
**Barve in laki - Vrednotenje lastnosti premaznih sistemov pri nanašanju - 1. del:
Slovar in priprava preskusnih plošč (ISO/DIS 28199-1:2020)**

Paints and varnishes - Evaluation of properties of coating systems related to the application process - Part 1: Relevant vocabulary and preparation of test panels (ISO/DIS 28199-1:2020)

Beschichtungsstoffe - Beurteilung applikationsbedingter Eigenschaften von Beschichtungssystemen - Teil 1: Begriffe und Vorbereitung der Probenplatten (ISO/DIS 28199-1:2020)

Peintures et vernis - Évaluation des propriétés des systèmes de revêtement liées au mode d'application - Partie 1: Vocabulaire pertinent et préparation des panneaux d'essai (ISO/DIS 28199-1:2020)

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ICS:

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

Part 1: Relevant vocabulary and preparation of test panels

*Peintures et vernis — Évaluation des propriétés des systèmes de revêtement liées au mode d'application —
Partie 1: Vocabulaire pertinent et préparation des panneaux d'essai*

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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).

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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*.

This second edition cancels and replaces the first edition (ISO 28199-1:2009), which has been technically revised.

The main changes compared to the previous edition are as follows:

- the terms locally related measurements and locally unrelated measurements have been deleted;
- the terms measurement pattern (3.5) and dynamic spray pattern (3.15) have been added;
- the distinction between long-wavelength and short-wavelength ranges for the surface texture (3.16) 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 measurement of mottling (9.4.5) and gloss (9.4.6) has 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.

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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 part of ISO 28199):

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

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

- colour stability/colour evaluation, process hiding power, re-dissolving, 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 (ISO 28199-3).

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

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

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

ISO 28199-2, *Paints and varnishes — Evaluation of properties of coating systems related to the 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 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 given in ISO 4618 and the following 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/>

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3.1 bubble

closed or already burst blister in a layer, arising when solvents or cleavage products evaporate from chemical crosslinking

Note 1 to entry: If bubbles are caused by the process control and/or the formulation components, the viscosity of the paint film has increased too rapidly during the drying phase so that solvents/reaction products still in the paint film have built up at the polymer paint skin which forms, usually resulting in closed blisters and sometimes resulting in burst blisters. Discontinuities can be identified in more detail using a cross-section.

3.2 bubble formation limit

start of a number agreed between the interested parties of bubbles in a measurement field

Note 1 to entry: A single bubble does not define the bubble formation limit. Bubbles at the edge of the measuring area and in the perforated area of the panel (see [Figure 3](#)) should not be taken into account.

3.3 colour stability

non-variability, or variability within agreed tolerances, of colour despite variation of influencing factors

Note 1 to entry: Examples of influencing factors are thickness and application method.

3.4 cratering

formation in a film or coating of small circular depressions that persist after drying/curing

Note 1 to entry: Craters can extend into deeper layers of a coating or into the substrate.

Note 2 to entry: Cratering is caused by limited irregularities in the surface tension of the coating. Contamination of the substrate or coating with incompatible materials such as small oil drops or particles are the most frequent causes.

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[SOURCE: ISO 4618:2014, 2.66]

3.5 measurement pattern

distance between individual measurements on the test panel in the dx and dy directions

3.6 minimum film-build

lowest thickness at which a coating material forms a continuous film on a substrate

3.7 mottling

non-uniform appearance of a film caused by presence of irregularly shaped, randomly distributed areas on the surface that vary in colour and/or gloss

[SOURCE: ISO 4618:2014; 2.160]

3.8 overspray absorption

ability of a coating material already applied to absorb overspray particles of the same coating material resulting from a subsequent application

Note 1 to entry: Evidence of poor overspray absorption is shown, for example, by raised surface texture and low colour stability as well as mottling.

3.9 pinholing

presence of small holes in a film or coating resembling those made by a pin

Note 1 to entry: Pinholes can be caused by gas inclusions in the base coat that reveal a discontinuity after the application of the clear coating material. They are often the result of inappropriate process parameters. Pinholes are similar to craters and bubbles. Discontinuities can be identified in more detail using a cross-section.

[SOURCE: ISO 4618:2014; 2.195 modified: note added]

3.10 pinholing limit

start of a number agreed between the contractual parties of pinholes in a measurement field

Note 1 to entry: A single pinhole does not define the pinholing limit. Pinholes at the edge of the measuring area and in the perforated area of the panel (see [Figure 3](#)) are not taken into account.

3.11 process hiding power

minimum thickness above which the complete coating system in combination with the colour of the complete substrate achieves colour stability or the colour location achieves a value agreed by the contractual partners

Note 1 to entry: See also “hiding power”, defined in ISO 4618:2014, 2.138 as “ability of a coating material or a coating to obliterate the colour or the differences in colour of a substrate”.

3.12 re-dissolving

mutual effects between an already applied coating material and a subsequently applied coating material where components of the subsequently applied coating interact with the already applied coating

Note 1 to entry: The interaction can be recognizable by a change in colour, for example.

3.13 sagging

downward movement of a coating material during application and/or during drying/curing in a vertical or an inclined position that results in irregularities in the dry coat

[SOURCE: ISO 4618:2014; 2.221]

3.14 static spray pattern

distribution of the coating material after spray application using defined parameters, with both coated object and spray application system at rest See [Figure 1](#) for an example.

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