

INTERNATIONAL
STANDARD

ISO
3681

Third edition
1996-06-01

**Binders for paints and varnishes —
Determination of saponification value —
Titrimetric method**

*Liants pour peintures et vernis — Détermination de l'indice de
saponification — Méthode titrimétrique*



Reference number
ISO 3681:1996(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 3681 was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*, Subcommittee SC 10, *Test methods for binders for paints and varnishes*.

This third edition cancels and replaces the second edition (ISO 3681:1983), which has been technically and editorially revised. The main change is that the saponification value is no longer related to 1 g of non-volatile matter of the product but to 1 g of the product itself.

Annex A forms an integral part of this International Standard.

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Binders for paints and varnishes — Determination of saponification value — Titrimetric method

1 Scope

This International Standard specifies a titrimetric method for determining the esterified acid content in binders for paints and varnishes, free acids and acid anhydrides being necessarily included in the result obtained.

Because different binders vary in their resistance to saponification, this International Standard is of limited applicability. If necessary, completeness of saponification may be checked by repeating the test under more severe conditions achieved by the use of longer saponification time, more concentrated potassium hydroxide solution, or a higher-boiling alcohol as solvent.

Annex A specifies a procedure suitable for binders that saponify with difficulty.

The method is not applicable to those materials that show further reaction with alkalis beyond normal saponification.

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 385-1:1984, *Laboratory glassware — Burettes — Part 1: General requirements*.

ISO 648:1977, *Laboratory glassware — One-mark pipettes*.

ISO 842:1984, *Raw materials for paints and varnishes — Sampling*.

ISO 3696:1987, *Water for analytical laboratory use — Specification and test methods*.

3 Definitions

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

3.1 saponification: The formation of the alkali metal salts of derivatives of organic acids.

3.2 saponification value: The number of milligrams of potassium hydroxide (KOH) required for the saponification of 1 g of the product tested.

4 Principle

After a preliminary test to determine the saponification conditions (concentration of potassium hydroxide solution, saponification time, etc.) for the product to be tested, a test portion is boiled under reflux with potassium hydroxide solution under these conditions. The hot solution is titrated with standard volumetric hydrochloric acid, either in the presence of a colour indicator or potentiometrically.

5 Reagents

During the analysis, use only reagents of recognized analytical grade, and only water of at least grade 3 purity as defined in ISO 3696.

5.1 Toluene, or other suitable unsaponifiable solvent.