SLOVENSKI STANDARD
SIST EN ISO 11401:2000

01-maj-2000

Polimerni materiali - Fenolne smole - Ločitev s tekočinsko kromatografijo (ISO 11401:1993)

Plastics - Phenolic resins - Separation by liquid chromatography (ISO 11401:1993)

Kunststoffe - Phenolharze - Trennung durch Flüssigchromatographie (ISO 11401:1993)

Plastiques - Résines phénoliques - Séparation par chromatographie en phase liquide (ISO 11401:1993)

Ta slovenski standard je istoveten z: **EN ISO 11401:1998**

ICS:

83.080.10 Duromeri Thermosetting materials

SIST EN ISO 11401:2000 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 11401

August 1998

ICS 83.080.10

Descriptors: see ISO document

English version

Plastics - Phenolic resins - Separation by liquid chromatography (ISO 11401:1993)

Plastiques - Résines phénoliques - Séparation par chromatographie en phase liquide (ISO 11401:1993)

Kunststoffe - Phenolharze - Trennung durch Flüssigchromatographie (ISO 11401:1993)

This European Standard was approved by CEN on 13 June 1998.

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.

This European Standard exists 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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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

Ref. No. EN ISO 11401:1998 E

Foreword

The text of the International Standard from Technical Committee ISO/TC 61 "Plastics" of the International Organization for Standardization (ISO) has been taken over as an European Standard by Technical Committee CEN/TC 249 "Plastics", the secretariat of which is held by IBN.

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 February 1999, and conflicting national standards shall be withdrawn at the latest by February 1999.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, 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 11401:1993 has been approved by CEN as a European Standard without any modification.

NOTE: Normative references to International Standards are listed in annex ZA (normative).

Annex ZA (normative)
Normative references to international publications with their relevant European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

Publication	Year	Title	EN	Year
ISO 10082	1991	Plastics - Phenolic resins - Definitions and test methods	EN ISO 10082	1995

INTERNATIONAL STANDARD

ISO 11401

First edition
1993-12-01

Plastics — Phenolic resins — Separation by liquid chromatography

Plastiques — Résines phénoliques — Séparation par chromatographie en phase liquide

Reference number
ISO 11401:1993(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 11401 was prepared by Technical Committee ISO/TC 61, *Plastics*, Sub-Committee SC 12, *Thermosetting materials*.

Later, this International Standard will become part of a general standard concerning liquid chromatography.

International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

Plastics — Phenolic resins — Separation by liquid chromatography

1 Scope

1.1 This International Standard specifies chromatographic methods for the separation of phenolic resins into their component compounds. Separation takes place according to molecular weight and/or polarity.

There are various liquid chromatographic methods:

A: Gel-permeation chromatography

B: High-performance liquid chromatography on polar columns

C: High-performance liquid chromatography on non-polar columns

It is possible to separate a phenolic resin into its components according to molecular size using method A (gel-permeation chromatography). Whereas free phenol and the sum of the dihydroxydiphenylmethanes (in novolaks) and various methylolphenols (in resols) are quantitatively separated in this procedure, high-molecular-weight components of the resins are only incompletely separated due to the multitude of isomers.

Methods B and C (high-performance liquid chromatography) separate the compounds in the resin according to molecular weight *and* polarity. Molecular-weight effects predominate on polar stationary phases (method B), and the effect of polarity on non-polar stationary phases (method C). These methods also allow quantitative determination of individual low-molecular-weight resin components. Because of the different resin solubilities, method B is more suitable for novolaks and method C for resols.

1.2 The methods are applicable to phenolic resins that are soluble in the solvents and solvent blends used.

1.3 This test is useful for characterization of products and for research.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were 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 recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 472:1988, *Plastics — Vocabulary.*

ISO 10082:1991, *Plastics — Phenolic resins — Definitions and test methods.*

3 Definitions

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

3.1 phenolic resin: Generally, a class of resins made by the polycondensation of phenol, its homologues and/or derivatives, with aldehydes or ketones. [ISO 472]

3.2 novolaks: Non-self-curing, soluble, fusible phenolic resins that remain stable when stored, the phenol nuclei of which are linked primarily by methylene bridges. Novolaks can be made to react further and crosslink by the addition of hardeners; heating is also usually necessary. [ISO 10082]

See also *novolak* in ISO 472.

3.3 resols: Soluble, fusible phenolic resins which, in contrast to novolaks, contain methylol groups and methylene-ether and sometimes also methylene-amine bridges. Resols are self-curing; they crosslink into insoluble products when heated and/or mixed with catalysts, without addition of further reaction components. Resols are perishable and can be stored for a limited time only. [ISO 10082]