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**Paints and varnishes — Determination of  
density —**

**Part 1:  
Pyknometer method**

*Peintures et vernis — Détermination de la masse volumique —*

*Partie 1: Méthode pycnométrique*



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## 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 2811-1 was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*, Subcommittee SC 9, *General test methods for paints and varnishes*.

This second edition cancels and replaces the first edition (ISO 2811-1:1997), which has been technically revised.

The main changes are the following.

- a) The unit for the density has been changed from grams per millilitre to grams per cubic centimetre, because this is the more common SI unit.
- b) The determination in duplicate has been changed to a single determination.
- c) The information on calibration procedure has been changed to an example only and the status of Annex B has been changed from normative to informative.
- d) The Hubbard pycnometer has been deleted because it is not used for paints and varnishes and their raw materials, but for bitumen and putty only (see ISO 3507).
- e) The dust-proof container has been deleted because it is not used in practice.
- f) The precision data has been updated by an interlaboratory test.
- g) The normative references have been updated.

ISO 2811 consists of the following parts, under the general title *Paints and varnishes — Determination of density*:

- *Part 1: Pycnometer method*
- *Part 2: Immersed body (plummet) method*
- *Part 3: Oscillation method*
- *Part 4: Pressure cup method*

# Paints and varnishes — Determination of density —

## Part 1: Pyknometer method

### 1 Scope

This part of ISO 2811 specifies a method for determining the density of paints, varnishes and related products using a metal or Gay-Lussac pyknometer.

The method is limited to materials of low or medium viscosity at the temperature of test. The Hubbard pyknometer (see ISO 3507) can be used for highly viscous materials.

### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1513, *Paints and varnishes — Examination and preparation of test samples*

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 15528, *Paints, varnishes and raw materials for paints and varnishes — Sampling*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

#### 3.1 density

$\rho$

mass divided by the volume of a portion of a material

NOTE It is expressed in grams per cubic centimetre.

### 4 Principle

A pyknometer is filled with the product under test. The density is calculated from the mass of the product in the pyknometer and the known volume of the pyknometer.