

Raudteelased rakendused. Nõuded pöördvankrile ja veermikule

Railway applications - Requirements for bogies and running gear

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 15827:2011 sisaldab Euroopa standardi EN 15827:2011 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 30.04.2011 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 30.03.2011.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN 15827:2011 consists of the English text of the European standard EN 15827:2011.

This standard is ratified with the order of Estonian Centre for Standardisation dated 30.04.2011 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

Date of Availability of the European standard text 30.03.2011.

The standard is available from Estonian standardisation organisation.

ICS 45.040

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ICS 45.040

English Version

Railway applications - Requirements for bogies and running gears

Applications ferroviaires - Exigences pour bogies et organes de roulement

Bahnanwendungen - Anforderungen für Drehgestelle und Fahrwerke

This European Standard was approved by CEN on 26 February 2011.

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Foreword

This document (EN 15827:2011) 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of an identical text or by endorsement, at the latest by September 2011, and conflicting national standards shall be withdrawn at the latest by September 2011.

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.

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 United Kingdom.

Introduction

The objective of this European Standard is to bring all the separate requirements related to the design and validation of bogies and running gear into one document. Since bogies and running gear are frequently produced by a different organisation to that responsible for the overall rail vehicle it starts by identifying the essential information needed to produce the required design.

The performance requirements for bogies and running gear fall into two related areas, covering functionality and safety, as required by TSI Essential requirements. Functionality relates to such things as speed, load capacity, ride quality and operating life. Safety covers gauging, structural integrity, dynamic performance, resistance to derailment and maintenance, etc.

Taking the requirements as a whole they involve three particular areas of expertise and discipline. Since each of these areas form a different part of the engineering process they have been addressed individually in the following main clauses of this standard, namely:

- structural requirements; Clause 6;
- dynamic requirements; Clause 7;
- maintenance requirements; Clause 11.

These clauses provide details of how the overall objectives are to be achieved in these important specific areas. This document structure is typical of the engineering process for the design, validation and maintenance support of bogies.

A bogie or running gear designed and validated in accordance with this standard will satisfy the Essential Requirements of the rolling stock TSIs.

1 Scope

This European Standard consolidates all the separate requirements specified in rolling stock TSIs and European Standards relating to bogies and running gear together into an overall requirement and process that ensures a functional and safe design is achieved for a defined operating envelope.

There are many European Standards that specify the design requirements and associated processes of bogie and running gear components and sub-assemblies. There are also European standards that specify vehicle performance and validation requirements that depend directly on the bogies or running gear. The objective of this standard is to bring all these separate design criteria together. This is accomplished by specifying the design and validation processes to be used for bogies and running gear with particular focus on the two key disciplines of dynamic behaviour and structural integrity. To ensure that safe operation can be continued throughout the product life the definition of a maintenance plan is also required.

This European Standard is applicable to bogies and running gear intended for vehicles that will operate under the Interoperability Directives on designated TEN routes. The requirements, however, can be used in other applications at the discretion of the interested parties. It specifies the requirements to achieve a satisfactory design of bogie or running gear and to validate the design against the relevant performance and safety criteria. Technical requirements are specified directly or by making reference to the relevant European standards and include the nature and content of an auditable record that should be produced of the design and validation processes.

The requirements address only the design and validation of bogies and running gear. No requirements are set for other systems components that are attached to the bogies or running gear, except to establish that a satisfactory interface has been provided.

NOTE Specifications that relate to bogies and running gear can only be considered in the context of a specific vehicle application. Therefore the performance, both safety and otherwise, can relate only to the bogies and running gear as part of a vehicle configuration and not to the individual elements of the bogies or running gear.

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 473, *Non-destructive testing — Qualification and certification of NDT personnel — General principles*

EN 12080, *Railway applications — Axleboxes — Rolling bearings*

EN 12081, *Railway applications — Axleboxes — Lubricating greases*

EN 12082, *Railway applications — Axleboxes — Performance testing*

EN 12299, *Railway applications — Ride comfort for passengers — Measurement and evaluation*

EN 12663-1, *Railway applications — Structural requirements of railway vehicle bodies — Part 1: Locomotives and passenger rolling stock (and alternative methods for freight wagons)*

EN 12663-2, *Railway applications — Structural requirements of railway vehicle bodies — Part 2: Freight wagons*

EN 13103, *Railway applications — Wheelsets and bogies — Powered axles — Design method*

EN 13104, *Railway applications — Wheelsets and bogies — Non-powered axles — Design method*

EN 13260, *Railway applications — Wheelsets and bogies — Wheelsets — Products requirements*

- EN 13261, *Railway applications — Wheelsets and bogies — Axles — Product requirements*
- EN 13262, *Railway applications — Wheelsets and bogies — Wheels — Product requirement*
- EN 13298, *Railway applications — Suspension components — Helical suspension springs, steel*
- EN 13597, *Railway applications — Rubber suspension components — Rubber diaphragms for pneumatic suspension springs*
- EN 13715, *Railway applications — Wheelsets and bogies — Wheels — Wheels tread*
- EN 13749:2005, *Railway applications — Wheelsets and bogies — Methods of specifying structural requirements of bogie frames*
- EN 13802, *Railway applications — Suspension components — Hydraulic dampers*
- EN 13913, *Railway applications — Rubber suspension components — Elastomer-based mechanical parts*
- EN 13979-1, *Railway applications — Wheelsets and bogies — Monobloc wheels — Technical approval procedure — Part 1: Forged and rolled wheels*
- EN 14200, *Railway applications — Suspension components — Parabolic springs, steel*
- EN 14363, *Railway applications — Testing for the acceptance of running characteristics of railway vehicles — Testing of running behaviour and stationary tests*
- EN 14535-1, *Railway applications — Brake discs for railway rolling stock — Part 1: Brake discs pressed or shrunk onto the axle or drive shaft, dimensions and quality requirements*
- prEN 14535-2, *Railway applications — Brake discs for railway rolling stock — Part 2: Brake discs mounted onto the wheel — Dimensions and quality requirements*
- EN 14817, *Railway applications — Suspension components — Air spring control elements*
- EN 15049, *Railway Applications — Suspension components — Torsion bar, steel*
- EN 15085-1, *Railway applications — Welding of railway vehicles and components — Part 1: General*
- EN 15085-2, *Railway applications — Welding of railway vehicles and components — Part 2: Quality requirements and certification of welding manufacturer*
- EN 15085-3, *Railway applications — Welding of railway vehicles and components — Part 3: Design requirements*
- EN 15085-4, *Railway applications — Welding of railway vehicles and components — Part 4: Production requirements*
- EN 15085-5, *Railway applications — Welding of railway vehicles and components — Part 5: Inspection, testing and documentation*
- EN 15227, *Railway applications — Crashworthiness requirements for railway vehicle bodies*
- EN 15273-1, *Railway applications — Gauges — Part 1: General — Common rules for infrastructure and rolling stock*
- EN 15273-2, *Railway applications — Gauges — Part 2: Rolling stock gauge*
- EN 15313, *Railway applications — In-service wheelset operation requirements — In-service and off-vehicle wheelset maintenance*

EN 15437-1, *Railway applications — Axlebox condition monitoring — Interface and design requirements — Part 1: Track side equipment and rolling stock axlebox*

prEN 15437-2, *Railway applications — Axlebox condition monitoring — Performance requirements — Part 2: Onboard systems*

EN 15528, *Railway applications — Line categories for managing the interface between load limits of vehicles and infrastructure*

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

EN 15686, *Railway applications — Testing for the acceptance of running characteristics of railway vehicles with cant deficiency compensation system and/or vehicles intended to operate with higher cant deficiency than stated in EN 14363:2005, Annex G*

EN 15687, *Railway applications — Testing for the acceptance of running characteristics of freight vehicles with static axle loads higher than 225 kN and up to 250 kN*

prEN 15839, *Railway applications — Testing for the acceptance of running characteristics of railway vehicles — Freight wagons — Testing of running safety under longitudinal compressive forces*

prEN 15892, *Railway applications — Noise emission — Measurement of noise inside driver's cabs*

EN 50125-1, *Railway applications — Environmental conditions for equipment Part 1: Equipment on board rolling stock*

EN 60721-3-5, *Classification of environmental conditions — Part 3: Classification of groups of environmental parameters and their severities — Section 5: Ground vehicle installations (IEC 60721-3-5:1997)*

EN ISO 3095, *Railway applications — Acoustics — Measurement of noise emitted by railbound vehicles (ISO 3095:2005)*

EN ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature (ISO 6892-1:2009)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13749:2005 and the following apply.

3.1 analysis

assessment of performance by calculation, comparison or simulation that does not require the presence of an actual product (though it may use the results of physical measurements or testing)

3.2 bounce

vertical translational motion, perpendicular to the axis of the running rail, where the two ends of the vehicle, bogie or component part move in phase with the same amplitude

3.3 broadly acceptable risk

level of risk that society considers trivial and is consistent with that experienced in normal daily life and any effort to reduce the risk further would be disproportionate to the potential benefits achieved

3.4 coupling element

component that transfers force and provides relative motion between other components but, though not necessarily intended as its primary function to act as a suspension element, can have characteristics that affect the dynamic motion (e.g. bush for damper/link)