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NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

ICS 83.060

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GB/T 15256-2014 / ISO 812:2011

Replacing GB/T 15256-1994

**Rubber, vulcanized or thermoplastic - Determination of low-
temperature brittleness (multiple test piece method)**

(ISO 812:2011, Rubber, vulcanized or thermoplastic - Determination of
low-temperature brittleness, IDT)

硫化橡胶或热塑性橡胶 低温脆性的测定(多试样法)

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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 15256-1994 "Rubber, vulcanized -- Determination of low-temperature brittleness (multiple test piece method)". Compared with GB/T 15256-1994, the main technical differences in this Standard are as follows:

- Add the WARNING;
- Add a test procedure to the scope (see Chapter 1 of this Edition);
- Add a movement mode of the impact head when impacting the test piece (see 4.1.3 of this Edition);
- Add the requirements for the test device (see 4.2, 4.3, 4.4, 4.5, 4.6, 4.7 of this Edition);
- Add device verification (see Chapter 5 of this Edition);
- Add a test procedure during the test (see Chapter 8 of this Edition);
- Modify the number of test pieces (see 8.1.2 of this Edition, 7.1.1.2 of Edition 1994);
- Add the part of precision (see Chapter 9 of this Edition);
- Add Annex B and Annex C.

This Standard uses translation method to identically adopt ISO 812:2011 "Rubber, vulcanized or thermoplastic - Determination of low-temperature brittleness".

The Chinese documents that have consistent correspondence with the international documents cited in this standard are as follows:

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

The following editorial modifications have been made to this Standard:

- Change the standard name to "Rubber, vulcanized or thermoplastic - Determination of low-temperature brittleness (multiple test piece method)".

This Standard was proposed by China Petroleum and Chemical Industry Federation.

This Standard shall be under the jurisdiction of Subcommittee on General Test Methods of National Technical Committee on Rubber and Rubber Products of Standardization Administration of China (SAC/TC 35/SC 2).

Rubber, vulcanized or thermoplastic - Determination of low-temperature brittleness (multiple test piece method)

WARNING -- Persons using this Standard should be familiar with normal laboratory practice. This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

IMPORTANT -- Certain procedures specified in this Standard might involve the use or generation of substances, or the generation of waste, that could constitute a local environmental hazard. Reference should be made to appropriate documentation on safe handling and disposal after use.

1 Scope

This Standard specifies a method for determining the lowest temperature at which rubber materials do not exhibit brittle failure or the temperature at which half of the test pieces used in a test fail when impacted under specified conditions.

This standard applies to the determination of low temperature brittleness of vulcanized rubber or thermoplastic rubber.

The temperatures thus determined do not necessarily relate to the lowest temperature at which the material can be used since the brittleness will be affected by the conditions of test and especially by the rate of impact. Data obtained by this method should, therefore, be used to predict the behavior of rubbers at low temperatures only in applications in which the conditions of deformation are similar to those specified in the test.

Three procedures are described: procedure A, in which the brittleness temperature is determined; procedure B, in which the brittleness temperature for 50% failure is determined; procedure C, in which the test piece is impacted at a specified temperature.

Procedure C is used in the classification of rubber materials and for specification purposes.

NOTE: A similar test for rubber-coated fabrics is described in ISO 4646, Rubber- or plastics-coated fabrics - Low-temperature impact test.

punched from sheet using a suitable sharp die. Alternatively, type A test pieces can be prepared using sharp, parallel double-bladed cutters, in a single stroke. The strip so formed is then cut to the correct length.

7 Time interval between manufacture and testing

Unless otherwise specified, the time interval between the date the material was formed and testing shall be in accordance with ISO 23529.

8 Procedure

8.1 Procedure A (determination of brittleness temperature)

8.1.1 Bring the bath or test chamber to a temperature below the expected lowest temperature of non-failure. In the case of a liquid heat-transfer medium, place sufficient liquid in the bath to ensure approximately 25 mm depth or more of the liquid over the test piece(s). Pre-cool the test piece clamp by immersing it in the cooled bath or test chamber.

8.1.2 Quickly mount the test piece(s) in the test piece clamp and immerse them for 5 min at the test temperature when using a liquid medium or for 10 min when using a gaseous medium (see also ISO 23529).

NOTE 1: For very soft materials, it might be necessary to use a device to support the test piece horizontally until just before the striker is released.

The free length of the test piece(s) shall be greater than 19 mm.

Test five type A or type B test pieces. If the available striking energy has the minimum value specified in 4.1.2, they may all be tested at the same time.

Proper tightening of the clamp is of the utmost importance. The clamp shall be tightened so that each test piece is held with approximately the same clamping torque.

NOTE 2: It has been reported that the temperature at which a test piece fails might be affected by the clamping torque. Clamping to a torque of 0.15 N to 0.25 N is suggested.

8.1.3 After immersion for the specified time at the test temperature, record the temperature and deliver a single impact blow to the test piece(s).

8.1.4 Remove the test pieces from the test piece clamp and allow them to reach standard laboratory temperature. Examine each test piece to determine whether or not it has failed. Failure is defined as any crack, fissure or hole visible to the naked eye, or complete separation into two or more pieces. Where a test piece has not completely separated, bend it to an angle of 90° in the same direction as the bend caused by the

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