SLOVENSKI STANDARD
SIST EN ISO 1874-2:1999

01-maj-1999

Polimerni materiali - Poliamidni materiali (PA) za oblikovanje in ekstrudiranje - 2. del: Priprava preskuġancev in doloļ evanje lastnosti (ISO 1874-2:1995)

Plastics - Polyamide (PA) moulding and extrusion materials - Part 2: Preparation of test specimens and determination of properties (ISO 1874-2:1995)

Kunststoffe - Polyamid (PA) Formmassen für das Spritzgießen und die Extrusion - Teil 2: Herstellung von Probekörpern und Bestimmung von Eigenschaften (ISO 1874-2:1995)

Plastiques - Matériaux polyamides (PA) pour moulage et extrusion - Partie 2: Préparation des éprouvettes et détermination des propriétés (ISO 1874-2:1995)

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Plastics - Polyamide (PA) moulding and extrusion materials - Part 2: Preparation of test specimens and determination of properties (ISO 1874-2:1995)

Plastiques - Matériaux polyamides (PA) pour moulage et extrusion - Partie 2: Préparation des éprouvettes et détermination des propriétés (ISO 1874-2:1995)

Kunststoffe - Polyamid (PA) Formmassen für das Spritzgießen und die Extrusion - Teil 2: Herstellung von Probekörpern und Bestimmung von Eigenschaften (ISO 1874-2:1995)

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CEN

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

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

Foreword

The text of the International Standard ISO 1874-2:1995 has been prepared by Technical Committee ISO/TC 61 "Plastics" in collaboration with Technical Committee CEN/TC 249 "Plastics".

This European Standard shall be given the status of a National Standard, either by publication of an identical text or by endorsement, at the latest by June 1996, and conflicting national standards shall be withdrawn at the latest by June 1996.

According to CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 1874-2:1995 has been approved by CEN as a European Standard without any modification.

INTERNATIONAL STANDARD

ISO 1874-2

Second edition
1995-12-15

Plastics — Polyamide (PA) moulding and extrusion materials —

Part 2:
Preparation of test specimens and determination of properties

Plastiques — Matériaux polyamides (PA) pour moulage et extrusion — Partie 2: Préparation des éprouvettes et détermination des propriétés

Reference number
ISO 1874-2:1995(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 1874-2 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 9, *Thermoplastic materials*.

This second edition cancels and replaces the first edition (ISO 1874-2:1987) and includes the following changes:

— the title has been modified in order to include copolymers;

— the standard SC 9 frame text has been used, and accordingly the format differs from that of the first edition;

— additional polyamide types, PA 46 and PA NDT/INDT, have been added and the moulding conditions listed in a new table;

— the list of properties and test conditions (table 2) has been revised in accordance with ISO 10350.

ISO 1874 consists of the following parts, under the general title *Plastics — Polyamide (PA) moulding and extrusion materials*:

— *Part 1: Designation*

— *Part 2: Preparation of test specimens and determination of properties*

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Plastics — Polyamide (PA) moulding and extrusion materials —

Part 2:
Preparation of test specimens and determination of properties

1 Scope

This part of ISO 1874 specifies the methods of preparation of test specimens and the test methods to be used in determining the properties of polyamide moulding and extrusion materials. Requirements for handling test material and for conditioning both the test material before moulding and the specimens before testing are given here.

Procedures and conditions for the preparation of test specimens and procedures for measuring properties of the materials from which these specimens are made are given. Properties and test methods which are suitable and necessary to characterize polyamide moulding and extrusion materials are listed.

The properties have been selected from the general test methods in ISO 10350. Other test methods in wide use for or of particular significance to these moulding and extrusion materials are also included in this part of ISO 1874, as are the designatory properties found in part 1: viscosity number and tensile modulus of elasticity.

In order to obtain reproducible and comparable test results, it is necessary to use the methods of preparation and conditioning, the specimen dimensions and the test procedures specified herein. Values determined will not necessarily be identical to those obtained using specimens of different dimensions or prepared using different procedures.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 1874. 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 1874 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 62:1980, *Plastics — Determination of water absorption.*

ISO 75-1:1993, *Plastics — Determination of temperature of deflection under load — Part 1: General test method.*

ISO 75-2:1993, *Plastics — Determination of temperature of deflection under load — Part 2: Plastics and ebonite.*

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

ISO 180:1993, *Plastics — Determination of Izod impact strength.*

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

ISO 294:1995, *Plastics — Injection moulding of test specimens of thermoplastic materials.*

ISO 307:1994, *Plastics — Polyamides — Determination of viscosity number.*

ISO 527-1:1993, *Plastics — Determination of tensile properties — Part 1: General principles.*

ISO 527-2:1993, *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics.*

ISO 899-1:1993, *Plastics — Determination of creep behaviour — Part 1: Tensile creep.*

ISO 960:1988, *Plastics — Polyamides (PA) — Determination of water content.*

ISO 1110:1995, *Plastics — Polyamides — Accelerated conditioning of test specimens.*

ISO 1183:1987, *Plastics — Methods for determining the density and relative density of non-cellular plastics.*

ISO 1210:1992, *Plastics — Determination of the burning behaviour of horizontal and vertical specimens in contact with a small-flame ignition source.*

ISO 1874-1:1992, *Plastics — Polyamide (PA) moulding and extrusion materials — Part 1: Designation.*

ISO 3146:1985, *Plastics — Determination of melting behaviour (melting temperature or melting range) of semi-crystalline polymers.*

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

ISO 3451-4:1986, *Plastics — Determination of ash — Part 4: Polyamides.*

ISO 8256:1990, *Plastics — Determination of tensile-impact strength.*

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

IEC 93:1980, *Methods of test for volume resistivity and surface resistivity of solid electrical insulation materials.*

IEC 112:1979, *Method for determining the comparative and the proof tracking indices of solid insulation materials under moist conditions.*

IEC 243-1:1988, *Methods of test for electric strength of solid insulating materials — Part 1: Tests at power frequencies.*

IEC 250:1969, *Recommended methods for the determination of the permittivity and dielectric dissipation factor of electrical insulating materials at power, audio and radio frequencies including metre wavelengths.*

IEC 296:1982, *Specification for unused mineral oils for transformers and switchgear.*

3 Preparation of test specimens

The specimens shall be prepared by injection moulding from dry granules.

It is essential that specimens are always prepared by the same procedure using the same processing conditions.

The material shall be kept in moisture-proof containers until it is required for use.

Moisture content of filled or reinforced materials shall be expressed as a percentage of the total mass of the compound.

3.1 Treatment of the material before moulding

Before processing, the material sample shall have reached room temperature.

Before processing, the moisture content of the material sample shall not exceed 0,2 % (*m/m*) in the case of PA having a viscosity number $\leqslant$ 200 ml/g, and not exceed 0,1 % (*m/m*) in the case of PA having a viscosity number $>$ 200 ml/g. For PA 46 and PA NDT/INDT, the moisture content shall be less than 0,1 % (*m/m*). Moisture content shall be determined in accordance with ISO 960 and viscosity number in accordance with ISO 307.

To ensure that the moisture content remains low, it is recommended that the sample material in the feed hopper of the injection-moulding machine be blanketed with a suitable gas (dried air, nitrogen or argon, for example). Better results may be obtained using a dehumidifier hopper drier.

3.2 Injection moulding

Injection-moulded specimens shall be prepared in accordance with ISO 294, using the conditions specified in table 1.

Table 1 — Conditions for injection moulding of test specimens

Material	Viscosity number mg/l	Glass and mineral content %	Plasticizer content %	Melt temperature °C	Mould temperature °C	Average injection velocity mm/s	Hold-pressure time s	Total cycle time s
PA 6	⩽ 160	0	0	250	80	200 ± 100	25 ± 5	⩽ 50
	> 160 but ⩽ 200	0	0	260	80	200 ± 100	25 ± 5	⩽ 50
	> 200	0	0	270	80	200 ± 100	25 ± 5	⩽ 50
	⩽ 160	⩽ 50	0	290	80	200 ± 100	25 ± 5	⩽ 50
PA 66	⩽ 200	0	0	290	80	200 ± 100	25 ± 5	⩽ 50
	⩽ 160	⩾ 10 but ⩽ 50	0	290	80	200 ± 100	25 ± 5	⩽ 50
	⩽ 160	> 50 but ⩽ 70	0	300	100	200 ± 100	25 ± 5	⩽ 50
PA 46	⩽ 260	0	0	315	120	200 ± 100	25 ± 5	⩽ 50
	⩽ 260	⩽ 50	0	315	120	200 ± 100	25 + 5	⩽ 50
PA 69, PA 610	⩽ 200	0	0	270	80	200 ± 100	25 ± 5	⩽ 50
PA 612	⩽ 150	⩽ 10	0	240	80	200 ± 100	25 ± 5	⩽ 50
	> 150 but ⩽ 200	⩽ 10	0	250	80	200 ± 100	25 ± 5	⩽ 50
	> 200 but ⩽ 250	⩽ 10	0	270	80	200 ± 100	25 ± 5	⩽ 50
	⩽ 140	⩾ 10 but ⩽ 30	0	250	80	200; 5	⩽ 50	
	> 140 but ⩽ 180	> 30 but ⩽ 50	0	270	80	200 ± 100	25 ± 5	⩽ 50
PA 11	⩽ 150	0	⩽ 5	210	80	200 ± 100	25 ± 5	⩽ 50
	> 150 but ⩽ 200	0	⩽ 5	230	80	200 ± 100	25 ± 5	⩽ 50
	> 200 but ⩽ 240	0	⩽ 5	250	80	200 ± 100	25 ± 5	⩽ 50
	⩽ 150	0	> 5	210	80	200 ± 100	25 ± 5	⩽ 50
	> 150 but ⩽ 200	0	> 5	230	80	200 ± 100	25 ± 5	⩽ 50
	> 200 but ⩽ 240	0	> 5	250	80	200 ± 100	25 ± 5	⩽ 50
	⩽ 130	⩾ 10 but ⩽ 30	0	220	80	200 ± 100	25 ± 5	⩽ 50
	⩽ 130	> 30 but ⩽ 50	0	230	80	200 ± 100	25 ± 5	⩽ 50
	> 130 but ⩽ 240	⩾ 10 but ⩽ 20	0	250	80	200 ± 100	25 ± 5	⩽ 50
	> 130 but ⩽ 240	> 20 but ⩽ 50	0	260	80	200 ± 100	25 ± 5	⩽ 50