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Replacing GB/T 3953-2009

Round copper wire for electrical purposes

电工圆铜线

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Foreword

This document was drafted in accordance with the rules given in GB/T 1.1-2020 "Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents".

This document replaces GB/T 3953-2009 "Round copper wire for electrical purposes". Compared with GB/T 3953-2009, apart from structural adjustments and editorial changes, the main technical changes are as follows:

- added terms and definitions (see Clause 3);

- added the type, the specification and the technical requirements of class 1 soft round copper wire (see 4.1, 4.3 and Clause 5);

- changed the type name of extra-hard round copper wire to class 1 hard round copper wire (see 4.1; 3.1 of the 2009 edition);

- added the designation of the multiline structure, its technical requirements and its test methods (see 4.2, 5.2 and 6.2);

- changed the designation of round copper wire for electrical purposes (see 4.4; 3.3 of the 2009 edition);

- changed the specification range and the dimensional deviations of round copper wire for electrical purposes (see 4.3 and 5.4; 3.2 and Clause 5 of the 2009 edition);

- changed the technical requirements and the test methods for the surface quality of round copper wire for electrical purposes (see 5.3 and 6.2; Clause 8 of the 2009 edition);

- changed the technical requirements for the tensile strength and the elongation of some specifications (see 5.5; Clause 6 of the 2009 edition);

- changed the technical requirements for the volume resistivity of some specifications of hard round copper wire (see 5.6; Clause 7 of the 2009 edition);

- changed the delivery requirements for round copper wire for electrical purposes (see Clause 7; Clause 9 of the 2009 edition);

- changed the acceptance rules for round copper wire for electrical purposes and added the acceptance rules for round copper wire of multiline structure (see Clause 8; Clause 10 of the 2009 edition);

- changed the requirements for the packaging and the marking of round copper wire for electrical purposes (see Clause 9; Clause 10 of the 2009 edition).

Attention is drawn to the possibility that some of the content of this document may be the subject of patent rights. The issuing body of this document bears no responsibility for identifying such patent rights.

This document was proposed by the China Electrical Equipment Industry Association.

This document is under the jurisdiction of the National Technical Committee on Bare Wire of Standardization Administration of China (SAC/TC 422).

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The editions of this document and of the document it replaces are as follows:

- first issued in 1983 as GB 3953-1983;

- first revised in 2009 as GB/T 3953-2009;

- this is the second revision.

1 Scope

This document specifies the type, the structure, the specification, the designation, the technical requirements, the delivery requirements, the packaging, the storage, the transport and the marking of round copper wire for electrical purposes; it describes the test methods and establishes the acceptance rules.

This document applies to the manufacture, the testing and the application of round copper wire used in wires and cables, in electric machines and in other electrical and electronic devices.

2 Normative references

The contents of the following documents constitute indispensable provisions of this document through normative reference in the text. For dated references, only the edition corresponding to that date applies to this document; for undated references, the latest edition (including all amendments) applies to this document.

GB/T 3048.2-2007 Test methods for electrical properties of electric cables and wires - Part 2: Test of resistivity of metallic materials · GB/T 3952 Copper wire rod for electrical purposes · GB/T 4909.1-2009 Test methods for bare wires - Part 1: General · GB/T 4909.2-2009 Test methods for bare wires - Part 2: Measurement of dimensions · GB/T 4909.3-2009 Test methods for bare wires - Part 3: Tensile test · GB/T 8170 Rules of rounding off for numerical values and expression and judgement of limiting values

3 Terms and definitions

For the purposes of this document, the terms and definitions given in GB/T 3048.2-2007, GB/T 4909.1-2009, GB/T 4909.2-2009 and GB/T 4909.3-2009 and the following apply.

3.1 Lot

Round copper wire of the same state and specification produced by the same manufacturer under the same production conditions.

Note: a lot usually comprises part or all of the ordered quantity.

3.2 Single wire

A metal wire of a single strand having a specified circular cross-section.

3.3 Multiline wire

A metal wire made up of several single wires of the same state and specification arranged parallel to one another.

4.1 Type

The type of round copper wire is composed of a material code, a state code and a performance code. The material code T means that the material is copper; in the state code R means the soft state and Y means the hard state; the performance code indicates the class by a figure. See Table 1.

Table 1 gives four types: TR, soft round copper wire; TR1, class 1 soft round copper wire; TY, hard round copper wire; and TY1, class 1 hard round copper wire. TR and TR1 are both copper round wires in the soft state, but the resistivity of TR1 is lower than that of TR; TY