

ICS 83.080.01
CCS G 31



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

GB/T 47549-2026

**Plastics - Determination of fracture toughness - J-R curves
approach**

塑料 断裂韧性的测定 J-R曲线法

(English Translation)

Issued on: April 30, 2026

Implemented on: November 1, 2026

Issued by: State Administration for Market Regulation

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C.1 Shape Function

C.2 Marking and Identification of Crack Fronts

C.3 Precision Specification

C.4 Recommended Test Report Form

Reference

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 modified to adopt ISO/T S28660.2022 "Determination of JR curves for fracture toughness in plastics". The document type is changed from ISO technical standard.

The technical specifications have been adjusted to become my country's national standards.

Compared with ISO/T S28660.2022, this document has undergone many structural adjustments. A comparison of the structural numbering changes between the two documents is provided below.

See Appendix A for the table of contents.

The technical differences between this document and ISO/T S28660.2022, and the reasons therefor, are as follows.

---ISO 13586 has been replaced with the normatively referenced GB/T 41932, and the normatively referenced ASTM D6068 (see GB/T 41932) has been deleted.

Chapter 3), to adapt to my country's technological conditions and increase operability;

---Additional symbols used in this document (see Chapter 4) have been added to the "Symbols" chapter to facilitate operators' understanding and use of this document;

---ISO 7500-1 (see 6.1) has been replaced with the normatively referenced GB/T 16825.1 to adapt to my country's technical conditions and add [further details needed].

Operability;

---ISO 9513 (see 6.1 and 6.2) has been replaced with the normatively referenced GB/T 12160 to adapt to my country's technical conditions, and the following has been added.

Operability;

---Requirements for specimen width and thickness measurement equipment have been added (see 6.4) to increase operability and facilitate the application of this document;

---Requirements for specimen crack length measurement equipment have been added (see 6.5) to increase operability and facilitate the application of this document;

---ISO 2818 (see 7.2 and 7.3) has been replaced with the normatively referenced GB/T 39812 to adapt to my country's technical conditions, and the following has been added.

Operability;

---ISO 16012 (see 8.2) has been replaced with the normatively referenced GB/T 44535 to adapt to my country's technical conditions and increase operability.

Actual nature;

---ISO 2818 (see 8.3) has been replaced with the normatively referenced GB/T 2918 to adapt to my country's technical conditions and increase operability.

Actual nature;

---Added requirements for the J-integral calculation of specimens with side grooves (see 9.2.4) to increase operability and facilitate the application of this document.

The following editorial changes have been made to this document.

---To align with existing standards, the standard name has been changed to "Determination of Fracture Toughness of Plastics - JR Curve Method";

---Appendix A (informative) "Comparison of Structure Numbers in this Document with ISO/T S28660.2022" has been added;

---Added Appendix B (informative) "Pre-cracks created by fatigue method".

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Petroleum and Chemical Industry Federation.

This document is under the jurisdiction of the National Technical Committee on Plastics Standardization (SAC/TC15).

1 Scope

This document describes a method for determining the fracture toughness of plastics based on the JR curve.

This document applies to tough and semi-tough polymers and their blends, but not to plastic deformation where the crack front and crack tip cannot be distinguished.

Materials in the shape of a shape.

This document does not apply to fiber-reinforced materials.

Note: The crack propagation resistance that cannot be characterized by the linear elastic fracture mechanics method of GB/T 41932 is characterized by the JR curve obtained by this method.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.

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

This document.

GB/T 2918 Standard environment for conditioning and testing of plastic specimens (GB/T 2918-2018, ISO 291:2008, MOD) GB/T 12160 Calibration of extensometer systems for uniaxial testing of metallic materials (GB/T 12160-2019, ISO 9513:2012, IDT) GB/T 16825.1 Inspection and calibration of static uniaxial testing machines for metallic materials - Part 1: Tensile and/or compressive testing machines Inspection and calibration of force measurement systems (GB/T 16825.1-2022, ISO 7500-1:2018, IDT) GB/T 39812 Machining preparation of plastic specimens (GB/T 39812-2021, ISO 2818:2018, IDT) GB/T 41932 Determination of fracture toughness (GIC and KIC) of plastics - Linear elastic fracture mechanics (LEFM) method (GB/T 41932-2022, ISO 13586:2018, MOD) GB/T 44535 Determination of linear dimensions of plastic specimens (GB/T 44535-2024, ISO 16012:2015, MOD)

3 Terms and Definitions

The terms and definitions defined in GB/T 41932, as well as the following terms and definitions, apply to this document.

J-Integral