INTERNATIONAL STANDARD

ISO 4593

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Plastics — Film and sheeting — Determination of thickness by mechanical scanning

Plastiques — Film et feuille — Détermination de l'épaisseur par examen mécanique

Reference number
ISO 4593:1993(E)

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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 4593 was prepared by Technical Committee ISO/TC 61, *Plastics*, Sub-Committee SC 11, *Products*.

This second edition cancels and replaces the first edition (ISO 4593:1979), which has been technically revised.

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Plastics — Film and sheeting — Determination of thickness by mechanical scanning

1 Scope

This International Standard specifies a method for the determination of the thickness of a sample of plastics film or sheeting by mechanical scanning.

The method is not suitable for use with embossed film or sheeting.

2 Apparatus

2.1 Thickness-measuring device, capable of measuring to the following accuracies:

— up to and including 100 µm to an accuracy of 1 µm (see note 1);

— above 100 µm and up to and including 250 µm to an accuracy of 2 µm;

— above 250 µm to an accuracy of 3 µm.

NOTE 1 Where the above is not adequate and a higher accuracy is required, this method should not be applied but a more suitable measuring device or method selected. The determination of gravimetric thickness is described in ISO 4591:1992, *Plastics — Film and sheeting — Determination of average thickness of a sample, and average thickness and yield of a roll, by gravimetric techniques (gravimetric thickness)*

The measuring surfaces of the device shall comprise a plane lower face and either a plane or radiused upper face. All surfaces shall be polished.

2.1.1 In the case of plane/plane measuring surfaces, the diameter of each face shall be between 2,5 mm and 10 mm and they shall be parallel to within 5 µm. The lower face shall be capable of being adjusted to conform to this requirement. The force applied to the measuring face shall be 0,5 N to 1,0 N.

2.1.2 In the case of plane/radiused measuring surfaces, the diameter of the plane lower surface shall not be less than 5 mm and the radius of curvature of the upper surface shall be 15 mm to 50 mm. The force applied to the radiused face shall be 0,1 N to 0,5 N.

NOTE 2 Transmission of the measured values may be performed, for example, mechanically (by micrometer), optically (by mirror instrument) or electronically (inductively).

3 Test specimens

Cut test specimens, about 100 mm wide, across the whole width of the sample. When required, take specimens at positions approximately 1 m apart in the longitudinal direction of the sample. The specimens shall contain no creases except those necessary for folding the film for presentation or packaging purposes. The specimens shall contain no other defects.

4 Procedure

4.1 Condition the specimens for at least 1 h at 23 °C ± 2 °C. For moisture-sensitive films, the conditioning time and atmosphere shall be as stated in the specification for the material under test or as specified between buyer and seller.

4.2 Ensure that the specimens and the faces of the measuring device (2.1) are free from contamination, for example dust.

4.3 Check the zero point of the measuring device before starting the measurements and recheck after each series of measurements.

4.4 When determining the thickness, lower the foot gently to avoid deforming the material.