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

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**Rubber, vulcanized - Determination of stress in tension upon
heating**

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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 for Standardization Documents" drafting.

This document is equivalent to ISO 12493:2017 "Determination of thermal tensile stress of vulcanized rubber".

Please note that some contents of this document may refer to patents. The issuing agency of this document assumes no responsibility for identifying patents.

Introduction

Under constant stress, vulcanized rubber will shrink as the test temperature increases, while under constant strain, the sample will produce stress.

Increase. These are the Gough-Joule effects of rubber, which should be considered in the design stage, otherwise the resulting forces and dimensional changes

Both affect the performance of some products, such as rotary seals operating under high temperature and high strain conditions (see reference [1]).

This document describes a test method for changes in tensile stress induced by an increase in test temperature.

Determination of thermal tensile stress of vulcanized rubber

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

In case of problems, the user is responsible for taking appropriate safety and health measures and ensuring compliance with the conditions stipulated in the relevant national laws and regulations.

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

Appropriate safe handling and post-use disposal of waste should be specified in relevant documents.

1 Scope

This document describes a method for measuring the tensile stress (thermal stress) developed in vulcanized rubber when heated.

Under different pre-strain and different temperature conditions, the change of thermal stress with time was measured.

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text. Among them, dated references

For documents, 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 5893 Specification for rubber and plastics testing apparatus in tension, flexion and compression (constant movement) type [Rubber and cation]

Note. GB/T 17200-2008 Technical specifications for rubber and plastic tensile, compressive and bending testing machines (constant speed drive) (ISO 5893.2002, IDT)

Note. GB/T 25269-2010 Guidelines for Calibration of Rubber Test Equipment (ISO 18899.2004, IDT)

Note. GB/T 2941-2006 Rubber Physical Test Methods Specimen Preparation and Adjustment General Procedures (ISO 23529.2004, IDT)

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1

thermal stress

σ_T

The force per unit initial area produced by a sample when it is heated.

Note. The unit is Newton per square meter (N/m²) or Pascal (Pa).

3.2

Maximum thermal stress maximumthermalstress

Peak thermal stress recorded during the test.

3.3

$\sigma_{T,t}$