

**Raudteealased rakendused. Veeremil kasutatavad
elektroonikaseadmed**

Railway applications - Electronic equipment used on
rolling stock

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 50155:2007 sisaldab Euroopa standardi EN 50155:2007 ingliskeelset teksti.

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English version

**Railway applications -
Electronic equipment used on rolling stock**

Applications ferroviaires -
Équipements électroniques utilisés
sur le matériel roulant

Bahnanwendungen -
Elektronische Einrichtungen
auf Schienenfahrzeugen

This European Standard was approved by CENELEC on 2007-03-01. CENELEC 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 Central Secretariat or to any CENELEC 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 CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC

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

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Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 9X, Electrical and electronic applications for railways.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50155 on 2007-03-01.

This European Standard supersedes EN 50155:2001 + A1:2002.

This EN 50155:2007 has been aligned with the new EN 50121 series and addresses some Portuguese comments.

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) 2008-03-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2010-03-01

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and covers essential requirements of EC Directives 96/48/EC and 2001/16/EC. See Annex ZZ.

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1 Scope

This standard applies to all electronic equipment for control, regulation, protection, supply, etc., installed on rail vehicles and associated with:

- either the accumulator battery of the vehicle;
- or a low voltage power supply source with or without a direct connection to the contact system (transformer, potentiometer device, auxiliary supply);

with the exception of electronic power circuits, which conform to EN 50207.

This standard covers the conditions of operation, design, construction, and testing of electronic equipment, as well as basic hardware and software requirements considered necessary for competent, reliable equipment.

Additional requirements in other standards or individual specifications may complement this standard, if they are justified.

Specific requirements related to practices necessary to assure defined levels of functional safety are to be determined in accordance with 4.6.3.1 and 4.6.3.2 of EN 50126 and its informative Annex A.

Software safety integrity level of 1 or higher shall only be considered when it is shown that a residual safety risk remains and that it has to be carried by the software driven programmable electronic system. In such a case (i.e. software safety integrity level 1 or higher), EN 50128 is applicable.

For the purpose of this standard, electronic equipment is defined as equipment mainly composed of semiconductor devices and recognized associated components. These components will mainly be mounted on printed boards.

NOTE Sensors (current, voltage, speed, etc.) and firing unit printed board assemblies for power electronic devices are covered by this standard. Complete firing units are covered by EN 50207.

2 Normative references

The following referenced documents are indispensable for the application 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 50121-3-2	2000	Railway Applications - Electromagnetic compatibility Part 3-2: Rolling stock – Apparatus
EN 50125-1	1999	Railway Applications – Environmental conditions for equipment– Part 1: Equipment on board rolling stock
EN 50126	Series	Railway applications - The specification and demonstration of Reliability, Availability, Maintainability and Safety (RAMS)
EN 50128	2001	Railway applications - Communication, signalling and processing systems - Software for railway control and protection systems
EN 50163	1995	Railway Applications - Supply voltages of traction systems
EN 50207	2000	Railway applications - Electronic power converters for rolling stock (IEC 61287-1:1995, related)
EN 60068	Series	Environmental testing (IEC 60068 series)
EN 60068-2-1	1993	Environmental testing – Part 2: Tests – Test A: Cold (IEC 60068-2-1:1990)
EN 60068-2-2	1993	Environmental testing – Part 2: Tests – Test B: Dry heat (IEC 60068-2-2:1974 + IEC 60068-2-2A:1976)
EN 60068-2-30	2005	Environmental testing – Part 2: Tests – Test Db and guidance: Damp heat, cyclic (12 + 12 hour cycle) (IEC 60068-2-30:2005)

EN 60077	Series	Railway applications – Electrotechnical equipment for rolling stock (IEC 60077 series, modified)
EN 60249-2-15	1994	Base materials for printed circuits – Part 2: Specifications -- Specification No. 15: Flexible copper-clad polyimide film, of defined flammability (publication withdrawn)
EN 60297	Series	Mechanical structures for electronic equipment - Dimensions of mechanical structures of the 482,6 mm (19 in) series (IEC 60297 series)
EN 60352	Series	Solderless connections (IEC 60352 series)
EN 60352-1	1997	Solderless connections – Part 1: Wrapped connections - General requirements, test methods and practical guidance (IEC 60352-1:1997)
EN 60352-2	2006	Solderless connections – Part 2: Crimped connections - General requirements, test methods and practical guidance (IEC 60352-2:2006)
EN 60529	1991	Degrees of protection provided by enclosures (IP Codes) (IEC 60529:1989)
EN 61000-4-4	2004	Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test (IEC 61000-4-4:2004)
EN 61082	Series	Preparation of documents used in electrotechnology (IEC 61082 series)
EN 61249	Series	Materials for printed boards and other interconnecting structures (IEC 61249 series)
EN 61249-2-7	2002	Materials for printed boards and other interconnecting structures – Part 2-7: Reinforced base materials, clad and unclad - Epoxide woven E-glass laminated sheet of defined flammability (vertical burning test), copper-clad (IEC 61249-2-7:2002)
EN 61249-2-10	2003	Materials for printed boards and other interconnecting structures – Part 2-10: Reinforced base materials, clad and unclad - Cyanate ester, brominated epoxide, modified or unmodified, woven E-glass reinforced laminated sheets of defined flammability (vertical burning test), copper-clad (IEC 61249-2-10:2003)
EN 61373	1999	Railway applications - Rolling stock equipment - Shock and vibration tests (IEC 61373:1999)
EN 62326	Series	Printed boards
EN 123000	1991	Generic specification - Printed boards
EN 123200	1992	Sectional specification - Single and double sided printed boards with plated-through holes
EN 123300	1992	Sectional specification - Multi-layer printed boards
EN 123400	1992	Sectional specification - Flexible printed boards without through connections
EN 123500	1992	Sectional specification - Flexible printed boards with through connections
EN ISO 9000-3	1997	Quality management and quality assurance standards Part 3: Guidelines for the application of ISO 9001 to the development, supply and maintenance of software (ISO 9000-3:1991)
EN ISO 9001		Quality management systems - Requirements (ISO 9001)
EN ISO 9002		Quality systems - Model for quality assurance in production, installation and servicing (ISO 9002)
IEC 60605	Series	Equipment reliability testing
IEC 60617	Database	Graphical symbols for diagrams