

ICS 83.100  
CCS G 32



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

**GB/T 8812.1-2007**

---

**Rigid cellular plastics -- Determination of flexural properties --  
Part 1: Basic bending test  
(English Translation)**

**Issued on: December 5, 2007**

**Implemented on: September 1, 2008**

---

**Issued by: General Administration of Quality Supervision, Inspection and  
Quarantine of the People's Republic of China**

## Table of Contents

|                            |   |
|----------------------------|---|
| Foreword...                | 3 |
| 1 Scope...                 | 4 |
| 2 Normative References...  | 4 |
| 3 Principle...             | 4 |
| 4 Instruments...           | 5 |
| 5 Specimens...             | 6 |
| 6 Operating Procedures...  | 6 |
| 7 Expression of Results... | 7 |
| 8 Precision...             | 7 |
| 9 Test Report...           | 7 |

### 1 Scope

This Part of GB/T 8812 specifies a test method for determining the load or breaking load of rigid cellular plastic specimens at a specified deformation under the action of three-point bending load.

This Part is applicable to materials with a thickness of not less than 20 mm.

This Part is not applicable to easily crushable cellular plastics.

This method uses small-sized specimens and does not generate pure bending deformation.

Therefore, it cannot be used to calculate flexural strength or apparent flexural modulus of elasticity.

The determined values can only be compared when the physical properties and dimensions of the materials are similar.

### 2 Normative References

The clauses in the following documents become clauses of this Part through the reference by this Part of GB/T 8812. For the references with a specified date, all subsequent amendments (excluding errata) or revisions are not applicable to this Part. However, parties to agreements based on this Part are encouraged to study whether the latest versions of these documents can be used. For undated references, the latest versions are applicable to this Part.

GB/T 2918 Plastics - Standard Atmospheres for Conditioning and Testing (GB/T

2918-1998, idt ISO 291.1997)

GB/T 6342 Cellular Plastics and Rubbers - Determination of Linear Dimensions (GB/T 6342-

1996, idt ISO 1923.1981)

### 3 Principle

The load head applies load to the specimen supported on two supports at a certain speed. The load shall be applied perpendicular to the specimen at the center of the two supporting points (see Figure 1). Record the load value or the breaking load value when the specimen reaches the specified deformation.

#### 4.1 Testing Machine

The material testing machine or bending testing machine shall have a load head capable of constant speed operation. Within the testing machine's measuring range, the load accuracy shall be  $\pm 1\%$  and the displacement accuracy shall be 0.1 mm.

#### 4.2 Supports

Composed of two parallel cylinders mounted on the same horizontal plate, with an arc radius of  $(5 \pm 0.2)$  mm and a length greater than the specimen width. The span between the two supports shall be  $(100 \pm 1)$  mm.

#### 4.3 Load Head

The shape and dimensions shall be identical to the supports. The load head shall be at the center of the supports and parallel to the supports.

#### 4.4 Measuring Tools

Accuracy. 0.01 mm.

#### 5.1 Shape and Dimensions

The specimens shall be cuboid. Length.  $(120 \pm 1.20)$  mm, width.  $(25 \pm 0.25)$  mm, thickness.  $(20 \pm 0.20)$  mm.

#### 5.2 Preparation

During specimen preparation, the cellular structure of the specimens shall not be deformed. The specimens may be skinned on one or more sides. If so, this condition shall be recorded.

### 5.3 Quantity

Each group shall consist of at least five specimens. When the test material is suspected to be anisotropic, two groups of specimens shall be prepared, with their axes respectively parallel and perpendicular to the direction of cell elongation.

When one side of the specimens is skinned, unless otherwise specified, two groups of specimens shall be tested. one with the skin in tension and the other in compression. The test results shall be separately reported.

### 5.4 Conditioning

The specimens shall be conditioned in an environment specified in GB/T 2918. The standard test conditions are a temperature of  $(23 \pm 2) ^\circ\text{C}$  and a relative humidity of  $50\% \pm 5\%$ , or  $(27 \pm$

$2) ^\circ\text{C}$  and a relative humidity of  $65\% \pm 10\%$ . Depending on the intended use, other test conditions may be selected, but the test temperature is preferably selected from  $-196 ^\circ\text{C}$ ,  $-70 ^\circ\text{C}$ ,

$-10 ^\circ\text{C}$ ,  $0 ^\circ\text{C}$  and  $40 ^\circ\text{C}$ .

## 6 Operating Procedures

In accordance with the provisions of GB/T 6342, measure the specimen dimensions. Place the specimen symmetrically on the supports and apply a load that is perpendicular to the specimen's longitudinal axis (see Figure 1).

Carefully adjust the position of the load head. When it just contacts the specimen, record this position as the zero point of specimen deformation. During operation, the load head applies the load to the specimen at a rate of  $(10 \pm 2) \text{ mm/min}$ . Record the load when the specimen deformation reaches  $(20 \pm 0.2) \text{ mm}$ . If the specimen breaks before reaching a deformation of

$20 \text{ mm}$ , record the load and deformation at the point of breaking.

.....