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Railway applications - Railway rolling stock - Buffers

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

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EN 15551

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Supersedes EN 15551:2009+A1:2010

English Version

Railway applications - Railway rolling stock - Buffers

Applications ferroviaires - Matériel roulant ferroviaire - Tampons

Bahnanwendungen - Schienenfahrzeuge - Puffer

This European Standard was approved by CEN on 24 September 2016.

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

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European foreword

This document (EN 15551:2017) 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of an identical text or by endorsement, at the latest by July 2017 and conflicting national standards shall be withdrawn at the latest by July 2017.

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 supersedes EN 15551:2009+A1:2010.

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.

NOTE After the publication of EN 16839, *Railway applications — Rolling stock — Head stock layout*, as a European Standard, the overlapping content and all items not pertinent to the product "Buffer" will be removed from this document.

Compared with EN 15551:2009+A1:2010, the following main changes have been done:

a) the “Introduction” was checked upon and revised;

b) Clause 1 “Scope” was revised;

c) Clause 2 “Normative references” as well the final “Bibliography” were checked upon and revised;

d) Clause 3 was modified:

   1) damping (3.11) was deleted and the calculation of damping in 3.8;

   2) definitions of stored energy and absorbed energy for static and dynamic condition were added as 3.12 to 3.15;

   3) the term “technical specification” was added as 3.16;

e) the term “elastic device” was replaced by “elastic system”;

f) the classification of crashworthy buffers was added as new Subclause 4.5;

g) tests for type tests and series tests were defined in the new Table 2 and modified in Table 7;

h) the static requirements in Table 5 have been changed;

i) Table C.2 "Nature of inspection and tests" was revised;

j) for friction and ring springs the two Subclauses C.2.4 "Static characteristics" and C.2.5 "Dynamic characteristics" were added;

k) Annex E was revised with the specification of the high sided test wagons;

l) Table H.1 was revised and new materials were added;

m) Annex I was modified to be analogous to prEN 16839 (this annex will be deleted after EN 16839 is published);

n) in Annex J, the test for crashworthy buffers was modified;

o) the following figures were modified:

   1) Figure 1 — Force-stroke diagram for stored and absorbed energy;

   2) Figure 2 — Mounting of buffers with non metallic inserts or heads;

   3) Figure 6 — Marking;

   4) Figure 7 — Boundary dimensions and minimum surface of buffer heads;

   5) Figure A.1 — Dimension of the maximum space envelope of buffer – Side view;

   6) Figure B.1 — Location of measurement;

   7) Figure K.1 — Dimension of the maximum space of the buffer;

p) editorial modifications were carried out.

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

Introduction

This European Standard is based on UIC 526-1, UIC 526-3, UIC 527-1, UIC 528, UIC 573, UIC 827-1 and UIC 827-2.

1 Scope

This European Standard defines the requirements for buffers with 105 mm, 110 mm and 150 mm stroke for vehicles or units which use buffers and screw coupling. It covers the functionality, interfaces and testing procedures, including pass fail criteria, for buffers.

NOTE 1 Typically, buffers with a stroke of 105 mm are used on freight wagons and locomotives, buffers with a stroke of 110 mm are used on coaches and locomotives and buffers with a stroke of 150 mm are used on freight wagons.

It defines the different categories of buffers, the space envelope, static and dynamic characteristics and energy absorption.

It includes a calculation method to determine the minimum size of the buffer head to avoid override between buffers.

It defines the static and dynamic characteristics of the elastic systems.

It also defines the requirements for buffers with integrated crash elements (crashworthy buffers) for tank wagons for dangerous goods.

The requirements of this European Standard also apply to buffers of locomotives and passenger coaches which need to meet the crashworthiness requirements of EN 15227 for normal service only. The properties for the energy absorbing function are defined in EN 15227 and the requirements specified in Clause 7 for tank wagons for dangerous goods are not applicable to the buffers of these locomotives and passenger coaches.

Diagonal buffers are excluded from this European Standard.

For the crashworthy buffers of locomotives, cab cars or passenger coaches according to EN 15227, and tank wagons for dangerous goods or buffers which form part of a combined system consisting of a special buffer and a deformation element, interchangeability with freight wagon buffers is not required, and therefore the requirements of 5.2 (Fixing on vehicle and interchangeability), 5.3 (Buffer dimensions) do not apply, those of 5.4 (Mechanical characteristics of buffers) and 5.6 (Marking) apply with restrictions.

NOTE 2 For tank wagon subjected to dangerous goods regulation, see [35].

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 1370, *Founding — Examination of surface condition*

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

EN 10168, *Steel products — Inspection documents — List of information and description*

EN 10204, *Metallic products — Types of inspection documents*

EN 10243-1, *Steel die forgings — Tolerances on dimensions — Part 1: Drop and vertical press forgings*

EN 12663 (all parts), *Railway applications — Structural requirements of railway vehicle bodies*

EN 15227, *Railway applications — Crashworthiness requirements for railway vehicle bodies*

EN ISO 148-1, *Metallic materials — Charpy pendulum impact test — Part 1: Test method (ISO 148-1)*

EN ISO 148-2, *Metallic materials — Charpy pendulum impact test — Part 2: Verification of testing machines (ISO 148-2)*

EN ISO 148-3, *Metallic materials — Charpy pendulum impact test — Part 3: Preparation and characterization of Charpy V-notch test pieces for indirect verification of pendulum impact machines (ISO 148-3)*

EN ISO 868, *Plastics and ebonite — Determination of indentation hardness by means of a durometer (Shore hardness) (ISO 868)*

EN ISO 6507-1, *Metallic materials — Vickers hardness test — Part 1: Test method (ISO 6507-1)*

EN ISO 6507-2, *Metallic materials — Vickers hardness test — Part 2: Verification and calibration of testing machines (ISO 6507-2)*

EN ISO 6507-3, *Metallic materials — Vickers hardness test — Part 3: Calibration of reference blocks (ISO 6507-3)*

EN ISO 6507-4, *Metallic materials — Vickers hardness test — Part 4: Tables and hardness values (ISO 6507-4)*

EN ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature (ISO 6892-1)*

EN ISO 11469, *Plastics — Generic identification and marking of plastics products (ISO 11469)*

ISO 37, *Rubber, vulcanized or thermoplastic — Determination of tensile stress-strain properties*

ISO 48, *Rubber, vulcanized or thermoplastic — Determination of hardness (hardness between 10 IRHD and 100 IRHD)*

ISO 188, *Rubber, vulcanized or thermoplastic — Accelerated ageing and heat resistance tests*

ISO 815-1, *Rubber, vulcanized or thermoplastic — Determination of compression set — Part 1: At ambient or elevated temperatures*

ISO 815-2, *Rubber, vulcanized or thermoplastic — Determination of compression set — Part 2: At low temperatures*