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

GB/T 36805.1-2018

**Plastics -- Determination of tensile properties at high strain
rates -- Part 1: Equation fitting method**

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Foreword

GB/T 36805 "Determination of tensile properties of plastics at high strain rate" is divided into two parts.

--- Part 1. Equation fitting method;

--- Part 2. Direct test method.

This part is the first part of GB/T 36805.

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

This section uses the translation method equivalent to ISO 18872.2007 "Determination of tensile properties at high strain rates of plastics".

The documents of our country that have a consistent correspondence with the international documents referenced in this part are as follows.

Plastics -- Determination of tensile properties of plastics -- Part 2 . Test conditions for moulding and extruded plastics

(ISO 527-2.1993, IDT).

This section has made the following editorial changes.

--- Modified the standard name.

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

This part is under the jurisdiction of the National Plastics Standardization Technical Committee General Method and Product Subcommittee (SAC/TC15/SC4).

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Introduction

Tensile performance data of plastic materials at different strain rates can be used for CAE deformation and failure behavior of plastic products and plastic parts

Simulation analysis. Plastic materials are sensitive to the rate of change, and performance at high strain rates and performance at low strain rates are usually presented.

Different laws.

In order to regulate the tensile properties of plastic materials at high strain rates, this standard is specifically formulated. This standard is for sample types, test equipment and

The test methods all set clear requirements.

Determination of tensile properties of plastics at high strain rates

Part 1. Equation fitting method

1 Scope

This part of GB/T 36805 specifies the method for determining the tensile properties of molded and extruded plastics over a wide range of strain rates.

The variable rate range includes a rate that approximates the high strain rate in the case of impact loading. Performance determination by combining the following methods. in test

Performance at low strain rates, using mathematical functions to fit the test results, extrapolating the equations to derive rate-dependent parameters. Then pass

Extrapolation over the calculation yields tensile properties at high strain rates. This method can eliminate the test problem of performance measurement at high strain rate.

And related errors in measurement. Performance at low to medium strain rates is determined in accordance with ISO 527-2 and is specified for use in this section.

Type of plastic material.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

Plastics -- Determination of tensile properties - Part 1. General (ISO 527-1:1993, IDT)

Plastics -- Determination of tensile properties of plastics -- Part 2 . Test conditions for molded and extruded plastics (Plastics-Determi-

nation of tensile properties-Part 2. Test condition for moulding and extrusion plastics)

Machined preparation of ISO 2818 plastic specimens (Plastics-Preparation of test specimens by machining)

3 Principle

The tensile stress-strain curve was obtained according to ISO 527-2 at a selected rate in the range of 0.1 mm/s to 100 mm/s.

In order to obtain the highest accuracy test results at higher rates, the design features of the test setup described in Chapter 5 should be noted. At the same time, measuring Poisson

The ratio varies with strain. Based on these results, the true stress and the true plastic strain value at each strain rate can be calculated. Mathematical letter

The numerical equation can accurately simulate each stress/plastic strain curve. At the same time, it is also possible to model and analyze the parameters in this function with the strain rate.

The change is extrapolated to give a parameter value at a higher strain rate. A stress/strain curve at a higher strain rate can be obtained by calculation.

4 Terms and definitions

The following terms and definitions as defined in GB/T 1040.1-2006 apply to this document.

4.1

True stress σ_T

σ_T

At the same time, the ratio of the measured force to the cross-sectional area between the gauge lengths of the specimen.

4.2

True strain ϵ_T

ϵ_T

At the same time, the ratio of the elongation between the gauge lengths to the length of the gauge length.

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