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KONSTRUKTSIOONI JA TALITLUSNÕUDED  
TEMPERATUURISEIRE SÜSTEEMIDELE VEEREMIL

Railway applications - Axlebox condition monitoring -  
Interface and design requirements - Part 2:  
Performance and design requirements of on-board  
systems for temperature monitoring

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN 15437-2:2012+A1:2022 sisaldab Euroopa standardi EN 15437-2:2012+A1:2022 ingliskeelset teksti.	This Estonian standard EVS-EN 15437-2:2012+A1:2022 consists of the English text of the European standard EN 15437-2:2012+A1:2022.
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 21.12.2022.	Date of Availability of the European standard is 21.12.2022.
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English Version

**Railway applications - Axlebox condition monitoring -  
Interface and design requirements - Part 2: Performance  
and design requirements of on-board systems for  
temperature monitoring**

Applications ferroviaires - Surveillance des boîtes  
d'essieux - Exigences liées aux interfaces - Partie 2 :  
Exigences de performance et de conception des  
systèmes embarqués de surveillance de la température

Bahnanwendungen - Zustandsüberwachung von  
Radsatzlagern - Schnittstellen und  
Gestaltungsanforderungen - Teil 2: Leistungs- und  
Konstruktionsanforderungen von fahrzeugbasierten  
Systemen für Temperaturüberwachung

This European Standard was approved by CEN on 12 August 2012 and includes Amendment 1 approved by CEN on 21 November 2022.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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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**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

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## European foreword

This document (EN 15437-2:2012+A1:2022) 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 June 2023, and conflicting national standards shall be withdrawn at the latest by June 2023.

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 includes Amendment 1 approved by CEN on 21 November 2022.

This document will supersede EN 15437-2:2012.

The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1** **A1**.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

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

EN 15437 “*Railway applications - Axlebox condition monitoring - Interface and design requirements*” is comprised of the following parts:

- *Part 1: Track side equipment and rolling stock axlebox;*
- *Part 2: Performance and design requirements of on-board systems for temperature monitoring (the present 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 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

## Introduction

Failed wheelset bearings on rolling stock create a hazard to the safe operation of the railway. If a bearing fails while rolling stock is in service there is the potential for a catastrophic event. A catastrophic event may result in fatalities, severe damage to rolling stock and/or the infrastructure and a risk that rolling stock may derail and/or a fire may develop.

One indication that a bearing is about to fail is a rise in the heat generated by the bearing. Bearings that are about to fail may, therefore, be detected by monitoring their temperature to identify an unacceptable rise.

This part of EN 15437 covers the monitoring of axlebox bearing temperature by on-board monitoring systems. According to the application, these may be considered to be basic systems or advanced systems.

In most cases, rolling stock axleboxes continue to be monitored by trackside Hot AxleBox Detectors [HABD] which is the subject of Part 1 of EN 15437. The monitoring system is fitted on the rolling stock and is able to function autonomously from trackside monitoring systems which are ground-based.

In contrast to trackside monitoring systems, the detection characteristic may be adapted to the particular vehicle design, such that the alarm levels employed are configured depending on the bearing properties, sensor arrangement, vehicle type, network characteristics, etc.

The use of on-board monitoring may also provide a solution for overcoming constraints related to bogie design or other aspects of vehicle design or operation which may prevent effective monitoring by means of the track-side monitoring systems.

Other devices which apply functionally equivalent alternatives (for example based on the principle of vibration monitoring) may be available and normalized elsewhere, such as in other parts of this series of European Standards.

## 1 Scope

This European Standard defines the minimum performance requirements of on-board monitoring systems for axlebox condition monitoring by means of temperature measurements.

This European Standard refers to temperature monitoring of the axlebox. However, the design may be such that the rolling bearing itself is monitored directly.

The requirements of this European Standard are intended to apply equally to basic monitoring systems for monitoring the axlebox temperature through to more technically complex systems that may employ a combination of mechatronics.

To ensure the compatibility of monitoring systems and the effective monitoring functions, this European Standard defines the requirements in the following areas:

- equipment and characteristics;
- monitoring performance;
- operation and interface.

This part of EN 15437 does not include:

- systems that do not give an indication to the driver;
- how an on-board monitoring system is structured and how it measures the temperature and identifies axlebox position. This is considered part of equipment design and not part of the functional requirements set out in this standard;
- operational requirements for acting on the information reported by the on-board monitoring system;
- operational requirements for conflict of information between trackside monitoring systems and on-board monitoring systems;
- maintenance requirements for on-board temperature monitoring systems.

## 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 50121-2:2017, *Railway applications — Electromagnetic compatibility — Part 2: Emission of the whole railway system to the outside world*

EN 50121-3-1:2017, *Railway applications – Electromagnetic compatibility Part 3-1: Rolling stock - Train and complete vehicle*

EN 50121-3-2:2016, *Railway applications – Electromagnetic compatibility - Part 3-2: Rolling stock - Apparatus*

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

EN 50126-1:2017, *Railway applications — The specification and demonstration of Reliability, Availability, Maintainability and Safety (RAMS) — Part 1: Generic RAMS process*

EN 50128:2011, *Railway applications — Communication, signalling and processing systems — Software for railway control and protection systems*

EN 50129:2018, *Railway applications — Communication, signalling and processing systems — Safety related electronic systems for signalling*

EN 50155:2017, *Railway applications — Rolling stock — Electronic equipment*

EN 61373:2010, *Railway applications — Rolling stock equipment — Shock and vibration tests (IEC 61373:2010)*

EN 61508:2010 (all parts), *Functional safety of electrical/electronic/programmable electronic safety-related systems (IEC 61508:2010 (all parts))*



### 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 <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

#### 3.1

##### **axlebox**

assembly of box housing, rolling bearings, sealing and grease

#### 3.2

##### **bearing**

axle journal bearing or bearing assembly on a rail vehicle axle that transmits a proportion of the weight of the rail vehicle directly to the wheel set

#### 3.3

##### **rolling bearing**

bearing operating with rolling motion between the parts, supporting load and moving in relation to each other

#### 3.4

##### **on-board monitoring system**

system that is capable of detecting a temperature of an axlebox that is indicative of the health of that axlebox and indicates when acceptable temperature conditions have been exceeded

#### 3.5

##### **Safety Integrity Level (SIL)**

one of a number of defined discrete levels to specify the safety integrity requirements of the safety functions to be allocated to the safety related systems

Note 1 to entry: The Safety Integrity Level with the highest figure has the highest level of safety integrity.