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Järnvägar – Klimatförhållanden – Utförande och provning av rullande materiel vid besvärliga förhållanden

Railway applications – Environmental conditions – Design guidance for rolling stock

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Dokumentet är framtaget av kommittén för Järnvägar, SIS/TK 254.

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TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

CEN/TR 16251

February 2016

ICS 45.060.01

English Version

Railway applications - Environmental conditions - Design guidance for rolling stock

Applications ferroviaires - Conditions d'environnement - Lignes directrices pour la conception du matériel roulant

Bahnanwendungen - Umweltbedingungen - Konstruktionsempfehlungen für Schienenfahrzeuge

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European foreword

This document (CEN/TR 16251:2016) has been prepared by Technical Committee CEN/TC 256 “Railway applications”, the secretariat of which is held by DIN.

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Introduction

In this Technical Report, environmental conditions are related to climate and big animals. Separately and in combination environmental conditions can represent considerable challenges to the railway sector as availability, economy, reputation and safety can be severely affected. Both severe summer and winter conditions occur, and more intense weather is predicted for the future.

The intention of this Technical Report is to help reduce technical risks related to environmental conditions.

All tests of the different clauses in this Technical Report can be performed either in a climate chamber or on track, if the corresponding test conditions are given.

1 Scope

This Technical Report gives guidance for designing rolling stock for its specified ranges of environmental conditions according to EN 50125-1. This guidance covers environmental conditions in Europe.

The relevant clauses for the particular vehicle should be chosen and described in the vehicle specification. Depending on the ranges selected, design and/or testing provisions described in this Technical Report should be taken into account. This Technical Report is a collection of existing test descriptions and design guidance based on long lasting experience of operators, test centres and industry.

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

3 Terms and definitions

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

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

[SOURCE: EN 50125-1]

3.2
winter conditions
conditions with temperatures below freezing point of water, where snow and ice can accumulate on the vehicle

3.3
summer conditions
conditions with temperatures above 35 °C in addition to intensive solar radiation and hot ballast effect

3.4
ice
is considered as glaze ice or clear ice

Note 1 to entry: It tends to accumulate rapidly and is very hard and therefore more difficult to remove. Such ice forms when large drops of water strike and spread over a surface whose temperature is below the freezing point. Mechanical components and the windscreen are elements typically tested with ice. For the test, a certain thickness of the ice layer is defined.

3.5
dry snow
form of precipitation where tiny ice crystals bond together into flakes, which have little to no liquid water content and a particle size of about 20 µm MVD (Median Volumetric Diameter)

Note 1 to entry: The density of this snow is about 200 kg/m^3 and can go up to 350 kg/m^3 if wind pressed.

Note 2 to entry: The snow intensity in kg/m^3 is defined.

3.6
wet snow
form of precipitation where tiny ice crystals bond together into flakes, which have a high liquid content and a particle size of 50 µm or more

Note 1 to entry: The density of this snow is about 350 kg/m^3 to 500 kg/m^3.

Note 2 to entry: The snow intensity in kg/m^3 is defined.

3.7
rain
precipitation in the form of water drops; both the amount that falls and the actual falling action of the water drops are often called rainfall

Note 1 to entry: Rain intensity is measured in mm/min.

Note 2 to entry: This standard does not scope with tests concerning water tightness of the vehicle and components.

3.8
condensation
precipitation of water vapour on a surface when the surface temperature is lower than the dew point temperature of the ambient air whereby water is transformed from vapour to the liquid state of aggregation

3.9
temperature class
classification system defined in EN 50125-1

3.10
hot ballast effect
heat accumulation of the ballast caused by solar radiation

Note 1 to entry: Heat accumulation of the ballast is caused not only by solar radiation but also by exhausts from cooling systems, braking resistors or similar devices and subsystems along the train.