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Second edition
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Binders for paints and varnishes — Amino resins — General methods of test

Liants pour peintures et vernis — Résines aminoplastes — Méthodes générales d'essai

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 35, *Paints and varnishes* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 139, *Paints and varnishes*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 11908:1996), which has been technically revised.

The main changes are as follows:

— CAS registry numbers have been added to the reagents used;

— the normative references have been updated.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Binders for paints and varnishes — Amino resins — General methods of test

1 Scope

This document specifies general test methods for amino resins and solutions of amino resins intended for use as binders in paints, varnishes and related products.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1523, *Determination of flash point — Closed cup equilibrium method*

ISO 2114, *Plastics (polyester resins) and paints and varnishes (binders) — Determination of partial acid value and total acid value*

ISO 2811-1, *Paints and varnishes — Determination of density — Part 1: Pycnometer method*

ISO 3219 (all parts), *Rheology*

ISO 3251, *Paints, varnishes and plastics — Determination of non-volatile-matter content*

ISO 3679, *Determination of flash point – Method for flash no-flash and flash point by small scale closed cup tester*

ISO 4630, *Clear liquids — Estimation of colour by the Gardner colour scale*

ISO 6271, *Clear liquids — Estimation of colour by the platinum-cobalt colour scale*

ISO 11402:2004, *Phenolic, amino and condensation resins — Determination of free-formaldehyde content*

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.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
amino resin
synthetic resin resulting from the condensation of urea or melamine or derivatives such as benzoguanamine with formaldehyde

Note 1 to entry: These resins are often etherified with alcohols.

[SOURCE: ISO 4618:2023, 3.12]

4 Properties and test methods

Unless otherwise agreed, the properties measured and the test methods used shall be as given in Table 1.

Table 1 — Properties and test methods for amino resins

Property	Test method
Colour	ISO 6271 (Platinum-cobalt colour scale) or ISO 4630 (Gardner colour scale)
Viscosity	ISO 3219 (all parts)
Non-volatile matter [a]	ISO 3251
Flashpoint [a]	ISO 1523 or ISO 3679
Density	ISO 2811-1
Free-formaldehyde content	ISO 11402:2004, 4.3 (Sulfite procedure)
Compatibility with hydrocarbons (turbidity titration) [a]	Annex A
Acid value	ISO 2114
[a] For resin solutions only.	

Annex A
(normative)

Test for compatibility with hydrocarbons (turbidity titration)

A.1 Principle

The compatibility with hydrocarbons is tested by titration of the resin solution at a temperature of 20 °C to 25 °C with a mixture of heptane and toluene until the solution becomes turbid.

A.2 Reagents

A.2.1 Heptane/toluene mixture, composed of 80 parts by volume of analytical-grade heptane (CAS Registry Number®[1)] 142-82-5) and 20 parts by volume of analytical-grade toluene (CAS Registry Number 108-88-3).

A.3 Apparatus

Use ordinary laboratory apparatus and glassware.

A.4 Sampling

Take a representative sample of the product to be tested, as described in ISO 15528.

A.5 Procedure

Weigh, to the nearest 0,01 g, about 2 g of the resin solution into a 50 ml conical flask. Titrate the solution with the mixture of heptane and toluene (A.2.1) until a faint bluish haze, just off perfect clarity, occurs for the first time. Record the volume of the mixture required.

A.6 Expression of results

Calculate the compatibility characteristic, c, expressed in millilitres of heptane/toluene mixture per gram of resin solution, using the Formula (A.1):

$$c = \frac{V}{m} \tag{A.1}$$

where

V is the volume, in millilitres, of heptane/ toluene mixture used;

m is the mass, in grams, of resin solution taken.

1) CAS Registry Number® is a trademark of the American Chemical Society (ACS). This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of the product named. Equivalent products may be used if they can be shown to lead to the same results.

A.7 Precision

A.7.1 Repeatability limit, *r*

The value below which the absolute difference between two 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 5 %.

A.7.2 Reproducibility limit, *R*

The value below which the absolute difference between two test results, each the mean of duplicates, obtained on identical material by operators in different laboratories using the standardized test method, may be expected to lie, with a 95 % probability, is 10 %.

A.8 Test report

The test report shall contain at least the following information:

a) all details necessary to identify the product tested;

b) a reference to this document, i.e. ISO 11908:2025;

c) the result of the test, as indicated in A.6;

d) any deviation from the test method specified;

e) any unusual features (anomalies) observed during the test;

f) the date of the test.