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NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

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GB/T 1689-2014

Partially replacing GB/T 1689-1998

**Rubber vulcanized - Determination of abrasion
resistance (Akron machine)**

硫化橡胶 耐磨性能的测定（用阿克隆磨耗试验机）

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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 1689-1998 Rubber vulcanized - Determination of abrasion resistance (Akron machine). As compared with GB/T 1689-1998, the main technical changes are as follows:

- DELETE the age number of the normative references (see Chapter 2; Chapter 2 of the 1998 edition);
- DELETE the normative reference GB/T 9865.1-1996 (see Chapter 2 of the 1998 edition);
- ADD relevant content in the principle (see Chapter 3);
- ADD Akron machine (see 4.1);
- ADD content related to the balance (see 4.2);
- ADD recommendations for regular calibration of grinding wheels (see note in Chapter 5);
- ADD the use of different sample preparation methods (see note in Chapter 6);
- CORRECT the unit of density in the calculation formula (see 9.1; 9.1 of 1998 edition).

This standard was proposed by the China Petroleum and Chemical Industry Federation.

This standard shall be under the jurisdiction of the National Rubber and Rubber Product Standardization Technical Committee General Test Method Subcommittee (SAC/TC 35/SC 2).

Drafting organizations of this standard: Zhongce Rubber Group Co., Ltd., Triangle Tire Co., Ltd., Fengshen Tire Co., Ltd., Qingdao Rubber Conveyor Belt Co., Ltd., Qingdao Yikesi New Materials Co., Ltd., Shandong Bayi Tire Manufacturing Co., Ltd., Qingdao Double Star Group Technology Development Center, Beijing Rubber Industry Research and Design Institute, Guizhou Tire Co., Ltd., Jiangsu Xinzhenwei Testing Machinery Co., Ltd., Jiangsu Mingzhu Testing Machinery Co., Ltd.

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Rubber vulcanized - Determination of abrasion resistance (Akron machine)

1 Scope

This standard specifies the method for determining the abrasion resistance of vulcanized rubber.

This standard is applicable to the determination of the abrasion resistance of vulcanized rubber by the Akron machine.

2 Normative references

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

GB/T 533 Rubber vulcanized or thermoplastic - Determination of density (GB/T 533-2008, ISO 2781:2007, IDT)

GB/T 2941 Rubber - General procedures for preparing and conditioning test pieces for physical test methods (GB/T 2941-2006, ISO 23529:2004, IDT)

3 Principle

In this test, the specimen and the grinding wheel are rubbed under a certain inclination angle and a certain load, to determine the wear volume or wear index of a certain mileage of the specimen.

4 Instruments

4.1 Akron machine

4.1.1 The rotation speed of the rubber wheel shaft is $76 \text{ r/min} \pm 2 \text{ r/min}$. The rotation speed of the grinding wheel shaft is $34 \text{ r/min} \pm 1 \text{ r/min}$.

4.1.2 When the angle between the rubber wheel shaft and the grinding wheel shaft is zero degrees, the two shafts shall remain parallel and horizontal.

is the circumference ratio.

6.2 The surface of the specimen shall be flat and shall be free from cracks and impurities.

6.3 After the two sides of the specimen are polished, they are glued to the rubber wheel. The specimen shall not be subjected to tension when bonding. The joint shall be smoothly transitioned during binding. The bonded sample wheel shall be conditioned for at least 16 h.

6.4 The rubber wheel has a diameter of 68 ± 0.5 mm, a thickness of $12.7 \text{ mm} \pm 0.2 \text{ mm}$, a hardness of 75 to 80 degrees (Shore A). The diameter of the center hole shall correspond to the diameter of the rotary shaft of the rubber wheel.

Note: The sample preparation method of vulcanizing the rubber to be tested or directly vulcanizing the rubber to be tested on the metal mold wheel can also be used. The test results obtained by different sample preparation methods are not comparable and shall be noted in the test report.

7 Environment conditioning

The environment conditioning of the sample shall be carried out in accordance with the provisions of GB/T 2941.

8 Procedures

8.1 Fix the glued specimen wheel on the rubber wheel shaft and start the motor to rotate the specimen clockwise.

8.2 Pre-grind the specimen for 15 min ~ 20 min, remove the rubber scraps and weigh the mass, accurate to 0.001 g.

8.3 Use pre-ground specimen for testing. After the specimen runs for 1.61 km, turn off the motor, remove the specimen, brush off the chips, weigh it within 1 h, accurate to 0.001 g.

8.4 Determine the density of the specimen according to GB/T 533.

9 Test results

9.1 The wear volume V of specimen is calculated according to formula (1):

$$V = \frac{m_1 - m_2}{\rho} \dots\dots\dots (1)$$

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