

Raudteealased rakendused. Veeremi ja rongi kontrollindikaatorsüsteemi vaheline ühilduvus

Railway applications - Compatibility between rolling stock and train detection systems

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 50238:2003 sisaldab Euroopa standardi EN 50238:2003 ingliskeelset teksti.	This Estonian standard EVS-EN 50238:2003 consists of the English text of the European standard EN 50238:2003.
Käesolev dokument on jõustatud 08.05.2003 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.	This document is endorsed on 08.05.2003 with the notification being published in the official publication of the Estonian national standardisation organisation.
Standard on kättesaadav Eesti standardiorganisatsioonist.	The standard is available from Estonian standardisation organisation.

Käsitlusala: The scope of this European Standard is to describe a procedure for mutual acceptance of rolling stock to run over specific routes. It describes the methods of measurement of interference currents, the methods of measurement of the susceptibility of train detection systems, the characterisation of traction power supplies and the procedure for acceptance	Scope: The scope of this European Standard is to describe a procedure for mutual acceptance of rolling stock to run over specific routes. It describes the methods of measurement of interference currents, the methods of measurement of the susceptibility of train detection systems, the characterisation of traction power supplies and the procedure for acceptance
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Võtmesõnad: classifications, electric loco, electrical equ, electrical transmission syste, railw, railways, specification (approval), specifications, stationary, supply voltages, switchgear, switchgears, testing, traction current supply plants, voltage, voltage limitation

English version

**Railway applications –
Compatibility between rolling stock
and train detection systems**

Applications ferroviaires –
Compatibilité entre matériel roulant
et systèmes de détection de train

Bahnanwendungen –
Kompatibilität zwischen Fahrzeugen
und Gleisfreimeldesystemen

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

This European Standard was prepared by SC 9XA, Communication, signalling and processing systems, of Technical Committee CENELEC TC 9X, Electrical and electronic applications for railways.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50238 on 2002-12-01.

This European Standard was prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and supports the essential requirements of Directive 96/48/EC.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2003-12-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2005-12-01

This European Standard is intended to be read in conjunction with the EN 50121 series.

Annexes designated “informative” are given for information only.
In this standard annexes A, B, C and D are informative.

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Introduction

This European Standard defines a process to obtain the assurance that specific rolling stock operating on a specific route does not interfere with train detection systems installed on this route.

Compatibility problems between train detection systems and rolling stock are a significant obstacle to cross-acceptance of rolling stock in Europe. Unfortunately it is not possible to establish general rules for the maximum levels of interference allowed, valid for every country. This is due to the great diversity of rolling stock, power supply and return current systems, and train detection systems installed in Europe. This diversity leads to consideration of the problem of compatibility of rolling stock and train detection systems for specific routes to avoid unnecessarily restrictive specifications.

Compatibility is determined by both physical and electromagnetic considerations. With regard to EMC, the need is not for general values for maximum levels of interference permitted, but for convenient methods by which to specify the level of interference allowed for operation on specific routes.

Interference may be caused by

- rail currents,
- electromagnetic fields,
- differential voltage between axles,

as shown in Figure 1:

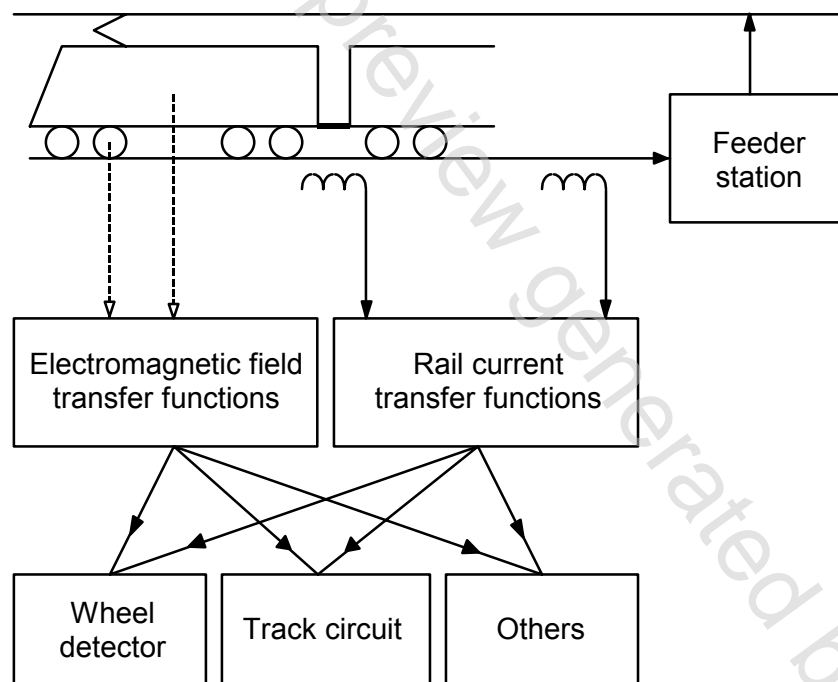


Figure 5 – Sources of electromagnetic interference

In practice, the susceptibility of the system is determined by

- the sensitivity of individual components of the system,
- the application of the components, i.e. the configuration of the system.

Therefore the problems concerning track circuits and axle counters or wheel detection systems will be looked at separately.

For determining the susceptibility of signalling systems, laboratory/simulation testing methods as well as methods to conduct tests on the “real railway” are proposed. Modelling enables worst-case conditions to be simulated. In addition, particular test sites are used because, from experience, they are known to provide the test evidence required. Then, taking account of the experience of the railways, it is possible to establish a general method for determining the susceptibility of train detection systems, described in this European Standard.

Before measuring the interference level on rolling stock, a sufficient knowledge of the electric circuit diagram of the power equipment is required, e.g. switching frequencies of on-board static converters, type of regulation used for power converters, resonant frequency of each filter, operating limits under high and low supply voltages, downgraded modes of operation etc.

1 Scope

The scope of this European Standard is to describe a procedure for mutual acceptance of rolling stock to run over specific routes. It describes the methods of measurement of interference currents, the methods of measurement of the susceptibility of train detection systems, the characterisation of traction power supplies and the procedure for acceptance. The result of the acceptance procedure is a structured justification document referred to as a “compatibility case”, which documents the evidence that the conditions for compatibility have been satisfied.

This European Standard is not generally applicable to those combinations of rolling stock, traction power supply and train detection system which were accepted as compatible prior to the issue of this European Standard. However, as far as is reasonably practicable, this European Standard may be applied to modifications of rolling stock, traction power supply or train detection systems which may affect compatibility.

The scope of the compatibility case is restricted to the demonstration of compatibility of rolling stock with a train detection system’s characterisation (e.g. gabarit). Radio based signalling systems are not within the scope of this European Standard.

2 Normative references

This European Standard incorporates by dated or undated references, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed below. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 50121	Series	Railway applications – Electromagnetic compatibility
EN 50126		Railway applications – The specification and demonstration of Reliability, Availability, Maintainability and Safety (RAMS)
EN 50163		Railway applications – Supply voltages of traction systems
EN/ISO 9001		Quality management systems – Requirements
EN ISO/IEC 17025		General requirements for the competence of testing and calibration laboratories
ORE B108/1		Unification of air-conditioning and electrical equipment in coaches
UIC 737-3		The application of thyristors in railway technology: Measures for the prevention of functional disturbances in signalling installations
UIC 550		Power supply installations for passenger stock

3 Definitions

For the purposes of this European Standard, the following definitions apply:

3.1

accepting body

the body responsible for the evaluation of the compatibility case and the issue of a certificate of acceptance