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Railway applications - System Engineering requirements for bogies and running gear

EESTI STANDARDIMIS- JA AKREDITEERIMISKESKUS
ESTONIAN CENTRE FOR STANDARDISATION AND ACCREDITATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 15827:2025 sisaldab Euroopa standardi EN 15827:2025 ingliskeelset teksti.	This Estonian standard EVS-EN 15827:2025 consists of the English text of the European standard EN 15827:2025.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 17.12.2025.	Date of Availability of the European standard is 17.12.2025.
Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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EUROPEAN STANDARD

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EN 15827

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English Version

Railway applications - System Engineering requirements for bogies and running gear

Applications ferroviaires - Exigences systèmes pour l'ingénierie des bogies et des organes de roulement

Bahnanwendungen - Anforderungen an das System Engineering für Drehgestelle und Fahrwerke

This European Standard was approved by CEN on 10 November 2025.

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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-CENELEC Management Centre has the same status as the official versions.

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

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Contents

European foreword

This document (EN 15827:2025) was 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 June 2026, and conflicting national standards shall be withdrawn at the latest by June 2026.

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 15827:2011.

EN 15827:2025 includes the following significant technical changes with respect to EN 15827:2011:

— The content has been rationalised between this document and EN 13749; that is, some content that was in EN 15827:2011 has been moved to the revision of EN 13749. EN 15827 is written as a process specification with general information and references to other standards; EN 13749 gives structural requirements.

— Some of the references have been moved to EN 13749 as a result of the above.

— Terms and definitions have been updated as a result of the above.

— Clause 4 sets out the “Engineering process” (formerly Clause 5), expanded to include functional requirements and risk assessment.

— Clause 5 is now “Requirements and interface management” (replaces former Clause 4).

— Clause 6 gives general “Structural design criteria”; details have been moved to EN 13749.

— Clause 7 gives general “Dynamic performance criteria”.

— Former Clause 8 has been removed as acceptance criteria are covered either elsewhere in this document or in their referenced standards.

— Clause 8 is now “Validation of the design” (formerly Clause 9).

— Clause 9 is the “Quality plan” (formerly Clause 10 “Quality requirement”).

— Clause 10 is the “Maintenance plan” (formerly Clause 11).

— The text from former Clause 12 “Proven operating envelope” has been distributed within Clauses 4, 5, 6 and 7.

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.

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

Introduction

This document focusses on system engineering requirements related to the specification, design, validation and maintenance of running gear and its interactions.

System engineering requirements are intended to ensure consistency over the complete life cycle from the specification, through design, validation, operation and maintenance.

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

Accordingly, three particular areas of expertise and discipline of the engineering process are relevant and they need to be addressed, namely:

— requirements for structural integrity; Clause 6;

— requirements for running characteristics; Clause 7;

— requirements for the maintenance regime; Clause 10.

The clauses in this document provide top-level information describing how the overall requirements are to be achieved in these specific areas. They contain references to other relevant standards which provide detailed requirements for specific running gear systems. The document structure is typical of the engineering process covering the design, validation and maintenance of bogies.

1 Scope

This document is applicable to the system engineering of bogies and running gear for rail vehicles, including those vehicles intended to operate under the Interoperability Directives.

It specifies the requirements to achieve:

— a satisfactory design of bogie or running gear,

— validation of the design within its operating envelope, and

— a maintenance plan

to ensure that the relevant performance and safety criteria are maintained.

The scope of the system engineering process specified in this document includes the design, validation and maintenance of bogies and running gear. No requirements are specified for other systems components that are attached to the bogies or running gear, except to ensure 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, including safety, 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 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 12663-1:2010+A2:2023, *Railway applications - Structural requirements of railway vehicle bodies - Part 1: Locomotives and passenger rolling stock (and alternative method for freight wagons)*

EN 13260:2020, *Railway applications - Wheelsets and bogies - Wheelsets - Product requirements*

EN 13749:2021+A1:2023, *Railway applications - Wheelsets and bogies - Method of specifying the structural requirements of bogie frames*

EN 14363:2016+A2:2022, *Railway applications - Testing and Simulation for the acceptance of running characteristics of railway vehicles - Running Behaviour and stationary tests*

EN 15273-1:2025, *Railway applications - Gauges - Part 1: General - Common rules for infrastructure and rolling stock*

EN 15273-2:2025, *Railway applications - Gauges - Part 2: Rolling stock gauge*

EN 15273-3:2025, *Railway applications - Gauges - Part 3: Structure gauges*

EN 15437-1:2009+A1:2022, *Railway applications - Axlebox condition monitoring - Interface and design requirements - Part 1: Track side equipment and rolling stock axlebox*

EN 15663:2017+A2:2024, *Railway applications - Vehicle reference masses*

EN 15839:2024, *Railway applications - Testing and simulation for the acceptance of running characteristics of railway vehicles - Running safety under longitudinal compressive force*

EN 16235:2023, *Railway applications - Testing for the acceptance of running characteristics of railway vehicles - Freight wagons - Conditions for dispensation of freight wagons with defined characteristics from on-track tests according to EN 14363*

EN 16404:2016, *Railway applications - Re-railing and recovery requirements for railway vehicles*

EN 17023:2018, *Railway applications - Railway vehicle maintenance - Creation and modification of maintenance plan*

EN 50125-1:2014, *Railway applications - Environmental conditions for equipment - Part 1: Rolling stock and on-board equipment*

EN ISO 3095:2025, *Acoustics - Railway applications - Measurement of noise emitted by railbound vehicles (ISO 3095:2025)*

EN ISO 3381:2021, *Railway applications - Acoustics - Noise measurement inside railbound vehicles (ISO 3381:2021)*

3 Terms and definitions

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

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

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

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

3.1
validation
process of ensuring that the system is fit for its intended use in its intended operational environment

Note 1 to entry: When applied to a numerical model, validation is the process of demonstrating that the model of the system responds in the manner of the actual system to a sufficient level of accuracy for its purpose.

3.2
verification
process of demonstrating that specific requirements are met

Note 1 to entry: Verification is answering whether a specific requirement is met, without questioning this requirement

3.3
technical specification
document specifying other or additional requirements not specified in this document

Note 1 to entry: Usually this is produced by and agreed between the customer and/or the manufacturer (sometimes called the supplier) or even a railway undertaking and can be an accompaniment to contractual requirements.

3.4
analysis
assessment of performance by calculation, comparison or simulation

3.5
testing
subjecting a specimen to a selection of specified inputs and measuring and recording its responses

3.6
partial factor
factor applied during the strength assessment which makes an allowance for a combination of the uncertainties and the consequences of failure