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**Test methods for properties of resin casting body
(English Translation)**

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1 Scope

This Standard specifies the test standard environment, specimen, test method, test result and test report for properties of resin casting body.

This Standard is applicable to testing the tensile, compression, bending, simply- supported beam impact toughness, torsion, alkali resistance and refractive index of thermosetting resin castings for fiber reinforced plastics, castings of special casting resins.

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For dated references, the subsequent amendments (excluding corrigendum) 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.

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

3 Standard environment for testing

Ambient temperature. $(23\pm 2)^{\circ}\text{C}$, relative humidity $(50\pm 5)\%$.

4.1.1.1 Flat casting mold

4.1.1.1.1

Materials a) The template is a flat and smooth glass plate or steel plate. Its size is determined according to the required specimen area plus the area of the mold frame;

4.1.4.1 Use a scribing tool on the casting plate. Mark the processing line

according to the specimen size. Sampling must avoid bubbles, cracks, pits, stress concentration areas.

4.1.4.2 Machine the specimen. During processing, the surface of the specimen

shall be prevented from damage and defects such as scratches.

4.1.4.3 The rough surface needs to be finely ground with a fine file or sandpaper.

The size of the notch is detected with a special template.

4.1.4.4 Water can be used to cool during processing. Dry in time after processing.

4.1.5 Internal stress examination

Before the casting body is tested, use polarized light to test the internal stress.

If there is internal stress, remove it.

4.1.6.1 Oil bathing method

Place the specimen steadily in a container filled with oil. Immerse the entire specimen in the oil. Place the container immersed in the specimen in the oven.

The temperature in the box is raised from room temperature to the glass transition temperature of resin within 1 h. Turn off the power after 3 h of constant temperature. After the oven is naturally cooled to room temperature, take the specimen out from the oil bath. Carry out the internal stress observation.

NOTE: The oil used in the oil bath shall not have chemical effects on the specimen, and shall not swell, dissolve, or absorb.

4.1.6.2 Air bathing method

Place the specimen in a drying oven with an air blower. The treatment temperature and time are the same as in the oil bath.

4.2 Specimen visual inspection and quantity

4.2.1

Before the test, the specimen must be strictly inspected. The specimen shall be flat, smooth, free of bubbles, cracks, obvious impurities and processing damage and other defects.

4.2.2

Each group shall have at least 5 valid specimens.

4.3 Specimen state adjustment

4.3.1

Before the test, the specimen shall be placed under the test standard environmental conditions for at least 24 h. The specimen after state adjustment shall be tested under the same test standard environmental conditions as the state adjustment (if otherwise specified, according to relevant regulations).

4.3.2

If the laboratory standard environmental conditions are not available, the specimens can be placed in a desiccator before the test for at least 24 h.

4.4 Specimen measurement accuracy

4.4.1

The measurement of the working area of the specimen is accurate to 0.01mm.

4.4.2

The measurement accuracy of other values of the specimen shall be in accordance with the provisions of the corresponding test method.

4.5 Test equipment

4.5.1

The load error of the test equipment does not exceed $\pm 1\%$. The selection of the test equipment range shall make the failure load of the specimen within the range of 10% to 90% of the full scale (as far as possible to fall on one side of the full scale) and not less than 4% of the full scale of the test equipment (electronic tensile test equipment is according to relevant regulations).

4.5.2

The error of the measuring deformation instrument shall not exceed $\pm 1\%$.

4.5.3

The test equipment can obtain the constant test speed specified in the test method standard. The speed error does not exceed 1%.

4.5.4

The test equipment shall be regularly verified by the national metrology department and used within the valid verification period.

5.1.1 Test principle

Apply a static tensile load at a constant speed along the axial direction of the specimen until the specimen breaks or reaches a predetermined elongation.

Throughout the process, measure the load applied to the specimen and the elongation of the specimen, so as to determine tensile stress (tensile yield stress, tensile stress at break or tensile strength), tensile modulus of elasticity, elongation at break rate and plot the stress-strain curve.

5.1.2 Specimen

5.2.4.1 Specimen preparation is according to the provisions of 4.1.

5.2.4.2 The visual inspection of the specimen shall be carried out in accordance with the provisions of 4.2.

5.2.4.3 The state of the specimen is adjusted according to the provisions of 4.3.

5.2.4.4 Number the specimens. Measure the width and thickness of the

specimen at any 3 places (the diameter of the type II sample is measured at any 3 places). Take the arithmetic mean. The measurement accuracy shall be as specified in 4.4.

5.2.4.5 Place the specimen. Align the center line of the specimen with the center line of the upper and lower platens. Make sure the end face of the specimen is parallel to the surface of the platen. Adjust the testing machine. Make the surface of the platen just contact the end face of the specimen. Apply the initial load (about 5% of the failure load) to the specimen to avoid the initial region of the stress-strain curve. Check and adjust specimen and deformation measurement system. Keep the whole system in normal working condition.