

ICS 83.100



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

GB/T 9641-2025

**Rigid cellular plastics - Determination of tensile properties
(English Translation)**

Issued on: October 31, 2025

Implemented on: May 1, 2026

Issued by: State Administration for Market Regulation

Table of Contents

Foreword...	3
1 Scope...	5
2 Normative References...	5
3 Terms and Definitions...	5
4 Principle...	5
5 Equipment...	6
6 Specimen...	6
7 Test Procedure (Routine Method)...	7
8 Calculation and Representation of Results...	8
9 Method Using Metal Plates...	9
10 Precision...	11
11 Test Report...	11

1 Scope

This Document describes a test method for determining the tensile properties of rigid cellular plastics.

This Document is primarily applicable to cellular plastics that can withstand specimen clamping.

If the specimen cannot withstand clamping, the method of reinforcing both ends of the specimen with metal plates as specified in Clause 9 shall be followed for testing.

The cell size and specimen size must meet the requirements for test feasibility.

2 Normative References

The provisions in following documents become the essential provisions of this Document through reference in this Document. For the dated documents, only the versions with the dates indicated are applicable to this Document; for the undated documents, only the latest version (including all the amendments) is applicable to this Document.

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 5725-2 Accuracy (trueness and precision) of measurement methods and results - Part 2. Basic method for the determination of repeatability and reproducibility of a standard measurement method

NOTE: GB/T 6379.2-2004 Accuracy (trueness and precision) of measurement methods and results - Part 2. Basic method for the determination of repeatability and reproducibility of a standard measurement method (ISO 5725-2:1994, IDT)

3 Terms and Definitions

For the purposes of this Document, there are no terms and definitions apply.

4 Principle

Using a suitable testing machine, a tensile force is applied to a specimen of a certain shape to obtain the corresponding stress-strain curve.

5 Equipment

The testing machine shall meet the following conditions.

a) The testing machine shall have appropriate clamps for holding the specimen. The clamps shall meet the following conditions.

1) The clamps shall be able to hold the specimen securely to prevent slippage;

2) The clamping force applied to the specimen by the clamps shall not cause tearing, deformation, or breakage at any part of the specimen end. If the clamps do not meet the requirements, the metal plate clamps described in Clause 9 may be used.

b) The moving clamp end shall be able to move away from the fixed clamp end at a uniform speed of (5 ± 1) mm/min along a direction parallel to the longitudinal axis of the specimen, maintaining proper specimen clamping during this period.

c) The machine shall be able to measure and record the force applied to the specimen, with a maximum permissible error of 1%.

d) If an extensometer is used, the extensometer shall apply a minimum force to the specimen surface and be able to read the increment of the specimen gauge length with an accuracy of 0.1 mm. The parallelism deviation between the two parallel planes that define the extensometer gauge length shall not exceed 1%.

6.1 Dimensions

The specimen shall have the shape and dimensions shown in Figure 1.

Figure 1 -- Specimen shape and dimensions

6.2 Preparation and conditioning of specimen

When preparing specimens, remove the molded outer layer. If necessary, cut the specimens to the specified dimensions using sawing or machining methods, without altering the material structure.

If required, indicate the orientation of anisotropic materials.

Specimens shall be conditioned according to ISO 291. For accurate measurements, specimens shall be conditioned for at least 6 h under any of the following conditions.

- $(23 \pm 2)^\circ\text{C}$, relative humidity $(50 \pm 10)\%$;
- $(23 \pm 5)^\circ\text{C}$, relative humidity $(50 + 20 - 10)\%$;
- $(27 \pm 5)^\circ\text{C}$, relative humidity $(65 + 20 - 10)\%$.

6.3 Quantity of specimens

At least 5 specimens shall be taken for testing; specimens that break outside the gauge length shall be discarded, and the quantity of specimens shall be increased to ensure at least 5 results.

If more than 7 specimens yield 5 valid data, the test method in Clause 9 shall be used.

7 Test Procedure (Routine Method)

The test shall be conducted in an indoor environment that meets the environmental conditions specified in 6.2.

Place the specimen in the clamping chamber. If necessary, proceed with the test as described in

Clause 9. Mark the initial gauge length on the specimen.

Move the clamps to apply the load evenly to the specimen at a speed of (5 ± 1) mm/min.

If an extensometer is not used, record the force and corresponding elongation at appropriate time intervals.

.....