



# SLOVENSKI STANDARD

## SIST EN ISO 1675:1999

01-maj-1999

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**Polimerni materiali – Tekoče smole – Določevanje gostote s piknometrom (ISO 1675:1985)**

Plastics - Liquid resins - Determination of density by the pyknometer method (ISO 1675:1985)

Kunststoffe - Flüssige Harze - Bestimmung der Dichte nach dem Pyknometer-Verfahren (ISO 1675:1985)

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Plastiques - Résines liquides - Détermination de la masse volumique par la méthode du pycnomètre (ISO 1675:1985)

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**Ta slovenski standard je istoveten z: EN ISO 1675:1998**

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**ICS:**

83.080.01	Polimerni materiali na splošno	Plastics in general
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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

EN ISO 1675

July 1998

ICS 83.080.01

Descriptors: see ISO document

English version

## Plastics - Liquid resins - Determination of density by the pycnometer method (ISO 1675:1985)

Plastiques - Résines liquides - Détermination de la masse  
volumique par la méthode du pycnomètre (ISO 1675:1985)

Kunststoffe - Flüssige Harze - Bestimmung der Dichte nach  
dem Pycnometer-Verfahren (ISO 1675:1985)

This European Standard was approved by CEN on 12 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.

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

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

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## 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 January 1999, and conflicting national standards shall be withdrawn at the latest by January 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 1675:1985 has been approved by CEN as a European Standard without any modification.

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# International Standard 1675

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## Plastics — Liquid resins — Determination of density by the pycnometer method

*Plastiques — Résines liquides — Détermination de la masse volumique par la méthode du pycnomètre*

Second edition — 1985-08-15

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Ref. No. ISO 1675-1985 (E)

Descriptors : plastics, liquid resins, tests, determination, density (mass/volume), pycnometric analysis, pycnometers.

## 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.

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 1675 was prepared by Technical Committee ISO/TC 61, *Plastics*.

ISO 1675 was first published in 1975. This second edition cancels and replaces the first edition, of which it constitutes a technical revision.

# Plastics — Liquid resins — Determination of density by the pycnometer method

## 1 Scope and field of application

This International Standard specifies a method for the determination of the density of liquid resins using a pycnometer.

## 2 Definition

**density; mass density** : Mass divided by volume. (Definition taken from ISO 31/3.)

It may be expressed in grams per millilitre (g/ml).\*

## 3 Principle

Determination of the mass at 23 °C of resin contained in a pycnometer of known volume.

NOTE — This method is easily applicable to low and medium viscosity resins. Difficulties in the procedure exist for high viscosity resins.

## 4 Apparatus

**4.1 Pycnometer**, consisting of a precision graduated flask. The height of the neck above the graduation mark shall not exceed 50 mm.

The graduated volume of the pycnometer at  $23 \pm 0,1$  °C, measured by weighing the mass of distilled water contained in the pycnometer at this temperature, shall be known to within 1 part in 10 000 (see note to clause 6).

The pycnometers normally used have the characteristics given in the following table.

Volume of flask, $V$	Internal diameter of neck, $d$
ml	mm
$100 \pm 0,1$	$13 \pm 1$
$50 \pm 0,05$	$11 \pm 1$

\*  $1 \text{ g/ml} = 1\,000 \text{ kg/m}^3$

**4.2 Funnel**, whose stem, the internal diameter of which shall be as large as possible, penetrates into the pycnometer exactly down to the level of the graduation mark.

**4.3 Balance**, accurate to 0,2 mg.

**4.4 Water-bath**, capable of being maintained at  $23 \pm 0,1$  °C.

**4.5 Fine filter paper**.

**4.6 Transparent conical flask**, with wide neck (for example Erlenmeyer), stoppered, of capacity 200 to 600 ml.

## 5 Procedure

### 5.1 Preparation of resin

Place at least 150 g of resin in the conical flask (4.6) and inspect the contents of the flask for bubbles. If any bubbles are observed, allow the stoppered flask to stand long enough for all the bubbles to dissipate before or while bringing the flask and its contents to  $23 \pm 0,1$  °C by immersion in the water bath (4.4).

NOTE — To accelerate the release of bubbles, especially any adjacent to the walls of the flask, disturb or detach them using a fine wire inserted through the neck of the flask.

### 5.2 Measurement of density

Weigh the empty pycnometer (4.1) to the nearest 0,2 mg.

Place the pycnometer in the water-bath (4.4) and fill the pycnometer with resin using the funnel (4.2).

The following points require close attention :

- bubbles shall not be present in the resin in the pycnometer; if bubbles form, wait for them to disappear, if necessary rubbing the walls of the pycnometer with a fine metal wire, or, better still, empty the pycnometer, clean it and refill;

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- b) fill the pyknometer exactly to the graduation mark;
- c) remove the funnel without letting its stem touch the neck of the pyknometer.

Wait at least 30 min and check that the level in the pyknometer remains at the graduation mark. If necessary, add a few more drops of resin or remove excess resin by means of fine filter paper (4.5), which may be wound around a glass rod.

Weigh the filled pyknometer to the nearest 0,2 mg.

## 6 Expression of results

The density at 23 °C,  $\rho_{23}$ , expressed in grams per millilitre, is given by the equation

$$\rho_{23} = \frac{m_1 - m_0}{V} + \rho_a$$

where

$m_1$  is the apparent mass, in grams, of the filled pyknometer at 23 °C;

$m_0$  is the apparent mass, in grams, of the empty pyknometer at 23 °C;

$\rho_a$  is the density of air at 23 °C  $\approx$  0,001 2 g/ml (air buoyancy correction);

$V$  is the volume, in millilitres, of the pyknometer at 23 °C.

Give the result to three places of decimals.

NOTE — To check or determine the volume of the pyknometer at 23 °C using distilled water, use the equation

$$V = \frac{m_2 - m_0}{\rho_e - \rho_a} = \frac{m_2 - m_0}{0,996\ 4}$$

where

$m_2$  is the apparent mass, in grams, of the pyknometer filled with distilled water at 23 °C;

$\rho_e$  is the density of distilled water at 23 °C  
= 0,997 6 g/ml.

## 7 Test report

The test report shall contain the following information :

- a) a reference to this International Standard;
- b) complete identification of the material tested;
- c) the density at 23 °C,  $\rho_{23}$ , expressed in grams per millilitre;
- d) details of procedure not specified in this International Standard and any incidents likely to have influenced the results.

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