphabetical
 keyword list if "X" is entered

Designation

- in principle to be indicated in the singular, a secondary attribute is allowed for clarification
- may be a list of the quantities contained, for example "FBGD belt, brace, purlin, bow"
- Keywords should consist of individual terms
- compound nouns: the word is followed by a single hyphen for example: "BAA Supply System, Water-"
- The "e" is omitted for trailing attributes, e.g: "CM electrical machine, rotating"
- Enumerations are to be separated by commas, "and" is only to be used if the meaning is better understood
- Prepositions are to be used to make the term easier to grasp, e.g: "NADB tape, elastomeric strip, plastic"
- Hyphenation or manual line breaks are not allowed
- Hyphens for long, compound terms are permitted for better readability. They shall be omitted if they would separate typical search terms
- Abbreviations should be avoided
- Attributes must also be written in lower case at the beginning of the name, unless the attributes are a proper name with the noun