Plastid. Termoplastidest proovikehade survevalu. Osa 1: Põhimõtted ning universaalsete ja latikujuliste proovikehade valamine.

Plastics - Injection moulding of test specimens of thermoplastic materials - Part 1: General principles, and moulding of multipurpose and bar test specimens

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 294-1:2000 sisaldab Euroopa standardi EN ISO 294-1:1998 ingliskeelset teksti. Käesolev dokument on jõustatud 10.05.2000 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN ISO 294-1:2000 consists of the English text of the European standard EN ISO 294-1:1998. This document is endorsed on 10.05.2000 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: Standardi käesolev osa määrab kindlaks põhimõtteid, mida tuleb järgida, kui termoplastsetest materjalidest valmistatakse proovikehasid survevalu meetodil. Standard annab üksikasjalikku infot valuvormi konstrueerimiseks, millega valmistatakse kaht tüüpi proovikehasid. Neid, s.o. standardis ISO 3167 kindlaksmääratud proovikehasid ja kange, mõõtmetega 80 mm x 10 mm x 4 mm kasutatakse võrdlusandmete saamiseks.	**Scope:**

ICS 83.080.20

Võtmesõnad: bars(materjalid), plastid, proovikeha ettevalmistus, survevalu, termoplastsed vaigud, testitavad proovikehad, vormitavad materjalid (vormimismaterjalid), võrdlusandmed, üldjuhised

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 294-1

July 1998

ICS 83.080.20

Descriptors: Plastics, moulding materials, specimens, testing.

English version

Plastics

Injection moulding of test specimens of thermoplastic materials

Part 1: General principles, and moulding of multipurpose and bar test specimens
(ISO 294-1 : 1996)

Plastiques – Moulage par injection des éprouvettes de matériaux thermoplastiques – Partie 1: Principes généraux, et moulage des éprouvettes à usages multiples et des barreaux
(ISO 294-1 : 1996)

Kunststoffe – Spritzgießen von Probekörpern aus Thermoplasten – Teil 1: Allgemeine Grundlagen und Herstellung von Vielzweckprobekörpern und Stäben (ISO 294-1 : 1996)

This European Standard was approved by CEN on 1998-06-12.

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 294-1 : 1996 Plastics – Injection moulding of test specimens of thermoplastic materials – Part 1: General principles, and moulding of multipurpose and bar test specimens,

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 January 1999 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 294-1 : 1996 was approved by CEN as a European Standard without any modification.

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

Introduction

Many factors in the injection-moulding process may influence the properties of moulded test specimens and hence the measured values obtained when the specimens are used in a test method. The mechanical properties of such specimens are in fact strongly dependent on the conditions of the moulding process used to prepare the specimens. Exact definition of each of the main parameters of the moulding process is a basic requirement for reproducible and comparable operating conditions.

It is important in defining moulding conditions to consider any influence the conditions may have on the properties to be determined. Thermoplastics may show differences in molecular orientation (important mainly with amorphous polymers), in crystallization morphology (for crystalline and semicrystalline polymers), in phase morphology (for heterogeneous thermoplastics) as well as in the orientation of anisotropic fillers such as short fibres. Residual ("frozen-in") stresses in the moulded test specimens and thermal degradation of the polymer during moulding may also influence properties. Each of these phenomena must be controlled to avoid fluctuation of the numerical values of the properties measured.

1 Scope

This part of ISO 294 specifies the general principles to be followed when injection moulding test specimens of thermoplastic materials and gives details of mould designs for preparing two types of specimen for use in acquiring reference data, i.e. multipurpose test specimens as specified in ISO 3167 and 80 mm × 10 mm × 4 mm bars. It provides a basis for establishing reproducible moulding conditions. Its purpose is to promote uniformity in describing the main parameters of the moulding process and also to establish uniform practice in reporting moulding conditions. The particular conditions required for the reproducible preparation of test specimens which will give comparable results will vary for each material used. These conditions are given in the International Standard for the relevant material or are to be agreed upon between the interested parties.

NOTE — ISO round-robin tests with acrylonitrile/butadiene/styrene (ABS), styrene/butadiene (SB) and poly(methyl methacrylate) (PMMA) have shown that mould design is an important factor in the reproducible preparation of test specimens.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 294. 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 294 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 179:1993, *Plastics — Determination of Charpy impact strength.*

ISO 294-2:1996, *Plastics — Injection moulding of test specimens of thermoplastic materials — Part 2: Small tensile bars.*

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

ISO 294-4:—[1)], *Plastics — Injection moulding of test specimens of thermoplastic materials — Part 4: Determination of moulding shrinkage.*

1) To be published. (Revision in part of ISO 294:1995)

ISO 3167:1993, *Plastics — Multipurpose test specimens.*

ISO 10350:1993, *Plastics — Acquisition and presentation of comparable single-point data.*

ISO 11403-1:1994, *Plastics — Acquisition and presentation of comparable multipoint data — Part 1: Mechanical properties.*

ISO 11403-2:1995, *Plastics — Acquisition and presentation of comparable multipoint data — Part 2: Thermal and processing properties.*

ISO 11403-3:—[2], *Plastics — Acquisition and presentation of comparable multipoint data — Part 3: Environmental influences on properties.*

3 Definitions

For the purposes of the various parts of ISO 294, the following definitions apply.

3.1 mould temperature, T_C**:** The average temperature of the mould cavity surfaces measured after the system has attained thermal equilibrium and immediately after opening the mould (see 4.2.5 and 5.3).

It is expressed in degrees Celsius (°C).

3.2 melt temperature, T_M**:** The temperature of the molten plastic in a free shot (see 4.2.5 and 5.4).

It is expressed in degrees Celsius (°C).

3.3 melt pressure, p**:** The pressure of the plastic material in front of the screw at any time during the moulding process (see figure 1).

It is expressed in megapascals (MPa).

The melt pressure, which is generated hydraulically for instance, can be calculated from the force F_S acting longitudinally on the screw using equation (1):

$$p = \frac{4 \times 10^3 F_S}{\pi D^2} \quad \ldots (1)$$

where

p is the melt pressure, in megapascals;

F_S is the longitudinal force, in kilonewtons, acting upon the screw;

D is the screw diameter, in millimetres.

3.4 hold pressure, p_H**:** The melt pressure (see 3.3) during the hold time (see figure 1).

It is expressed in megapascals (MPa).

3.5 moulding cycle: The complete sequence of operations in the moulding process required for the production of one set of test specimens (see figure 1).

2) To be published.