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

GB/T 41936.2-2022

**Determination of stiffness in torsion of flexible materials - Part
2: Application to plasticized compounds of homopolymers and
copolymers of vinyl chloride**

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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 part 2 of GB/T 41936 "Determination of Torsional Rigidity of Plastic Flexible Materials". GB/T 41936 has been issued

The following sections.

--- Part 1. General method;

--- Part 2. Plasticized vinyl chloride homopolymers and copolymers.

This document is equivalent to ISO 458-2:1985 "Determination of torsional stiffness of plastic flexible materials - Part 2. Plasticized vinyl chloride homopolymers and Copolymers".

The chapter "Terms and Definitions" has been added to this document.

The following minimal editorial changes have been made to this document.

--- The specific article number is quoted in the text, and the era number of the normative reference document ISO 458-1 is added;

--- Increased description of each parameter in formula (1).

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

GB/T 41936 consists of two parts.

--- Part 1. General method. The purpose is to provide a general method for the determination of the torsional stiffness of flexible plastics, and to give the Relevant requirements for testing equipment.

--- Part 2. Plasticized vinyl chloride homopolymers and copolymers. The purpose is to provide plasticized vinyl chloride homopolymer and copolymer materials

Rotational stiffness provides a test method.

For plasticized polyvinyl chloride, the logarithm of torsional stiffness versus temperature curve is inversely S-shaped. Each curve consists of 3 regions.

a) Two slowly changing regions, where the stiffness changes relatively slowly with temperature.

1) In the high stiffness region, the material exhibits high stiffness, which some scholars believe is due to the lack of elasticity of the material. Clash and

Berg[1] gives the characteristic value of torsional stiffness in this area as 310MPa ($3.1 \times 10^9 \text{ dyn/cm}^2$).

2) In the region of low stiffness, the material exhibits high elasticity. The corresponding characteristic value of torsional stiffness in this area is 4.1MPa (42kgf/

cm^2), this value applies to film materials that are still sufficiently flexible at normal service temperatures, such materials are usually used

Curtains, drapes and waterproofing.

b) In the middle stiffness area, the stiffness of this area changes relatively quickly with temperature, and there is an inflection point in the curve, and the characteristic value of torsional stiffness is 22.8MPa

(233kgf/ cm^2).

Considering the accuracy of the test, the torsional stiffness eigenvalues of the three regions are.

---300MPa (high stiffness area);

---23MPa (medium rigidity area);

---4MPa (low stiffness area).

34, pp. 1218-1222 (1942).

Determination of torsional stiffness of plastic flexible materials

Part 2. Plasticized vinyl chloride homopolymers and copolymers

1 Scope

This document describes a method for the determination of the temperature corresponding to the three characteristic values of torsional stiffness of plasticized vinyl chloride homopolymers and copolymers.

This document applies to flexible materials that use vinyl chloride homopolymers and copolymers as main raw materials and add plasticizers.

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 458-1.1985 Determination of torsional rigidity of plastic flexible materials - Part 1. General method (Plastics-

Note. GB/T 41936.1-2022 Determination of torsional rigidity of plastic flexible materials Part 1. General method (ISO 458-1.1985, IDT)

3 Terms and Definitions

This document does not have terms and definitions that need to be defined.

4 principles

For plasticized vinyl chloride homopolymers and copolymers, according to method A described in ISO 458-1.1985, when the selected deflection angle is 55° ~ 65° ,

Measure the temperature corresponding to three torsional stiffness characteristic values (300MPa, 23MPa and 4MPa) of the material.

5 devices

See Clause 4 of ISO 458-1.1985.

6 samples

Use the following samples in order to draw a curve in which the samples have the same shape at the eigenvalues.

- a) Specimen I, with a thickness of 1.8mm~2mm, is used to draw the part of the curve area whose characteristic value of torsional stiffness is 300MPa;
- b) Specimen II, with a thickness of 2 mm to 5 mm, used to draw the part of the curve area where the characteristic value of torsional stiffness is 23 MPa;
- c) Specimen III, with a thickness of 4mm~5mm, is used to draw the part of the curve area whose characteristic value of torsional stiffness is 4MPa.

The length of the sample should be 60mm $\pm$ 2mm, and the width should be 6.2mm~6.4mm.

Note 1. A single sample with a thickness of 4mm~5mm is used to draw the curve parts with characteristic values of torsional stiffness of 23MPa and 4MPa to shorten the test

time.

Note 2. Some properties of plastics may change slightly during placement, especially those involved in this method. Record the date the specimen was prepared. Enter

When conducting the comparison test, the state of the sample should be adjusted for at least 48 hours.