
International Standard



9113

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Plastics — Polypropylene (PP) and propylene-copolymer thermoplastics — Determination of isotactic index

Plastiques — Thermoplastiques à base de polypropylène (PP) et de copolymères de propylène — Détermination de l'indice d'isotacticité

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 9113 was prepared by Technical Committee ISO/TC 61, *Plastics*.

It cancels and replaces the annex to International Standard ISO 1873/1-1980, of which it constitutes a minor revision.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Plastics — Polypropylene and propylene-copolymer thermoplastics — Determination of isotactic index

1 Scope and field of application

1.1 This International Standard specifies a method for determining the percentage of matter which can be extracted from crystalline propylene plastics by boiling *n*-heptane under standard conditions of testing.

1.2 This method provides for the identification and coding of types H, B and R propylene plastics referred to in ISO 1873/1.

1.3 This method is not applicable to the testing of type Q propylene plastics referred to in ISO 1873/1 because it is intended and is suitable only for base polymers and not for mixtures such as those covered by type Q.

1.4 This method starts with solid propylene plastics in the form of particles of specified fineness.

2 Reference

ISO 1873/1, *Plastics — Polypropylene (PP) and propylene-copolymer thermoplastics — Part 1: Designation*.

3 Apparatus

3.1 **Extractor**, of the type shown in the figure, or any other type giving the same results. This extractor shall be suitable for use at the boiling point of *n*-heptane.

3.2 **Glass fibre or paper cartridges (thimbles)**, of diameter 30 ± 3 mm and length 100 ± 10 mm.

3.3 **Drying ovens**, capable of being maintained at temperatures of 70 ± 2 °C and 140 ± 2 °C respectively, both of them provided with vacuum lines of less than 25 kPa*.

3.4 **Balance**, accurate to the nearest 0,000 1 g.

3.5 **Grinding mill** or equivalent machine.

3.6 **Sieve**, of mesh size not greater than 1 mm. A mesh size of $0,5 \pm 0,1$ mm is recommended.

4 Procedure

4.1 Preparation of sample

4.1.1 Reduce the propylene plastic solid matter to particles fine enough to pass through the sieve (3.6). For powder, flakes, fibres or films, grinding and screening are unnecessary if at least one dimension is less than 0,6 mm. Films shall be cut into small fragments or changed to a crushable form by melting to the shape of ribbons or small plaques.

4.1.2 Grind the sample as follows.

Mix at least 10 g of the sample with solid carbon dioxide or liquid nitrogen in excess, place in the grinding mill (3.5) and crush until reduced to small particles.

After screening, collect the matter which passes through the sieve (3.6) and allow to stand at room temperature until it is tested.

4.2 Determination

4.2.1 Weigh the glass fibre or paper cartridge (3.2), dried to constant mass at 140 °C and cooled to room temperature in a desiccator, to the nearest 0,000 1 g (mass m_1) (see note 1 in 4.2.4).

Then fill it with approximately 5 g of the sample and place it in the oven (3.3) controlled at 140 ± 2 °C, under 25 kPa nitrogen vacuum or less. This means that the existing residual pressure of nitrogen in the apparatus must be 25 kPa or lower (see note 2 in 4.2.4).

Usually, 2 h are sufficient for complete drying and sample annealing, but calibration of the oven efficiency is recommended to determine the minimum time required to achieve constant mass of the samples.

* 25 kPa = 250 mbar