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

GB/T 2913-2026

Replacing GB/T 2913-1982

Plastics - Test for whiteness

塑料 白度试验方法

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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 replaces GB/T 2913-1982 "Test Method for Whiteness of Plastics". Compared with GB/T 2913-1982, the only changes are structural adjustments and rewriting. Aside from the logical changes, the main technical changes are as follows:

- a) Added terms and definitions for whiteness and paleness index (see Chapter 3);
- b) The requirements for the instrument spectrophotometer have been increased (see 5.1);
- c) The types of test specimens have been increased (see Chapter 6);
- d) The experimental procedures were modified (see Chapter 8, Chapter 4 of the 1982 edition);
- e) Added calculation methods for whiteness, paleness index, and blue light whiteness (see Chapter 9);
- f) The recommendations regarding the test method for the apparent whiteness of translucent plastics have been removed (see Appendix A of the 1982 edition). 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). This document was drafted by: Zhonglan Chenguang Chengdu Testing Technology Co., Ltd., Caipu Technology (Zhejiang) Co., Ltd., and Zhejiang Xinhecheng Special Materials Co., Ltd. Materials Co., Ltd., Zhonglan Chenguang Chemical Co., Ltd., Huikeqi (Shanghai) Technology Co., Ltd., Sinopec (Beijing) Chemical Research Institute Co., Ltd. Yongxuan New Materials Group Co., Ltd., and Jiangxi Chenshi Technology Group Co., Ltd. The main

drafters of this document are. Cao Jinpeng, Yuan Kun, Chen Xiaofeng, Ji Zhuang, Wan Yi, Ma Herong, Yu Gaoxuan, Chen Wenqi, and Shen Cuiyun. This document was first published in 1982, and this is its first revision. Plastic Whiteness Test Method

1 Scope

GB/T 2913-2026 is the Chinese national standard covering the whiteness of a plastic - the measurement and index by which a resin or a moulded part is judged, and by which the yellowing from heat, ageing or a poor stabiliser package is detected. It replaces GB/T 2913-1982, a standard forty-four years old - one of the longest intervals in the whole batch - and has been in force since 1 October 2026, with the whiteness specification standard GB/T 17749-2026. It was issued on 31 March 2026 and takes effect on 1 October 2026, replacing GB/T 2913-1982. The document is under the responsibility of the China Petroleum and Chemical Industry Federation. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document describes a method for determining the whiteness, paleness index, and blue light whiteness of plastics using a spectrophotometer or blue light spectrophotometer. This document applies to the determination of translucent or opaque, white or near-white, fluorescent or non-fluorescent powders, granules or flakes of plastics.

4.Principles Under the CIE-specified light source and optical geometry, the tristimulus values X , Y , and Z of the sample (2° observer field of view) are measured using the reflection method. X_{10} , Y_{10} , and Z_{10} (10° observer field of view) are used to calculate the whiteness and paleness index according to the formulas in this document. Blue light whiteness is determined by measuring the radiant flux reflected from a sample under specified blue light conditions, and then comparing it with that of an ideal diffuse reflector. The relative value is obtained by comparing the reflected radiation flux under the same conditions.

5 Equipment

5.1 Spectrophotometer Whiteness, paleness index, and blue light whiteness can be measured using a spectrophotometer, provided the instrument meets the following conditions.

a) The light source and/or photodetector shall be equipped with filters, and the output of the combined system shall conform to the CIE standards specified in ISO /CIE 11664-1. The optical geometry conforms to the requirements of the chromaticity observer and the CIE standard illuminant D65 as specified in ISO /CIE 11664-2. The structures conforming to the types specified by the International Commission on Illumination (CIE) are given in Tables 1

and 2, which provide the requirements for integrating spheres and non-integrating spheres. The optical geometry, requirements, and different testing methods are proposed.

5.2 Blue Light Whiteness Meter Blue light whiteness is measured using a blue light whiteness meter, and the instrument should meet the following conditions.

a) The peak value of the blue light spectral characteristic curve is at $457\text{nm} \pm 2\text{nm}$, and the full width at half maximum (FWHM) is between 40nm and 60nm. The optical geometry should conform to... The structure conforms to the type specified by the International Commission on Illumination (CIE) (see Tables 1 and 2 for reflection measurements). The light-receiving area of the sample is the diameter. A circle 20 mm or larger. The light source contains ultraviolet light and is suitable for measuring fluorescent samples.

b) The instrument reading accuracy is 0.2%, and the stability is 0.5%.

5.3 Whiteness board Reference whiteness plate. pressed from a calibrated diffuse reflector. Barium sulfate is recommended as the diffuse reflector for transferring the standard. Used for calibrating and verifying whiteness. Degree board. Whiteness calibration board. Used to calibrate the working whiteness board. Working whiteness plate. used for instrument calibration. Cleaning of working whiteboards. Contaminated working whiteboards should be washed with a detergent free of fluorescent agents and a soft-bristled brush, and then rinsed with distilled water. After washing, rinse with pure acetone, then absorb the solvent with filter paper, and place in a desiccator to air dry until calibration.

6 Samples

6.1 Granular or powdered samples. The particles should be uniform in size and color, and free of foreign matter and impurities. Pour the sample evenly into a transparent glass or quartz container. In glass or other containers, the thickness of the sample along the optical path should be $\geq 45\text{mm}$ to prevent light from passing through the sample (maintaining whiteness). Recommended container size. The container should have an inner diameter of 60 mm (or a side length of 60 mm) and a height of 50 mm, and should completely cover the test window. The number of samples should be no less than 3 cups.

6.2 Sheet specimens. Specimens with an area greater than or equal to 50 mm x 50 mm are cut directly from the sheet material. Unless otherwise specified, the specimen thickness... The sample should be at least 2mm thick and have a uniform color. Both surfaces should be flat and parallel, free from bumps, streaks, stains, scratches, and internal defects such as air bubbles. The number of samples should be sufficient to ensure that the whiteness value does not change as the number of sample layers increases.

7 Conditioning and Test Environment

Before the test, the samples were conditioned according to GB/T 2918 at $(23 \pm 2)^{\circ}\text{C}$ and $(50 \pm 5)\%\text{RH}$. The test instrument was set up and used in an environment of $(23 \pm 2)^{\circ}\text{C}$ and

(50±5)%RH.

8 Test Procedure

8.1 Instrument Preparation The instrument should be warmed up before measurement. Calibrate the instrument according to the calibration procedures specified in GB/T 22880 or GB/T 7974.

8.2 Test methods for particulate or powder specimens Prepare the specimen according to the requirements of 6.1. Cover the surface of the specimen with a smooth glass plate, press the specimen firmly, rotate it slightly, and then slowly... Remove the glass plate. Using a smooth metal ruler, move it along the edge of the sample cell from one side to the other, removing any excess material beyond the edge of the sample cell. The sample is scraped off to make the sample surface smooth. Place the sample on the instrument's sample stage and measure the tristimulus value or blue light whiteness. Calculate the whiteness and paleness index using the tristimulus values. The intensity and palatability index should meet the requirements of the applicable range in 9.3. Place the sample on the instrument's sample stage and rotate it horizontally by 90° before measuring the tristimulus. Value or blue light whiteness. Take two more sample cups and test them according to the steps above.

8.3 Test methods for sheet specimens Overlap the samples to an appropriate thickness, using the thickness at which the measured whiteness remains unchanged as the test sample thickness. If a single sample is overlapped with... Since the whiteness of the samples is the same, only a single sample needs to be tested. Single sample. Place the sample on the instrument's sample stage and measure the tristimulus value or blue light whiteness using the reflectance method. Calculate the whiteness using the tristimulus value. Whiteness and hue index. Whiteness and hue index shall meet the requirements of the applicable scope of 9.3. Remove the sample and invert it before placing it back into the sample stage. Measure the tristimulus values or blue light whiteness. Take two more samples and test them according to the above steps. Overlapping specimens. Fix the specimens on the instrument's sample stage, and move the topmost specimen to the bottom in sequence. Use the reflection method to determine at least... The tristimulus values or blue light whiteness of three samples are used to calculate the whiteness and paleness index. The whiteness and paleness index should meet a value of 9.3. Application scope requirements. Remove the sample, flip it over, and then test it again following the steps above. If the sample does not reach the thickness required for constant whiteness during testing, a photomask (or other backing) should be used to cover the sample, following the steps for single-piece samples. The test was conducted immediately, and the report should specify the type of backing and tristimulus values, sample thickness, and any abnormalities.