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

GB/T 33061.6-2023

**Plastics - Determination of dynamic mechanical properties -
Part 6: Non-resonance method under shear vibration
(English Translation)**

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3.1 Terms and definitions

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Foreword

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

Drafting.

This document is Part 6 of GB/T 33061 "Determination of Dynamic Mechanical Properties of Plastics". GB/T 33061 has issued the following

part.

---Part 1.General principles;

---Part 4.Non-resonant tensile vibration method;

---Part 5.Non-resonant bending vibration method;

---Part 6.Non-resonant shear vibration method;

---Part 7.Non-resonant torsional vibration method;

---Part 10.Determination of complex shear viscosity using a parallel plate oscillating rheometer;

---Part 11.Glass transition temperature.

This document is modified to adopt ISO 6721-6.2019 "Determination of dynamic mechanical properties of plastics - Part 6.Shear vibration non-resonant method".

Compared with ISO 6721-6.2019, this document has many structural adjustments. Comparison list of structure number changes between two files

See Appendix A for the table.

Compared with ISO 6721-6:2019, there are many technical differences between this document and the clauses involved in the outer margin of the page.

Single lines (l) are marked. A list of these technical differences and their causes is shown in Appendix B.

The following editorial changes have been made to this document.

---In order to coordinate with the existing standards, the name of the standard is changed to "Determination of dynamic mechanical properties of plastics - Part 6. Non-resonant shear vibration"

"Movement Method";

---Replaced ISO 6721-7 with the informative reference GB/T 33061.7, and GB/T 33061.1 replaced ISO 6721-1 (see

Chapter 1);

The material height is at least 100 times (see Note 2)" is changed to Note 1 (see 3.2);

---Add Appendix A (informative) "List of comparison between this document and ISO 6721-6:2019 structure numbers";

---Add Appendix B (informative) "List of technical differences between this document and ISO 6721-6:2019 and their reasons".

Please note that some content in this document may be subject to patents. The publisher of this document assumes no responsibility for identifying patents.

Introduction

Dynamic mechanical analysis (DMA) measures the response of a material under alternating stress or strain under programmed temperature control. The measurement results reflect the material's response to alternating stress or strain.

The viscoelasticity of the material.

This paper uses the DMA method to determine the storage modulus, loss modulus and loss factor of plastics in non-resonant shear modes as a function of temperature.

Variety. Based on these data, the relaxation behavior of plastics at all levels in shear mode can be characterized and important information related to the use properties of plastics can be obtained.

parameter.

GB/T 33061 specifies various methods for determining the dynamic mechanical properties of rigid plastics within the range of linear viscoelastic behavior. It is planned to consist of twelve

Part composition.

---Part 1.General principles. The purpose is to establish common definitions and various aspects of test methods for the determination of dynamic mechanical properties.

---Part 2.Twist method. The purpose is to establish an operable, traceable and verifiable method for the measurement of energy storage and loss components of torsional modulus.

Real program.

---Part 3.Resonant bending vibration curve method. The purpose is to obtain the bending composite modulus E_f^* of the homogeneous plastic and the layer used for sound insulation.

Determine the damping characteristics of compressed plastics and establish operable, traceable and verifiable procedures.

---Part 4.Non-resonant tensile vibration method. The purpose is to determine the forced non-resonance method of the tensile complex modulus E^* of plastics.

Establish operable, traceable and verifiable procedures.

---Part 5.Non-resonant bending vibration method. The purpose is to determine the forced non-resonance method of the plastic bending complex modulus E_f^* .

Establish operable, traceable and verifiable procedures.

---Part 6.Non-resonant shear vibration method. The purpose is to determine the forced non-resonant method of plastic shear complex modulus G^* ,

Establish operable, traceable and verifiable procedures.

---Part 7.Non-resonant torsional vibration method. The purpose is to calculate the torsion of the shear complex modulus G^* of a strip or rod-shaped solid polymer.

Convert the measurement to non-resonant methods and establish operable, traceable and verifiable procedures.

---Part 8.Longitudinal shear vibration wave propagation method. The purpose is to calculate the longitudinal complex modulus L^* and shear complex modulus of the polymer

For the determination of the energy storage component of G^* , establish an operable, traceable and verifiable procedure.

---Part 9.Tensile vibration sonic pulse propagation method; the purpose is to measure the storage component of the polymer composite tensile modulus E^*

Determine and establish operable, traceable and verifiable procedures.

---Part 10.Determination of complex shear viscosity using a parallel plate oscillating rheometer. The purpose is to provide dynamic rheological properties of polymer melts.

Determination of test methods and establishment of operable, traceable and verifiable procedures.

---Part 11. Glass transition temperature. The purpose is to determine the glass transition temperature (T_g) for dynamic mechanical properties.

Establish operable, traceable and verifiable procedures.

---Part 12. Non-resonant compression vibration method. The purpose is to establish an operable and practical method for the determination of the compression composite modulus E^* of polymers.

Traceable and verifiable procedures.

Determination of dynamic mechanical properties of plastics

Part 6. Non-resonant shear vibration method

1 Scope

This document describes a forced non-resonant method for determining the shear complex modulus G^* of plastics in the frequency range 0.01 Hz to 100 Hz.

Note: Higher frequencies may lead to larger errors in the measured dynamic performance (see 9.5.1 and 10.1.2).

This document is suitable for the determination of dynamic storage modulus between 0.1MPa and 50MPa. This document can study materials with a modulus greater than 50MPa.

However, the torsional vibration method can be used to more accurately measure its dynamic shear mechanical properties (see ISO 6721-2 and GB/T 33061.7).

This document is particularly suitable for the determination of loss factors greater than 0.02, in order to facilitate the study of the dynamics of most glassy-rubbery relaxation zones.

Can change with temperature and frequency (see GB/T 33061.1).

2 Normative reference documents

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

For undated referenced documents, only the version corresponding to that date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to

this document.

GB/T 33061.1 Determination of dynamic mechanical properties of plastics Part 1. General