

**Raudteealased rakendused. Teljelaagripukside seisundi seire. Nõuded konstruktsioonile ja liidesed. Osa 2. 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

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See Eesti standard EVS-EN 15437-2:2012 sisaldab Euroopa standardi EN 15437-2:2012 ingliskeelset teksti.	This Estonian standard EVS-EN 15437-2:2012 consists of the English text of the European standard EN 15437-2:2012.
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.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 19.09.2012.	Date of Availability of the European standard is 19.09.2012.
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ICS 45.060.01

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ICS 45.060.01

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 - Leistungsanforderungen - Teil 2:  
Leistungs- und Konstruktionsanforderungen von  
fahrzeugbasierten Systemen für Temperaturüberwachung

This European Standard was approved by CEN on 12 August 2012.

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## Foreword

This document (EN 15437-2:2012) 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of an identical text or by endorsement, at the latest by March 2013, and conflicting national standards shall be withdrawn at the latest by March 2013.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.

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).*

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

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

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

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

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

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

EN 50155, *Railway applications — Electronic equipment used on rolling stock*

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

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

### 3 Terms and definitions

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

- 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.

### 4 Equipment and characteristics

#### 4.1 Design requirements

The equipment shall respect the applicable requirements regarding the environmental conditions for equipment on-board rolling stock as set out in EN 50125-1. In particular, vibration design of electrical and electronic equipment, as well as their fixing, associated with the measurements on the bearing unit or on the axle box shall respect the requirements set out in EN 61373.

The equipment shall respect the applicable requirements regarding electronic equipment as set out in EN 50155.

On-board monitoring systems shall not interfere or influence the behaviour of trackside equipment or other train-borne equipment.

**NOTE** This document does not set out the architecture of the environment in which an on-board temperature monitoring system may be installed. The range of architectures may differ significantly (from a freight wagon to a high