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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 36800.2-2018

Plastics -- Thermomechanical analysis (TMA) -- Part 2: Determination of coefficient of linear thermal expansion and glass transition temperature

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Foreword

GB/T 36800 "Plastic Thermomechanical Analysis (TMA)" is divided into three parts.

--- Part 1. General;

--- Part 2. Determination of linear thermal expansion coefficient and glass transition temperature;

--- Part 3. Determination of penetration temperature.

This part is the second part of GB/T 36800.

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 11359-2.1999 "Plasma Thermomechanical Analysis (TMA) Part 2. Linear Heat

Determination of expansion coefficient and glass transition temperature.

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

---GB/T 2918-1998 Standard environment for conditioning and testing of plastic specimens (ISO 291.1997, IDT);

--- GB/T 36800.1-2018 Plastic thermomechanical analysis (TMA) Part 1. General (ISO 11359-1.2014).

This section has made the following editorial changes.

--- Added informative Appendix NA.

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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1 Scope

This part of GB/T 36800 specifies the use of thermal expansion principle, the use of thermomechanical analysis (TMA) to determine the state of plastic solid state line

Method of thermal expansion coefficient. A method for determining the glass transition temperature by thermomechanical analysis is also specified.

Note. Various types of thermal expansion instruments can be used to measure the linear thermal expansion coefficient. This section only covers TMA instruments.

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.

Standard environment for conditioning and testing of ISO 291 plastic specimens (Plastics-Standardatmospheresforcondition

Andtesting)

ISO 11359-1 Plastics Thermomechanical Analysis (TMA) Part 1. General Rules [Plastics-Thermomechanical

Analysis(TMA)-Part 1.Generalprinciples]

3 Terms and definitions

The following terms and definitions as defined by ISO 11359-1 apply to this document.

3.1

Thermal expansion thermalexpansion

The change in sample size at the time of temperature change was measured by a thermal expansion method.

3.2

Linear thermal expansion coefficient coefficientoflinearthermalexpansion

The length of material per unit length varies reversibly for every 1 °C change in temperature.

Note. Two different linear thermal expansion coefficients can be determined. differential linear thermal expansion coefficient and average linear thermal expansion coefficient.

3.2.1

Differential linear thermal expansion coefficient
differentialcoefficientoflinearthermalexpansion

Calculate the expansion coefficient in either direction in three directions at temperature (T) and constant pressure (p). The equation is as follows.

alpha=

dL( ) p

dT( ) p

L0=

dL/dt( ) p

dT/dt( ) p

L0

(1)

In the formula.

L0 --- the initial length of the sample in the measurement direction at room temperature;

L --- the length of the sample in the measurement direction at temperature T;

dL---the change in length during the test time interval dt under a constant pressure p;

dT---the change in temperature during the test time interval dt under a constant pressure p.