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

GB/T 29324-2024

Replacing GB/T 29324-2012

**Carbon fibre reinforced composite core for overhead electrical
conductors**

架空导线用碳纤维增强复合材料芯

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Foreword

This document is in accordance with the provisions of GB/T 1:1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting: This document replaces GB/T 29324-2012 "Fiber reinforced resin matrix composite core rods for overhead conductors" and GB/T 29324- Compared with:2012, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

- Added model and its component codes (see 4:1);
- Changed the representation method of rod-type composite core products (see 4:2:2, Chapter 4 of the:2012 edition);
- Added the representation method of JTF and JBTF composite core products (see 4:2:3 and 4:2:4);
- Changed the chapter name, added the recommended structure of the composite core, and gave the structural diagrams (see Chapter 5,:2012 Edition Chapter 5);
- Added appearance requirements for JTF and JBTF composite cores (see 6:1);
- Added the diameter deviation requirements for JTF and JBTF composite cores (see 6:2);
- Added composite core twisting requirements (see 6:3);
- Added unit length mass requirements and test methods (see 6:4 and 7:3);
- Added the minimum tensile strength requirements for grade 3 tensile strength composite

cores (see 6:5);

--- Added the long-term allowable operating temperature requirements for C-grade temperature grade composite cores (see 6:6);

--- Added the linear expansion coefficient requirements and theoretical calculation values of JTF and JBTF composite cores (see 6:7);

--- Added density requirements and theoretical calculation values for JTF and JBTF composite cores (see 6:8);

--- Added JTF and JBTF composite core winding performance requirements and test methods (see 6:9 and 7:7);

1 Scope

GB/T 29324-2024 is the Chinese standard for the carbon fibre composite core used in overhead conductors. Replacing the steel core of a conductor with a carbon fibre one is the standard way of increasing the capacity of an existing transmission line without rebuilding the towers: the composite is lighter and has a far lower thermal expansion, so the conductor sags less and can be run hotter, and a line can carry substantially more current on the same route. Everything then depends on the core, because it carries the whole mechanical load and it is inside the conductor for forty years where nobody can inspect it. The standard sets the classification and designation, the requirements on the constituent materials, the dimensions and tolerances, the mechanical properties including tensile strength, modulus and the retention of strength after ageing, the thermal properties including the coefficient of expansion and the temperature capability, the requirements on the resistance to torsion, bending and crushing, the electrical and environmental requirements, and the test methods, inspection rules and marking. The 2024 edition replaces GB/T 29324-2012.

This document specifies the product model and representation method, structure, technology and application of carbon fiber reinforced composite core (referred to as "composite core") for overhead conductors: Technical requirements, inspection rules, packaging, marking, transportation and storage, acceptance and rejection, and describes the corresponding test methods: This document applies to the manufacture, testing and application of carbon fiber reinforced composite reinforcement cores for overhead conductors:

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document: For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document:

GB/T 1463 Test method for density and relative density of fiber reinforced plastics

GB/T 2572 Test method for average linear expansion coefficient of fiber reinforced plastics

GB/T 6995:

1 Identification and marking methods for wires and cables Part 1: General provisions

GB/T 22315-2008 Test method for elastic modulus and Poisson's ratio of metallic materials

GB/T 22567-2008 Test method for determining glass transition temperature of electrical insulating materials

JB/T 8137:2-2013 Wire and cable delivery trays Part 2: Full wood structure delivery trays

3 Terms and definitions

The following terms and definitions apply to this document: 3:

1 Composite material composite material A new material composed of two or more component materials compounded through a special preparation process:

Note: Composite materials retain the basic properties of the original component materials and have more excellent properties that cannot be obtained by the original single component materials: 3:2 A wire core composed of one or more continuous fibers: 3:3 diameter The average value of two measurements on the same circular cross section and in perpendicular directions: 3:4 f value value f The difference between the maximum and minimum diameters measured on the same circular section perpendicular to the axis: 3:

5 Strength grade strength grade Graded according to the tensile strength of the composite core: