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

YB/T 4089-2015

**High power graphite electrode
(English Translation)**

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1 Scope

This standard specifies the terms, definitions, classifications, markings, ordering content, dimensions, technical requirements, inspection, testing, acceptance methods, packaging, quality assurance period, transportation, marking, quality certificate, safe use, maintenance requirements, for the steel wire ropes for temporarily installed suspended access equipment.

This standard applies to galvanized steel wire ropes for temporarily installed suspended access equipment (hereinafter referred to as steel wire rope). It is also applicable to steel wire ropes for other similar lifting mechanisms.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document;

for the undated documents, only the latest version (including all the amendments) is applicable to this standard.

GB/T 228.1 Metallic materials - Tensile testing - Part 1: Method of test at room temperature

GB/T 239.1 Metallic materials - Wire - Part 1: Simple torsion test

GB/T 1839 Test method for gravimetric determination of the mass per unit area of galvanized coatings on steel products

GB/T 2104 Steel wire ropes - Packing, marking and certificate - General requirements

GB/T 8358 Steel wire ropes - Determination of measured breaking force

GB/T 8706 Steel wire ropes - Vocabulary, designation and classification

GB 19155 Temporarily installed suspended access equipment

GB/T 21965 Steel wire ropes - Vocabulary for acceptance and defect

GB/T 29086 Steel wire ropes - Safety - Use and maintenance

YB/T 081 Rule for rounding off of numerical values and judgement of testing values for technical standards of metallurgy

YB/T 4452 Fibre cores for steel wire ropes

YB/T 5343 Steel wire for ropes

3 Terms and definitions

The terms and definitions, which are established in GB/T 8706 and GB 19155, apply to this document.

3.1

Slightly untwisting of strands in rope

When cutting off one end of the wire rope, loosen the outer strands, which are about

3 lay lengths long. Tap lightly; the strands will scatter downward slightly, but they can still be basically closed into the original shape after twisting hard.

4.1 Classification

4.1.1

There are eight typical wire rope structures: 4X25Fi-FC, 4X31WS-FC, 6X19W-

WSC, 6X19S-WSC, 6X31WS-FC, 6X31WS-WSC, 6X36WS-FC, 6X36WS-WSC.

Steel wire ropes of other structures can also be supplied, upon negotiation between the supplier and the buyer.

4.1.2

The nominal tensile strength of steel wire ropes is divided into six types: 1870MPa, 1960MPa, 2060MPa, 2160MPa, 2260MPa, 2360MPa.

4.2 The marking code of the steel wire rope shall comply with the provisions of GB/T 8706.

5 Order contents

The contract for ordering, according to this standard, shall include the following main contents:

- a) Standard number;
- b) Product name;
- c) Wire rope structure;

steel wire, that is, 30d (g/m²).

7.1.1.6 The surface of the steel wire shall be smooth and clean, without defects such as scratches, flattening or hard bending.

7.1.2 Fiber core

7.1.2.1

The fiber core shall comply with the provisions of YB/T 4452. It may adopt natural fiber core, synthetic fiber core or composite material core.

7.1.2.2

The fiber core of the steel wire rope may contain a small amount of anti-rust lubricating oil.

7.1.3 The lubricating oil applied on the surface of the wire rope shall be anti-friction, anti-corrosion, anti-rust lubricating oil. If it needs other types of oil products, please specify in the order contract.

7.2.1 Laying quality

7.2.1.1

The laying method of the steel wire rope shall be right alternating lay (sZ). The lay direction of the center strand is opposite to that of the outer strands. The steel wire size of the strand core, in the steel wire rope, shall be able to ensure sufficient support, so that the steel wire wrapped in the outer layer can be twisted evenly. For strands and steel cores in ropes, which are made of steel wires of the same diameter, the nominal diameter of the central steel wire and the central strand shall be appropriately increased.

7.2.1.2

Each strand in the steel wire rope and each steel wire in each strand shall be tightly laid together; the strands shall not collapse, protrude or loosen. There must be no fold marks, protrusions, broken, crushed and disorderly crossed steel wires in the strands. There shall be no defects such as scratches, flattening or hard bending on the surface of the steel wire.

7.2.1.3

The joints of steel wires in the steel wire rope shall be reduced, as much as possible. When the wires have to be connected during twisting, the wires allow electrical connection. The spacing between joints of the same steel wire strand shall not be less than 20 m.

7.2.1.4

The lay length of the strands in the wire rope and the lay length of the steel wires in the strands shall be uniform, throughout their length. The lay length of the steel wire rope shall not be greater than 6.7 times the rope diameter; the lay length of the outer layer of the strands shall not be greater than 9.5 times the strand diameter.

7.2.1.5

Each strand of the outer layer of the steel wire rope shall be pre-deformed and tightly twisted around the rope core in a helical shape. It shall be slightly loose, with little residual torsion. The surface is flat and must not be wavy, when unfolded and

8.2.2.2 The measurement shall be carried out, on the straight line of the wire rope under the condition of no tension. At two points 1 m away from the rope end, at least 0.5 m apart, measure a diameter value at each point, in a direction perpendicular to each other.

The average value of the four measurements is taken as the actual diameter of the wire rope.

8.2.2.3 The difference -- between the diameters measured in mutually perpendicular

directions at the same point -- is the ellipticity value.

8.3 Inspection of wire rope flatness

Touch the surface of the wire rope with your hands; it feels smooth; it is flat without any obvious fluctuations and hard bends.

8.4 Inspection of slightly untwisting of strands in rope

When cutting off one end of the wire rope, remove the strands of outer layer, about 3 lay lengths long; tap lightly; each strand will spread out slightly downwards; but after twisting hard, they can still be basically surrounded into the original shape. In this case, the wire rope is in the state of slightly untwisting of strands.

8.5 Inspection of wire rope residual torsion

Bend at an angle of approximately 90°, at approximately 50 mm from the end of the rope. Hold the bend tightly, to avoid rotation of the wire rope, when pulling out a 6 m long (not cut from the coil) sample. Then release the free segment of the wire rope and let it rotate freely