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Prevlečene kovine, ki se navijajo - Preskusne metode - 25. del: Odpornost proti vlagi

Coil coated metals - Test methods - Part 25: Resistance to humidity

Bandbeschichtete Metalle - Prüfverfahren - Teil 25: Beständigkeit gegen Feuchte

Tôles prélaquées - Méthodes d'essai - Partie 25: Résistance à l'humidité

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ICS:

17.040.20	Lastnosti površin	Properties of surfaces
25.220.60	Organske prevleke	Organic coatings

SIST EN 13523-25:2022 **en,fr,de**

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English Version

Coil coated metals - Test methods - Part 25: Resistance to humidity

Tôles prélaquées - Méthodes d'essai - Partie 25 : Résistance à l'humidité

Bandbeschichtete Metalle - Prüfverfahren - Teil 25: Beständigkeit gegen Feuchte

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

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

Contents

Page

European foreword

This document (EN 13523-25:2022) 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of an identical text or by endorsement, at the latest by August 2022, and conflicting national standards shall be withdrawn at the latest by August 2022.

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 13523-25:2014.

The main changes are:

a) EN ISO 3696 has been added to 6.1 as reference for the deionised water;

b) a remark concerning the assessment of organic coated steel substrates having multiple metallic phases in zinc based coating has been added to Clause 10;

c) the list of the existing parts of EN 13523 has been updated;

d) the text has been editorially revised and the normative references have been updated.

The EN 13523 series, *Coil coated metals — Test methods*, consists of the following parts:

— *Part 0: General introduction*

— *Part 1: Film thickness*

— *Part 2: Gloss*

— *Part 3: Colour difference and metamerism — Instrumental comparison*

— *Part 4: Pencil hardness*

— *Part 5: Resistance to rapid deformation (impact test)*

— *Part 6: Adhesion after indentation (cupping test)*

— *Part 7: Resistance to cracking on bending (T-bend test)*

— *Part 8: Resistance to salt spray (fog)*

— *Part 9: Resistance to water immersion*

— *Part 10: Resistance to fluorescent UV radiation and water condensation*

— *Part 11: Resistance to solvents (rubbing test)*

— *Part 12: Resistance to scratching*

— *Part 13: Resistance to accelerated ageing by the use of heat*

— *Part 14: Chalking (Helmen method)*

— *Part 16: Resistance to abrasion*

— *Part 17: Adhesion of strippable films*

— *Part 18: Resistance to staining*

— *Part 19: Panel design and method of atmospheric exposure testing*

— *Part 20: Foam adhesion*

— *Part 21: Evaluation of outdoor exposed panels*

— *Part 22: Colour difference — Visual comparison*

— *Part 23: Resistance to humid atmospheres containing sulfur dioxide*

— *Part 24: Resistance to blocking and pressure marking*

— *Part 25: Resistance to humidity*

— *Part 26: Resistance to condensation of water*

— *Part 27: Resistance to humid poultice (Cataplasm test)*

— *Part 29: Resistance to environmental soiling (Dirt pick-up and striping)*

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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.

1 Scope

This document specifies a procedure for evaluating the resistance to humidity of an organic coating on a metallic substrate, by means of exposure in a humidity cabinet under controlled conditions.

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.

EN 13523-0, *Coil coated metals — Test methods — Part 0: General introduction*

EN ISO 3696:1995, *Water for analytical laboratory use — Specification and test methods (ISO 3696:1987)*

EN ISO 4628-2, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 2: Assessment of degree of blistering (ISO 4628-2)*

EN ISO 4628-3, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 3: Assessment of degree of rusting (ISO 4628-3)*

EN ISO 4628-4, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 4: Assessment of degree of cracking (ISO 4628-4)*

EN ISO 4628-5, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 5: Assessment of degree of flaking (ISO 4628-5)*

EN ISO 4628-8, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 8: Assessment of degree of delamination and corrosion around a scribe or other artificial defect (ISO 4628-8)*

EN ISO 4628-10, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 10: Assessment of degree of filiform corrosion (ISO 4628-10)*

EN ISO 17872, *Paints and varnishes — Guidelines for the introduction of scribe marks through coatings on metallic panels for corrosion testing (ISO 17872)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13523-0 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 https://www.electropedia.org/

4 Principle

The method consists of exposing a test panel to humidity, for a pre-determined time, at a specified temperature. The test panel is evaluated for any changes such as blistering or corrosion (e.g. red rust, white rust).

Both continuous and cyclic humidity tests can be carried out.

5 Apparatus

Ordinary laboratory apparatus and glassware, together with the following:

5.1 Humidity cabinet with air temperature control, capable of achieving relative humidity of approx. 100 % with condensation on the test panels. It should also ensure dry periods by adequate purging or allow for the cabinet door to be left open during the dry period.

5.2 Cutting tool, with a hard metal tip having a radius or width capable of exposing at least 0,2 mm of metal substrate, in accordance with EN ISO 17872.

6 Materials

6.1 Deionised water, having a conductivity not greater than 5 µS/cm at 25°C (0,5 mS/m at 25°C), as specified in EN ISO 3696:1995, Grade 3.

7 Sampling

Sampling shall be in accordance with EN 13523-0.

8 Test panels

Test panels shall be in accordance with EN 13523-0.

The test panels (usually 150 mm × 100 mm) shall be cut from flat material and free from contamination. The longer side shall be in the rolling direction.

If not otherwise specified, the edges are exposed and the reverse side is protected.

If not otherwise specified, the edges of exposed panels shall be sheared with the burrs away from the test surface.

9 Procedure

9.1 Preparation

Scribing or bending of test panels to evaluate blistering and corrosion phenomena at the scribes or at the bend is optional.

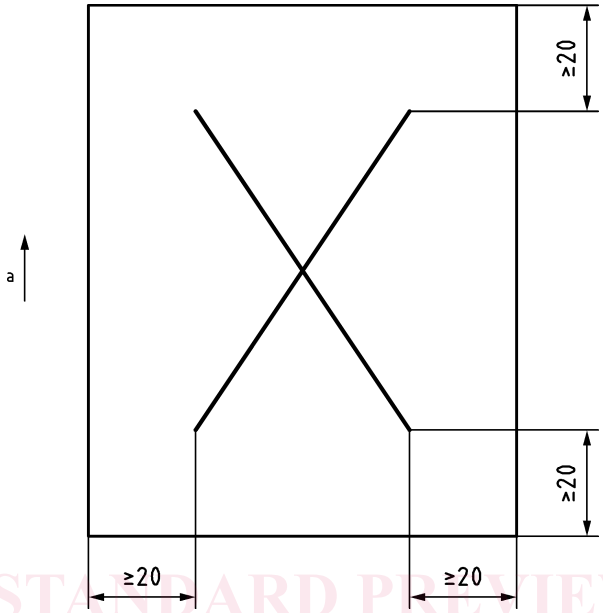
In case of scribing, the scribes shall be prepared by means of the cutting tool (5.2) and extend down just through the organic coating. The scribed indentation shall expose at least 0,2 mm of metal substrate. If the substrate is zinc- or zinc-alloy coated steel, the scribe shall be to the zinc coating, and not down to the steel.

Two configurations are possible, either:

— two scribes arranged diagonally, crossing each other in the middle of the panels and extending to about 20 mm from the edges (see Figure 1); or

— two scribes of equal length arranged at 90° to each other, the scribes being at least 40 mm in length with the vertical scribe central to the horizontal but separated by 20 mm. All scribes shall extend at least 20 mm from the edges (see Figure 2).

Dimensions in millimetres

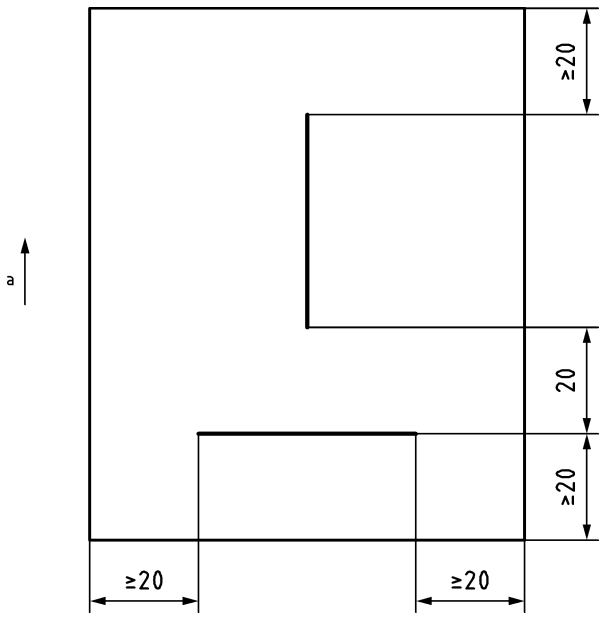


Key

a rolling direction

Figure 1 — Diagonal scribe marks on coated panels

Dimensions in millimetres



Key

a rolling direction

Figure 2 — Perpendicular scribe marks on coated panels

9.2 Exposure in humidity cabinet

Use deionised water (6.1) having a conductivity not greater than 5 µS/cm at 25°C (0,5 mS/m at 25°C) and maintain the quantity of the water throughout the test.

Expose the test panels in the humidity cabinet at an angle of between 15° and 25° to the vertical. If a different angle is used, it shall be stated in the test report.

The test panels may be exposed to different combinations of relative humidity (RH) and temperature (t) for a specified exposure time.

Table 1 summarizes some typical conditions (other conditions and cycles may be agreed).

Table 1 — Typical conditions for humidity testing

	Test duration	Conditions / Cycles
Continuous humidity test	500 h (21 days)	t = (40 ± 3) °C, RH approximately 100 % with condensation on the test panels
Cyclic humidity test, dry periods	500 h (21 days)	Each cycle consists of two periods: Period 1: 8 h t = (40 ± 3) °C RH approximately 100 % with condensation on the test panels Period 2: 16 h including cooling down (climatic chamber open or ventilated) t = (23 ± 3) °C RH approaching ambient

9.3 Evaluation

9.3.1 General

Examine the test panels periodically. Inspection time shall be as short as possible as further changes can occur outside the cabinet. The point in the cycle when the panels were evaluated shall be stated in the test report.

At the end of the required test exposure remove the test panels from the humidity cabinet, carefully wipe off surface moisture with a soft tissue and immediately conduct the final evaluation.

If required, take pictures to record any change caused by exposure.

9.3.2 Overall surface (flat surface of the panel)

The overall surface shall be inspected for blisters in accordance with EN ISO 4628-2 and corrosion in accordance with EN ISO 4628-3.

9.3.3 Edges, scribes and bends (as applicable)

Edges, scribes and bends shall be examined for defects: e.g. filiform corrosion in accordance with EN ISO 4628-10, delamination and corrosion around a scribe in accordance with EN ISO 4628-8, blisters in accordance with EN ISO 4628-2 and rust (white or red) in accordance with EN ISO 4628-3.

To determine the time of the on-set of defects, limited intermediate inspections of test panels may be carried out.