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

GB/T 14450-2016

**Bead wire
(English Translation)**

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Foreword

This Standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This Standard replaces GB/T 14450-2008 "Bead Wire". Compared with GB/T 14450-2008, the main technical changes are as follows.

- it deletes the examples of marking;
- it modifies the scope of application;
- it increases the terms and definitions of out-of-roundness, total elongation at fracture, yield strength, yield ratio and residual torsion;
- it modifies Table 2 and sets the breaking forces and their corresponding tensile strengths of different specifications of wire;
- it modifies the total elongation at fracture, changing the minimum total elongation at fracture 5% into the total elongation at fracture of wire $\geq 5\%$;
- it modifies the yield ratio and cancels the division of strength;
- it cancels the differences of strength in Table 3, divides the torsions by the

specifications and changes the minimum number of torsions into the number of torsions;

-- it deletes the brass part in Table 4; and

-- it deletes the parts of brass and copper in Table 5 and adds the conversion formula of coating thickness and coating weight.

This Standard was re-drafted by reference to ISO 16650.2004 "Bead Wire"; it is not equivalent to ISO 16550.2004.

This Standard was proposed by China Steel Industry Association.

This Standard shall be under the jurisdiction of the National Steel and Iron Standardization Technical Committee (SAC/TC 183).

The main drafting organizations of this Standard. Shandong Daye Co., Ltd., Ningbo Xinlun Wire Co., Ltd., China Metallurgical Information and Standardization Institute, Guizhou Steel Rope (Group) Co., Ltd., Triangle Tire Co., Ltd. and Shandong SNTON Steel Rope Co., Ltd..

1 Scope

This Standard specifies the terms and definitions, classification and codes, dimensions, shape, weight and tolerance, order content, technical requirements, test method, inspection rules, packaging, marking and quality certification of bead wire.

This Standard applies to the tempered round steel wire for all kinds of tire beads (hereinafter referred to as "wire").

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition dated applies to this document. For undated references, the latest edition of the referenced document (including any amendments) applies to this Standard.

GB/T 228.1 Metallic Materials - Tensile Testing - Part 1. Method of Test at Room Temperature (GB/T 228.1-2010, ISO 6892-1.2009, MOD)

GB/T 239.1 Metallic Materials - Wire - Part 1. Simple Torsion Test (GB/T 239.1-2012,

ISO 7800.2003, MOD)

GB/T 2103 General Requirements for Acceptance, Packing, Marking and Quality Certification of Steel Wire

GB/T 24242.1 Non-alloy Steel Wire Rods for Conversion to Wire - Part 1. General Requirements (GB/T 24242.1-2009, ISO 16120-1.2001, MOD)

GB/T 24242.2 Non-alloy Steel Wire Rods for Conversion to Wire - Part 2. Specific Requirements for General Purpose Wire Rod (GB/T 24242.2-2009, ISO16120-2.2011, MOD)

GB/T 24242.4 Non-alloy Steel Wire Rods for Conversion to Wire - Part 4. Specific Requirements for Wire Rod for Special Applications (GB/T 24242.4-2014, ISO 16120-4.2011, MOD)

YB/T 135 Copper Coated Steel Wire - Test Method for Weight of Copper Coating and Composition

YB/T 081 Rule for Rounding-off of Numerical Values and Judgement of Testing Values for Technical Standards of Metallurgy

3 Terms and Definitions

For the purpose of this Standard, the following terms and definitions apply.

3.1 Out-of-roundness

It is the arithmetic difference between the maximum and minimum diameter measured in the same transverse cross-section perpendicular to the wire axis.

3.2 Tensile strength

It is the ratio of the maximum breaking force of the sample to the original sectional area of the sample in a tensile test, expressed with R_m .

Tensile strength = maximum breaking force ÷ nominal sectional area of wire

Note: The tensile strength shall be calculated in accordance with the nominal diameter.

3.3 Total elongation at fracture

It is the ratio of the total elongation at fracture of wire (elastic elongation + plastic elongation) to the original gauge length (L₀), expressed in percentage (%).

3.4 Yield strength

It is the ratio of the tensile strength to the original sectional area of the sample when the sample begins to produce plastic deformation and the tensile force is no longer increased in a tensile test.

3.5 Yield ratio

It is the ratio of the yield strength to the tensile strength.

3.6 Residual torsion

It is the number of free rotation laps around its own axial direction over a specified length.

Note: "+" indicates the clockwise direction; "-" indicates the anticlockwise direction; "t" indicates the number of laps.

4.1 Wire can be classed into two categories in according with the tensile strength grade.

a) normal tenacity, NT; and

a wire coil

5 straightness One end of a wire coil 1 pc/ coil

Drop down the wire

from a position 500

mm above the

smooth test platform

to make the wire

spread naturally,

then determine its