INTERNATIONAL STANDARD

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Tall-oil fatty acids for paints and varnishes — Specifications and test methods

Acides gras d'huile de tall pour peintures et vernis — Spécifications et méthodes d'essai

Reference number
ISO 8623:1997(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 8623 was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*.

Annex A of this International Standard is for information only.

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Tall-oil fatty acids for paints and varnishes — Specifications and test methods

1 Scope

This International Standard specifies the requirements and the corresponding test methods for distilled tall-oil fatty acids for paints and varnishes.

2 Normative references

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was 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 ecition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 150:1980, *Raw, refined and boiled linseed oil for paints and varnishes - Specifications and methods of test.*

ISO 383:1976, *Laboratory glassware - Interchangeable conical ground joints.*

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

ISO 2811:1974, *Paints and varnishes - Determination of density.*

ISO 3681:1983, *Binders for paints and varnishes - Determination of saponification value - Titrimetric method.*

ISO 3682:1983, *Binders for paints and varnishes - Determination of acid value - Titrimetric method.*

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

ISO 3961:1989, *Animal and vegetable oils and fats - Determination of iodine value*

ISO 4630:1981, *Binders for paints and varnishes - Estimation of colour of clear liquids by the Gardner colour scale*

3 Requirements and test methods

Tall-oil fatty acids shall comply with the requirements given in table 1.

Table 1 - Requirements and test methods

Property		Requirement	Test method
Density	at 20 °C g/ml	0,900 to 0,910	ISO 2811
	at 23 °C g/ml	0,898 to 0,908	
Colour		max. 5	ISO 4630 (Gardner scale)
Acid value	mg KOH/g	min. 192	ISO 3682
Saponification value	mg KOH/g	min. 193	ISO 3681
Iodine value	g Iodine/100 g	min. 125	ISO 3961 (Wijs method)
Unsaponifiable matter	% (*m/m*)	max. 2,5	ISO 150, Annex
Rosin acid content	% (*m/m*)	max. 2,5	Clause 4

4 Determination of rosin acid content

4.1 Principle

A test portion is treated with butanol sulfuric acid esterification reagent under specified conditions and subsequently titrated against a standard volumetric potassium hydroxide solution, using phenolphthalein as indicator. The rosin acid content is calculated in terms of abietic acid.

4.2 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.

4.2.1 Butanol Sulfuric acid esterification reagent

Introduce 500 ml of n-butanol, 500 ml of toluene and 3,3 ml of concentrated sulfuric acid, ρ = 1,84 g/ml, into a 2 l round-bottom flask with ground-glass neck, connect to a moisture trap and condenser, and reflux on a hotplate for 30 min to distil of the water. Cool and store in a glass-stoppered bottle.

4.2.2 Potassium hydroxide, standard volumetric methanolic solution, c(KOH) = 0,2 mol/l.

Dissolve 13,3 g of KOH pellets in 1 l of methanol. Standardize against a potassium hydrogen phthalate primary standard.

4.2.3 Phenolphthalein, indicator solution, 10 g/l in 95 % (*V*/*V*) ethanol.

4.3 Apparatus

Ordinary laboratory apparatus and glassware, together with the following:

4.3.1 Air condenser, 760 mm long, with a 24/29 ground glass cone.

4.3.2 Burette, automatic type, having a capacity of 25 ml, for the standard potassium hydroxide solution, fitted with soda lime traps to protect against absorption of atmospheric CO_2.

4.3.3 Conical flask, of borosilicate glass, of capacity 250 ml, with a 24/29 conical ground glass neck.

4.3.4 24/29 Conical ground glass joints, complying with the requirements of ISO 383.

4.3.5 Moisture trap, of construction similar to that shown in figure 1 and wrapped with 12,5 mm heat resistant-tape.

4.3.6 Pipette, automatic, of capacity 50 ml.

Dimensions in millimeters

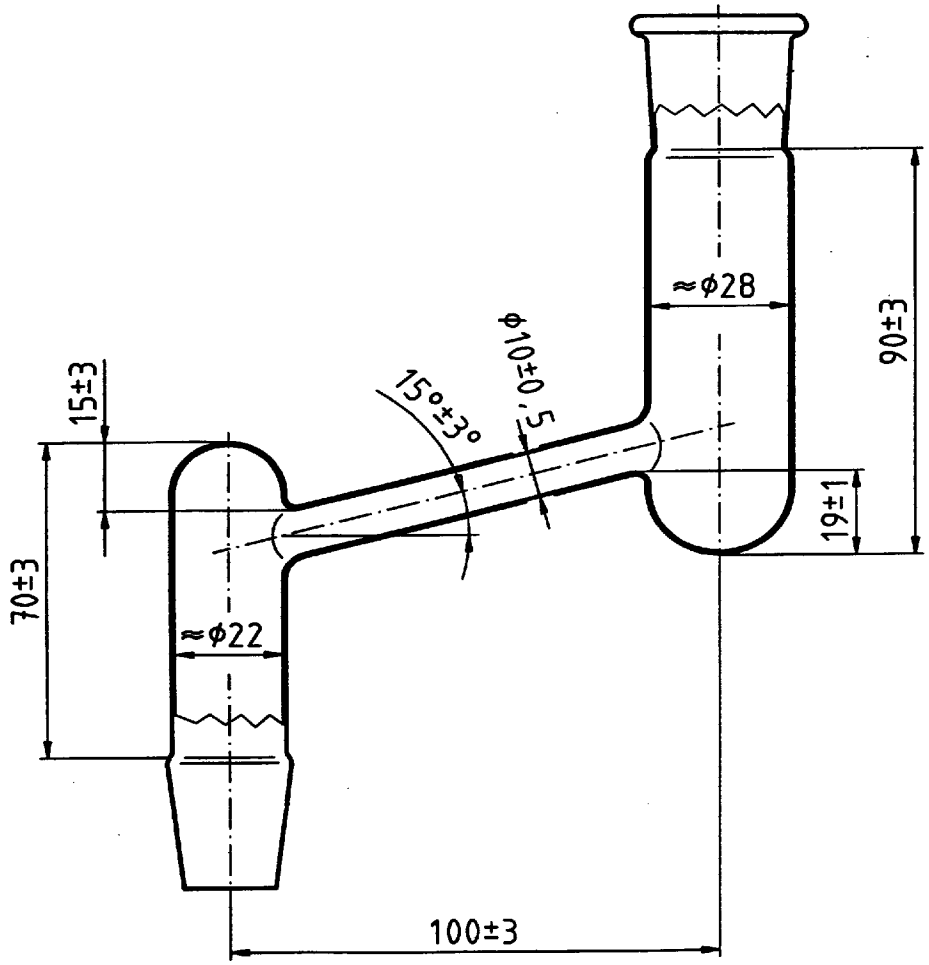

Figure 1 - Moisture trap

4.4 Sampling

Take a representative sample of the fatty acid, as described in ISO 842.

4.5 Procedure

Carry out the determination in duplicate.
Weigh to the nearest 1 mg, 5 g to 8 g of the sample and transfer to a 250 ml conical flask (4.3.3). Using the automatic pipette (4.3.6), measure 50 ml of the esterification reagent (4.2.1) into the flask. Connect the flask to the moisture trap (4.3.5) and condenser (4.3.1), place on a hotplate, heat to boiling, and reflux for 20 min.

At the end of the heating period, remove the flask from the hotplate and allow to cool to room temperature.
Add 0,5 ml of the phenolphthalein solution (4.2.3) and titrate with the standard volumetric potassium hydroxide solution (4.2.2) until the solution turns pink-red.

Note 1 - In the case of dark-coloured products or those containing small amounts of mineral acid or alkali, the end-point of the titration should preferably be determined potentiometrically.

Carry out a blank test, also using 50 ml of the esterification reagent.

4.6 Expression of results

Calculate the rosin acids content C_R, expressed as a percentage by mass, using the following equation:

$$C_R = \frac{(V_1 - V_2) \times c \times 302,4 \times 1,042}{m \times 10} - 0,1$$

V_1 is the volume, in millilitres, of the standard volumetric potassium hydroxide solution (4.2.2) used for the determination;

V_2 is the volume, in millilitres, of the standard volumetric potassium hydroxide solution (4.2.2) used for the blank test;

c is the concentration, in mol/l, of the potassium hydroxide solution (4.2.2);

m is the mass, in grams, of the test portion;

302,4 is the molecular mass of abietic acid;

1,042 is an experimentally determined factor to correct for the slight esterification of rosin acids;

0,1 is an experimentally determined factor to correct for unesterified acids.

If the two results (duplicates) differ by more than the value indicated in 4.7, repeat the procedure.

Calculate the mean of two valid results (replicates) and report the result to one decimal place.

4.7 Repeatability

The value below which the absolute difference between two single test results, each the mean of duplicates, obtained on identical material by one operator in one laboratory within a short interval of time using the standardized test method, may be expected to lie with a 95% probability is 0,2% (*m/m*).

5 Test report

The test report shall contain at least the following information:

a) all details necessary for the identification of the product tested;
b) a reference to this International Standard (ISO 8623);
c) the results of the tests and whether or not the product complies with the relevant specification limits;
d) any unusual features noted during the determination;
e) any deviation from the test methods specified or regarded as optional;
f) the date of the tests.

Annex A
(informative)

Bibliography

[1] ISO 5508:1990, Animal and vegetable fats and oils - Analysis by gas-liquid chromatography of methyl esters of fatty acids.

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Descriptors: paints, varnishes, binders (materials), oils, vegetable oils, fatty acids, classification, specifications, tests.

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