

Paints and varnishes - Evaluation of properties of coating systems related to the spray application process - Part 1: Vocabulary and preparation of test panels (ISO 28199-1:2021)

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 28199-1:2021 sisaldab Euroopa standardi EN ISO 28199-1:2021 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 28199-1:2021 consists of the English text of the European standard EN ISO 28199-1:2021.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
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EUROPEAN STANDARD

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**Paints and varnishes - Evaluation of properties of coating systems related to the spray application process - Part 1: Vocabulary and preparation of test panels (ISO 28199-1:2021)**

Peintures et vernis - Évaluation des propriétés des systèmes de revêtement liées au mode d'application par pulvérisation - Partie 1: Vocabulaire et préparation des panneaux d'essai (ISO 28199-1:2021)

Beschichtungsstoffe - Beurteilung spritzapplikationsbedingter Eigenschaften von Beschichtungssystemen - Teil 1: Begriffe und Vorbereitung der Probenplatten (ISO 28199-1:2021)

This European Standard was approved by CEN on 10 March 2021.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

## European foreword

This document (EN ISO 28199-1:2021) 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 October 2021, and conflicting national standards shall be withdrawn at the latest by October 2021.

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.

This document supersedes EN ISO 28199-1:2009.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Endorsement notice

The text of ISO 28199-1:2021 has been approved by CEN as EN ISO 28199-1:2021 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 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](http://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](http://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](http://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 28199-1:2009), which has been technically revised. It also incorporates the Technical Corrigendum ISO 28199-1:2009/Cor.1: 2009.

The main changes to the previous edition are as follows:

- the terms "minimum film-build", "locally related measurements" and "locally unrelated measurements" have been deleted;
- the terms "bubble formation limit" and "cratering" have been moved to ISO 28199-3;
- the terms "measurement pattern" and "dynamic spray pattern" have been added;
- the distinction between long-wavelength and short-wavelength ranges for the surface texture (3.13) has been deleted;
- the descriptions of the automatic painting machine (5.1) and the device for automatic positioning of measuring devices (5.2) have been revised;
- the description of the film thickness wedge (8.4) has been revised;
- the measurement pattern for colour measurement (9.4.3) has been adapted in line with the measurement pattern for texture measurement (9.4.4) for version A of the samples;
- the measurements of mottling (9.4.5) and gloss (9.4.6) have been added;
- examples of applications with high-speed rotation have been added as new Figure 2 and in Annex A;
- the normative references have been updated;

— the text has been editorially revised.

A list of all parts in the ISO 28199 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](http://www.iso.org/members.html).

## Introduction

In many areas (e.g. car manufacture, industrial coatings, coatings for plastics) the coating materials used are adapted to the specific application equipment and settings of the particular user. A coating material is, therefore, to be understood as a semi-manufactured product that only achieves its final form in combination with the specific application conditions. The adaptation to the application conditions is therefore decisive for the quality of the coated product.

The test methods specified in ISO 28199 are based on studies by a working group of the European Council for Automotive R&D (EUCAR).

They may be used for evaluation of coating materials in research, development and production with regard to their suitability and safety for industrial processes, and error analysis. The properties to be evaluated for coating materials and coatings depend on the film thickness, so a coating system of increasing or constant thickness is applied to one or more test panels under defined conditions depending on the surface properties to be tested.

The following characteristics are measured (in this document):

- film thickness in accordance with ISO 2808;
- surface texture;
- colour in accordance with ISO 18314-1;
- mottling;
- gloss in accordance with ISO 2813.

In combination with visual assessment, the following properties are determined:

- Colour stability or colour evaluation, process hiding power, redissolving, overspray absorption, wetting, surface texture and mottling (ISO 28199-2). The surface texture can be measured both independently of the film thickness and at constant film thickness. Mottling is preferably measured at constant film thickness.
- Tendency to sagging, formation of bubbles, pinholing and hiding power (see ISO 28199-3).

# Paints and varnishes — Evaluation of properties of coating systems related to the spray application process —

## Part 1:

## Vocabulary and preparation of test panels

### 1 Scope

This document defines terms relating to the evaluation of coating materials in research, development and production with regard to their suitability and safety for industrial processes and error analysis.

This document also specifies methods for the preparation of test panels and the subsequent measurement of film thickness, colour, surface texture and other measurable surface properties.

### 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 1513, *Paints and varnishes — Examination and preparation of test samples*

ISO 2808, *Paints and varnishes — Determination of film thickness*

ISO 3270, *Paints and varnishes and their raw materials — Temperatures and humidities for conditioning and testing*

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

ISO 18314-1, *Analytical colorimetry — Part 1: Practical colour measurement*

ISO 28199-2, *Paints and varnishes — Evaluation of properties of coating systems related to the spray application process — Part 2: Colour stability, process hiding power, re-dissolving, overspray absorption, wetting, surface texture and mottling*

ISO 28199-3, *Paints and varnishes — Evaluation of properties of coating systems related to the spray application process — Part 3: Visual assessment of sagging, formation of bubbles, pinholing and hiding power*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>