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JAPANESE INDUSTRIAL STANDARD

Testing Methods of Plastics by Thermogravimetry

JIS K 7120—1987

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by

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In the event of any doubt arising,
the original Standard in Japanese is to be final authority.

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Testing Methods of Plastics by Thermogravimetry K 7120-1987

1. Scope

This Japanese Industrial Standard specifies the general method for thermogravimetry of plastics.

2. Definitions

The definitions of the main terms used in this Standard shall be as follows except as specified in JIS K 6900.

- (1) thermogravimetry (TG) A method of measuring the mass of a substance as a function of temperature or time by varying the temperature of the substance according to a controlled program, usually performed by measuring the change in mass of the test piece as a function of temperature.
- (2) TG curve A curve drawn in thermogravimetry by taking the mass on the axis of ordinate and the temperature or time on the axis of abscissa.
- (3) thermobalance A device which continuously measures the mass of the sample when it is being heated or cooled.
- (4) start temperature The temperature at which the change in mass of the test piece or the apparent change in mass of the standard substance starts.
- (5) mid-point temperature The temperature at which the change in mass of the test piece or the apparent change in mass of the standard substance reaches 50 %.
- (6) end temperature The temperature at which the change in mass of the test piece or the apparent change in mass of the standard substance takes place no more.
- (7) Curie temperature The critical temperature at which the magnetic property shifts from the ferromagnetic to paramagnetic stage.

Applicable Standards:

JIS K 6900-Glossary of Terms Used in Plastic Industry

JIS K 7100-Standard Atmospheres for Conditioning and Testing of Plastics

JIS Z 8401-Rules for Rounding off of Numerical Values

Corresponding International Standard:

ISO 7111-1987-Plastics-Thermogravimetry of polymers-Temperature scanning method

3. Conditioning of Test Piece

Test pieces shall as a rule, be conditioned before the test for 24 h or longer under the standard temperature condition Grade 2 and standard humidity condition Grade 2 (a temperature of $23 \pm 2^\circ\text{C}$ and a relative humidity of $50 \pm 5\%$) specified in JIS K 7100. However, conditioning may be performed by the method specified by agreement between the parties concerned.

4. Apparatus and Appliance

The apparatus and appliance shall be as follows:

- (1) Thermobalance Where the quantity of the test piece is within 50 mg, the thermobalance shall be able to measure the mass with an accuracy of 0.5 %, and have a construction in which a gas flows around the test piece so as to allow heating at a constant speed.
- (2) Recording Device The recording device shall be able to automatically record the mass and temperature.
- (3) Gas Flowmeter The gas flowmeter shall be able to measure the flow rate over the range of 50 to 100 ml/min.

5. Test Piece

The test piece shall be in the form of a powder or finely cut pieces weighing about 10 mg.

Remark: Where the quantities of volatile matter, additives, and fillers are measured, the mass of the test piece shall be increased to 50 mg according to their contents to improve the measuring accuracy.

6. Calibration of Thermobalance

The following calibrations shall be carried out before undertaking the test.

- (1) Mass Calibration Calibration shall be carried out by using the weights for chemical balance with respect to the measuring range of mass.

Remark: In the thermobalance, a change in buoyancy and convection occur, and even if there is no change in mass, an apparent change in mass is observed and the accuracy of mass measurement lowers. It is recommended in order to check the change in mass, to preliminarily observe the apparent change in mass without placing the test piece and at the same heating speed and gas flow rate as in the actual test. Thus, the accuracy of value of mass measurement does not fall from the accuracy value derived from such apparent change in mass.