

INTERNATIONAL STANDARD

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Plastics — Film and sheeting — Determination of the coefficients of friction

*Plastiques — Film et feuille — Détermination des coefficients
de frottement*



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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. 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 8295 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 11, *Products*.

This second edition cancels and replaces the first edition (ISO 8295:1986), which has been technically revised.

Annex A of this International Standard is for information only.

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Plastics — Film and sheeting — Determination of the coefficients of friction

1 Scope

1.1 This International Standard specifies a method for determining the coefficients of starting and sliding friction of plastic film and sheeting when sliding over itself or other substances. The method is intended to be used for non-sticky plastic film and sheeting (in the following text, referred to simply as “film”) of up to approximately 0,5 mm thickness.

1.2 This test method serves primarily for quality control. It does not give a comprehensive assessment of the machinability on packaging or processing machines since other effects, e.g. electrostatic charges, air cushion, local rise of temperature and abrasion are, as a rule, involved.

1.3 The static frictional force increases as a rule, with the time the surfaces are in contact. Therefore, to get comparable results, this time span is specified.

1.4 Slip properties are sometimes generated by additives in the plastic material. The additives have varying degrees of compatibility with the film matrix. They may bloom or exude to the surface and change the slip properties. Since these effects are time-dependent, measurements on such films have to be related to the age of the film.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most re-

cent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 291:1977, *Plastics — Standard atmospheres for conditioning and testing*.

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 friction: The resistance that two surfaces lying in contact with each other build up against sliding. A distinction is made between static friction and dynamic friction.

3.1.1 static friction: Friction which has to be overcome as a “threshold value” at the onset of sliding motion.

3.1.2 dynamic friction: Friction which persists during a sliding motion at a given speed.

3.2 frictional force: The force necessary to overcome friction. A distinction is made between the static frictional force F_S and the dynamic frictional force F_D .

3.3 normal force, F_p : The force acting perpendicular to the surfaces in contact.

3.4 coefficient of friction: The ratio of the frictional force to the normal force, acting perpendicular to the two surfaces in contact.

3.4.1 static coefficient of friction:

$$\mu_S = \frac{F_S}{F_p}$$

3.4.2 dynamic coefficient of friction:

$$\mu_D = \frac{F_D}{F_p}$$

NOTES

- 1 The coefficient of friction of films usually ranges between 0,2 and 1.
- 2 Ideally, the coefficient of friction is a characteristic independent of the test equipment and the test conditions. Since films generally do not behave ideally, all test parameters are specified in this International Standard.

4 Principle

The surfaces to be tested are placed together in plane contact and under uniform contact pressure. The force needed to displace the surfaces relative to each other is recorded.

5 Apparatus

5.1 The test device may be constructed in different ways. In general, it consists of a horizontal test table, a sled, and a driving mechanism to produce a relative motion between the sled and the test table, regardless of which is the moving part.

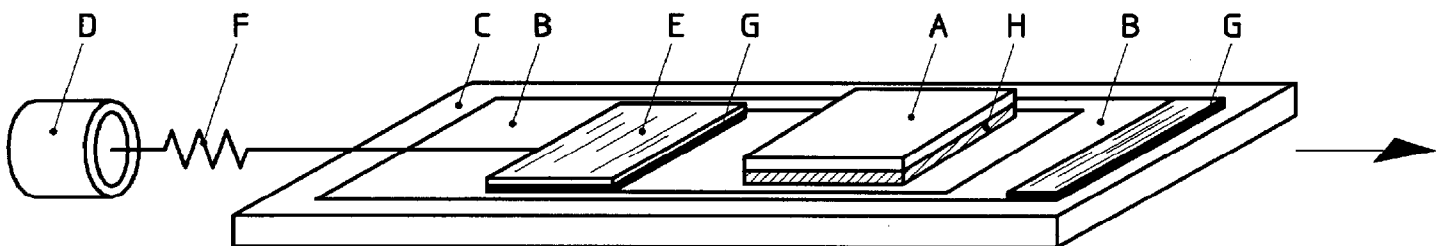
Figure 1 shows an example of apparatus in which the table is moved horizontally. The vertical motion of a tensile tester may also be utilized; in this case, the test table is fixed to the crosshead of the machine and the force is deflected to the horizontal direction by a pulley.

The force is recorded by a chart recorder or an equivalent electrical data-processing unit.

5.2 The test device shall comply with the following conditions.

5.2.1 The surface of the test table shall be flat and smooth, and made of a non-ferromagnetic metal.

5.2.2 The normal force shall be generated by a sled with a square-shaped contact base of 40 cm² (edge length 63 mm). To ensure uniform pressure distribution, the base of the sled shall be covered with an elastic material, for example felt. The structure of this covering material shall be fine enough to avoid embossing thin films. The total mass of the sled shall be 200 g ± 2 g (exerting a normal force of 1,96 N ± 0,02 N).



Key

- A Sled
- B Test specimens
- C Moving table
- D Load cell
- E Reinforcement plate
- F Spring
- G Double-faced adhesive tape
- H Felt

Figure 1 — Example of moving-table apparatus for determination of coefficients of friction