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

GB/T 12528-2008

Rail vehicle cables with rated voltages up to and including 3kV

交流额定电压3kV及以下轨道交通车辆用电缆

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1 Scope

GB/T 12528-2008 is the Chinese national standard on rail vehicle cables with rated voltages up to and including 3kv, in the field of electrical engineering. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 30 June 2008 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 April 2009. Classification: ICS 29.060.20, CCS K13. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This Standard specifies the type, specification, technical requirement, test method, mark, and package of the cable used in rail vehicles with rated voltages up to and including 3kV. This Standard is applicable to cables used in electric units like power distribution system,

control system, signal system etc. It is suitable for rail transit vehicles of rated voltages up to and including 3kV.

2 Normative references

The articles contained in the following documents have become part of this Standard when they are quoted herein. For the dated documents so quoted, all the modifications (excluding corrections) or revisions made thereafter shall not be applicable to this Standard. For the undated documents so quoted, the latest editions shall be applicable to this Standard.

GB 252-2000 Light diesel fuels

GB/T 1690-2006 Rubber vulcanized or thermoplastic - Determination of the effect of liquids (ISO 1817:2005, MOD)

GB/T 2900.10-2001 Electrotechnical vocabulary--Electric cables (idt IEC 60050(461). 1984)

GB/T 2951.1-1997 Common test methods for insulating and sheathing materials of electric cables Part

1.Methods for general application Section one. Measurement of thickness and overall dimensions-Tests for determining the mechanical properties (idt IEC 811-1-1:1993)

GB/T 2951.2-1997 Common test methods for insulating and sheathing materials of electric cables--Part

1.Methods for general application--Section two. Thermal ageing methods (idt IEC 811-1-2:1985)

GB/T 2951.4-1997 Common test methods for insulating and sheathing materials of electric cables Part

3 Terms and definitions

The following terms and definitions and those established in GB/T 2900.10-2001 apply to this Standard.

3.1 Ethylene-propylene rubber compound It is the compound of specific components including ethylene propylene rubber and/or synthetic elastomer, after the procedure of being properly selected, matched, processed and vulcanized.

3.2 CSP or equivalent synthetic compound It is the compound of specific components including chlorosulfonated polyethylene or chlorinated polyethylene synthetic elastomer after the procedure of being properly selected, matched, processed and vulcanized.

3.3 Cross-linked polyolefin compound It is the compound of specific components including polyethylene, polypropylene, and polybutylene-1 or its copolymer after the procedure of being properly selected, matched, processed and cross-linked.

3.4 Polyolefin compound for thin-wall Its special components include the polymer, copolymer and alloy of aromatic group and heteroatom (N, O and Si in main chain of polymer molecule). Or the compound of polymer and copolymer of olefin polymers, if necessary, it shall be cross-linked.

3.5 Voltage rating The voltage rating of cable refers to the reference voltage used for cable design and electrical performance test.

3.6 Type tests (Symbol T) Type test refers to testing one type cable stipulated in this Standard before delivery so as to prove that it is of good properties to satisfy the stipulated application requirements in line with general business principles. The nature of type test is that there is no need to conduct another test once the cable is tested; and there is a need to conduct another one in case that the materials or designs of the cable are changed, which will influence its properties.

4.3 Thermal endurance properties code 100°C 100 125°C 125 150°C 150

4.6 Product marking Products are represented by models, specifications and number of this Standard. The composition is as shown.

4.7 Example labeling

a) The mineral oil and fuel oil resistant, 100°C temperature resistant class, AC rated voltage 1500V, Category 6 conductor, 95mm², ethylene propylene rubber compound, insulated chlorosulfonated polyethylene rubber compound or other comparable synthetic elastomer sheathed cables is expressed as. DCEH/3-100 1500V 95(B) GB/T 12528-2008.

b) 125°C temperature resistant class, AC rated voltage 1,500V, Category 5 conductor, 50mm², low-smoke zero halogen cross-linked polyolefin insulated cable is expressed as. WDZ-DCYJ/1-125 1500V 50(A) GB/T 12528-2008.

c) 125°C temperature resistant class, AC rated voltage 750V, Category 2 conductor, 4mm², polyolefin insulated cable for low-smoke zero halogen thin-wall type cable is expressed as. WDZ-DCYJB/1-125 750V 4(C) GB/T 12528-2008.

d) 125°C temperature resistant class, AC rated voltage 1500V, Category 5 conductor, 50mm², low-smoke zero halogen cross-linked polyolefin insulated cable is expressed as. WDZ-DCYJ/3-125 1500V 50(A) GB/T 12528-2008.

5 Operational properties

5.1 Rated voltage of the cable AC voltage rating U_0 of cable is 500V, 750V, 1.5kV and 3kV. The DC rated voltage is

1.5 times the AC rated voltage.

6 Model, name and specification of the product

6.1 Product model and name See Table 1 for product model and name.

7.1 Conductor

7.1.1 Material The copper conductor shall adopt the soft round copper wire which complies with GB/T 3956-1997. The conductor surface shall be smooth and clean, free from oil stains, no burrs and sharp edges, no raised or fractured single line.

7.1.3 Resistance Resistance of cable conductor at 20°C shall be in compliance with the provisions of Table 3.

7.3 Sheathing

7.3.1 Material The selection of cable sheathing shall be consistent with the cable model. Select the appropriate specified compound.

7.4 Finished electric level

7.4.1 Structure size of the finished electric level The external diameter of the finished cable shall be in compliance with the provisions of Table 6-Table 11.

7.4.4 Test on leakage and discharge of cable surface Cable sheaths or surface of the single insulation layer shall be subject to surface discharge test under the test conditions specified in Table

14. And the measured value (mA) of leakage current shall not exceed half of the measured value (mm) of the cable diameter. Its flashover voltage is not less than 10kV.

7.4.10 Acidity test of combustion gas Low-smoke zero halogen flame retardant cable shall be carried out by test according to the prescribed conditions of GB/T 17650.2-1998. The pH of combustion gas acidity is ≥ 4.3 ; Conductivity is $\leq 10\mu\text{S}/\text{mm}$.

7.4.11 Delivery length The length of looped cable shall be 100 m or integer multiples of 100 m and that of the plated cable shall not be less than 100 m. It is allowed to deliver short-length cable of not less than 30 m, but the quantity of such cable shall not be more than 10% of total length of delivered cable. Any length delivery is allowed according to the mutual agreements. USE length counter for the length metering and the error shall not exceed $\pm 0.5\%$.

8 Test Methods

8.1 Structure size Appearance shall be inspected by normal eyesight. Conductor structure shall be designed in accordance with GB/T 4909.2-1985. For thickness of insulation, thickness of sheath, as well as external diameter of cable and f value, it shall respectively