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

GB/T 7755.1-2018

Replacing GB/T 7755-2003

**Rubber, vulcanized or thermoplastic -- Determination of
permeability to gases -- Part 1: Differential-pressure methods**

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Foreword

GB/T 7755 "Vulcanization of rubber or thermoplastic rubber" is divided into the following two parts.

--- Part 1. Differential pressure method;

--- Part 2. Isobaric method.

This part is the first part of GB/T 7755.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This part replaces GB/T 7755-2003 "Determination of gas permeability of vulcanized rubber or thermoplastic rubber", and GB/T 7755-2003

The main technical changes are as follows.

--- Increase the gas permeability, gas diffusion coefficient, gas solubility coefficient in the range (see Chapter 1);

--- Terms and definitions increase gas permeability, gas diffusion coefficient, gas solubility coefficient, gas permeability curve, steady state terminology

(see 3.1, 3.3, 3.4, 3.5, 3.6);

--- Improve the capillary pressure measuring device into an electronic pressure sensor pressure measuring device (see 5.1 and 5.4, 2003 editions 5.2 and 5.4);

--- Removed the capillary pressure measuring device (see 2003 edition 5.2);

--- Added a schematic diagram of the differential pressure method for gas permeability measurement (see Figure 1);

--- Added sample support, pressure sensor, test gas supply container, vacuum pump parts (see 5.3~5.6);

--- Added "Calibration" chapter (see Chapter 6);

- Added introduction to test gas (see Chapter 7);
- Removed the surface of the venting chamber (see Figure 3 in.2003);
- Added detailed test procedures (see 9.1~9.11);
- Modified the adjustment operation of the venting chamber (see 9.2~9.6,.2003 edition 9.1.3);
- Removed the determination of capillary cross-sectional area (see.2003 version 9.1.4);
- Removed the determination of the flow rate (see.2003 edition 9.2);
- Removed the determination of ($V_{2p2}-V_{1p1}$) (see.2003 edition 9.3);
- Increased gas permeability, gas diffusion coefficient, gas solubility coefficient calculation process and results (see 10.1, 10.3, 10.4);
- Removed the requirement for deviation of the results of the air permeability coefficient (see Chapter 10 of the.2003 edition);
- Added Appendix A.

This section uses the redrafting method reference ISO 2782-1.2012 "Vulcanized rubber or thermoplastic rubber permeability determination Part 1

The score. the differential pressure method is compiled, and the degree of consistency with ISO 2782-1.2012 is non-equivalent.

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

This part is under the jurisdiction of the National Rubber and Rubber Products Standardization Technical Committee (SAC/TC35).

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Introduction

The importance of measuring rubber permeability is to evaluate the use of inner tubes, tubeless tire inner liners, hoses, balloons and other gas containers,

Seal and film compound. This measurement is theoretical in studying the relationship between the diffusion and dissolution properties of a gas and the structure of a polymer. significance.

Determination of gas permeability of vulcanized rubber or thermoplastic rubber

Part 1. Differential pressure method

Caution - Personnel using this section should have hands-on experience in formal laboratory work. This section does not point out all possible security questions.

The user is responsible for taking appropriate safety and health measures and ensuring compliance with the relevant national regulations.

1 Scope

This part of GB/T 7755 specifies the test method for the determination of the permeability of vulcanized rubber or thermoplastic rubber by differential pressure method, including gas permeation.

Determination of excess rate, gas permeability coefficient, gas diffusion coefficient and gas solubility coefficient.

This section applies to vulcanized rubber or thermoplastic rubber with a hardness of not less than 35IRHD (International Rubber Hardness).

a gas or a mixture of gases.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 2941-2006 Rubber physics test methods - General procedures for preparation and adjustment of specimens (ISO 23529.2004, IDT)

GB/T 25269-2010 Rubber Test Equipment Calibration Guide (ISO 18899.2004, IDT)

3 Terms and definitions

The following terms and definitions apply to this document.

3.1

Gas transmission rate

The number of moles of test gas per unit area of the test unit per unit time in a state where there is a unit partial pressure difference on both sides of the sample.

3.2

Gas permeability coefficient gaspermeabilitycoefficient

In the state where there is a unit partial pressure difference on both sides of the sample, the test gas permeates the unit area and the unit thickness sample in a unit time.

Number.

3.3

Gas diffusion coefficient gasdiffusioncoefficient

The amount of test gas diffused per unit area of the sample per unit time under unit concentration gradient conditions.

3.4

Gas solubility coefficient gassolubilitycoefficient

The ratio of the molar concentration of the test gas in the sample to the partial pressure of the test gas on the surface of the sample.

3.5

Gas transmission curve gastransmissioncurve

When the gas permeation reaches equilibrium, the pressure curve on the low pressure side of the test chamber is plotted on the abscissa of time.

Note. The gas transmission curve is shown in Figure 2.