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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 30470-2026

Replacing GB/T 30470-2013

Superabrasive products - Diamond wire saws

超硬磨料制品 金刚石绳锯

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1.Structure and Drafting Rules of Standardization Documents". Drafting. This document replaces GB/T 30470-2013 "Superhard Abrasive Products - Diamond Wire Saws". Compared with GB/T 30470-2013, it includes the following improvements. Aside from structural adjustments and editorial changes, the main technical changes are as follows:

a) Product categories and codes have been changed (see Chapter 3, Chapter 3 of the.2013 edition);

b) The structural form diagram has been revised (see Figures 1-3, Figure 1 in the.2013 version);

c) The code for the manufacturing method of the beaded abrasive layer has been changed (see 5.1.3,

4.3.1 in the.2013 version);

d) The dimensional specifications have been changed (see 5.2.2,

4.2.2 in the.2013 version);

e) Product labeling has been changed (see Chapter 6,

4.4 of the.2013 edition);

f) Appearance requirements have been changed (see 7.4,

5.4 in the.2013 version);

g) The requirements and test methods for the basic dimensional tolerances have been changed (see

7.5 and 8.4, and

5.1 Structural Type and Code

5.1.1 The wire saw mainly consists of three parts. a steel wire rope, diamond beads (hereinafter referred to as "beads"), and fixing materials. Its structure is shown in Figure 1 and Figure 2. As shown in Figure 3.

5.1.2 The beads are mainly composed of two parts. a steel substrate and an abrasive layer, as shown in Figure 4.

5.1.3 The manufacturing method and code of the beaded abrasive layer are shown in Table 2.

5.1.4 The types and codes of materials for fixing beads are shown in Table 3.

5.2 Size Codes and Dimensions

5.2.1 Size Code The dimension codes for each part of the wire saw are shown in Table 4, and the dimension markings are shown in Figures 1, 2, 3 and 4 respectively.

5.2.2 Dimensions and Specifications The dimensions and specifications of the wire saw are shown in Table 5.

7 Technical Requirements

7.1 Steel Wire Rope The tensile strength of the wire rope required for wire sawing should not be less than 800 MPa.

7.2 Superhard Abrasives The type and technical requirements of diamonds used in wire saws shall comply with the requirements of GB/T 23536 and JB/T 7989, respectively.

7.3 Steel substrate The steel substrate should be made of 45 steel or a material with equivalent or higher mechanical properties.

7.4 Appearance

7.4.1 For wire saws that use rubber or plastic to fix the beads, the surface of the fixing material should not have blistering, cracks or other defects.

7.4.2 For wire saws using spring-loaded beaded cables, the wire rope should be free of any damage after assembly. The spring ends should be closed and wound, and each end should be ground. smooth.

7.4.3 The surface of the beads should not have rust spots or oxide layers.

7.4.4 The diamond particles on the working surface of the beaded surface should be exposed and evenly distributed.

7.4.5 The working surface of the sintered beads shall be free from defects such as chipped edges, chipped corners, cracks, gaps, and dents.

7.4.6 The working surfaces of brazed and electroplated beads should be free from defects such as peeling and blistering.

7.5 Basic Dimensional Limit Deviations The basic dimensional tolerances of the wire saw should conform to the specifications in Table 6. Table

6 Basic Dimensional Limit Deviations The unit is millimeters. Basic dimensional tolerances D ±0.2 0.005L <=15 (Difference in length between closed-loop wire saws used in the same group) L2 0.2 -0.3

7.6 Bond strength between abrasive layer and steel substrate For beads manufactured by sintering, the bonding strength between the abrasive layer and the steel substrate, expressed as shear stress (tau1), should not be less than 60 MPa.

7.7 Fixing strength of beads and wire rope A wire saw that uses rubber, plastic, plastic and spring, or rubber and spring to fix the beads; the fixing strength between the beads and the wire rope is measured by shear stress. (tau2) indicates that it should not be less than 10 MPa.

7.8 Fixing strength between the pressure ring and the wire rope The fixing strength between the spring wire saw clamping ring and the wire rope should not be less than 20% of the minimum breaking tensile strength of the wire rope.

7.9 Connection strength of wire saw joints The connection strength of a conventional wire saw joint should not be less than 30% of the minimum breaking tensile strength of the wire rope; the connection strength of a closed-loop wire saw wire rope should not be less than... It should be less than 60% of the minimum breaking tensile strength of the wire rope. The connection strength of the wire saw joint should be tested under the following conditions.

---New product design specifications;

---Changes occur in key raw materials (joints, wire ropes) during production;

8 Test Methods

8.1 Steel Wire Rope Check the product inspection report within its validity period, and conduct inspection in accordance with GB/T 8358 if necessary.

8.2 Superhard Abrasives and Steel Matrix Test or verify the product inspection report within its validity period according to the test methods of the corresponding product standard.

8.3 Appearance Visual inspection.

8.4 Basic Dimensional Limit Deviations The outer diameter of the beads and the length of the abrasive layer were measured using a vernier caliper with a graduation of

0.02 mm. Twenty beads were tested, and the average value was taken. For standard wire saw lengths, a Grade II steel tape measure is used; for closed-loop wire saw lengths, the guide rollers must be tensioned to 600N before using a Grade I steel tape measure. Or use a measuring instrument of equivalent precision for measurement.

8.5 Bond strength between abrasive layer and steel substrate

8.5.1 Test Apparatus The support base is made of cemented carbide or tool steel with a hardness of not less than 60 HRC. The inner diameter of the support base is determined by the outer diameter of the bead base. The outer diameter of the material should be 0.10mm to 0.15mm larger than that of the beaded matrix. The measuring range of the material testing machine should not exceed 30kN, and the accuracy should be grade 0.5.

8.5.2 Test Method The testing method steps are as follows:

a) Randomly cut 10 beads from the wire saw sample, retaining the steel wire rope and fixing material inside the inner hole, and place the bead base under test on the top and bottom. The end face is ground flat.

b) The length of the abrasive layer and the outer diameter of the substrate of the beads were measured using a vernier caliper with a graduation of

0.02 mm, and the values were accurate to the decimal point. One. Place the specimen on the support, then start the testing machine at

0.5 mm/min at the center axis position of the steel substrate. The load is applied uniformly at a displacement velocity (as shown in Figure 5) until the abrasive layer peels off from the substrate, and the shear force (F1) at the time of peeling is recorded. The shear stress (tau1) value is calculated according to formula (1).

8.6 Fixing strength of beads and wire rope

8.6.1 Test Apparatus The fixture is made of cemented carbide or tool steel with a hardness of not less than 60 HRC. There should be a bisected circular hole at the center of the lower