SLOVENSKI STANDARD
SIST EN 50125-1:2014

01-junij-2014

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: **EN 50125-1:2014**

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

SIST EN 50125-1:2014 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 50125-1

April 2014

ICS 29.280; 45.060.10

Supersedes EN 50125-1:1999

English version

Railway applications - Environmental conditions for equipment - Part 1: Rolling stock and on-board equipment

Applications ferroviaires - Conditions d'environnement pour le matériel - Partie 1: Equipement embarqué du matériel roulant

Bahnanwendungen – Umweltbedingungen für Betriebsmittel – Teil 1: Betriebsmittel auf Bahnfahrzeugen

This European Standard was approved by CENELEC on 2014-02-24. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

CENELEC

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 50125-1:2014 E

Contents

Page

Foreword

This document (EN 50125-1:2014) has been prepared by CLC/SC 9XB "Electromechanical material on board rolling stock" of CLC/TC 9X "Electrical and electronic applications for railways".

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2015-02-24
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2017-02-24

This document supersedes EN 50125-1:1999.

EN 50125-1:2014 is a revision of EN 50125-1:1999 with an extended scope to cover mechanical requirements, as requested by the European Railway Agency (ERA).

EN 50125 is divided into the following parts:

- EN 50125-1, *Railway applications — Environmental conditions for equipment — Part 1: Rolling stock and on-board equipment* (the present document).
- EN 50125-2 *Railway applications — Environmental conditions for equipment — Part 2: Fixed electrical installations*.
- EN 50125-3 *Railway applications — Environmental conditions for equipment — Part 3: Equipment for signalling and telecommunications*.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

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 Directive(s) see informative Annex ZZ, which is an integral part of this document.

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 for rolling stock and on-board equipment (mechanical, electromechanical, electrical, 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.

NOTE 2 Further guidance on severe conditions can be found within prCEN/TR 16251.

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

NOTE 3 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 (e.g. earthquake).

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 14067-6, *Railway applications — Aerodynamics — Part 6: Requirements and test procedures for cross wind assessment*

EN 50124-2, *Railway applications — Insulation coordination — Part 2: Overvoltages and related protection*

EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529)*

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

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

3 Terms and definitions

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

3.1
environmental condition
physical, chemical or biological condition, external to a product to which it is subjected at a certain time

3.2
vehicle compartment
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, humidity)

EXAMPLE The environmental factor “snow and hail” is characterised by the parameters: snow level above top of rail and diameter of the hailstones.

3.4
severity of environmental parameters
value of each quantity characterising the environmental parameter

EXAMPLE The severity of snow is defined by values of snow level above top of rail (in mm).

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 shall be required 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 be additionally 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.

Table 1 — Classes of altitude range

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

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.

When the class AX is specified, the maximum altitude should be provided.

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

4.3 Temperature

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

Table 2 — Classes of air temperatures

Classes	(1) Air temperature external to vehicle °C		(2) Inside vehicle compartment temperature °C	
T1	-25	+40	-25	+50
T2	-40	+35	-40	+45
T3	-25	+45	-25	+55
TX	-40	+50	-40	+60

NOTE 1 Class T1 of Table 2 corresponds to Class 5K2 of EN 60721-3-5.

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.

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 performances 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 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.

NOTE 2 The yearly average temperature for cubicles inside the rolling stock defined in EN 50155 is conventionally taken as 45 C for all classes (e. g. for reliability calculation).

4.4 Humidity

The following external humidity levels shall be assumed:

- yearly average: ≤ 75 % relative humidity;
- on 30 d 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 g/m^3 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 d per year: