

# SVENSK STANDARD

## SS-EN 16116-2:2013

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### **Järnvägar – Konstruktionskrav för trappsteg, räcken och tillhörande genomfart för personal – Del 2: Godsvagnar**

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

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EUROPEAN STANDARD

**EN 16116-2**

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2013

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ICS 45.060.20

English Version

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

Applications ferroviaires - Exigences pour la conception des  
marchepieds, mains courantes et accès du personnel -  
Partie 2: Wagons

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

This European Standard was approved by CEN on 29 May 2013.

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

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

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## Foreword

This document (EN 16116-2:2013) 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of an identical text or by endorsement, at the latest by March 2014, and conflicting national standards shall be withdrawn at the latest by March 2014.

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

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

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

This European Standard 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, luggage vans and locomotives;*
- *Part 2: Freight wagons.*

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## **Introduction**

To achieve an undisturbed, reliable and safe operation of freight trains it is essential to define common requirements for safe access and egress for rolling stock of interoperable trains with respect to e.g. structural requirements, operating characteristics, way of operation, maintenance as well as their handling.

Coupling of freight wagons by means of screw couplings is usually done by personnel.

The design of freight wagons needs to be suitable to meet these functions without exposing staff to undue risk.

Freight wagons require sufficient space for their coupling and uncoupling by staff without any rigid features impeding accessibility to the screw coupler. Also there is a need for provision of suitable footsteps and handrails for personnel, to allow temporary travel outside the vehicle during shunting as well as to access the vehicle.

If wagons according to TSI-FW are equipped with steps and handholds, these needs apply to all designs of vehicle.

To achieve an undisturbed, reliable and safe operation it is therefore essential to harmonise the functional requirements and characteristic dimensions and assess and permanently ensure their suitability for interoperable traffic.



## **1 Scope**

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

It defines in particular the required spaces necessary for handling of screw couplings with side buffers, for shunter handrails, for shunter's stand, for steps and handrails.

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

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

## **2 Normative references**

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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, *Hot rolled products of structural steels — Part 2: Technical delivery conditions for non-alloy structural steels*

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

EN 15085 (all parts), *Railway applications — Welding of railway vehicles and components*

EN 15273-2, *Railway applications — Gauges — Part 2: Rolling stock gauge*

## **3 Terms and definitions**

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

### **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

### **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 cotted 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, grade S235JR.

### 4.2 Steps

#### 4.2.1 General

Steps shall be made with non-slip surface.

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

For all other solutions the following characteristics shall be fulfilled:

#### — Resistance to friction

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 mm<sup>2</sup> 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.

#### **4.2.2 Shunter's step**

The material for the steps support shall be S355J2C + N in accordance with EN 10025-2.

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 can be reduced to 270 mm x 225 mm.

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