BS EN ISO 19403-2:2024

BSI Standards Publication

Paints and varnishes — Wettability

Part 2: Determination of the surface free energy of solid surfaces by measuring the contact angle

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Full document details: BS EN ISO 19403-2:2024

National foreword

This British Standard is the UK implementation of EN ISO 19403-2:2024. It is identical to ISO 19403-2:2024. It supersedes BS EN ISO 19403-2:2020, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee STI/10, Test methods for paints.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Published by BSI Standards Limited 2024

ISBN 978 0 539 27505 6

ICS 01.040.87; 01.040.87; 87.040; 87.040

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 September 2024.

Amendments/corrigenda issued since publication

Date	Text affected

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 19403-2

September 2024

ICS 87.040

Supersedes EN ISO 19403-2:2020

English Version

Paints and varnishes - Wettability - Part 2: Determination of the surface free energy of solid surfaces by measuring the contact angle (ISO 19403-2:2024)

Peintures et vernis - Mouillabilité - Partie 2: Détermination de l'énergie libre de surface des surfaces solides par la mesure de l'angle de contact (ISO 19403-2:2024)

Beschichtungsstoffe - Benetzbarkeit - Teil 2: Bestimmung der freien Oberflächenenergie fester Oberflächen durch Messung des Kontaktwinkels (ISO 19403-2:2024)

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European foreword

This document (EN ISO 19403-2:2024) has been prepared by Technical Committee ISO/TC 35 "Paints and varnishes" in collaboration with Technical Committee CEN/TC 139 “Paints and varnishes” the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2025, and conflicting national standards shall be withdrawn at the latest by March 2025.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

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The text of ISO 19403-2:2024 has been approved by CEN as EN ISO 19403-2:2024 without any modification.

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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.

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*, 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 19403-2:2017), which has been technically revised.

The main changes are as follows:

— the minimum size of the text samples has been changed to 4 cm × 4 cm;

— definition 3.1 on “recently advanced contact angle” has been added;

— the use of ethylene glycol as test liquid has been deleted;

— in 7.2.1, the information on the camera tilt angle has been added;

— the normative references have been updated.

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

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Paints and varnishes — Wettability —

Part 2: Determination of the surface free energy of solid surfaces by measuring the contact angle

1 Scope

This document specifies a test method to measure the contact angle for the determination of the surface free energy of a solid surface. The method can be applied for the characterization of substrates and coatings.

NOTE 1 For the determination of the surface free energy of polymers and coatings, it is preferred to use either the method according to Owens, Wendt, Rabel and Kaelble [3],[4],[5] or the method according to Wu.

NOTE 2 The morphological and chemical homogeneity have an influence on the measuring results. The procedures indicated in this document are based on the state-of-the-art employing the drop projection method in penumbral shadow. Other methods are not excluded.

Measuring the contact angle on powders is not part of this document.

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 4618, *Paints and varnishes — Vocabulary*

ISO 19403-1:2022, *Paints and varnishes — Wettability — Part 1: Vocabulary and general principles*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4618, ISO 19403-1 and the following 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
recently advanced contact angle
contact angle of a droplet at rest after the three-phase contact line has advanced over a previously dry surface

Note 1 to entry: The recently advanced contact angle is thermodynamically not defined.

4 Principle

A minimum of three drops of at least two test liquids are dosed onto the flat surface of a test specimen. For every drop, the contact angle is measured. From the averaged contact angles of every liquid, their surface

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