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МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Plastics film and sheeting — Determination of impact resistance by the free-falling dart method

Part 1: Staircase methods

*Film et feuille de plastiques — Détermination de la résistance au choc par la méthode
par chute libre de projectile*

Partie 1: Méthodes dites de «l'escalier»

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 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 7765-1 was prepared by Technical Committee ISO/TC 61, *Plastics*.

ISO 7765 consists of the following parts, under the general title *Plastics film and sheeting — Determination of impact resistance by the free-falling dart method*:

- *Part 1: Staircase methods*
- *Part 2: Instrumented puncture test*

Plastics film and sheeting — Determination of impact resistance by the free-falling dart method

Part 1: Staircase methods

1 Scope

1.1 This part of ISO 7765 specifies methods for the determination of the energy that causes plastics film and sheet less than 1 mm in thickness to fail under specified conditions of impact of a free-falling dart from a specified height that would result in failure of 50 % of the specimens tested.

1.2 Two methods of test are described.

1.2.1 Method A employs a dart with a $38 \text{ mm} \pm 1 \text{ mm}$ diameter hemispherical head dropped from a height of $0,66 \text{ m} \pm 0,01 \text{ m}$. This method may be used for materials whose impact resistance requires masses of about 0,05 kg to about 2 kg to fracture them.

1.2.2 Method B employs a dart with a $50 \text{ mm} \pm 1 \text{ mm}$ diameter hemispherical head dropped from a height of $1,50 \text{ m} \pm 0,01 \text{ m}$. Its range of applicability is from about 0,3 kg to about 2 kg.

1.3 The measurement technique is the staircase method. A uniform missile mass increment is employed during testing and the missile weight is decreased or increased by the uniform increment after test of each specimen, depending upon the result (failure or no failure) observed for the specimen.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 7765. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 7765 are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

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

ISO 4591 : 1979, *Plastics — Film and sheeting — Determination of average thickness of a sample and average thickness and yield of a roll, by gravimetric techniques (gravimetric thickness).*

ISO 4593 : 1979, *Plastics — Film and sheeting — Determination of thickness by mechanical scanning.*

3 Significance

3.1 Methods A and B are used to establish the mass of the dart causing 50 % of the specimens to fail under the conditions specified. Data obtained by one method cannot be compared directly with those from the other method, nor with those obtained from tests employing different conditions of missile velocity, missile impinging surface diameter, effective specimen diameter, and specimen thickness. The results obtained with particular values of these test variables are highly dependent on the method of fabrication of the film or sheeting.

3.2 The results obtained by methods A and B are greatly influenced by the quality of the material under test. The confidence limits of data obtained by this procedure can, therefore, vary significantly, depending on the sample quality, uniformity of gauge, die marks, contaminants, etc.

3.3 Methods A and B have been found useful for specification purposes. Correlation between test results and field performance can usually be established.

3.4 The impact resistance of film and sheeting, while partly dependent on thickness, has no simple correlation with sample thickness. Hence, impact values cannot be normalized over a range of thicknesses without producing misleading data as to the actual impact resistance of the material. Data from these methods are comparable only for sample sets that vary by no more than $\pm 10 \%$ from the nominal or average thickness of the specimens tested.

4 Definitions

For the purposes of this part of ISO 7765, the following definitions apply.