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

GB/T 1843-2008

**Plastics - Determination of izod impact strength
(English Translation)**

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1 Scope

1.1

This standard specifies the method for determining the plastic Izod impact strength under standard conditions, as well as various types of specimens and test types.

Different test parameters are specified according to the material, specimen, notch.

1.2

This method is used to study the impact behavior of the specified type of specimen under standard conditions. It is used to evaluate the brittleness and toughness of the specimen under test conditions.

1.3

This standard applies to the following materials:

- Rigid thermoplastic molding and extrusion materials, including filled and reinforced composite materials, as well as unfilled types; rigid thermoplastic sheets;
- Rigid thermosetting molding materials, including filled and reinforced composite materials; rigid thermosetting sheets, including laminates;
- Fiber-reinforced thermosetting and thermoplastic composites, including sheets containing unidirectional or non-unidirectional reinforcement materials such as felt, fabric, textile roving, chopped strands, composite reinforcements, rovings, milled fibers and sheet made from prepregs;

- Thermotropic liquid crystal polymers.

1.4

This standard is not generally applicable to rigid foam materials and sandwich structures containing foam materials. Notched specimens are not generally applicable to long fiber reinforced composites or thermotropic liquid crystal polymers.

1.5

This standard applies to specimens molded to the selected size, specimens machined from the middle of standard multi-purpose specimens (see GB/T 11997), or specimens machined from finished or semi-finished products such as molded parts, laminates, extruded or cast sheets.

1.6

This standard specifies the preferred dimensions of the specimens. The results of tests with different notches or specimens prepared by different methods are not comparable. Other factors, such as the energy of the device, the impact velocity, the state conditioning of the specimen, can also affect the test results. Therefore, when data comparison is required, these factors shall be carefully controlled and recorded.

1.7

This standard shall not be used as a basis for design. However, by testing at different temperatures, changing the notch radius and (or) thickness, and preparing specimens under different conditions, can obtain the information on typical properties of the material.

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 5471-2008 Plastics - Compression moulding of test specimens of thermosetting materials (ISO 295:2004, IDT)

GB/T 9352-2008 Plastic - Compression moulding of test specimens of thermoplastic materials (ISO 293:2004, IDT)

GB/T 11997-2008 Plastic - Multipurpose test specimens (ISO3167:2002, IDT)

GB/T 17037.1-1997 Injection moulding of test specimens of thermoplastic materials

- Part 1: General principles and moulding of multipurpose and bar test specimens (IDT ISO294-1: 1996)

GB/T 21189-2007 Verification of pendulum impact-testing machines used for Charpy Izod and tensile impact-testing of plastics (ISO13802: 1999, IDT)

ISO 1268 1) Fiber-reinforced plastics - Methods of producing test sheets - Part 1: General conditions

ISO 2602:1980 Statistical interpretation of test results - Estimation of the mean - Confidence interval

ISO 2818:1994 Plastics - Preparation of test specimens by machining

ISO 10724-1:1998 Plastics - Injection moulding of test specimens of thermosetting powder moulding compounds (PMCs) - Part 1: General principles and moulding of multipurpose test specimens

1 It is being revised into 11 parts.

4 Principle

A pendulum of known energy strikes a specimen supported as a vertical Izod once, to measure the energy absorbed when the specimen fails. The impact line is a fixed distance from the specimen fixture; for notched specimens, the distance from the impact line to the notch centerline is the fixed distance (see Figure 2).

5.1.1 For the principle, characteristics, identification of the testing machine, please refer

to GB/T 21189-2007.

5.1.2 Some plastics are very sensitive to clamping force. When testing such materials, a standardized clamping force method shall be used and the clamping force shall be noted in the test report. The clamping force can be controlled by a calibrated torque wrench or a pneumatic or hydraulic device on the screw tightened by the vise.

5.2 Micrometer and gauge

Measure the main dimensions of the specimen, using a micrometer or gauge which has an accuracy of 0.02 mm. In order to measure the dimension of the notched specimen b_N , a measuring probe which has a width of 2 mm ~ 3 mm and a shape suitable for the shape of the notch shall be installed on the micrometer.

6.1.1 Molded and extruded materials

The materials shall be prepared in accordance with the relevant material standards. If there is no such standard or otherwise specified, the specimens shall be directly compression molded or injection molded in accordance with the corresponding standards of GB/T 9352-2008, GB/T 17037.1-1997, GB/T 5471-2008 or ISO 10724-

1:1998, or machined from compression molded or injected sheets. The specimens may also be cut from type A multi-purpose specimens conforming to GB/T 11997-2008.

6.1.2 Sheets

The specimens shall be machined from sheets in accordance with ISO 2818:1994, using type A notches whenever possible. During testing, the machined surface of the unnotched specimen shall not be in tension.

material is to be obtained, specimens with notches of Type A and Type B shall be tested.

6.3.3 Sheets, including long fiber reinforced materials

The recommended thickness h is 4 mm. If the specimen is cut from a sheet or component, its thickness shall be the same as the original thickness of the sheet or component, which shall not exceed 10.2 mm.

When the thickness of the sheet is uniform and contains only one regularly distributed reinforcement material, when its thickness is greater than 10.2 mm, it shall be machined from one side of the sheet to $10.2 \text{ mm} \pm 0.2 \text{ mm}$. When testing unnotched specimens, in order to avoid surface effects, the original surface of the specimen shall be in tension during the test.

During the test, the side of the impact specimen is impacted; the impact direction is parallel to the plane of the sheet. Only when $h = b = 10 \text{ mm}$ can the test be carried out parallel or perpendicular to the sheet surface (see Figure 1).

6.4 Number of specimens

6.4.1

Unless otherwise specified in the standard of the test material, a group of specimens shall be 10. When the coefficient of variation (see ISO 2602:1980) is less than 5%, 5 specimens can be tested.

6.4.2

If the laminated material is tested in the vertical and parallel directions, 10 specimens shall be tested in each direction.