SLOVENSKI STANDARD

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Kovine, prevleļene v svitkih ï Preskusne metode ï 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 a l'humidité

Ta slovenski standard je istoveten z: EN 13523-25:2006

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25.220.60 Organske prevleke Organic coatings

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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

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This European Standard was approved by CEN on 27 April 2006.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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

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Foreword

This document (EN 13523-25:2006) 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of an identical text or by endorsement, at the latest by November 2006, and conflicting national standards shall be withdrawn at the latest by November 2006.

This European Standard EN 13523, *Coil coated metals — Test methods* consists of the following parts:

Part 0: General introduction and list of test methods;

Part 1: Coating thickness;

Part 2: Specular gloss;

Part 3: Colour difference — 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 light 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 15: Metamerism;

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: Colour stability in 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.

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

1 Scope

This Part of EN 13523 specifies a procedure for evaluating the humidity resistance of an organic coating (coil coating) on a metallic substrate, by means of exposure in a humidity cabinet under controlled conditions.

2 Normative references

The following referenced documents are indispensable for the application 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 13523-0:2001, *Coil coated metals — Test methods — Part 0: General introduction and list of test methods*

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 4628-2:2003)*

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 4628-3:2003)*

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 4628-4:2003)*

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 4628-5:2003)*

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 (ISO/4628-8:2005)*

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 4628-10:2003)*

prEN ISO 17872, Paints *and varnishes — Guidelines for the introduction of scribe marks through coatings on metallic panels for corrosion testing (ISO/DIS 17872:2005)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13523-0:2001 apply.

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 uniform or local 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 to achieving relative humidity of approximately 100 % with condensation on the test panels. It should also allow for the cabinet door to be left open during the dry period of a cycle.

5.2 Cutting tool (optional, see 8.1), with a hard metal tip having a radius capable of exposing at least 0,2 mm of metal substrate according to prEN ISO 17872.

6 Sampling

See EN 13523-0.

7 Test panels

See EN 13523-0.

The panels (usually 150 mm × 100 mm) shall be flat and free from contamination.

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.

8 Procedure

8.1 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 scratch 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 specimen 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

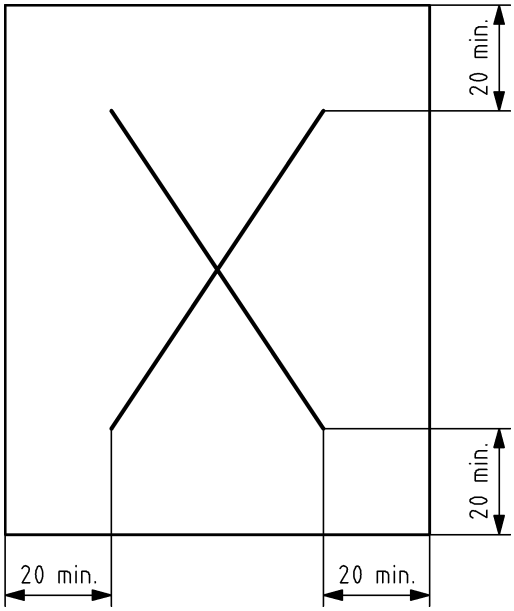

Figure 1 — Diagonal scribe marks on coated panels

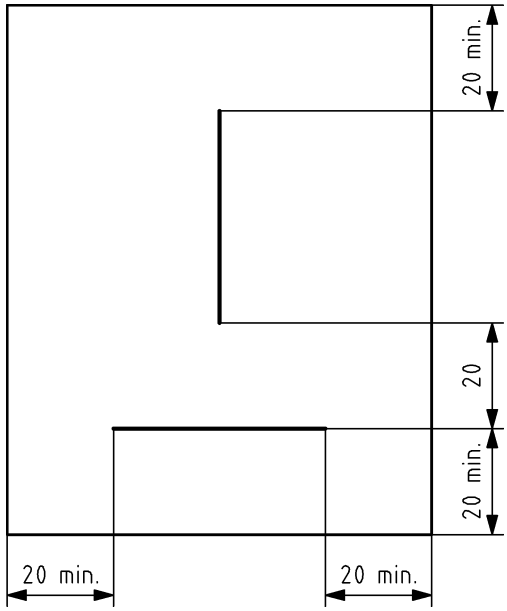

Figure 2 — Perpendicular scribe marks on coated panels

8.2 Exposure in humidity cabinet

Expose the test panels in the humidity cabinet at an angle of between 15° and 25° to the vertical.

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

Table 1 summarises some typical conditions (other conditions and cycles can be agreed upon).

Table 1 — Typical conditions for humidity testing

	Test duration	Conditions / cycles
Continuous humidity test	500 h (21 days)	$t = (40 \pm 3)$ °C
Cyclic humidity test, dry periods	500 h (21 days)	Each cycle consists of two periods: Period 1: 8 h $t = (40 \pm 3)$ °C Period 2: 16 h $t = (23 \pm 3)$ °C

8.3 Evaluation

8.3.1 General

Examine the test panels periodically (see 8.3.3, Note). Inspection time shall be as short as possible (maximum 30 min) as further changes can occur outside the cabinet. Return the test panels to the humidity cabinet and continue the test.

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

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

8.3.2 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.

8.3.3 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.

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

Cracking and flaking as described in EN ISO 4628-4 and EN ISO 4628-5 are not frequently observed in humidity testing, but shall also be evaluated if necessary.

9 Expression of results

The results shall be expressed as:

Overall surface:

— degree of blistering;

— degree of rusting.

Edges, scribes and bends:

— the type of defect: filiform corrosion, delamination and corrosion, blistering, rust (white or red);

— for each type of defect the measurements shall be given:

  — mean and maximum length and/or size of defects in millimetres;

  — percentage of edge, scribe or bend affected.

Any other observation.

10 Precision

No precision data are currently available.