



SLOVENSKI STANDARD

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Prevlečene kovine, ki se navijajo - Preskusne metode - 21. del: Vrednotenje preskušancev, izpostavljenih zunanjemu okolju

Coil coated metals - Test methods - Part 21: Evaluation of outdoor exposed panels

Bandbeschichtete Metalle - Prüfverfahren - Teil 21: Bewertung von freibewitterten Probenplatten

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Tôles prélaquées - Méthodes d'essais - Partie 21 : Évaluation des panneaux exposés en extérieur

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25.220.60

Organske prevleke

Organic coatings

SIST EN 13523-21:2017

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EUROPEAN STANDARD
NORME EUROPÉENNE
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EN 13523-21

July 2017

ICS 25.220.60

Supersedes EN 13523-21:2010

English Version

Coil coated metals - Test methods - Part 21: Evaluation of outdoor exposed panels

Tôles prélaquées - Méthodes d'essais - Partie 21 :
Évaluation des panneaux exposés en extérieur

Bandbeschichtete Metalle - Prüfverfahren - Teil 21:
Bewertung von freibewitterten Probenplatten

This European Standard was approved by CEN on 21 May 2017.

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 CEN-CENELEC 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 CEN-CENELEC Management Centre has the same status as the official versions.

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

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Contents	Page
European foreword.....	3
1 Scope	5
2 Normative references	5
3 Terms and definitions	6
4 Principle	7
5 Apparatus and materials	7
6 Sampling	7
7 Test panels	7
8 Procedure	7
8.1 General	7
8.2 Preparation	8
8.3 Evaluation	8
8.3.1 General	8
8.3.2 Panel 1 (45° panel)	8
8.3.3 Panel 2 (90° panel)	9
8.3.4 Panel 3 (5° panel)	10
9 Expression of results	11
10 Precision	11
11 Test report	11
Bibliography	17

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[SIST EN 13523-21:2017
https://standards.itech.ai/catalog/standards/sist/a4710085-573a-41c8-93d9-7c815ae86927/sist-en-13523-21-2017](https://standards.itech.ai/catalog/standards/sist/a4710085-573a-41c8-93d9-7c815ae86927/sist-en-13523-21-2017)

European foreword

This document (EN 13523-21:2017) 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 January 2018, and conflicting national standards shall be withdrawn at the latest by January 2018.

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 13523-21:2010.

The main changes compared to the previous edition are:

- a) a “terms and definitions” clause has been added containing all terms and definitions from EN ISO 4628-8 and a definition for edge;
- b) “corrosion” and “delamination” was changed to “corroded area” and “delaminated area”, where appropriate;
- c) the first inspection after 6 months was deleted;
- d) the inspection of defects using a $\times 10$ magnification was amended;
- e) a reference to EN ISO 4628-8 was amended for evaluation of delamination and corrosion around the scribe;
- f) the text has been revised editorially 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 — 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*

EN 13523-21:2017 (E)

- *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 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: 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)*

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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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This part of the EN 13523 series specifies the procedure for evaluating the behaviour of an organic coating on a metallic substrate during and after outdoor exposure. Panel design, preparation and the procedure for outdoor exposure are performed in accordance with EN 13523-19.

After washing of the panel, some dirt can remain on the panel. This remaining dirt can influence the accuracy and precision of readings of gloss and colour, performed on exposed panels, although carried out in accordance with the standards. Unlike other precise measurements, the objective of this European Standard is to report on trends in the corrosion and/or paint degradation behaviour of coil coated panels.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1396, *Aluminium and aluminium alloys - Coil coated sheet and strip for general applications - Specifications*

EN 10169, *Continuously organic coated (coil coated) steel flat products — Technical delivery conditions*

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

EN 13523-2, *Coil coated metals - Test methods - Part 2: Gloss*

EN 13523-3, *Coil coated metals - Test methods - Part 3: Colour difference - Instrumental comparison*

EN 13523-14, *Coil coated metals - Test methods - Part 14: Chalking (Helmen method)*

EN 13523-19, *Coil coated metals - Test methods - Part 19: Panel design and method of atmospheric exposure testing*

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 4628-8:2012, *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 4628-8:2012)*

EN 13523-21:2017 (E)

3 Terms and definitions

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

3.1

holiday

absence of a paint film from certain areas of a coated substrate

[SOURCE: EN ISO 4628-8:2012, 3.1]

3.2

artificial defect

holiday through a coating, deliberately introduced in order to expose the underlying metal substrate prior to exposure to a corrosive environment

[SOURCE: EN ISO 4628-8:2012, 3.2]

3.2.1

circular defect

circular holiday through a coating, deliberately introduced in order to expose the underlying metal substrate prior to exposure in a corrosive environment

[Source: EN ISO 4628-8:2012, 3.3]

3.2.2

scribe

linear holiday through a coating, deliberately introduced in order to expose the underlying metal substrate prior to exposure in a corrosive environment

[SOURCE: EN ISO 4628-8:2012, 3.6] <https://standards.iteh.ai/catalog/standards/sist/a47f0085-573a-41c8-93d9-7c815ae86927/sist-en-13523-21-2017>

3.2.3

edge

unprotected cut edge, in order to expose the underlying metal substrate prior to exposure in a corrosive environment

3.3

corroded area

area around a defect where the substrate has been attacked by corrosion

[SOURCE: EN ISO 4628-8:2012, 3.4]

3.4

delaminated area

area around a defect where loss of adhesion of a coating from a substrate or an underlying coating has occurred

[SOURCE: EN ISO 4628-8:2012, 3.5]

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4 Principle

The behaviour of the test panels exposed in accordance with EN 13523-19 is evaluated. Any degradation in the relevant area is reported, using the relevant parts of the EN 13523 series and appropriate EN ISO Standards.

In cases where the inspection area is limited (e.g. at screws and bends), the evaluation method (see the EN ISO 4628- series) is replaced by an easier and more suitable measurement of the degradation in millimetres.

Where possible, the results of symmetrical areas, e.g. left and right edges, are combined and the average value is reported.

The inspection of the 45° panel (panel 1) will focus on paint degradation, whereas the 90° panel (panel 2) and the 5° panel (panel 3) are mainly evaluated for corrosion.

NOTE 1 Panel designations (1, 2, 3) are as defined in EN 13523-19.

NOTE 2 Due to restrictions in the available flat area, the number of recommended readings might vary from other parts of the EN 13523 series and relevant EN ISO Standards.

It is strongly recommended to take a photograph of each exposed panel at each inspection.

5 Apparatus and materials

5.1 **Gloss meter**, in accordance with EN 13523-2.

5.2 **Apparatus for colour measurement**, in accordance with EN 13523-3.

5.3 **Apparatus for measurement of chalking**, in accordance with EN 13523-14.

5.4 **Washing solution**, containing 0,5 % (by mass) of a mild non-reactive detergent (pH 6 to 7) in water.

5.5 **Cloth or sponge**, non-abrasive and smooth.

6 Sampling

In accordance with EN 13523-0.

7 Test panels

In accordance with EN 13523-0.

8 Procedure

8.1 General

Evaluate the coating properties at ambient temperature.

The panels shall be inspected yearly and for a minimum duration as specified in EN 1396 or EN 10169. Colour measurements on metallics as well as gloss and colour measurements on textured and embossed surfaces are only indicative.