



SLOVENSKI STANDARD
SIST EN 13523-1:2002
01-september-2002

Coil coated metals - Test methods - Part 1: Coating thickness

Bandbeschichtete Metalle - Prüfverfahren - Teil 1: Schichtdicke

Tôles prélaquées - Méthodes d'essai - Partie 1: Epaisseur du revêtement

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Ta slovenski standard je istoveten z: EN 13523-1:2001

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ICS:

17.040.20	Lastnosti površin	Properties of surfaces
25.220.60	Organske prevleke	Organic coatings

SIST EN 13523-1:2002

en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 13523-1

January 2001

ICS 17.040.20; 25.220.60

English version

Coil coated metals - Test methods - Part 1: Coating thickness

Tôles prélaquées - Méthodes d'essai - Partie 1: Epaisseur
du revêtement

Bandbeschichtete Metalle - Prüfverfahren - Teil 1:
Schichtdicke

This European Standard was approved by CEN on 30 December 2000.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Foreword

This European Standard has been prepared by 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of an identical text or by endorsement, at the latest by July 2001, and conflicting national standards shall be withdrawn at the latest by July 2001.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This Part of EN 13523 specifies the procedures for determining the thickness of an organic coating on a metallic substrate, using electrical measuring devices.

Two appropriate methods are given in this Part of EN 13523:

- a) thickness measurement on magnetic substrate, for example cold rolled steel and metallic coated steel;
- b) thickness measurement on non-magnetic substrate, for example aluminium and its alloys.

The methods are applicable only to products with smooth and flat substrates but the coating itself may be textured. In that case, the average of a series of readings will represent an average of the thickness of the organic coating.

The methods are not applicable for coating thicknesses less than 3 μm .

2 Normative references

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 13523-0:2001

Coil coated metals – Test methods – Part 0: General introduction and list of test methods

EN 23270:1991

Paints and varnishes and their raw materials – Temperatures and humidities for conditioning and testing (ISO 3270:1984)

3 Terms and definitions

For the purposes of EN 13523-1:2001, the terms and definitions given in EN 13523-0:2001 as well as the following terms and definitions apply:

3.1 coating thickness

total thickness of the organic coating on either side.

3.2 measurement area

probe area or the area influencing the reading.

4 Principle

4.1 Measurement on a magnetic substrate

The coating thickness on a magnetic substrate is determined by means of an electrical probe placed on the coating and developing an electromagnetic field between it and the substrate. The potential variation of this field is a function of the distance between the probe and the substrate. This signal is measured and converted to the coating thickness reading.

4.2 Measurement on a non-magnetic substrate

The coating thickness on a non-magnetic substrate is determined by means of an electrical probe placed on the coating and generating eddy currents in the substrate. The amplitude and phase shift is a function of the distance between the probe and the substrate. This signal is measured and converted to the coating thickness reading.

5 Apparatus and materials

5.1 Instruments for measuring coating thickness, using the principles described in clause 4 and commercially available.

For metallic coated steel only:

5.2 Suitable solvent, for removing organic coatings, for example methyl ethyl ketone (2-butanone)

5.3 Suitable abrasive and/or blunt knife, or other means of removing softened organic coatings which do not damage the substrate.

6 Sampling

See EN 13523-0:2001.

7 Test panels

See EN 13523-0:2001.

8 Procedure

8.1 Calibration

8.1.1 General

For the measurement the instructions of the manufacturer of the instrument shall be taken into account, in particular regarding the calibration and/or setting up procedure.

Before use, calibrate each instrument in accordance with the manufacturer's instructions using suitable calibration standards. For instruments which cannot be calibrated, determine the deviation from the nominal value by comparison with calibration standards and take this into consideration for all measurements.

During use, check the calibration of the instrument at frequent intervals.

8.1.2 Calibration standards

Calibration standards of known and uniform thickness are available either as foils or shims, or as coated standards with assigned values traceable to nationally recognized standards.

Calibration foils are generally made of suitable plastic materials. They are subject to indentation and shall, therefore, be replaced frequently.

The surface and magnetic properties of the metallic substrate of the coated calibration standards shall be similar to those of the test specimen.

The thickness of the substrate of the test panel and of the calibration standards, where differing, shall be above the critical thickness of the instrument used.

NOTE: For each instrument, there is a critical thickness of metallic substrate above which instruments will not be affected by an increase in thickness.

8.2 Scale rating

If necessary, select the scale with a maximum above the estimated thickness of the coating and adjust the instrument to the thickness of a well defined non-metallic standard measured on the reference plate. The readings at several positions shall not vary more than $\pm 5\%$. The thickness of the standard shall be greater than half the measuring scale used.

8.3 Measurement

8.3.1 Ambient conditions

Measure the coating thickness at ambient temperature. For more accurate measurements, as required for instance in case of dispute, the temperature shall be $(23 \pm 2)^\circ\text{C}$ and the relative humidity $(50 \pm 5)\%$, in accordance with EN 23270 : 1991.

8.3.2 Substrates without metallic coatings

Place the probe on the coated panel and read the coating thickness on the standard scale. Take at least 3 measurements on smooth surfaces to be checked, and at least 10 measurements on textured coatings.

8.3.3 Steel with metallic and organic coating (removal of organic coating)

In the case of metallic coated steel, the electric probe cannot measure simultaneously the metallic and the organic coating. Therefore, determine first the total thickness of the metallic coating and organic coating and, after having removed the organic coating, measure the thickness of the metallic coating on the same place. The difference gives the thickness of the organic coating.

Remove the organic coating with a suitable solvent (5.2). After a contact of a suitable time, remove the softened organic coating by abrasive action using an abrasive and/or blunt knife (5.3). This stripping process shall not remove any metallic coating.

9 Expression of results

Express the results as the mean of the measurements taken, in micrometres.

10 Precision

The instrument, its calibration, and its operation shall be such that the coating thickness can be determined to within 10 % or $\pm 1,5 \mu\text{m}$ of its true thickness, whichever is greater.

11 Test report

The test report shall contain at least the following information:

- a) all details necessary to identify the product tested;
 - b) a reference to this Part of EN 13523 (EN 13523-1);
 - c) the results of the test, as indicated in clause 9;
 - d) any deviation from the test method specified;
 - e) the date of the test.
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EN 10169-1:1996

Continuously organic coated (coil coated) steel flat products – Part 1: General information (definitions, materials, tolerances, test methods)

ENV 10169-2:1999

Continuously organic coated (coil coated) steel flat products – Part 2: Products for building exterior applications

EN ISO 2808:1999

Paints and varnishes – Determination of film thickness (ISO 2808:1997)

ISO 2178:1982

Non-magnetic coatings on magnetic substrates – Measurement of coating thickness – Magnetic method

ISO 2360:1982

Non-conductive coatings on non-magnetic basis metals – Measurement of coating thickness – Eddy current method

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