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

GB/T 3682.2-2018

**Plastics -- Determination of the melt mass-flow rate (MFR) and melt
volume-flow rate (MVR) of thermoplastics -- Part 2: Method for
materials sensitive to time-temperature history and/or moisture**

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Table of Contents

Foreword

Introduction

1 Scope

2 Normative references

Foreword

GB/T 3682 "Determination of Melt Mass Flow Rate (MFR) and Melt Volume Flow Rate (MVR) of Plastic Thermoplastics" by

The following two parts are composed.

--- Part 1. Standard methods;

--- Part 2. Test methods for time-temperature history and/or humidity sensitive materials.

This part is part 2 of GB/T 3682.

This section was drafted in accordance with the rules given in GB/T 1.1-2009.

This section uses the redrafted method to modify the use of international standards ISO 1133-2:2011 "plastic thermoplastic melt flow rate

Determination of (MFR) and melt volume flow rate (MVR) - Part 2. Tests on time-temperature history and/or humidity-sensitive materials

Inspection method."

The technical differences between this part and ISO 1133-2:2011 and its causes are as follows.

--- On the normative reference documents, this section made adjustments with technical differences to adapt to China's technical conditions, adjust the situation

The focus is reflected in Chapter 2, "Normative References," and the specific adjustments are as follows.

* Replace ISO 1628-1:1998 with GB/T 1632.1-2008 modified to adopt international standards;

* Replace ISO 1133-1:2011 with GB/T 3682.1-2018 modified to adopt international standards;

* Replace GB/T 12006.1-2009 with international standards instead of ISO 307:2007;

* Replace ISO 15512.1999 with GB/T 12006.2-2009 modified to adopt international standards.

This part is proposed by China Petroleum and Chemical Industry Federation.

This part is under the jurisdiction of the General Methods and Products Section of the National Plastics Standardization Technical Committee (SAC/TC15/SC4).

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Introduction

The methods provided in this section apply to materials whose rheological behavior is time-temperature history and/or humidity sensitive during testing.

GB/T 3682.1-2018 does not specify the test conditions for such materials. The precision of the test data obtained cannot meet the requirements (ie at least

Equivalent to the precision level of the data obtained using the GB/T 3682.1-2018 test stability material). This section and humidity sensitive materials

For relevance.

The main difference between this part and GB/T 3682.1-2018 is the temperature tolerance, time line, sample size and pretreatment specified in this part.

Strict, with better repeatability and reproducibility, test results have better precision.

Rheological behavior MVR measurement of thermoplastic materials affected by hydrolysis and condensation phenomena, the precision of which is often severely affected by the following factors.

- Moisture content and sample conditioning;
- Sample processing;
- Weak temperature difference, that is, the temperature within the barrel changes with position and time;
- The total time of the material at the test temperature;
- sample volume;
- Sample pattern (shape and size - particles, powder, small pieces, etc.);

--- Instrument cleaning.

In order to obtain accurate, repeatable and reproducible results, not only the instrument needs to meet the requirements of this part, sample preparation and test steps

The steps also need to meet the instructions in this section, especially the above-mentioned sensitive details of the test results. Equipment, test procedures, and/or sample processing

Small deviations can seriously affect the repeatability, reproducibility, and test precision of test data.

In general, the MVR and MFR test conditions specified in the material standards should be proposed and used to guide the test before testing.

test. Materials whose rheological behavior is affected by hydrolysis, condensation or cross-linking during testing are not specified in their material standards in many cases.

Test conditions for MVR and MFR values. The standards for these materials may be revised or improved later. When there is no relevant material standard or

When the test conditions are not specified in the material standards, the relevant parties shall communicate the confirmation of the drying and test conditions.

Note. At the time of publication, there was no evidence that using this part of the test stability material was more accurate than using GB/T 3682.1-2018.

Plastic Thermoplastic Melt Mass Flow Rate (MFR)

And melt volume flow rate (MVR) determination

Part 2. Time-Temperature History and/or Humidity

Sensitive materials test methods

Warnings - The personnel in this section should be familiar with the laboratory specifications used. This section does not cover all safety issues related to use

Questions, if any, are only relevant to their use. The users of this section have the responsibility to establish appropriate measures to protect personal safety and determine these regulations.

The applicability of the system.

Important Note. The instrument must meet the provisions of this section, need to be tested under the specified temperature and load conditions, pay attention to sample pretreatment,

Strictly implement the test procedures in this section and any applicable material standards.

1 Scope

This part of GB/T 3682 specifies a thermoplastic material that is sensitive to the rheological properties of time-temperature history and/or humidity.

The material's melt mass flow rate (MFR) and melt volume flow rate (MVR) methods.

Note 1. Some materials are affected by the hydrolysis reaction, such as polyethylene terephthalate (PET), polybutylene terephthalate (PBT), poly naphthalene dicarboxylic acid Ethylene glycol esters (PEN), as well as other polyester polymers, polyamides, etc.; other materials are affected by cross-linking reactions such as thermoplastic elastomers (TPE) and

Thermoplastic vulcanizates (TPV). This method may also be applicable to other materials.

This method may not be suitable for materials whose rheological behavior is greatly affected during testing.

Note 2. For those materials whose MFR and MVR have a higher coefficient of variation than that in GB/T 3682.1-2018, use the viscosity in their dilute solution (GB/T 12006.1-2009, GB/T 1632.1-2008) may be more appropriate to characterize.

Note 3. Small differences in equipment, operational procedures, and/or sample processing may significantly reduce the repeatability, reproducibility, and accuracy of measurement results. Appendix B gives

Under ideal conditions, using this section to test the MVR results of different materials, this shows the repeatability of this section.

If the density of the material under test temperature and pressure is known, or when the cutting device is fitted, the accuracy of the measurement is at least the same as when measuring MVR,

MFR can be calculated by MVR.

Note 4. The required melt density should be obtained at the test temperature and load. In fact, at low pressures, the data obtained at test temperature and ambient pressure can be used.

The main difference between this part and GB/T 3682.1-2018 lies in this part of the barrel temperature and the time the material has experienced at this temperature.

There is a stricter tolerance. Therefore, it is necessary to strictly control the time history of materials and apply materials that are susceptible to high temperatures.

Compared with the results obtained in GB/T 3682.1-2018, the use of this part can reduce the variability of the results.

This section also gives methods for preparing and processing moisture-sensitive materials, which are closely related to obtaining reproducible, reproducible and accurate data.