



SLOVENSKI STANDARD SIST EN 16116-2:2021

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**Železniške naprave - Izvedbene zahteve za stopnice, ograje in dostop za osebje -
2. del: Tovorni vagoni**

Railway applications - Design requirements for steps, handrails and associated access
for staff - Part 2: Freight wagons

Bahnanwendungen - Konstruktionsanforderungen an Tritte, Handgriffe und zugehörige
Zugänge für das Personal - Teil 2: Güterwagen

Applications ferroviaires - Exigences pour la construction des marchepieds, mains
courantes et accès destinés au personnel - Partie 2 : Wagons

Ta slovenski standard je istoveten z: EN 16116-2:2021

ICS:

45.060.20 Železniški vagoni Trailing stock

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EUROPEAN STANDARD
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English Version

Railway applications - Design requirements for steps, handrails and associated access for staff - Part 2: Freight wagons

Applications ferroviaires - Exigences pour la
construction des marchepieds, mains courantes et
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Tritte, Handgriffe und entsprechende Zugänge für das
Personal - Teil 2: Güterwagen

This European Standard was approved by CEN on 14 June 2021.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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| Contents | Page |
|---|-------------|
| European foreword | 3 |
| Introduction | 4 |
| 1 Scope | 5 |
| 2 Normative references | 5 |
| 3 Terms and definitions | 6 |
| 4 Steps and handrails | 7 |
| 4.1 General requirements | 7 |
| 4.2 Steps | 7 |
| 4.2.1 General | 7 |
| 4.2.2 Shunter's step | 8 |
| 4.2.3 Other steps | 11 |
| 4.3 Handrails | 11 |
| 4.3.1 General | 11 |
| 4.3.2 Shunter handrail | 11 |
| 4.3.3 Other handrails | 12 |
| 5 Shunter's stand | 13 |
| 5.1 General | 13 |
| 5.2 Shunter's stand at wagons with end wall boards | 14 |
| 5.3 Shunter's stand with tilting handrail | 15 |
| 5.4 Shunter's stand for special case flat wagons with fixed handrails | 17 |
| 5.5 Steps for gangways and end platforms | 17 |
| 6 Reserved spaces | 17 |
| 6.1 General | 17 |
| 6.2 Space for shunting staff operation | 17 |
| 6.3 Clearances for tail light | 19 |
| Annex A (informative) Gangways and other access solutions | 21 |
| Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of Directive (EU) 2016/797 aimed to be covered | 26 |
| Bibliography | 27 |

European foreword

This document (EN 16116-2:2021) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2022, and conflicting national standards shall be withdrawn at the latest by January 2022.

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

This document supersedes EN 16116-2:2013.

This document is part of the series EN 16116, *Railway applications – Design requirements for steps, handrails and associated access for staff*, which consists of the following parts:

- *Part 1: Passenger vehicles, vans and locomotives*
- *Part 2: Freight wagons*

The technical changes with respect to the previous edition are listed below:

- a) 6.2.1 Space for shunter during coupling (Berne Rectangle) is deleted and transferred to prEN 16839:2020;
- b) 6.3.2 Clearance for draw hook is deleted and transferred to prEN 16839:2020;
- c) Annex A (normative) Calculation of space for shunter (Berne Rectangle) in curves when using screw couplings is deleted and transferred to prEN 16839:2020.

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

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

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

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

EN 16116-2:2021 (E)**Introduction**

Freight wagons are designed so that staff are not exposed to undue risk during coupling and access to the vehicle or to special equipment.

This document gives requirements related to steps, handrails and shunter's steps for freight wagons, to allow temporary travel outside the vehicle during shunting as well as to access the vehicle.

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1 Scope

This document is applicable to all types of freight wagons.

This document specifies the minimum requirements for ergonomic and structural integrity of steps and handrails used together to give staff access. It does not cover ladders, top platforms and top gangways.

It defines in particular the required spaces necessary for shunter handrails, for shunter's stand, for steps and handrails.

This document also defines their dimensions, positions, limits for durability and functionality.

It also defines the general requirements for the access to tail lights.

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 10025-2:2019, *Hot rolled products of structural steels - Part 2: Technical delivery conditions for non-alloy structural steels*

EN 12561-7:2011, *Railway applications - Tank wagons - Part 7: Platforms and ladders*

EN 15085-1:2007+A1:2013, *Railway applications - Welding of railway vehicles and components - Part 1: General*

EN 15085-2:2020, *Railway applications - Welding of railway vehicles and components - Part 2: Requirements for welding manufacturer*

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EN 15085-3, *Railway applications - Welding of railway vehicles and components - Part 3: Design requirements*¹⁾

EN 15085-4, *Railway applications - Welding of railway vehicles and components - Part 4: Production requirements*²⁾

EN 15085-5, *Railway applications - Welding of railway vehicles and components - Part 5: Inspection, testing and documentation*³⁾

prEN 15085-6:2020, *Railway applications - Welding of railway vehicles and components - Part 6: Maintenance welding requirements*

EN 15273-2:2013+A1:2016, *Railway applications - Gauges - Part 2: Rolling stock gauge*

EN 17343:2020, *Railway applications - General terms and definitions*

1) The document is currently being revised. For the application of EN 16116-2, reference is made to prEN 15085-3:2021.

2) The document is currently being revised. For the application of EN 16116-2, reference is made to prEN 15085-4:2020.

3) The document is currently being revised. For the application of EN 16116-2, reference is made to prEN 15085-5:2020.

EN 16116-2:2021 (E)**3 Terms and definitions**

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

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

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

3.1**clearance**

defined free space which is needed to ensure space for the correct functioning of, and safety when handling, devices

3.2**step**

footstep with defined properties solely for staff use

3.3**shunter**

shunting staff who couples and uncouples vehicles or directs movements

3.4**shunter's step**

specific step used for the shunter's stand

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3.5**handrail**

handrail with defined properties solely for staff use

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3.6**shunter handrail**

specific handrail fitted at headstock under each buffer

3.7**shunter's stand**

shunter's step in combination with handrail for the specific use of shunting staff to allow travel outside the wagon during shunting

3.8**reserved spaces**

defined free space which is needed to ensure safe working conditions for the shunting staff during coupling and uncoupling of screw couplings

4 Steps and handrails

4.1 General requirements

If not otherwise defined in this standard, steps and handrails used by staff shall be secured as follows:

- with bolts of adequate length and self-locking nuts, or
- with bolts of adequate length and cottered hexagon castlenuts, or
- with high-strength lock ring-bolts.

The mechanical strength of the material used for all kind of handrails and steps, where the properties according to 4.2.2 are not required, shall be as a minimum that of EN 10025-2:2019, grade S235JR.

4.2 Steps

4.2.1 General

Steps shall be made with non-slip surface.

If steps are welded into place, it shall be done in accordance with the EN 15085 series.

The clearance of steps shall be in accordance with EN 12561-7:2011.

This should be a metal grating, see Figure 1, Pos. One or Pos. 2.

For all other solutions, the following characteristics shall be fulfilled:

— **Friction resistance:**

The average value of the friction coefficient measured in three directions (lengthwise, breadthwise and diagonally) shall reach the following minimum values:

- a) in dry condition = 0,65;
- b) in wet condition (water) = 0,65;
- c) in oiled condition = 0,30.

Friction coefficient values shall be ascertained by means of a 100 mm × 100 mm movable plate, on which a rubber pad with 80 shore hardness shall be glued; this plate shall be loaded with a weight of 75 kg. For the measurements carried out with water and oil, the grating shall be fully immersed.

— **Mechanical strength:**

Metal gratings shall withstand, without residual deformation, a horizontal compression force of at least 4 kN, exerted parallel and at right angles to the edge of the step board, and of at least 8 kN exerted diagonally in relation to the edge of the step board. Elastic deformations shall not exceed 10 mm.

— **Grating structure:**

To ensure that the gratings are sufficiently well-adapted to winter conditions, a ratio of at least 50 % of “void” area to total area shall be observed. Only apertures with a minimum area of 400 mm² shall be taken into account to determine this ratio.

NOTE The “void” area is the free space afforded by the grating apertures in the vertical direction.

EN 16116-2:2021 (E)**4.2.2 Shunter's step**

The material for the steps support shall be S355J2C + N in accordance with EN 10025-2:2019. Cold forming for steps support is not allowed.

The shunter's step is shown in Figure 1. The grating according to Figure 1 is mandatory.

For specific operation the size of the step of the shunter's stand may be reduced to 270 mm x 225 mm.

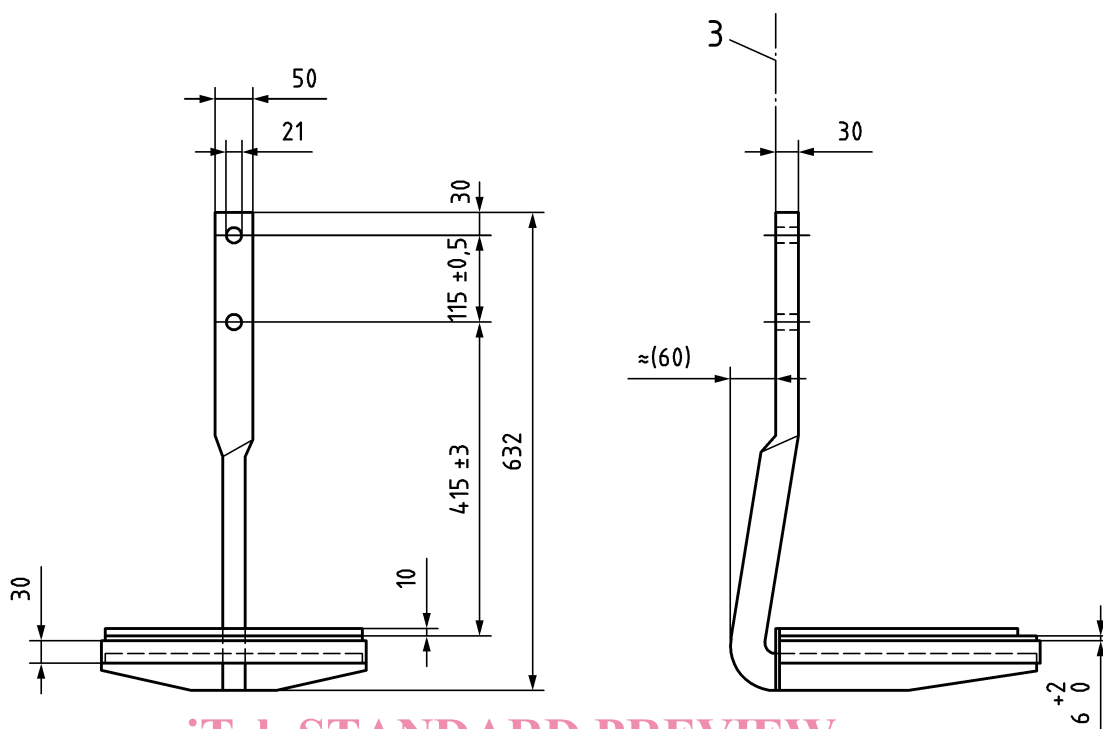
The surface protection (e.g. hot-galvanized) should provide an adequate service life.

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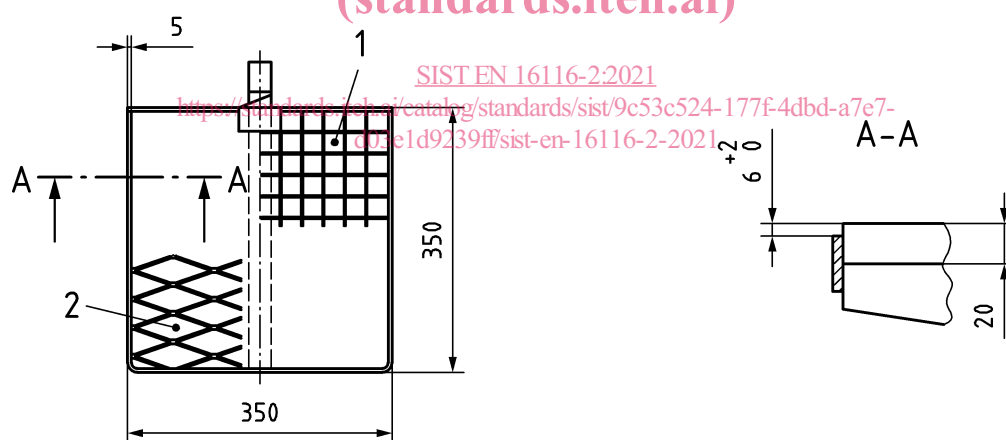
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Dimensions in millimetres



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Key

- 1 grating from welded metal (Figure 2 a))
- 2 grating from expanded metal (Figure 2 b))
- 3 buffer fixing plane

Figure 1 — Shunter's step