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### Zinc-coated steel wire ropes for high-pressure rubber hose

高压胶管用镀锌钢丝绳

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# **Zinc-coated steel wire ropes for high-pressure rubber hose**

## **1 Scope**

This Standard specifies the terms and definitions, classification and marking, order content, dimensions, shape, weight and allowable deviations, technical requirements, inspection, test, acceptance, packing, quality assurance period, storage, transport, marking, and quality certificate of zinc-coated steel wire ropes for high-pressure rubber hose.

This Standard applies to zinc-coated steel wire ropes (hereafter known as steel wire ropes for short) for the skeleton reinforcing material of high-pressure rubber hose. The steel wire ropes for the reinforcing material of other rubber hoses, plastic hoses, and composite hoses can also be implemented with reference to this Standard.

## **2 Normative references**

The following documents are indispensable for the application of this document. For the dated references, only the versions with the dates indicated are applicable to this document. For the undated references, the latest version (including all the amendments) are applicable to this document.

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

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

YB/T 5343 Steel wire for ropes

and shall not be greater than 13 times the diameter of the rope. The lower lay length of the wire rope of the 1×19 structure shall be no more than 60% of the upper lay length.

**7.2.1.5** The wire rope shall not be loose. After cutting, the end shall be flat; and there shall be no obvious reverse pullout or loose shell.

### **7.2.2 Mechanical properties**

**7.2.2.1** The minimum breaking force of steel wire rope shall comply with the provisions of Table 2.

**7.2.2.2** The steel wire rope shall be subjected to an elongation test. The elongation at break shall be not less than 2.0%.

### **7.2.3 Surface quality**

The surface of steel wire rope shall be free from oil, dirt, and other impurities. The wire shall be free of defects such as scratches, breaks, hard bending, and rust.

### **7.2.4 Special requirements**

Through negotiation between the supplier and the buyer, the test of bond strength between steel wire rope and rubber can be carried out. Test items with other special requirements shall be negotiated between the supplier and the buyer.

### **7.2.5 Rounding off of numerical values**

The rounding off of numerical values and judgement of testing values for steel wire rope shall be implemented in accordance with the provisions of YB/T 081.

## **8 Inspection**

### **8.1 Surface quality inspection**

The surface quality is checked by hand and eye.

### **8.2 Diameter inspection**

#### **8.2.1 Diameter inspection of steel wire**

The diameter of steel wire shall be measured in two mutually perpendicular directions of the same cross section using a measuring tool with an accuracy of 0.001 mm. The arithmetic mean of the diameters obtained from the two

**9.1.3** From the 1 sample of wire rope taken, 1 core steel wire is taken, and 1 wire is taken in each different layer for the test of zinc-coating weight.

**9.1.4** From the 1 sample of wire rope taken, in each different layer, 2 steel wires are taken for the test of mechanical properties (The core wire is not subjected to a test).

## **9.2 Determination of knot rate of steel wire**

The knotting tensile test of steel wire shall be implemented in accordance with the provisions of GB/T 228.1.

## **9.3 Determination of number of torsions of steel wire**

The number of torsions of steel wire shall be determined in accordance with the provisions of GB/T 239.1. The rotational speed of the torsion test shall be  $(3\pm 0.2)r/s$ .

## **9.4 Determination of zinc-coating weight of steel wire**

The test of zinc-coating weight shall be carried out in accordance with the provisions of GB/T 1839.

## **9.5 Determination of breaking force of steel wire rope**

The breaking force of steel wire rope shall be determined in accordance with the provisions of GB/T 8358.

## **9.6 Determination of elongation of steel wire rope**

The method for determining the elongation at break of the wire rope shall be in accordance with the provisions of GB/T 228.1. The gauge length is 250 mm.

## **9.7 Bond test of steel wire rope**

The method for determining the bond strength between steel wire and rubber shall be in accordance with the provisions of GB/T 5755.

## **9.8 Judgement rules and re-inspection**

**9.8.1** If all tests meet the requirements, the lot (or strip) of wire rope is qualified.

**9.8.2** If one or more test items do not meet the specified requirements, it shall, on the same wire rope, take double samples again to carry out the re-inspection of unqualified items. If the re-inspection results meet the specified requirements, the lot (or strip) of wire rope is still qualified.

If one or more of the re-inspection results do not meet the specified

**11.1.3** For aluminum-plastic composite packing bag, an appropriate amount of desiccant bag shall be placed outside the neutral moisture-proof paper of the steel wire rope, and the plastic film is wound to seal the pack. The packaged wire rope spools are arranged in the aluminum-plastic composite packing bag. After pumping and sealing, USE packing strap to fasten the spool and packing bag to wooden pallet.

**11.1.4** For plastic film wrap packing, an appropriate amount of desiccant bag shall be placed outside the neutral moisture-proof paper of the steel wire rope, and the plastic film is wound to seal. The packaged wire rope spools are arranged on a wooden pallet; and the whole spool is wrapped with a plastic film; then, by packing strap, the spool is fastened to the wooden pallet.

**11.1.5** Each spool is allowed to be wound with no more than 3 wire ropes. The length of each wire rope and the joint mark shall be indicated.

## **11.2 Quality assurance period**

From the date of leaving the factory, the quality assurance period of the wire rope is 1 year without opening the intact pack.

## **11.3 Storage**

The wire rope shall be stored in a dry, ventilated room protected from light. It is recommended to store the wire rope at an ambient temperature of 10 °C~40 °C, relative humidity below 60%, and dew point temperature below 20 °C.

## **11.4 Transport**

During the transport, the wire rope shall be prevented from being exposed to the sun. The wire rope package shall be prevented from being damaged by impact, and a rainproof oil cloth shall be covered and fastened for transport.

## **11.5 Marking and quality certificate**

The marking and quality certificate of the wire rope shall comply with the requirements of GB/T 2104. The surface of the outer packing shall also be marked with obvious signs of protection against rain, moisture, and impact.

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