

ICS 83.060
CCS G 40



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

GB/T 1687.1-2016

Replacing GB/T 15584-1995

**Rubber, vulcanized -- Determination of temperature rise and
resistance to fatigue in flexo meter testing -- Part 1: Basic
principles**

(English Translation)

Issued on: December 13, 2016

Implemented on: July 1, 2017

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China**

Table of Contents

Foreword

Introduction

1 Scope

2 Normative reference documents

3 Terms and definitions

Foreword

GB/T 1687 "vulcanized rubber in the flexion test temperature rise and fatigue resistance of the determination" is divided into the following four parts.

- Part 1. Fundamentals;
- Part 2. Rotation flex test;
- Part 3. Compression test (constant strain);
- Part 4. Constant stress flexion test.

This part is part 1 of GB/T 1687.

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

Part 1. GB/T 15584-1995 "Determination of temperature rise and fatigue resistance of vulcanized rubber in flexion test Part 1.

Basic principles ", compared with GB/T 15584-1995, the main technical changes are as follows.

- updated the normative reference file (this chapter, Chapter 2);
- adjust Chapter 4 to Chapter 6 and re-edit to increase the temperature measurement requirements (Chapter 6, Chapter 4 of 1995);
- adjust Chapter 5 to Chapter 4 and re-edit to increase the test temperature requirements (Chapter 4, Chapter 5 of the 1995 edition);
- adjust Chapter 6 to Chapter 5 and re-edit (Chapter 5, Chapter 6 of the 1995 edition);
- re-edit the contents of Chapter 7 (this edition of Chapter 7, 1995 edition of Chapter 7);
- Added test report (this chapter, Chapter 8).

This part uses the translation method equivalent to ISO 4666-1:2010 "vulcanized rubber in

the flexion test temperature rise and fatigue resistance of the determination Part 1. Fundamentals ".

In this part of the normative reference to the international documents have a consistent correspondence between the following documents.

Rubber - Physical test methods - General procedure for the preparation and adjustment of specimens (ISO 23529.:2004, IDT); GB/T 2941-2006.

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

2005, IDT).

This section is proposed by the China Petroleum and Chemical Industry Association.

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

This part of the drafting unit. Triangle Tire Co., Ltd., Fengshen Tire Co., Ltd., Guangzhou South China Rubber Tire Co., Ltd., Guizhou Tire Co., Ltd., Beijing Rubber Industry Research and Design Institute, Yangzhou Pearl Experimental Machinery Factory, Jiangsu Xinwei Wei Test Machinery Co., Ltd.

the company.

This part of the main drafters. Xu Qiuhan, Ni Shujie, Ren Shaowen, Ma Tiancheng, Liang Yaping, Chen Yutao, Feng Ping, Xie Junfang, Li Jing, Zhu Muzhi, Shen Kehui.

This part of the previous version of the standard to replace the release of the situation.

--- GB/T 15584-1995.

Introduction

Due to the viscoelasticity of the rubber, all the rubber will absorb a part of the deformation energy and convert it into heat energy under the periodic deformation. Heat the heat generated by the rubber is poor, and the heat generated by the deformation causes the internal temperature of the thicker rubber member to reach a considerable temperature High degree. In the periodic deformation is very large or high temperature rise, the rubber caused by fatigue rupture, leading to damage. This damage begins to take place Inside the rubber, then extended to the outside, eventually leading to complete damage to the rubber parts.

The tests specified in this section give the temperature rise data or fatigue life of the rubber under given test conditions. Can use a series of fatigue Labor life measurement results to determine the rubber fatigue resistance deformation limit or fatigue stress limit. The instruments used in this section are commonly referred to as flexion the test machine

allows the sample to undergo periodic deformation of periodic or constant strain at constant stress.

The fatigue tests specified in this section do not apply to fatigue tests on tensile deformations or bending deformations of thin specimens. In this fatigue test in the event of heat dissipation, the temperature rise is usually negligible, and the damage is due to the formation of cracks, growth, and finally the specimen fracture Caused by. In ISO 132, the method of determining flexion and crack growth with a Demarcia testing machine is specified. ISO 6943 regulations Determination of rubber tensile fatigue resistance of the determination method.

Vulcanized rubber in the flexion test temperature rise and fatigue resistance Determination of performance - Part 1. Fundamental principles

1 Scope

This part of GB/T 1687 specifies the general principles of flexion tests and the terms and definitions involved.

The flex test is suitable for the prediction of rubber products (such as tires, rubber bearings, rubber bearings, V-belts and sheave insert rings, etc.) Flexion when the durability. However, due to the large differences in the conditions of use of rubber products, can not assume its use characteristics and GB/T 1687 the Some of the accelerated fatigue tests have a simple correlation.

2 Normative reference documents

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

ISO 4664-1 vulcanized rubber or thermoplastic rubber - Determination of dynamic properties - Part 1. General principles (Rubber, vulcanized-De-terminationoftemperatureriseandresistancetofatigueinflexometertesting-Part 1. Basicprinci-ples ISO 23529 Rubber Physical Test Method Sample Preparation and Adjustment General Procedure (Rubber-Generalproceduresforpre-paringandconditioningtestpiecesforphysicaltestmethods)

3 Terms and definitions

ISO 4664-1 and the following terms and definitions apply to this document.

Load

So that the specimen undergoes a predetermined static or periodic stress or strain.

Pre - stress

σ_p

The constant static stress experienced by the test specimen.

Note 1: The prestressing unit is Pa.

Note 2: The prestress can simulate the product requirements, but also directly to the sample fixed on the instrument.

Note 3: The term "average stress" (see ISO 4664-1) is the same as or similar to "prestressing".

Pre-strain

ϵ_p

A constant static strain applied to the specimen in the test.

Note 1: The pre-strain can simulate the product requirements, but also directly to the sample fixed on the instrument.

Note 2: The term "average strain" (see ISO 4664-1) is the same as or similar to "pre-strain".