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ROOMEVAHEMIKUD

Railway applications - Insulation coordination - Part 1:
Basic requirements - Clearances and creepage distances
for all electrical and electronic equipment

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 50124-1:2017 sisaldab Euroopa standardi EN 50124-1:2017 ingliskeelset teksti.	This Estonian standard EVS-EN 50124-1:2017 consists of the English text of the European standard EN 50124-1:2017.
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English Version

Railway applications - Insulation coordination - Part 1: Basic requirements - Clearances and creepage distances for all electrical and electronic equipment

Applications ferroviaires - Coordination de l'isolement -
Partie 1: Prescriptions fondamentales - Distances
d'isolement dans l'air et lignes de fuite pour tout matériel
électrique et électronique

Bahnanwendungen - Isolationskoordination - Teil 1:
Grundlegende Anforderungen - Luft- und Kriechstrecken für
alle elektrischen und elektronischen Betriebsmittel

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Europäisches Komitee für Elektrotechnische Normung

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European foreword

This document (EN 50124-1:2017) has been prepared by 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) 2018-02-06
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2020-02-06

This document supersedes EN 50124-1:2001, EN 50124-1:2001/A1:2003 and EN 50124-1:2001/A1:2005.

EN 50124-1:2017 includes the following significant technical changes with respect to EN 50124-1:2001:

- the scope has been enlarged to include altitudes higher than 2 000 m above sea level;
- related requirements have been included, especially new subclause 5.4, Table A.9 and Table A.10.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC 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.

Introduction

Special conditions occurring in railway applications and the fact that the equipment here concerned falls into the scope of both the EN 60071 series (prepared by CLC/SR 28) and EN 60664-1 (prepared by CLC/SR 109), led to the decision to draw from these documents and from EN 60077-1 (prepared by CLC/TC 9), a single document of reference for all standards applicable to the whole railway field.

EN 50124 consists of two parts:

- EN 50124-1, *Railway applications - Insulation coordination - Part 1: Basic requirements - Clearances and creepage distances for all electrical and electronic equipment*;
- EN 50124-2, *Railway applications - Insulation coordination - Part 2: Overvoltages and related protection*.

This Part 1 allows, in conjunction with EN 50124-2, to take into account advantages resulting from the presence of overvoltage protection when dimensioning clearances.

1 Scope

This European Standard deals with insulation coordination in railways. It applies to equipment for use in signalling, rolling stock and fixed installations.

Insulation coordination is concerned with the selection, dimensioning and correlation of insulation both within and between items of equipment. In dimensioning insulation, electrical stresses and environmental conditions are taken into account. For the same conditions and stresses, these dimensions are the same.

An objective of insulation coordination is to avoid unnecessary over dimensioning of insulation.

This standard specifies:

- requirements for clearances and creepage distances for equipment;
- general requirements for tests pertaining to insulation coordination.

The term equipment relates to a section as defined in 3.3 it may apply to a system, a sub-system, an apparatus, a part of an apparatus, or a physical realization of an equipotential line.

This standard does not deal with:

- distances through solid or liquid insulation;
- distances through gases other than air;
- distances through air not at atmospheric pressure;
- equipment used under extreme conditions.

Product standards should align with this generic standard.

However, they may require, with justification, different requirements due to safety and/or reliability reasons, e.g. for signalling, and/or particular operating conditions of the equipment itself, e.g. overhead contact lines which should comply with EN 50119.

This standard also gives provisions for dielectric tests (type tests or routine tests) on equipment (see Annex B).

NOTE For safety critical systems, specific requirements are needed. These requirements are given in the product specific signalling standard EN 50129.

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 50123 (all parts), *Railway applications - Fixed installations - D.C. switchgear*

EN 50163, *Railway applications - Supply voltages of traction systems*

EN 60060-1, *High-voltage test techniques - Part 1: General definitions and test requirements (IEC 60060-1)*

EN 60071-1, *Insulation co-ordination - Part 1: Definitions, principles and rules (IEC 60071-1)*

EN 60112, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials (IEC 60112)*

EN 60587, *Electrical insulating materials used under severe ambient conditions - Test methods for evaluating resistance to tracking and erosion (IEC 60587)*

EN 60664-1:2007, *Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests (IEC 60664-1:2007)*

3 Terms and definitions

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

NOTE The definitions apply according to the following order of priority:

- the definition given here-under;
- the definition given in EN 60664–1;
- the definition given in the documents mentioned in Clause 2 other than EN 60664–1.

3.1

clearance

shortest distance in air between two conductive parts

3.2

creepage distance

shortest distance along the surface of the insulating material between two conductive parts

3.3 Sections

3.3.1

section

part of an electrical circuit having its own voltage ratings for insulation coordination

Note 1 to entry: Sections fall into two categories: earthed section and floating section.

3.3.2

earthed section

section connected to earth or to the vehicle body through a circuit for which interruption is not expected

3.3.3

floating section

section isolated from earth or from the vehicle body

Note 1 to entry: A section can be under electrical influence from adjacent sections.

Note 2 to entry: A particular point of a circuit can be considered as a section.

3.4 Voltages

3.4.1

nominal voltage

U_n

suitable approximate voltage value used to designate or identify a given supply system