



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

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**Plastics - Methods of exposure to solar radiation - Part 1:
General guidance**

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Foreword

This document is drafted in accordance with GB/T 1.1-2020 "Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents".

This document is Part 1 of GB/T 3681 "Plastics - Methods of exposure to solar radiation". GB/T 3681 has issued the following parts:

- Part 1: General guidance;
- Part 2: Direct weathering and exposure behind window glass.

This document, as the general guidance of GB/T 3681, replaces the general technical content of relevant guidance test method A, method B and method C in GB/T 3681-

2011 "Plastics - Methods of exposure to direct weathering, to weathering using glass-

filtered daylight, and to intensified weathering by daylight using Fresnel mirrors".

Compared with GB/T 3681-2011, in addition to structural adjustment and editorial changes, the main technical changes are as follows:

- a) Change the content of "Terms and definitions" (see Clause 3; Clause 3 of the 2011 edition);
- b) Change the specific requirements for inert materials and backings in "Apparatus" (see 5.1; 5.1 of the 2011 edition);
- c) Change the requirements for apparatus for measurement of radiant exposure and its calibration, which shall comply with ISO 9370 (see 5.2.1; 5.5.1 of the 2011 edition);
- d) Change the passband of total-ultraviolet radiometers from "300 nm ~ 400 nm" to "290 nm ~ 400 nm" (see 5.2.1.4 and 8.3.2.3; 5.5.1.3 and 8.2.1.2 of the 2011 edition);
- e) Change the content of "Other climate-measuring instruments" (see 5.2.2; 5.5.3 of the 2011 edition);
- f) Add "Conditions of exposure of the test specimens" and "Mounting of reference materials" (see Clause 7 and 9.2);
- g) Delete "Blue wool reference sample", "Mounting of pyranometer and material standard", and "Use blue wool reference sample to test radiant exposure" (see 8.2.2, 9.2, Annex A of the 2011 edition);
- h) Change the contents of "Expression of exposure stages" and "Climate conditions" (see 10.2 and 10.3; 10.2 of the 2011 edition);
- i) Add "Classification of climates" (see Annex A);
- j) Delete "Climate divisions and climatic characteristics of China" (see Annex B of the 2011 edition).

This document is identical to ISO 877-1:2009 "Plastics - Methods of exposure to solar radiation - Part 1: General guidance".

The following minimal editorial changes have been made to this document:

- To explain the term "fillet", add Note 1 to 9.1;
- To provide the benchmark climate regions in China, add Note 2 to Table A.1 of Annex A.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. The issuing authority of this document shall not be held responsible for identifying any or all such patent rights.

This document was proposed by China Petroleum and Chemical Industry Federation. This document shall be under the jurisdiction of National Technical Committee 15 on Plastic of Standardization Administration of China (SAC/TC 15).

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This document was first issued in 1983; and first revised in 2000. The second revision in 2011 incorporated the content of GB/T 14519-1993 "Plastics - Method of exposure to indirect weathering using glass-filtered daylight". This is the third revision.

Plastics - Methods of exposure to solar radiation - Part 1:

General guidance

1 Scope

This document provides information and general guidance on the selection and use of the methods of exposure to solar radiation described in detail in GB/T 3681. These methods of exposure to solar radiation are applicable to plastics materials of all kinds as well as to products and portions of products.

This document also specifies methods for determining radiant exposure.

This document does not include direct weathering using black-box test fixtures, which simulate higher end-use temperatures in some applications.

Note: ASTM G7 and ASTM D4141 describe black-box exposure tests.

2 Normative references

The contents of the following documents, through normative references in this text, constitute indispensable provisions of this document. Among them, for dated references, only the edition corresponding to that date applies to this document. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 3681.2-2021 Plastics - Methods of exposure to solar radiation - Part 2: Direct weathering and exposure behind window glass (ISO 877-2:2009, IDT)

ISO 291 Plastics - Standard atmospheres for conditioning and testing

Note: GB/T 2918-2018 Plastics - Standard atmospheres for conditioning and testing (ISO 291:2008, MOD)

ISO 472 Plastics - Vocabulary

Note: GB/T 2035-2008 Terms and definitions for plastics (ISO 472:1999, IDT)

ISO 877-3 Plastics - Methods of exposure to solar radiation - Part 3: Intensified weathering using concentrated solar radiation

ISO 2818 Plastics - Preparation of test specimens by machining

Note: GB/T 39812-2021 Plastics - Preparation of test specimens by machining (ISO 2818:2018,

IDT)

ISO 4582 Plastics - Determination of changes in colour and variations in properties after exposure to glass-filtered solar radiation, natural weathering or laboratory radiation sources

Note: GB/T 15596-2021 Plastics - Determination of changes in colour and variations in properties after exposure to glass-filtered solar radiation, natural weathering or laboratory radiation sources (ISO 4582:2017, IDT)