

**Plastics - Determination of puncture impact
of rigid plastics - Part 1: Non-instrumented
impact testing**

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 6603-1:2000 sisaldab Euroopa standardi EN ISO 6603-1:2000 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 12.09.2000 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN ISO 6603-1:2000 consists of the English text of the European standard EN ISO 6603-1:2000.</p> <p>This document is endorsed on 12.09.2000 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p>Käsitlusala:</p> <p>This standard specifies methods for the determination of puncture-impact properties of rigid plastics in the form of flat test specimens, such as disks or square pieces, under defines conditions. Specimens may be moulded directly, cut from sheets or taken from finished products. Different types of test specimens and test conditions are defined.</p>	<p>Scope:</p> <p>This standard specifies methods for the determination of puncture-impact properties of rigid plastics in the form of flat test specimens, such as disks or square pieces, under defines conditions. Specimens may be moulded directly, cut from sheets or taken from finished products. Different types of test specimens and test conditions are defined.</p>
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ICS 83.080.10

Võtmesõnad:

English version

Plastics

**Determination of puncture impact behaviour of
rigid plastics**

**Part 1: Non-instrumented impact testing
(ISO 6603-1 : 2000)**

Plastiques – Détermination du
comportement des plastiques rigides
perforés sous l'effet d'un choc –
Partie 1: Essais de choc non
instrumentés (ISO 6603-1 : 2000)

Kunststoffe – Bestimmung des
Durchstoßverhaltens von festen
Kunststoffen – Teil 1:
Nicht-instrumentierter Schlagversuch
(ISO 6603-1 : 2000)

This European Standard was approved by CEN on 2000-02-14.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Foreword

International Standard

ISO 6603-1 : 2000 Plastics – Determination of puncture impact behaviour of rigid plastics – Part 1: Non-instrumented impact testing,

which was prepared by ISO/TC 61 ‘Plastics’ of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 249 ‘Plastics’, the Secretariat of which is held by IBN, as a European Standard.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards withdrawn, by September 2000 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard:

Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 6603-1 : 2000 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to international publications are listed in Annex ZA (normative).

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1 Scope

This International Standard specifies methods for the determination of puncture-impact properties of rigid plastics in the form of flat test specimens, such as discs or square pieces, under defined conditions. Specimens may be moulded directly, cut from sheets or taken from finished products. Different types of test specimens and test conditions are defined.

These falling-dart methods are used to investigate the behaviour of plastic sheeting or mouldings under the impact of a striker applied perpendicular to the plane of the specimen.

This part of ISO 6603 can be used if it is sufficient to characterize the impact behaviour of plastics by a threshold value of impact-failure energy based on many test specimens. ISO 6603-2 is used if a force-deflection or force-time diagram, recorded at nominally constant striker velocity, is necessary for detailed characterization of the impact behaviour.

These test methods are applicable to specimens with a thickness between 1 mm and 4 mm.

NOTE For thicknesses less than 1 mm, ISO 7765 should preferably be used. Thicknesses greater than 4 mm may be tested if the equipment is suitable, but the test falls outside the scope of ISO 6603-1 and ISO 6603-2.

These methods are suitable for use with the following types of material:

- rigid thermoplastic moulding and extrusion materials, including filled, unfilled and reinforced compounds and sheets;
- rigid thermosetting moulding and extrusion materials, including filled and reinforced compounds, sheets and laminates;
- fibre-reinforced thermoset and thermoplastic composites incorporating unidirectional or non-unidirectional reinforcements such as mats, woven fabrics, woven rovings, chopped strands, combination and hybrid reinforcements, rovings, milled fibres and sheets made from pre-impregnated materials (prepregs).

These methods are also applicable to specimens which are either moulded or machined from finished products, laminates and extruded or cast sheet.

The test results are comparable only if the conditions of preparation of the specimens, their dimensions and surfaces as well as the test conditions are the same. In particular, results determined on specimens of different thickness cannot be compared with one another (see annex E of ISO 6603-2:—). Comprehensive evaluation of the reaction to impact stress requires that determinations be made as a function of impact velocity and temperature for different material variables, such as crystallinity and moisture content.

The impact behaviour of finished products cannot be predicted directly from this test, but specimens may be taken from finished products (see above) for test by these methods.

Test data developed by these methods should not be used for design calculations. However, information on the typical behaviour of the material can be obtained by testing at different temperatures and impact velocities (see annex D of ISO 6603-2:—), by varying the thickness (see annex E of ISO 6603-2:—) and by testing specimens prepared under different conditions.

Two statistical methods of test are described in this part of ISO 6603:

— Method A: staircase method (individual) (preferred)

In this method, a uniform energy increment is employed during testing. The energy is decreased or increased by the uniform increment after testing each specimen, depending upon the observed result (pass or fail) for the preceding test.

— Method B: group method (optional)

In this method, successive groups of at least ten test specimens are tested. The impact failure energy is calculated by statistics.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 6603. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 6603 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 291:1997, *Plastics — Standard atmospheres for conditioning and testing*.

ISO 293:1986, *Plastics — Compression moulding test specimens of thermoplastic materials*.

ISO 294-3:1996, *Plastics — Injection moulding of test specimens of thermoplastic materials — Part 3: Small plates*.

ISO 295:1991, *Plastics — Compression moulding of test specimens of thermosetting materials*.

ISO 1268:1974¹⁾, *Plastics — Preparation of glass fibre reinforced, resin bonded, low-pressure laminated plates or panels for test purposes*.

ISO 2818:1994, *Plastics — Preparation of test specimens by machining*.

ISO 6603-2:—²⁾, *Plastics — Determination of puncture impact behaviour of rigid plastics — Part 2: Instrumented impact testing*.

ISO 7765-1:1988, *Plastics film and sheeting — Determination of impact resistance by the free-falling dart method — Part 1: Staircase methods*.

ISO 7765-2:1994, *Plastics film and sheeting — Determination of impact resistance by the free-falling dart method — Part 2: Instrumented puncture test*.

1) Under revision.

2) To be published (Revision of ISO 6603-2:1989)