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

GB/T 1687.4-2021

**Rubber, vulcanized - Determination of temperature rise and
resistance to fatigue in flexometer testing - Part 4:
Constant-stress flexometer**

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part 1. Structure and Drafting Rules of Standardization Documents"

Drafting.

This document is part 4 of GB/T 1687 "Determination of Temperature Rise and Fatigue Resistance of Vulcanized Rubber in Flexural Test".

GB/T 1687 has released the following parts.

---Part 1. Basic principles;

---Part 3. Compression flexion test (constant strain type);

---Part 4. Constant stress flexion test.

This document uses the translation method equivalent to ISO 4666-4:2018 "Determination of Temperature Rise and Fatigue Resistance of Vulcanized Rubber in Flexural Test"

Part 4. Constant Stress Flexural Test.

The Chinese documents that have consistent correspondence with the normatively cited international documents in this document are as follows.

---GB/T 1687.1-2016 Determination of temperature rise and fatigue resistance of vulcanized rubber in flexural test Part 1. Basic

Principle (ISO 4666-1:2010, IDT);

---GB/T 2941-2006 Rubber physical test methods, general procedures for sample preparation and adjustment (ISO 23529:2004, IDT);

---GB/T 9870.1-2006 Determination of dynamic properties of vulcanized rubber or thermoplastic rubber Part 1. General rules (ISO 4664-

1.2005, IDT).

Introduction

The purpose of GB/T 1687 is to establish a test method for determining the temperature rise and fatigue resistance of vulcanized rubber in a flexural test. It is intended to consist of three parts.

constitute.

---Part 1. Basic principles. The purpose is to explain the general principle of vulcanized rubber flexing test, and define the

Terms and definitions.

---Part 3. Compression flexion test (constant strain type). The purpose is to specify the vulcanized rubber in the constant strain amplitude flexural test

Method for measuring temperature rise and fatigue resistance.

---Part 4. Constant stress flexion test. The purpose is to specify the temperature rise and resistance of vulcanized rubber in the constant stress amplitude flexural test

Method for measuring fatigue performance.

This document gives a method for compressive flexion test by applying a constant amplitude dynamic load. Its characteristics and significance are as follows.

a) In order to accurately simulate the heat-generating behavior of rubber products in use, selecting the appropriate temperature measurement point is an important consideration. and

GB/T 1687.3 measures the different surface temperature of the sample, and the constant stress flexural testing machine uses a needle-shaped temperature detector to directly measure the sample

The temperature of the inner center (this part is a hot spot).

b) During the test, the dynamic performance of the rubber (viscoelastic

Parameter) as a function of time.

c) Through continuous information feedback, it was once considered difficult to detect the initial stage or initial stage of damage due to heat generation.

Signs become possible.

Compared with the result of the test according to the method described in GB/T 1687.3, the temperature rise of the constant stress compression flexion test is compared with the rise of the tire temperature.

High has a good correlation.

Temperature rise and fatigue resistance of vulcanized rubber in flexural test

Determination of performance. Part 4.Constant stress flexural test

Warning 1---The personnel using this document should have practical experience in formal laboratory work. This document does not indicate all possible safety

Questions, users are responsible for taking appropriate safety and health measures, and to ensure that they meet the requirements of relevant national laws and regulations.

Warning 2-Certain steps specified in this document may involve the use or generation of certain wastes, which may cause harm to the local environment.

The relevant documents shall stipulate appropriate safe operation and waste disposal clauses after use.

1 Scope

This document describes the method of measuring the temperature rise and fatigue resistance of vulcanized rubber using a constant stress flexing tester.

Many rubber products (such as tires and conveyor belts) require periodic dynamic loads with constant amplitude during testing. In order to make the experiment

The laboratory test results have a good correlation with the actual operating conditions of the product. This document gives the corresponding test methods under the above conditions.

This document does not apply to vulcanized rubber with a hardness above 85IRHD.

2 Normative references

The content of the following documents constitutes an indispensable clause of this document through normative references in the text. Among them, dated quotations

Only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to

This document.

ISO 4664-1 Determination of dynamic properties of vulcanized rubber or thermoplastic rubber Part 1.General (Rubber, vulcanized or

thermoplastic-Determination of dynamic properties-Part 1.General guidance)

ISO 4666-1 Determination of temperature rise and fatigue resistance of vulcanized rubber in a flexural test Part 1.Basic principles (Rubber,

vulcanized-Determination of temperature rise and resistance to fatigue in flexometer testing-Part 1.

Basic principles)

ISO 18899.2013 Rubber-Guide to the calibration of test equipment (Rubber-Guide to the calibration of test equipment)

ISO 23529 Rubber-General procedures for preparing and conditioning test pieces for physical test methods)

3 Terms and definitions

The terms and definitions defined in ISO 4666-1 and ISO 4664-1 apply to this document.

The addresses of the terminology databases maintained by ISO and IEC for standardization are as follows.

4 Principle

On a cylindrical specimen with a pre-static load, a periodic dynamic load with a constant amplitude is applied for compression, and the temperature of the specimen can be measured.

appreciation. The fatigue life of the sample is given by the number of cycles when failure occurs or the test time. Specimen height change (creep) and dynamic characteristics

Can be measured as a function of time. After the test, measure the compression set of the sample.