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

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

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Foreword

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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 third edition cancels and replaces the second edition (ISO 11909:2007), which has been technically revised.

The main changes are as follows:

— in A.5, potentiometric titration has been introduced as a general alternative to titration using a colour indicator, not only in the case of highly coloured resins;

— CAS-numbers have been added to the reagents;

— the normative references have been updated.

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

1 Scope

This document provides general test methods for polyisocyanate resins and solutions of polyisocyanate 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 648, *Laboratory glassware — Single-volume pipettes*

ISO 1523, *Determination of flash point — Closed cup equilibrium method*

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

ISO 2811-2, *Paints and varnishes — Determination of density — Part 2: Immersed body (plummet) method*

ISO 2811-3, *Paints and varnishes — Determination of density — Part 3: Oscillation method*

ISO 2811-4, *Paints and varnishes — Determination of density — Part 4: Pressure cup method*

ISO 3219-2, *Rheology — Part 2: General principles of rotational and oscillatory rheometry*

ISO 3219-3, *Rheology — Part 3: Test procedure and examples for the evaluation of results when using rotational and oscillatory rheometry*

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

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 10283, *Binders for paints and varnishes — Determination of monomeric diisocyanates in isocyanate resins*

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/

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3.1
polyisocyanate resin
synthetic resin, containing free or blocked isocyanate groups, based on aromatic, aliphatic or cycloaliphatic isocyanates

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

Property	Test method
Colour	ISO 6271 or ISO 4630, depending on the intensity of the colour
Viscosity	ISO 3219-2 and ISO 3219-3
Non-volatile matter	ISO 3251, in accordance with the test conditions listed in Table 2
Flashpoint	ISO 1523 or ISO 3679
Density	ISO 2811-1, ISO 2811-2, ISO 2811-3 or ISO 2811-4
Isocyanate content	Annex A
Monomeric diisocyanate content	ISO 10283

Table 2 gives the test conditions for the determination of non-volatile matter content in accordance with ISO 3251.

Table 2 — Test conditions for the determination of non-volatile matter content

Resin basis	Period of heating h	Test temperature[a] °C
HDI biuret	1	80
HDI cyanurate	1	105
TDI and MDI polyisocyanates, adducts and prepolymers	1	125
IPDI polyisocyanates	1	150

Key
HDI = Hexamethylene diisocyanate
TDI = Toluene diisocyanate
MDI = Diphenyl-4-methane-4,4-diisocyanate
IPDI = Isophorone diisocyanate
[a] For binders dissolved in highly volatile solvents, a lower temperature may be used.

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