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

GB/T 8810-2005

**Determination of water absorption of rigid cellular plastics
(English Translation)**

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Foreword

This standard modifies and adopts ISO 2896.2001 "Rigid cellular plastics - Determination of water absorption".

The main differences between this standard and ISO 2896.2001 are as follows.

- DELETE the phrase "unless otherwise stated" in the test environment;
- ADD the accuracy of volume measurement "V0 accurate to 0.1 cm³";
- USE the sentence "Remove the specimen from the water and remeasure the dimensions immediately; wipe off surface moisture with filter paper before measurement" to replace that "Remove the specimen from the water and remeasure the dimensions within 4 hours of removal".

The relevant technical differences are incorporated into the text and marked with a vertical single line in the margin of the clauses to which they pertain. A summary of these technical differences and their reasons is provided in Appendix C for reference.

This standard replaces GB/T 8810-1988 "Test method for water absorption of rigid

cellular plastics".

The main changes, as compared to GB/T 8810-1988, are as follows.

- CHANGE the standard name;
- ADD a foreword;
- INCLUDE the Appendix B in the main text of the standard;
- DELETE the test condition "water temperature $(23 \pm 2) ^\circ\text{C}$ ";
- CHANGE the phrase "Accurate to 0.01 g" for the balance and weighing to "Accurate to 0.1 g";
- ADD that "V0 accurate to 0.1 cm³";
- ADD the instructions for volume measurement after immersion;
- ADD the precision;
- ADD the clauses regarding uncertain accuracy;
- ADD the derivation of the formula for calculating the average bubble diameter D;
- CHANGE the phrase "Specimen volume not greater than 500 cm³" in the cross-section bubble volume correction to "Specimen volume not less than 500 cm³";

Determination of water absorption of rigid cellular plastics

1 Scope

This standard specifies the method for determining the water absorption rate of rigid cellular plastics. by measuring the buoyancy of the sample after immersion in water for

50 mm for 96 h.

It specifies the corrections for sample volume change and volume correction for the pores on the cut surface of the sample.

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For the dated references, the subsequent amendments (excluding corrections) or revisions do not apply to this Standard; however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions

of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 2918-1998 Plastics. Standard atmospheres for conditioning and testing (idt ISO 291.1997)

GB/T 6342-1996 Cellular plastics and rubbers - Determination of linear dimensions (idt ISO 1923.1981)

3 Principle

The water absorption rate of a material is determined, by measuring the buoyancy of a specimen immersed in distilled water for a certain period of time.

4 Immersion solution

Distilled water that has been left to stand for at least 48 hours after distillation.

5.2 Mesh cage, made of stainless steel, large enough to hold the specimen, with a weight

at the bottom to counteract the specimen's buoyancy, and a hanger at the top for attaching to a balance (see Figure 1).

5.5 Slicer, capable of cutting sample slices to a thickness of 0.1 mm ~ 0.4 mm (see

Figure 2).

5.6 Slide carrier, two slides glued together with adhesive tape to form a leaf shape, with

a transparent plastic sheet printed with standard graduations (30 mm in length) for calculating coordinates placed in the middle (see Figure 3).

5.7 Projector. A general-purpose 35 mm slide projector suitable for 50 mm x 50 mm

standard slides, or a projection microscope with a standard scale.

6.1 Specimen quantity

Not less than 3 pcs.

6.2 Dimensions

The length is 150 mm, width is 150 mm, volume is not less than 500 cm³. For products with natural or composite skins, the specimen thickness is the product thickness; for products with a thickness greater than 75 mm and without a skin, the specimen shall be processed to a thickness of 75 mm; the parallelism tolerance between the two planes shall not exceed 1%.

6.3 Specimen preparation and conditioning

Figure 3 -- Slide mounting device

Specimens are prepared by mechanical cutting. The specimen surface shall be smooth, flat, free of powder. Place the specimen in a desiccator at room temperature; weigh it every 12 hours, until the difference between two consecutive weighing is no greater than 1% of the average value.

7.1 Adjust the test environment to (23 ± 2) °C and (50 ± 5) % relative humidity

according to GB/T 2918.

7.3 Measure the linear dimension of the specimen according to GB/T 6342 to calculate

V_0 , accurate to 0.1 cm³.

7.5 Immerse the mesh cage in water; remove air bubbles from its surface; hang it on a

balance; weigh its apparent mass (m_2), accurate to 0.1 g.

7.6 Place the specimen into the mesh cage; re-immerses it in water, ensuring the top

surface of the specimen is approximately 50 mm below the water surface; remove air bubbles from the mesh cage and sample surface using a soft brush or agitation.