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Paints and varnishes — Wettability —

Part 4: Determination of the polar and dispersive fractions of the surface tension of liquids from an interfacial tension

Peintures et vernis — Mouillabilité —

Partie 4: Détermination des fractions polaire et dispersive de la tension superficielle des liquides à partir d'une tension interfaciale

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Foreword

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This document was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*, Subcommittee SC 9, *General test methods for 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 19403-4:2017), which has been technically revised.

The main changes are as follows:

— in 5.3, the requirement on the wall thickness of the optical cell has been reduced to 2 mm;

— in 5.4, the requirement for the reference liquids has been changed from colourless to transparent;

— the normative references have been updated.

A list of all parts in the ISO 19403 series can be found on the ISO website.

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.

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Paints and varnishes — Wettability —

Part 4: Determination of the polar and dispersive fractions of the surface tension of liquids from an interfacial tension

1 Scope

This document specifies a test method to determine the polar and dispersive fractions of the surface tension of liquids from an interfacial tension with optical methods. The method can be applied for the characterization of liquid coating materials, especially if drying effects occur during alternative measurement. If applied to liquids with non-Newtonian flow behaviour (see ISO 3219-1:2021, 3.22), restrictions can apply.

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 1409, *Plastics/rubber — Polymer dispersions and rubber latices (natural and synthetic) — Determination of surface tension*

ISO 4618, *Paints and varnishes — Vocabulary*

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

ISO 19403-1, *Paints and varnishes — Wettability — Part 1: Vocabulary and general principles*

ISO 19403-3, *Paints and varnishes — Wettability — Part 3: Determination of the surface tension of liquids using the pendant drop method*

EN 14370, *Surface active agents — Determination of surface tension*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4618 and ISO 19403-1 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/

4 Principle

One drop of the respective liquid to be tested, hanging from or ascending from a needle, is reproduced within an optical cell, which is completely filled with a reference liquid. The reproduced drop shall deviate significantly from the spherical shape due to the difference in density compared to the reference liquid. The interfacial tension is calculated from the shape of the reproduced pendant or ascending drop according to the Young-Laplace equation (see ISO 19403-1:2022, 3.2.2). The polar and dispersive fraction of the surface

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