BS EN 16116-2:2024

BSI Standards Publication

Railway applications — Design requirements for steps, handrails and associated access for staff

Part 2: Freight wagons

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National foreword

This British Standard is the UK implementation of EN 16116-2:2024. It supersedes BS EN 16116-2:2021, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee RAE/3/-/9, Railway Applications - Wagons (Tank/Freight).

A list of organizations represented on this committee can be obtained on request to its committee manager.

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European foreword

This document (EN 16116-2:2024) 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of an identical text or by endorsement, at the latest by December 2024, and conflicting national standards shall be withdrawn at the latest by December 2024.

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 16116-2:2021.

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*.

EN 16116-2:2024 includes the following significant technical changes with respect to EN 16116-2:2021:

a) concretization of the scope (heavy rail);

b) revision of figures;

c) minor corrections to clarify the requirements.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, 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.

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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 heavy rail 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.

This document specifies in particular the required free spaces necessary for handrails below buffer, for shunter's stand, for steps and handrails.

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

This document also specifies 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 15085-3:2022+A1:2023,*Railway applications — Welding of railway vehicles and components — Part 3: Design requirements*

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

EN 17343:2023, *Railway applications — General terms and definitions*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 17343:2023 and the following apply.

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

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

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

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

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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

3.6
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

3.7
reserved space
defined free space which is needed to ensure safe working conditions for the shunting staff

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 and self-locking nuts, or

— with bolts 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 EN 15085-3:2022+A1:2023.

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

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

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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 free space afforded by the grating apertures in the vertical direction to total area shall be observed. Only apertures with a minimum area of 400 mm^2 may be taken into account to determine this ratio.

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.

The surface protection (e.g. hot-galvanized) should provide a minimum service life of 6 years.

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