



SLOVENSKI STANDARD
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Paints and varnishes - Wettability - Part 7: Measurement of the dynamic contact angles and the roll-off angle on a tilt stage (ISO/DIS 19403-7:2023)

Beschichtungsstoffe - Benetzbarkeit - Teil 7: Messung der dynamischen Kontaktwinkel und des Abrollwinkels auf einem Neigetisch (ISO/DIS 19403-7:2023)

Peintures et vernis - Mouillabilité - Partie 7: Mesurage des angles de contact dynamiques et de l'angle de roulement sur un plan incliné (ISO/DIS 19403-7:2023)

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ICS:

87.040

Barve in laki

Paints and varnishes

oSIST prEN ISO 19403-7:2023

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Paints and varnishes — Wettability —

Part 7:

Measurement of the dynamic contact angles and the roll-off angle on a tilt stage

ICS: 87.040

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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 documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

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 19403-7:2017), which has been technically revised.

The main changes are as follows:

- the term 3.2 “advancing angle” has been amended by “advancing contact angle” and the definition has been reworded;
- the term 3.3 “receding angle” has been amended by “receding contact angle” and the definition has been reworded;
- the minimum size of the text samples has been changed to 4 cm × 4 cm;
- the text has been editorially revised and 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.

Introduction

Dynamic contact angles describe the processes on the interface liquid/solid during volume increase (advancing contact angle) or volume decrease (receding contact angle) of a drop in horizontal position. As an alternative to the static method (see ISO 19403-2), for the advancing contact angle always a surface area is wetted, which was previously unwetted. For the receding contact angle, the contact angle during dewetting is observed. From the difference between advancing contact angle and receding contact angle, information on chemical homogeneity and roughness can be concluded. The receding contact angle is not suitable for the determination of the surface energy.

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Paints and varnishes — Wettability —

Part 7:

Measurement of the dynamic contact angles and the roll-off angle on a tilt stage

1 Scope

This document specifies a method for the dynamic measurement of the roll-off angle of a liquid drop on a solid surface. From the dynamic measurement, the advancing and receding contact angles of the drop rolling off can also be determined. The roll-off angle plays a role when evaluating, for example, easy-to-clean or anti-adherent surfaces.

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, *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 and 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 roll-off angle

α_s

tipping of the surface of the solid body, due to which a liquid drop put down onto this surface rolls off

3.2 advancing contact angle

advancing angle

θ_a

contact angle measured at the three-phase line during advancing the liquid phase

[SOURCE: ISO 19403-6:—, 3.2]

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3.3

advancing contact angle

advancing angle

θ_a

contact angle measured at the three-phase line during advancing the liquid phase

[SOURCE: ISO 19403-6:—, 3.3]

4 Principle

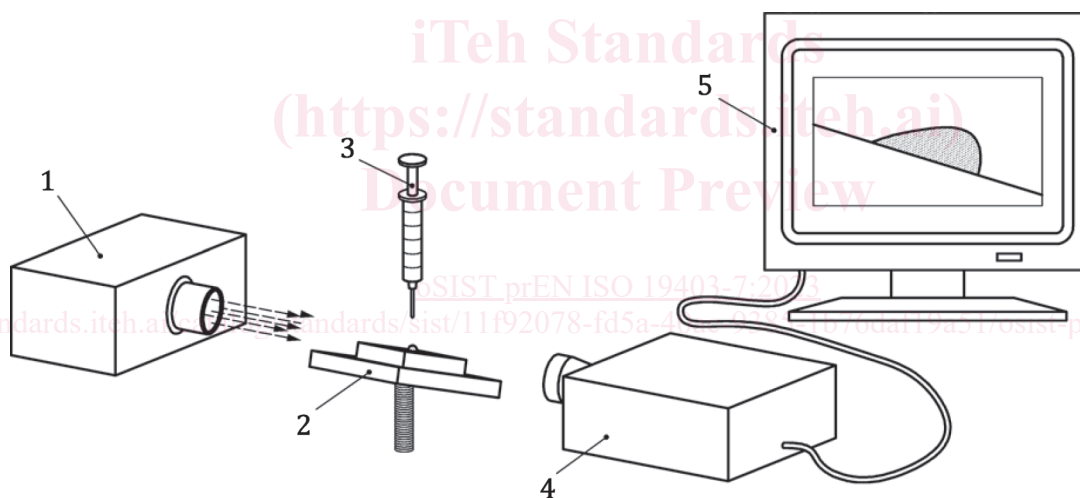
A drop is put down onto the surface to be tested. The surface is tipped with constant inclination speed until the drop rolls off. The advancing and receding contact angles are determined from the time curve of the left and right three-phase point.

5 Apparatus and materials

Ordinary laboratory apparatus, together with the following.

5.1 Contact angle measuring system.

Any state-of-the-art contact angle measuring device fitted with a tilting device, preferably systems with digital image capture and analysis for measuring the contact angle. [Figure 1](#) shows a schematic example of a contact angle measuring system for which only the sample table is inclined. [Figure 2](#) shows a system for which the camera as well as the sample table are inclined.



Key

- 1 light source
- 2 specimen holder
- 3 graduated microsyringe
- 4 optical system
- 5 screen

Figure 1 — Schematic diagram of a contact angle measuring system for which only the sample table is inclined