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

GB/T 7142-2026

Replacing GB/T 7142-2002

**Plastics - Determination of time-temperature limits after
prolonged exposure to heat**

塑料 长期热暴露后时间-温度极限的测定

(English Translation)

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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 supersedes GB/T 7142-2002 "Determination of Time-Temperature Limits of Plastics After Long-Term Heat Exposure", and is consistent with GB/T 7142-2002.

In comparison, aside from structural adjustments and editorial changes, the main technical changes are as follows.

a) Some text has been changed to footnotes (see footnotes 1 and 2 in 3.5, footnotes in Chapter 6, footnotes 1-3 in 7.2, and footnote 1 in Chapter 10).

Note 2, Note 1 and Note 2 of 11.5, 3.5, Chapter 6, 7.2, Chapter 10, and 11.5 of the 2002 edition);

- b) Added normative reference to GB/T 11026.3 (see 4.3, Chapter 12, and D.2);
- c) Added normative reference to GB/T 11026.2 (see Chapter 5);
- d) GB/T 7141-1992 has been replaced by the normatively referenced GB/T 11026.4 (see Chapter 9, Chapter 9 of the 2002 edition);
- e) GB/T 2918-1998 has been replaced by the normatively referenced GB/T 2918 (see Chapter 10, Chapter 10 of the 2002 edition);
- f) Added the normative reference GB/T 11026.1 (see Figures 1, 2, and 3);
- g) Added normative reference to IEC 60216-5:2022 (see note in Chapter 12).

This document is modified to adopt ISO 2578:1993 "Determination of time-temperature limits of plastics after prolonged heat exposure".

This document has undergone the following structural adjustments compared to ISO 2578:1993.

---The content concerning the reservation of "spare specimens" in Chapter 10 of ISO 2578:1993 has been moved to Chapter 7 (see 7.3).

The technical differences between this document and ISO 2578:1993, and the reasons therefor, are as follows.

---IEC 216-3-1:1990 and IEC 216-3-3 (see 4.3 and Chapter 12) have been replaced by the normatively referenced GB/T 11026.3.

To adapt to my country's technological conditions and improve operability;

---IEC 216-2:1990 (see Chapter 5) has been replaced with the normatively referenced GB/T 11026.2 to adapt to my country's technical conditions.

Improve operability;

---IEC 216-4-1:1990 (see Chapter 9) has been replaced with the normatively referenced GB/T 11026.4 to adapt to my country's technical requirements.

Improve operability;

---ISO 291:1977 (see Chapter 10) has been replaced with the normatively referenced GB/T 2918 to adapt to my country's technical conditions and improve...

Operability;

---IEC 216-1:1990 has been replaced with the normatively referenced GB/T 11026.1 (see notes in Figures 1, 2, 3 and D.2) to suit [the requirements of the standard].

To improve operability based on my country's technological conditions;

---IEC 216-5:1990 has been replaced with the normatively referenced IEC 60216-5:2022

(see note in Chapter 12) to accommodate my country's national standards.

Improve technical conditions and enhance operability;

---Added requirements for recording the number of samples [see Chapter 13f)], improving standardization.

The following editorial changes have been made to this document.

---Added recommendations regarding performance testing methods standard GB/T 11026.2 (see Chapter 5) to improve operability;

---The footnote numbers have been changed (see footnotes 1-3 in 7.2, footnotes in Chapter 10, footnotes 1 and 2 in 11.5, and footnotes in Chapter 12);

---The footnote (see 11.1 of ISO 2578:1993) has been deleted, and its contents have been included in informative Annex D;

---The axis labels have been changed and indexing instructions have been added (see Figures 1, 2, and 4);

---Explanations of some symbols in Figure 3 and Equation (1) have been removed (see Chapter 12 of ISO 2578:1993), and the labels in Figure 3 have been changed.

The annotations and figure captions have been added (see Figure 3), and an explanation of the symbols in the formula (1) has been added after the formula.

---The content of the comment has been changed (see the note in Chapter 12);

---Table A.1 "Commonly Used Test Temperatures (in °C), Corresponding Absolute Temperatures, and Their Reciprocals and Reciprocal Squares" has been deleted (see Table A.1).

Table A.1 of ISO 2578:1993

---Appendix D (informative) has been added to examine the test;

---References have been added.

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 the principles and methods for evaluating the heat resistance of plastics after prolonged heat exposure.

This document applies to the evaluation of the heat resistance of plastics subjected to hot air aging tests at a series of temperatures. The test procedure does not include applying heat to the samples.

Add any other effects.

This document does not apply to the testing of plastics in non-air environments and/or under applied stress.

Note 1: The plastic thermal aging studies in this document are based solely on changes in plastic properties after a certain period of thermal aging. Performance evaluation is typically conducted at the aging temperature recovery temperature.

Perform after returning to room temperature.

Note 2: During the thermal aging process, various properties of plastics change at different rates. To compare the thermal aging properties of various plastics, [further details are needed].

The criteria for judgment depend on the performance being studied and the permissible limits.

Note 3: This document is applied under the premise that there exists an approximate linear relationship between the logarithm of the time required to cause a change in the predetermined properties of the plastic and the reciprocal of the corresponding absolute temperature.

Sexual relations (i.e., conforming to the Arrhenius equation).

Note 4: Within the temperature range studied, if the tested plastic undergoes a phase change, especially a first-order phase change, it will affect the derivation of the heat resistance diagram.

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 11026.1 Electrical insulating materials - Heat resistance - Part 1: Aging procedures and evaluation of test results (GB/T 11026.1-2016, IEC 60216-1:2013, IDT) GB/T 11026.2 Electrical insulating materials-Heat resistance-Part 2: Selection of test criteria (GB/T 11026.2-2012) IEC 60216-2:2005 (IDT) GB/T 11026.3 Electrical insulating materials-Heat resistance-Part 3: Procedure for calculating characteristic parameters of heat resistance (GB/T 11026.3-2017, IEC 60216-3:2006, MOD) GB/T 11026.4 Heat resistance of electrical insulating materials - Part 4: Aging ovens