SLOVENSKI STANDARD
oSIST prEN ISO 22553-6:2020

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Barve in laki - Nanašanje premazov z elektrodepozicijo - 6. del: Potopni markerji (ISO 22553-6:2019)

Paints and varnishes - Electro-deposition coatings - Part 6: Entry marks (ISO 22553-6:2019)

Beschichtungsstoffe - Elektrotauchlacke - Teil 6: Eintauchmarkierungen (ISO 22553-6:2019)

Peintures et vernis - Peintures d'électrodéposition - Partie 6: Repères d'immersion (ISO 22553-6:2019)

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Paints and varnishes — Electro-deposition coatings —

Part 6: Entry marks

Peintures et vernis — Peintures d'électrodéposition —
Partie 6: Repères d'immersion

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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*.

A list of all parts in the ISO 22553 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.

Paints and varnishes — Electro-deposition coatings —

Part 6:
Entry marks

1 Scope

This document specifies a method for identifying entry marks, which can occur during electro-deposition coating. Entry marks can often occur in the form of streaks when the workpiece, either set as cathode or anode, is immersed in the electro-deposition tank under applied electric potential (relation of voltage and current). These marks occur parallel to the bath surface on the objects to be coated.

It is applicable to electro-deposition coatings for automotive industries and other general industrial applications, e.g. chiller units, consumer products, radiators, aerospace, agriculture.

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 1514, *Paints and varnishes — Standard panels for testing*

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

ISO 4618, *Paints and varnishes — Terms and definitions*

ISO 22553-1, *Paints and varnishes — Electro-deposition coatings — Part 1: Vocabulary*

ISO 23321, *Solvents for paints and varnishes — Demineralized water for industrial applications — Specification and test methods*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4618, ISO 22553-1 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/

3.1
breakaway voltage
electric potential, from which the deposition of the electro-deposition coating material ceases to be continuous any longer though, for instance, significant variations of the film thickness, gas formation or heat development occur

Note 1 to entry: The breakaway voltage can only be experimentally determined by means of an electromotive series.

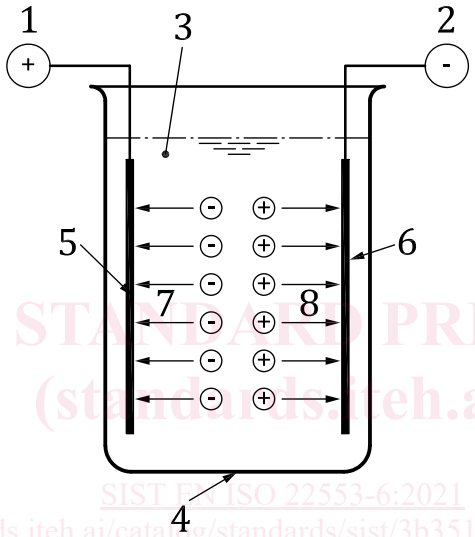
4 Principle

The test panel is wetted with demineralized water on one half of the side which is facing the counter electrode. It is immediately vertically mounted to the immersion unit and contacted with the voltage source. Then the test panel is immediately immersed under the specified deposition conditions in the e-coat material and it is coated.

5 Apparatus and materials

Ordinary laboratory apparatus, together with the following.

5.1 Laboratory deposition system, consisting of a deposition tank with tank recirculation and DC voltage equipment, see Figure 1.



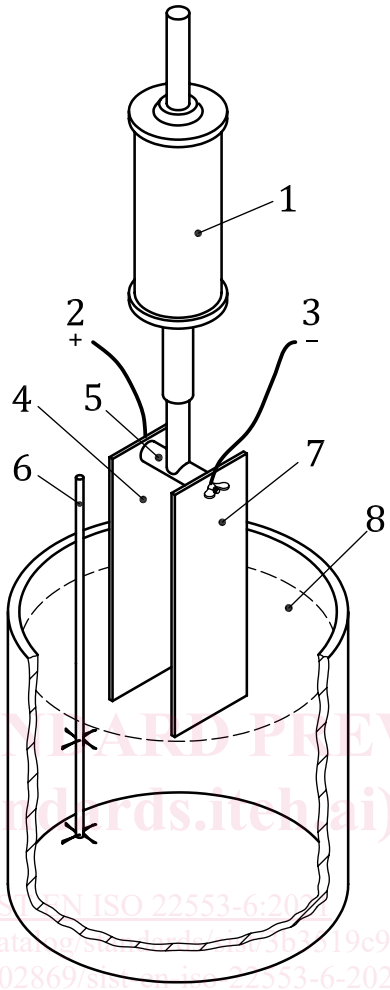
Key

1	anode	5	anode (counter electrode for cathodic e-coat)
2	cathode	6	cathode (test panel for cathodic e-coat)
3	electro-deposition coating material	7	acid
4	deposition tank	8	electro-deposition coating material

Figure 1 — Schematic diagram of a laboratory deposition system with cathodic e-coat material as an example

The container of the deposition system is filled with the electro-deposition coating material and the tank circulation (stirrer or pump) is initiated. Subsequently, the test panels are immersed in the container. The deposition conditions are adjusted according to the specification and the deposition process is initiated. Upon completion of the deposition process, remove the test panels from the container and thoroughly rinse using demineralized water as specified in ISO 23321, so that any excess of the electro-deposition coating material (cream coat) is removed.

5.2 Conveyor unit, with controllable conveying speed (for an example, see Figure 2).



Key

1	conveyer unit	5	electrically isolating joint
2	positive pole	6	stirrer
3	negative pole	7	test panel (for cathodic e-coating)
4	counter electrode (for cathodic e-coating)	8	EDC tank

Figure 2 — Example of a laboratory deposition system with conveyor unit

5.3 Film thickness measuring device, with a maximum permissible error of 0,1 µm.

5.4 Thermometer, with a reading accuracy of 0,1 °C.

5.5 Oven, in which the test can be carried out reliably and where the specified or agreed test temperature can be held to within ±2 °C (for temperatures up to 150 °C) or ±3,5 °C (for temperatures between 150 °C and 200 °C).

5.6 Demineralized water, in accordance with ISO 23321.

6 Test panels

Use electrically conductive test panels with pretreatment as specified in ISO 1514 and with dimensions of approximately 190 mm × 105 mm × 0,75 mm.

7 Number of determinations

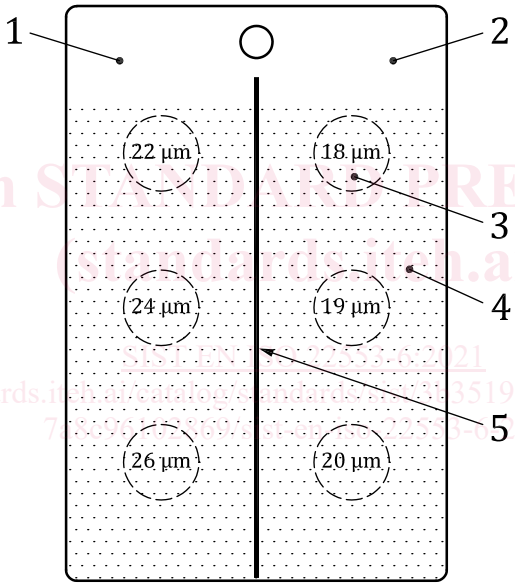
Carry out the determination in duplicate.

8 Procedure

Fill the tank with the electro-deposition coating material up to about 1 cm below the edge and homogenize the coating material, e.g. using a stirring machine with a paddle stirrer (diameter min. 50 mm) at 500 min^{-1}, so that sufficient tank circulation is visually detectable.

Put the test panel in the laboratory deposition system (5.1) and connect the anode and cathode to the current source. Maintain stirring the electro-deposition coating material with a stirring machine or a magnet stirrer.

Divide the test panel into a left and right half using, for example, a marker or a scribing iron. No tape or anything similar may be used for dividing, since adhesive or other foreign substances could be introduced into the tank. Wet the right side using demineralized water (5.6) in accordance with ISO 23321 (see Figure 3).



Key

1	unwetted side of the test panel	4	coating
2	wetted side of the test panel	5	division
3	measuring point for film thickness measurement		

Figure 3 — Test panel

Adjust the laboratory deposition system (5.1) and the conveyor unit (5.2) to the values given in Table 1.