

SLOVENSKI STANDARD oSIST prEN 50125-1:2012

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Železniške naprave - Okoljski pogoji za opremo - 1. del: Oprema na voznih sredstvih				
Railway applications - Environmental conditions for equipment - Part 1: Equipment on board rolling stock				
Bahnanwendungen - Umweltbedingungen für Betriebsmittel - Teil 1: Betriebsmittel auf Bahnfahrzeugen				
Applications ferroviaires - Conditions d'environnement pour le matériel - Partie 1: Equipement embarqué du matériel roulant				
Ta slovenski standard je istoveten z: prEN 50125-1:2012				

ICS:

13.020.99	Drugi standardi v zvezi z varstvom okolja	Other standards related to environmental protection
45.060.01	Železniška vozila na splošno	Railway rolling stock in general

oSIST prEN 50125-1:2012

en



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EUROPEAN STANDARD NORME EUROPÉENNE EUROPÄISCHE NORM

DRAFT prEN 50125-1

March 2012

Will supersede EN 50125-1:1999

ICS

English version

Railway applications -Environmental conditions for equipment -Part 1: Equipment on board rolling stock

Applications ferroviaires -Conditions d'environnement pour le matériel -Partie 1: Equipement embarqué du matériel roulant Bahnanwendungen -Umweltbedingungen für Betriebsmittel -Teil 1: Betriebsmittel auf Bahnfahrzeugen

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This draft European Standard is submitted to CENELEC members for CENELEC enquiry. Deadline for CENELEC: 2012-09-07.

It has been drawn up by CLC/SC 9XB.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CENELEC 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 CEN-CENELEC Management Centre has the same status as the official versions.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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CENELEC

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Foreword

This document [prEN 50125-1:2012] has been prepared by CLC/SC 9XB " Electromechanical material on board rolling stock" of CLC/TC 9X "Electrical and electronic applications for railways".

This document is currently submitted to the Enquiry.

This document will supersede EN 50125-1:1999.

prEN 50125-1:2012 is a revision of EN 50125-1:1999 with an extended scope to cover mechanical requirements, as requested by the European Railway Agency (ERA).

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

For the relationship with EU Rail Directive (2008/57/EC) see informative Annex ZZ ¹), which is an integral part of this document.

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¹⁾ To be provided at voting stage.

1 Scope

This European Standard intends to define environmental conditions within Europe.

NOTE 1 It can also be applied elsewhere by agreement.

The scope of this European Standard covers the definitions and ranges of the following parameters:

Altitude, temperature, humidity, air movement, rain, snow and hail, ice, solar radiation, lightning, pollution, vibrations and shocks, electromagnetic interference environment, Supply system characteristics for complete rolling stock and all on-board equipment (mechanical, electromechanical, electromechanical, electronic).

In particular, this European Standard defines interface conditions between the vehicle and its environment. The defined environmental conditions are considered as normal in service. Further guidance on severe conditions can be found within prEN 16251.

Rolling stock or parts of it can also be used outside the specification with reduced performance.

NOTE 2 In these cases, relevant operating rules could be necessary to ensure the technical compatibility between the rolling stock and environmental conditions.

Microclimates surrounding components may be defined by relevant product standards or by special requirements. Passenger effects on the equipment and equipment effects on the passengers are not considered in this European Standard.

This European Standard does not apply to cranes, mining vehicles, cable cars. This European Standard also does not apply to natural disaster (earthquakes).

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2^{http}Normative references^{g/standards/sist/8a48e5ff-c03c-45af-bfbf-9de4998b6c78/sisten-50125-1-2014}

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 50121-3-1:2006 + corr. May. 2008, *Railway applications – Electromagnetic compatibility – Part 3-1: Rolling stock – Train and complete vehicle*

EN 50121-3-2:2006 + corr. May. 2008, *Railway applications – Electromagnetic compatibility – Part 3-2: Rolling stock – Apparatus*

EN 50124-2:2001 + corr. May. 2010, *Railway applications – Insulation coordination – Part 2: Overvoltages and related protection*

EN 50388:2005 + corr. May. 2010, *Railway applications – Power supply and rolling stock – Technical criteria for the coordination between power supply (substation) and rolling stock to achieve interoperability*

EN 60529:1991 + A1 2000, Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989 + A1:1999)

EN 60721-3-5:1997, Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Section 5: Ground vehicle installations (IEC 60721-3-5:1997)

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EN 61373:2010, Railway applications – Rolling stock equipment – Shock and vibration tests (IEC 61373:2010 + corr. Oct. 2011)

HD 478.2.3 S1:1990, Classification of environmental conditions – Part 2: Environmental conditions appearing in nature – Air pressure (IEC 60721-2-3:1987)

3 Terms and definitions

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

3.1

environmental conditions

physical, chemical or biological condition, external to a product to which it is subjected at a certain time

3.2

vehicle compartment

any enclosure for housing of mechanical, electrical and/or electronic equipment

3.3

environmental parameters

one or more physical, chemical or biological properties characterising an environmental factor (e.g. temperature, acceleration)

EXAMPLE 1 The environmental factor 'vibration' is characterised by the parameters: type of vibration (sinusoidal, random), acceleration and frequency.

3.4

severity of environmental parameters ST EN 50125-1:2014

value of each quantity characterising the environmental parameter -45af-bfbf-9de4998b6c78/sist-

EXAMPLE 2 The severity of sinusoidal vibration is defined by values of the acceleration (in m/s²) and frequency (in Hz).

4 Environmental conditions

4.1 General

In the following clauses the environmental parameters are given at which the vehicle and its equipment shall function as specified.

In the text, normal environmental conditions are considered as being those of Europe. They are classified with a suffix 1, 2, 3, etc. and special conditions with a suffix X.

The class to consider shall be stated in the specification, otherwise the class with suffix 1 shall be assumed.

NOTE Except otherwise stated in this document, general information is given by EN 60721-3-5, HD 478.2.1 S1, HD 478.2.2 S1, HD 478.2.3 S1 and HD 478.2.7 S1.

The severities specified are those which will have a low probability of being exceeded. All specified values are maximum or limiting values. These values may be reached, but do not occur permanently. Depending on the situation there may be different frequencies of occurrence related to a certain period of time. Such frequencies of occurrence have not been included in this European Standard, but should be considered for any environmental parameter. They should additionally be specified if applicable.

4.2 Altitude

The vehicle and its equipment shall perform as specified for the different classes of altitude range relative to sea level given in Table 1.

Classes	Altitude range relative to sea level		
	m		
A1	Up to1 400		
A2	Up to 1 000		
A3	Up to 1 200		
AX	More than 1 400		

Table 1 – Classes of altitude range

NOTE 1 The mainline railway lines with the highest altitudes are

- Gotthard (Switzerland): 1 151 m,
- Brenner (Italy): 1 371 m,
- Semmering (Austria): 985 m,
- Finse: (Norway): 1 222 m.

NOTE 2 Altitude is relevant, in particular for air pressure level and its consequence on cooling systems, air conditioning systems, diesel engines and electrical clearances.

The air pressure shall be considered according to HD 478.2.3 S1.

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4.3 tp Temperature eh.ai/catalog/standards/sist/8a48e5ff-c03c-45af-bfbf-9de4998b6c78/sist-9de498b6c78/sist-9de4988b6c78/sist-9de4988b6c78/sist-9de4988b6c7

The vehicle and its equipment shall operate as specified for the different classes of temperatures given in table 2, column 1.

(1)		1)	(2)		(3)	
Classes	Air temperature external to vehicle		Inside vehicle compartment temperature		Inside cubicle temperature	
	°C		°C		°C	
T1	-25	+40	-25	+50	-25	+70
T2	-40	+35	-40	+45	-40	+65
Т3	-25	+45	-25	+55	-25	+70
ТХ	-40	+50	-40	+60	-40	+75

Table 2 – Classes of air temperatures

Class T1 of Table 2 corresponds to Class 5K2 of EN 60721-3-5.

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The temperatures in column (2) are informative as the maximum and minimum within a vehicle and should be considered in the design of equipment within the vehicle. Where different operational temperatures are considered due to local knowledge, or where operational temperature ranges are limited by heating or cooling systems these shall be agreed and stated in the specification.

The temperatures in column (3) are to be considered as the minimum and absolute maximum for equipment cubicles. Equipment suppliers shall take these into consideration for their equipment design.

A reference temperature of 25 °C is considered as being the permanent temperature for which the effects on the material ageing are equivalent to those of the climatic temperature during the lifetime.

When stated in product or equipment standards, particular requirements apply.

Where particular system attributes or performance are disproportionally affected by extremes of temperature, it is permissible to derate such equipment and to install it in a controlled climatic environment. The temperature range shall be defined in the specification.

The temperatures inside vehicle and cubicle are values measured in free air out of the heat emitting elements.

It shall be taken into account that the external ambient air temperature in special locations such as near the ballast or over the roof may exceed the external open air temperature. In this case, the temperature level to be considered shall be defined in the specification.

The yearly average temperature for column (3) is conventionally taken as 45 °C for all classes (e.g. for reliability calculation).

4.4 Humidity <u>SIST EN 50125-1:2</u>

The following external humidity levels shall be considered:

- yearly average: \leq 75 % relative humidity;
- on 30 days in the year continuously: between 75 % and 95 % relative humidity;
- on the other days occasionally: between 95 % and 100 % relative humidity;
- maximum absolute humidity: $30 \text{ g/m}^3 \text{ occurring in tunnels.}$

An operationally caused infrequent and slight moisture condensation shall not lead to any malfunction or failure.

The psychometric charts of Figures 1 and 2 give the ranges of variation of the relative humidity for the different temperature classes that will not be exceeded for more than 30 days per year:

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Absolute air humidity (g/m³)

— — — — maximum for tunnel

