

SVENSK STANDARD

SS-EN 12663-2:2010



Fastställt/Approved: 2010-04-12
Publicerad/Published: 2010-05-12
Utgåva/Edition: 1
Språk/Language: engelska/English
ICS: 45.060.20

Järnvägar – Strukturella krav för fordonskorgar – Del 2: Godsvagnar

Railway applications – Structural requirements of railway vehicle bodies – Part 2: Freight wagons

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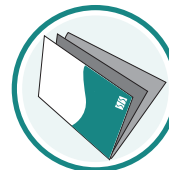
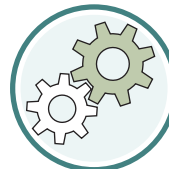
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Denna standard ersätter SS-EN 12663, utgåva 1.

The European Standard EN 12663-2:2010 has the status of a Swedish Standard. This document contains the official English version of EN 12663-2:2010.

This standard supersedes the Swedish Standard SS-EN 12663, edition 1.

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12663-2

March 2010

ICS 45.060.20

Supersedes EN 12663:2000

English Version

Railway applications - Structural requirements of railway vehicle bodies - Part 2: Freight wagons

Applications ferroviaires - Prescriptions de dimensionnement des structures de véhicules ferroviaires - Partie 2 : Wagons de marchandises

Bahnanwendungen - Festigkeitsanforderungen an Wagenkästen von Schienenfahrzeugen - Teil 2: Güterwagen

This European Standard was approved by CEN on 23 January 2010.

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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 Management Centre has the same status as the official versions.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 12663-2:2010) 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 September 2010, and conflicting national standards shall be withdrawn at the latest by September 2010.

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(s).

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

This European Standard is part of the series EN 12663, *Railway applications — Structural requirements of railway vehicle bodies*, which consists of the following parts:

- *Part 1: Locomotives and passenger rolling stock (and alternative methods for freight wagons)*
- *Part 2: Freight wagons*

This document, together with EN 12663-1, supersedes EN 12663:2000.

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

- a) the standard has been split into two parts. EN 12663-1 contains validation methods mainly for locomotives and passenger rolling stock but as an alternative to EN 12663-2 also for freight wagons. EN 12663-2 contains validation methods for freight wagon bodies and associated specific equipment based on tests;
- b) full scale test methods for freight wagons have been added;
- c) the design validation requirements for associated specific equipment have been added;
- d) the buffing impact test requirements have been added;
- e) a validation programme has been added.

According to the CEN/CENELEC Internal Regulations, the national standards organizations 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

The structural design and assessment of freight wagon bodies depend on the loads they are subject to and the characteristics of the materials they are manufactured from. Within the scope of this European Standard, it is intended to provide a uniform basis for the structural design and assessment of the vehicle body.

The loading requirements for the vehicle body structural design and assessment are based on proven experience supported by the evaluation of experimental data and published information. The aim of this European Standard is to allow the supplier freedom to optimise his design whilst maintaining requisite levels of safety considered for the assessment.

1 Scope

This European Standard specifies minimum structural requirements for freight wagon bodies and associated specific equipment such as: roof, side and end walls, door, stanchion, fasteners and attachments. It defines also special requirements for the freight wagon bodies when the wagon is equipped with crashworthy buffers.

It defines the loads sustained by vehicle bodies and specific equipment, gives material data, identifies its use and presents principles and methods to be used for design validation by analysis and testing.

For this design validation, two methods are given:

- one based on loadings, tests and criteria based upon methods used previously by the UIC rules and applicable only for vehicle bodies made of steel;
- one based on the method of design and assessment of vehicles bodies given in EN 12663-1. For this method, the load conditions to be applied to freight wagons are given in this European Standard. They are copied in the EN 12663-1 in order to facilitate its use when applied to freight wagons.

The freight wagons are divided into categories which are defined only with respect to the structural requirements of the vehicle bodies.

Some freight wagons do not fit into any of the defined categories; the structural requirements for such freight wagons should be part of the specification and be based on the principles presented in this European Standard.

The standard applies to all freight wagons within the EU and EFTA territories. The specified requirements assume operating conditions and circumstances such as are prevalent in these countries.

2 Normative references

The following referenced documents are indispensable for the application 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 12663-1, *Railway application — Structural requirements of railway vehicle bodies — Part 1: Locomotives and passenger rolling stock (and alternative method for freight wagons)*

EN 13749, *Railway applications — Wheelsets and bogies — Methods of specifying structural requirements of bogie frames*

EN 15551:2009, *Railway applications — Railway rolling stock — Buffers*

EN 15663, *Railway applications — Definition of vehicle reference masses*

3 Terms and definitions

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

3.1

freight wagon body

main load carrying structure above the suspension units including all components which are affixed to this structure which contribute directly to its strength, stiffness and stability

NOTE Mechanical equipment and other mounted parts are not considered to be part of the vehicle body though their attachments to it are.

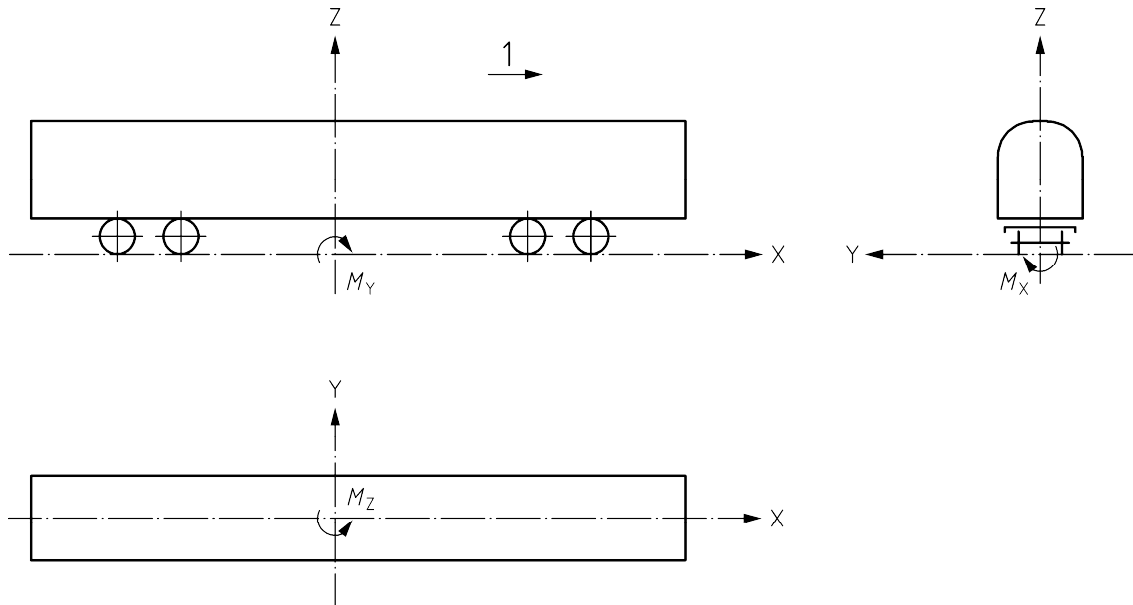
3.2

equipment attachment

fastener and any associated local load carrying substructure or frame which connects equipment to the vehicle body

4 Coordinate system

The coordinate system is shown in Figure 1. The positive direction of the x-axis (corresponding to vehicle body longitudinal axis) is in the direction of movement. The positive direction of the z-axis (corresponding to vehicle vertical axis) points upwards. The y-axis (corresponding to vehicle transverse axis) lies in the horizontal plane completing a right hand coordinate system.



Key

- 1 direction of movement
- X longitudinal direction
- Y lateral direction
- Z vertical direction
- M moment

Figure 1 — Vehicle coordinate system

5 Load cases

5.1 Categories of freight wagons

For the application of this European Standard, all freight wagons are classified in categories.

The classification of the different categories of freight wagons is based only upon the loadings of the vehicle bodies.

NOTE It is the responsibility of the customers to decide as to which category railway vehicles should be designed. There are differences between customers whose choice of the category should take into account the shunting conditions and system safety measures. This is expected and should not be considered as conflicting with this European Standard.