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**Railway applications - Testing for the acceptance of  
running characteristics of railway vehicles - Freight  
wagons - Testing of running safety under longitudinal  
compressive forces**

## EESTI STANDARDI EESSÕNA

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See Eesti standard EVS-EN 15839:2012 sisaldab Euroopa standardi EN 15839:2012 ingliskeelset teksti.	This Estonian standard EVS-EN 15839:2012 consists of the English text of the European standard EN 15839:2012.
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English Version

**Railway applications - Testing for the acceptance of running characteristics of railway vehicles - Freight wagons - Testing of running safety under longitudinal compressive forces**

Applications ferroviaires - Essais en vue de l'homologation du comportement dynamique des véhicules ferroviaires - Wagons - Vérification de la sécurité de circulation des wagons soumis à des forces longitudinales de compression

Bahnanwendungen - Prüfung für die fahrtechnische Zulassung von Eisenbahnfahrzeugen - Güterwagen - Prüfung der Fahrsicherheit unter Längsdruckkräften

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## Foreword

This document (EN 15839:2012) 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of an identical text or by endorsement, at the latest by April 2013, and conflicting national standards shall be withdrawn at the latest by April 2013.

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.

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

## Introduction

Due to the operating conditions of braking or propelling, high longitudinal compressive forces can occur between some coupled freight wagons. These forces can be safety related especially in S-shaped curves with small radii under some conditions depending also on the design of the coupling.

This document defines the acceptance process to be followed by vehicles that:

- are equipped with standard ends consisting of side buffers and screw couplers; and
- operated in a way that high longitudinal compressive forces may occur in the trains.

The establishment of this document was based on currently existing rules, practices and procedures in order to define acceptance criteria ensuring a safe operation under the existing operating conditions. It provides a defined testing interface between vehicle design, track layout and braking operation. Investigations according to this standard are not necessary if operating practice shows that a safe operation is achieved without them.

The following principles are applied:

- 1) the railway system requires comprehensive technical rules in order to ensure an acceptable interaction of vehicle and track;
- 2) due to the numerous national and international regulations new railway vehicles shall be tested and homologated before putting them into service. In addition, existing acceptance shall be checked when operating conditions are extended;
- 3) in view of the significance of international traffic, the harmonisation of existing regulations is required. In some cases, additional rules are required as well: an update of existing regulations is also needed due to the considerable progress achieved in the field of railway-specific methods for measuring, evaluation and data processing;
- 4) it is of particular importance that the existing level of safety and reliability is not compromised even when changes in design and operating practices are demanded.

This document is derived in essential parts from UIC 530-2, which is based on practical tests performed in ERRI-B12.

The torsional coefficient of the car body  $c_t^*$  is a significant parameter for the endurable longitudinal compressive force as well as for the safety against derailment on twisted track as defined in EN 14363. For this reason, a description of a measuring procedure for this parameter is included in this standard. Furthermore, for defined standard freight wagons, the possibility of a dispensation from derailment tests on twisted track according to EN 14363:2005 is defined based on already published calculated results in the diagram collection of UIC 530-2.

Variations from the conditions specified in this document are allowed as specified by Article 7 of Directive 2004/50/EC.

For national or multilateral operations the infrastructure managers concerned may authorise variations to the defined conditions.

# 1 Scope

This European Standard defines the acceptance process to be followed by vehicles that are operated in trains capable of generating high longitudinal forces and that are susceptible, as a result of their design, to derailment as a result of being subjected to these forces.

This European Standard applies to the following types of freight wagons equipped with standard ends as defined in this EN:

- single wagons;
- permanently coupled units with side buffers and screw couplers between the vehicles;
- permanently coupled units with diagonal buffers with screw couplers between the vehicles;
- articulated units with three 2-axle bogies;
- low-floor wagons with eight or more axles (e.g. rolling road wagon <sup>1)</sup>).

The following vehicles are not currently in the scope of this European Standard:

- wagons that are not subjected to extensive longitudinal compressive forces due to their operational environment (as train composition, braking regime, track layout);
- wagons with automatic couplers <sup>2)</sup>;
- wagons with 3-axle bogies <sup>3)</sup>;
- permanently coupled units with a bar coupler between the vehicles <sup>4)</sup>;
- articulated wagons with more than three 2-axle bogies.

Acceptance criteria and test conditions as well as conditions for the dispensation from tests are defined in this European Standard.

This document applies principally to wagons which operate without restriction on standard gauge tracks in Europe (1 435 mm).

**NOTE** The influence on railway systems using other gauges is not sufficiently understood to extend the scope of this document to gauges other than standard.

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<sup>1)</sup> A description of such vehicles is given in UIC 571-4:2004, 3.4.

<sup>2)</sup> These wagons are handled in UIC 530-2.

<sup>3)</sup> Due to their high tare mass and their short length, these wagons need no special investigation according to this standard.

<sup>4)</sup> A working group of UIC is developing the acceptance conditions for this type of wagon. It is planned to include the regulations into this European Standard.

## 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 14363:2005, *Railway applications — Testing for the acceptance of running characteristics of railway vehicles — Testing of running behaviour and stationary tests*

EN 15551:2009+A1:2010, *Railway applications — Railway rolling stock — Buffers*

EN 15566, *Railway applications — Railway rolling stock — Draw gear and screw coupling*

prEN 16235:2011, *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*

## 3 Terms and definitions

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

**3.1**  
**torsional coefficient of vehicle body**  
relevant parameter for running safety under compressive forces and safety against derailment on twisted track

Note1 to entry: The torsional coefficient describes the resistance of the car body structure against a torque around the longitudinal axis.

**3.2**  
**safety against derailment on twisted track**  
safety of a vehicle against wheel climbing of a guiding wheel whilst negotiating a curved track with limit conditions of twist

Note1 to entry: Test conditions are defined in EN 14363.

**3.3**  
**endurable longitudinal compressive force**  
longitudinal force which can be applied on a wagon under defined conditions related to the flanking wagons and the track layout without exceeding limits specified for wheel lift, lateral axle box force, overlap of buffer plates and axle guard deformation

**3.4**  
**standard ends**  
specific design of the coupling end of a wagon equipped with side buffers and screw couplers

Note1 to entry: Geometric location of buffers and draw gear is specified in CR TSI RST FW (freight wagons), 4.2.2.1. Characteristics of buffers are specified in EN 15551, characteristics of draw gear are specified in EN 15566.

**3.5**  
**permanently coupled unit**  
unit consisting of several elements (single wagons fitted with bogies or single axle running gear), equipped at both ends with side buffers and screw couplers as defined in 3.4 where the elements cannot be operated separately

**3.6**  
**articulated unit**  
unit consisting of several elements, connected with articulations and equipped at both ends with side buffers and screw couplers as defined in 3.4 where the elements cannot be operated separately