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

GB/T 45183-2025

**Plastics - Instrumental determination of radiant exposure in
weathering tests - General guidance and basic test method**

塑料 气候老化试验中辐照量的仪器测定 总则和基本测试方法

(English Translation)

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting is required.

This document is modified to adopt ISO 9370:2017 "General principles and basic tests for instrumental determination of radiation exposure in plastic weathering tests" method".

The technical differences between this document and ISO 9370:2017 and their reasons are as follows.

- ISO 9059 (see 6.2.4 and 7.2.1) has been replaced by the normative reference GB/T 14890 to adapt to my country's technical conditions, Improve operability;
 - ISO 9060 has been replaced by the normative references GB/T 19565 and GB/T 37468 (see 5.2.1, 5.2.1.1, 5.2.2, 5.2.2.1 and 6.1.1 Note 3) to adapt to my country's technical conditions and improve operability;
 - Replaced ASTM G90 (see 5.2.2.1 and 7.2.1) with the normative reference GB/T 20236 to adapt to my country's technical requirements parts, improve operability;
 - ASTM G183 is replaced by the normative references GB/T 31156, GB/T 33698 and GB/T 33866 (see 7.1.2), to adapt to my country's technical conditions and improve operability;
 - Added normative references to GB/T 33868 (see 6.3.1, 6.4.1 and 7.2.1), JJF 1975 (see 6.3.1), JJG 456 (see 6.1.1 and 6.2.4), JJG 458 (see 6.1.1 and 6.2.4) and JJG 879 (see 6.3.1, 6.3.2 and 7.2.1) to adapt to my country's Technical conditions and improved operability;
 - Deleted the normative references ASTM E816, ASTM E824, ASTM G130 and ASTM G138;
 - Changed the range of half-maximum full width (see 3.22, 3.34 and 5.3.2) to be consistent with Table 2;
 - The technical requirements for the temperature response of the first-level pyranometer have been changed from " ± 2 " to " ± 4 " (see Table 1) to adapt to the technical requirements of my country.
- Technical conditions;
- Changed the technical requirements for temperature response and tilt response of the secondary pyranometer. The temperature response was adjusted from " ± 4 " to " ± 8 ", and the tilt the response was adjusted from " ± 3 " to " ± 5 " (see Table 1) to adapt to my country's technical conditions;
 - The technical requirements for the "spectral sensitivity" of radiometers (see Table 1 of

ISO 9370:2017) have been deleted and the technical requirements of "sensitivity" have been added (see Table 1) to adapt to my country's technical conditions and improve operability;

--Added calibration traceability agency "National Metrology Institute" (see 5.2.1.2, 5.2.2.2 and 6.2.3) to improve operability;

-- Added the calibration traceability agency "national metrology institution" in 5.2.1.2, 5.2.2.2 and 6.2.3 to improve operability;

-- Changed the transmittance of the narrowband filter in the blocking area for measuring narrowband UVB from "0.001%" to "0.01%" (see 5.3.1) to adapt to my country's technical conditions;

--Added the organization "China Meteorological Administration" in 6.1.1 to improve operability.

The following editorial changes were made to this document.

--In order to better understand individual terms and definitions, reference diagrams are added (see Note 3.24);

-- Added terminology notes (see 3.14);

-- Changed the wavelength range of broadband pyrheliometer and added explanation (see 4.2.2 Note);

-- Added a note to recommend the test method for the annual stability of the global pyranometer (see footnote a of Table 1);

-- Changed the content of the notes (see footnotes b and c of Table 1, footnotes a and b of Table 1 of ISO 9370:2017);

--Added notes on spectral mismatch information and calibration methods for selective radiometers (see Notes 5.3.5 and 6.3.1);

--Changed the location, time and corresponding irradiance data measured by different UV radiation meters, replacing foreign data with domestic data (see

Table A.1);

--Changed the location, time and corresponding radiation exposure data for measuring annual radiation exposure, and replaced foreign data with domestic data (see

Table A.2);

-- ISO/IEC 17025 is replaced by the informative reference GB/T 27025 (see Note 1 of 6.1.1);

-- ISO 11341 was replaced by the informative reference GB/T 1865-2009 (see references);

- ISO 11507 is replaced by the informative reference GB/T 23987-2009 (see references);
- Added informative references to ISO 9059, ISO 9060, ASTM E816, ASTM E824, ASTM G130 and ASTM G138 (see references).

Introduction

When the exposure period of natural weathering, accelerated natural weathering, artificially accelerated weathering, or artificially accelerated radiation exposure is determined only by time, the effects of changes in the spectral irradiance of the light source and differences in moisture and/or temperature between different exposure tests are often ignored.

The exposure cycle of natural aging determined by the total solar radiation is conducive to the results of exposure tests at different times at the same location.

In addition, monitoring the amount of UV radiation in natural weathering exposure, artificial accelerated weathering or artificial accelerated radiation exposure is the same this is very important.

There are two common methods for measuring UV radiation. One is to use a physical standard, that is, to expose a reference material at the same time.

The preferred method is to use a radiometer that responds to UV radiation.

The instrumental method and the main characteristics of the instruments used are introduced to provide guidance for users in selecting and using radiometers.

Instrumental determination of radiation dose in plastic weathering test General principles and basic test methods

1 Scope

This document describes the instrumental method for determining irradiance on a flat surface (hereinafter referred to as the "instrumental method"), including solar radiation in nature, Concentrated solar radiation and radiation produced by laboratory light sources.

For the measurement of solar radiation in natural weathering and accelerated natural weathering, the instrumental method includes continuous measurement of total solar radiation, solar the irradiance is obtained by accumulating or integrating the total solar ultraviolet radiation and solar (ultraviolet) spectral radiation and the above instantaneous measured values.

For the measurement of radiation during artificial accelerated weathering or artificial accelerated radiation exposure, instrumental methods involve continuous measurement of all or specified wavelengths.

The ultraviolet radiation, visible spectrum irradiance and/or ultraviolet spectrum irradiance