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

GB/T 27691-2017

Replacing GB/T 27691-2011

Wire rod for steel cord

钢帘线用盘条

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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 27691-2011, Wire Rod for Steel Cord. Compared with GB/T 27691-2011, the major changes of this Standard are as follows: -- it is confirmed that the nominal diameter of wire rod shall not be greater than

6.5 mm; -- the designations of LX85B, LX90B and relevant specifications are added; -- the requirements for the content of chemical component Mn of the designations of LX70A, LX80A are modified; -- the allowable grade of network cementite is confirmed; -- strict control shall be exercised on centre segregation in accordance with grades A and B; -- the requirements for the maximum widths of longitudinal inclusions and the maximum dimensions of lateral inclusions are modified; -- the provisions on the surface scale of wire rod are changed into as-agreed clauses. This Standard was proposed by China Iron and Steel Association. This Standard shall be under the jurisdiction of the National Standardization Technical Committee on Steels (SAC/TC 183). The drafting organizations of this Standard. Angang Steel Co., Ltd., Zenith Steel Group Co., Ltd., Jiangsu Yonggang Group Co., Ltd., Qingdao Special Steel Co., Ltd., China Metallurgical Information and Standardization Institute. The main drafters of this Standard. Zhai Liping, Han Litao, Guo Dayong, Ren Cuiying, Wang Lingjun, Huang Yongsheng, Liu Cheng, Wu Jinyuan, Hu Haiping, Wang Miao, Liu He. The previous edition of the standard replaced by this Standard is as follows: -- GB/T 27691-2011. Wire Rod for Steel Cord

1 Application Scope

China's national standard for the wire rod from which steel cord is drawn. It specifies the designation system and symbols, the ordering information, the dimensions, shape, weight and tolerances, the technical requirements, the test methods, the inspection rules and the packaging, marking and quality certification. Steel cord is the reinforcement inside a radial tyre, and it is drawn from this rod to a final filament diameter of about a fifth of a millimetre, at a tensile strength approaching three thousand megapascals. The drawing takes the rod through more than twenty dies without an intermediate anneal, and a single break in that sequence stops the line and scraps the coil. So the property being bought is not strength but freedom from defects, at a level that has almost no parallel in steelmaking. The requirements follow from that. The steel is a high carbon rod of no more than 6.5 millimetres nominal diameter, and its chemistry, its cleanness, its structure and its surface all have to be controlled to a degree that a rod for any other purpose would not need. Non-metallic inclusions are limited by their maximum width along the rod and their maximum size across it, because a hard inclusion that survives drawing becomes a crack initiator in a filament a fraction of its own size. Centre segregation is graded and controlled, since a segregated core embrittles under the strain the drawing imposes. Network cementite at the grain boundaries is graded and limited, because it cracks rather than deforms. The 2017 edition adds the LX85B and LX90B grades, tightens the manganese range on LX70A and LX80A, confirms the diameter limit and the permitted grades of network cementite and centre segregation, and revises the inclusion limits. Issued on 31 May 2017 and in force since 1 February 2018, it replaces GB/T 27691-2011.

This Standard specifies the designation system and symbols, ordering content, and dimensions, shape, weight and tolerances, specifications, test methods, inspection rules and packaging, marking and quality certification of wire rod for steel cord. This Standard applies to wire rod for steel cord of nominal diameter not greater than

6.5 mm (hereinafter referred to as "wire rod").

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 documents (including all amendments) applies to this Standard.

GB/T 222, Permissible Tolerances for Chemical Composition of Steel Products

GB/T 223.5, Steel and iron - Determination of Acid-Soluble Silicon and Total Silicon Content - Reduced Molybdosilicate Spectrophotometric Method

GB/T 223.12, Methods for Chemical Analysis of Iron, Steel and Alloy - The Sodium

Carbonate Separation-Diphenyl Carbazide Photometric Method for the Determination of Chromium Content

GB/T 223.19, Methods for Chemical Analysis of Iron Steel and Alloy - The Neocuproine-Chloroform Extraction Photometric Method for the Determination of Copper Content

GB/T 223.23, Iron, Steel and Alloy - Determination of Nickel Content - The Dimethylglyoxime Spectrophotometric Method

GB/T 223.31, Iron Steel and Alloy - Determination of Arsenic Content - Distillation-Molybdenum Blue Spectrophotometric Method

GB/T 223.37, Methods for Chemical Analysis of Iron, Steel and Alloy - The Indophenol Blue Photometric Method for the Determination of Nitrogen Content after Distillation Separation

GB/T 223.50, Methods for Chemical Analysis of Iron, Steel and Alloy - The Phenylfluorone-CTMAB Direct Photometric Method for The Determination of Tin Content

GB/T 223.62, Methods for Chemical Analysis of Iron, Steel and Alloy - the Butyl Acetate Extraction Photometric Method for the Determination of Phosphorus Content

GB/T 223.63, Methods for Chemical Analysis of Iron, Steel and Alloy - The Sodium (Potassium) Periodate Photometric Method for the Determination of Manganese Content

GB/T 223.69, Iron, Steel and Alloy - Determination of Carbon Contents - Gas- volumetric Method after Combustion in the Pipe Furnace

GB/T 223.72, Iron, Steel and Alloy - Determination of Sulfur Content - Gravimetric Method

GB/T 223.81, Iron Steel and Alloy - Determination of Total Aluminum and Total Boron Contents - Microwave Digestion-Inductively Coupled Plasma Mass Spectrometric Method

5 Dimensions, Shape, Weight and Tolerances

5.1 The dimensions, shape and tolerances of wire rod shall be as specified for accuracy grade B or grade C of GB/T 14981-2009. When they are not specified, wire rod shall be delivered as specified for accuracy grade B.

5.2 The weight of wire rod shall be as specified in GB/T 14981-2009.

6.1 Designations and chemical compositions

6.1.1 The designations and chemical compositions (by ladle analysis) of steel for wire rod shall be as specified in Table 1.

6.1.2 When the purchaser requires the analysis of chemical compositions of finished products, the tolerances from the chemical compositions specified in Table 1 shall be as specified in GB/T 222.

6.1.3 Without the consent of the purchaser, the chemical elements not listed in Table 1 shall not be added in steel.

6.1.4 Wire rod of other designations and chemical compositions may be supplied, which shall be as agreed on by the supplier and the purchaser and stated in the contract.

6.2 Smelting method Steel shall be smelted in a converter or electric furnace and then refined outside of the furnace.

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