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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 32350.1-2025

Replacing GB/T 32350.1-2015

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

轨道交通 绝缘配合 第1部分：基本要求 电工电子设备的电气间隙和爬电距离
(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is Part 1 of GB/T 32350 "Insulation Coordination for Rail Transit". GB/T 32350 has already published the following parts.

---Part 1: Basic Requirements for Electrical Clearances and Creepage Distances in Electrical and Electronic Equipment;

---Part 2: Overvoltage and related protection.

This document replaces GB/T 32350.1-2015 "Insulation Coordination for Rail Transit - Part 1: Basic Requirements for Electrical and Electronic Equipment".

"Clearances and Creepage Distances". Compared with GB/T 32350.1-2015, the main technical changes are as follows, except for structural adjustments and editorial modifications.

as follows.

- a) The scope has been changed (see Chapter 1, Chapter 1 of the 2015 edition);
- b) The term "long-duration overvoltage" and its definition have been changed (see 3.5.1, 2015 version 3.5.1);

- c) A definition for overhead contact lines has been added (see 3.7);
- d) The method for determining the minimum rated impulse voltage and some of the values have been changed (see 4.2.3.2, Table B.2, 2015 version of 4.2.3.2).

Table A.2);

- e) Requirements for electrical clearances and elevation correction requirements in the dimensional determination rules have been added (see 5.1, 5.2.1, 5.2.2);
- f) An electrical clearance correction method has been added (see 5.4);
- g) The method for determining the minimum creepage distance based on the rated insulation voltage UNm has been changed (see 6.2.1, 2015 version of 6.2.1);
- h) The method for verifying electrical clearance by impulse voltage test has been modified (see 7.3.1, 2015 version of 7.3.1);
- i) The method for verifying electrical clearance by power frequency voltage testing has been modified (see 7.4.1, 2015 version of 7.4.1);
- j) The method for verifying electrical clearance by DC voltage test has been modified (see 7.5.1, 2015 version of 7.5.1);
- k) The special requirements for contamination of signaling equipment have been changed (see 8.2.5, 2015 version of 8.2.5);
- l) The requirements for dielectric testing methods for type inspection and factory inspection of equipment have been revised (see A.2.1, B.2.1 of the 2015 version);
- m) Added equipment dielectric testing based on short-time power frequency (AC) tests corresponding to rated impulse voltages UNi of 135kV and 180kV.

Voltage (see Table A.1);

- n) The rated insulation voltage value was changed from 30kV to 30.5kV, and the rated impulse voltage was specified separately for locomotives, rolling stock, and ground equipment.

Requirements (see Tables B.2 and C.1, and Tables A.2 and D.1 from the 2015 edition);

- o) The rated insulation voltage has been increased to 31.5kV, along with the corresponding rated impulse voltage and applicable range requirements (see Table B.2 and Table C.1);
- p) Linear interpolation requirements have been added (see Tables B.3, B.5, B.6, and B.8);
- q) An altitude correction for electrical clearance has been added for circuits with a rated insulation voltage of 60kV and below used at altitudes above 2000m.

Coefficients and related requirements (see Table B.9);

r) Added clearance altitude correction for circuits with rated impulse voltage UNi exceeding 60kV used at altitudes above 1400m.

Coefficients and related requirements (see Table B.10).

This document is modified to adopt IEC 62497-1:2010 "Railway traffic - Insulation coordination - Part 1: Basic requirements for electrical and electronic equipment".

Clearance and creepage distance.

This document has undergone the following structural adjustments compared to IEC 62497-1:2010.

- Appendix A corresponds to Appendix B of IEC 62497-1:2010;
- Appendix B corresponds to Appendix A of IEC 62497-1:2010;
- Appendix C corresponds to Appendix D of IEC 62497-1:2010;
- Appendix D corresponds to Appendix E of IEC 62497-1:2010;
- Appendix E corresponds to Appendix C of IEC 62497-1:2010.

This document differs significantly from IEC 62497-1:2010 in several technical aspects. The relevant clauses are indicated in vertical margins.

The straight line (|) is marked. These technical differences and their reasons are as follows.

---Regarding normative references, this document has made adjustments due to technical differences to adapt to my country's technical conditions. The adjustments are as follows.

The changes are mainly reflected in Chapter 2, "Normative References," and the specific adjustments are as follows.

- IEC 60071-1 has been replaced by the normatively referenced GB/T 311.1 (see Tables B.2, F.1, F.2.9);
- IEC 60112 has been replaced by the normatively referenced GB/T 4207 (see 4.5.2.3);
- IEC 60587 has been replaced by the normatively referenced GB/T 6553 (see 4.5.2.3);
- IEC 60060-1 has been replaced with the normatively referenced GB/T 16927.1 (see 7.4.1, A.2.1);
- IEC 60664-1:2007 has been replaced by the normatively referenced GB/T 16935.1-2023; there is no consistency between the two documents.

For the correspondence between genders, see 7.3.1, 7.4.1, 7.5.1, A.2.1, F.1, and Table B.9).

- IEC 62236 (all parts) has been replaced with the normatively referenced GB/T 24338 (all parts) (see 5.3);