



# SLOVENSKI STANDARD

## SIST EN 13523-9:2002

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Coil coated metals - Test methods - Part 9: Resistance to water immersion

Coil coated metals - Test methods - Part 9: Resistance to water immersion

Bandbeschichtete Metalle - Prüfverfahren - Teil 9: Beständigkeit gegen Eintauchen in Wasser

**Standard PREVIEW**

Tôles prélaquées - Méthodes d'essai - Partie 9: Résistance à l'immersion dans l'eau

Ta slovenski standard je istoveten z: **EN 13523-9:2001**

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### **ICS:**

17.040.20	Lastnosti površin	Properties of surfaces
25.220.60	Organske prevleke	Organic coatings

**SIST EN 13523-9:2002**

**en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 13523-9**

April 2001

ICS 17.040.20; 25.220.60

English version

## Coil coated metals - Test methods - Part 9: Resistance to water immersion

Tôles prélaquées - Méthodes d'essai - Partie 9: Résistance à l'immersion dans l'eau

Bandbeschichtete Metalle - Prüfverfahren - Teil 9: Beständigkeit gegen Eintauchen in Wasser

This European Standard was approved by CEN on 18 February 2001.

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 October 2001, and conflicting national standards shall be withdrawn at the latest by October 2001.

Annex A is normative.

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 describes the procedure for determining the resistance to water immersion of an organic coating on a metallic substrate.

The test is applicable to all kinds of organic coatings, including metallics and embossed, textured, pearlescent and printed coatings. The results of the test give an indication of the resistance of the coil coated metal to water.

The method is not intended to reproduce any particular condition of condensation.

## 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

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

ISO 4628-2:1982

Paints and varnishes – Evaluation of degradation of paint coatings – Designation of intensity, quantity and size of common types of defect – Part 2: Designation of degree of blistering

IEC 60454-2

Specifications for pressure-sensitive adhesive tapes for electrical purposes – Part 2: Methods of test

## 3 Terms and definitions

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

## 4 Principle

A test specimen is immersed in water of 40 °C for a defined period of time. The degree of blistering on the general surface and the corrosion at the cut edges and scribes are then evaluated.

NOTE The procedure described in this Part of EN 13523 is similar to the test method specified in EN ISO 2812-2. A major difference is that the water is not aerated.

## 5 Apparatus and materials

**5.1 Tank**, of suitable size (a convenient size is 700 mm x 400 mm x 400 mm), fitted with a cover, a heater and capable of being maintained at  $(40 \pm 1)$  °C.

**5.2 System for circulation or stirring of the water.**

**5.3 Support for the specimens**, made from non-conductive material and arranged so that the specimens are maintained at an angle of 15° to 20° to the vertical.

**5.4 Deionized water**, having a conductivity not greater than 0,2 mS/m (mS/m = millisiemens per metre).

**5.5 Cutting tool**, with a hard metal tip (according to Clemen). The scratch shall have an upwards-broadening cross section which shows a width of approximately 1 mm of the substrate.

NOTE If the substrate is zinc- or zinc-alloy coated steel, the intention is that the scratch should be to the zinc coating, and not further, to the steel.

**5.6 Transparent pressure-sensitive adhesive tape**, 25 mm wide, with an adhesion strength of  $(10 \pm 1)$  N per 25 mm width when tested in accordance with IEC 60454-2.

## 6 Sampling

See EN 13523-0:2001.

## 7 Test specimens

See EN 13523-0:2001.

The test specimen shall be of 100 mm x 150 mm, the 150 mm in rolling direction.

The reverse face shall always be protected to prevent any corrosive influence from the reverse face to the front face. The bottom drip edge and one side edge shall remain unprotected, one or both of the other two edges may be protected or unprotected as specified or agreed.

## 8 Procedure

### 8.1 Scribing of test specimens and immersion

**8.1.1** Scribe the front face of the test specimens by means of the cutting tool (5.5). The scribe shall extend down just through the organic coating and not through any metallic layer. The scribed indentation shall exhibit a vee-shaped profile and shall expose at least 0,2 mm of the substrate. The use of any other cutting tool other than described in 5.5 is not permitted.

**8.1.2** Carry out two diagonal scribes crossing each other in the middle of the specimen and extending to 20 mm from the edges (see annex A).

**8.1.3** Fill the tank (5.1) with deionized water (5.4) and bring the temperature of the water to  $(40 \pm 1)^\circ\text{C}$ .

**8.1.4** Place the specimens in the tank filled with deionized water so that they are immersed for three-quarters of their length. The water shall not be renewed during the duration of the test nor shall air be injected in the water or be introduced by the action of too vigorous stirring.

**8.1.5** When the specimens are placed in the tank, allow the temperature of the water to stabilize at  $(40 \pm 1)^\circ\text{C}$  again and maintain this temperature throughout the duration of the test.

**8.1.6** Expose the specimens to the water for the specified period of time.

### 8.2 Assessment

Remove the test specimens from the tank and carefully dry them in a stream of warm air. Allow the specimens to come to ambient temperature and immediately assess. For a more accurate evaluation, as required for instance in case of dispute, the ambient temperature shall be  $(23 \pm 2)^\circ\text{C}$  and the relative humidity  $(50 \pm 5)\%$ , in accordance with EN 23270:1991.

#### 8.2.1 Blistering

Examine the whole of the front face of each test specimen including the scribe, and the edges, for blistering as described in ISO 4628-2:1982.

#### 8.2.2 Corrosion creep

**8.2.2.1** For category 1 coatings as defined in EN 13523-0:2001

Measure corrosion creep as follows: Apply the adhesive tape (5.6) along one of the scribe marks. Smooth the tape into place over the area of the scribe and for a distance of at least 20 mm beyond each end of the scribe (see figure in annex A). To ensure good contact with the coating, rub the tape firmly with a fingertip. The colour of the coating seen through the tape is a useful indication of overall contact.

Within 5 min of applying the tape, remove the tape by holding the free end and pulling it off steadily in 0,5 s to 1 s at an angle that is as close as possible to  $60^\circ$  to the panel.

Retain the tape for reference purposes, for example by attaching it to a sheet of transparent film.

Corrosion creep shall be measured perpendicularly from the scribe mark to the edge of the undetached coating and expressed as an average distance for the whole length of the scribe.

Alternatively, corrosion creep can be measured in accordance with 8.2.2.2. In case of dispute, corrosion creep shall be measured using the method described in this sub-clause.

**8.2.2.2** For category 2 coatings as defined in EN 13523-0:2001

Measure corrosion creep as follows: Remove the loosened coating (if any) adjacent to the scribe marks by scraping with a blunt knife or suitable similar tool.

Corrosion creep shall be measured perpendicularly from the scribe mark to the edge of the undetached coating and expressed as an average distance for the whole length of the scribe.

## 9 Expression of results

Express the results as follows:

on the front face excluding the scribe:

- degree of blistering

at the unprotected edges:

- degree of blistering
- delamination or corrosion creep (mm)

at the scribe:

- degree of blistering
- delamination or corrosion creep (mm).

If more than one specimen of the same coil coated metal is tested, the results shall be expressed as the average of the individual results.

## 10 Precision

No precision data are currently available. [SIST EN 13523-9:2002](#)

## 11 Test report

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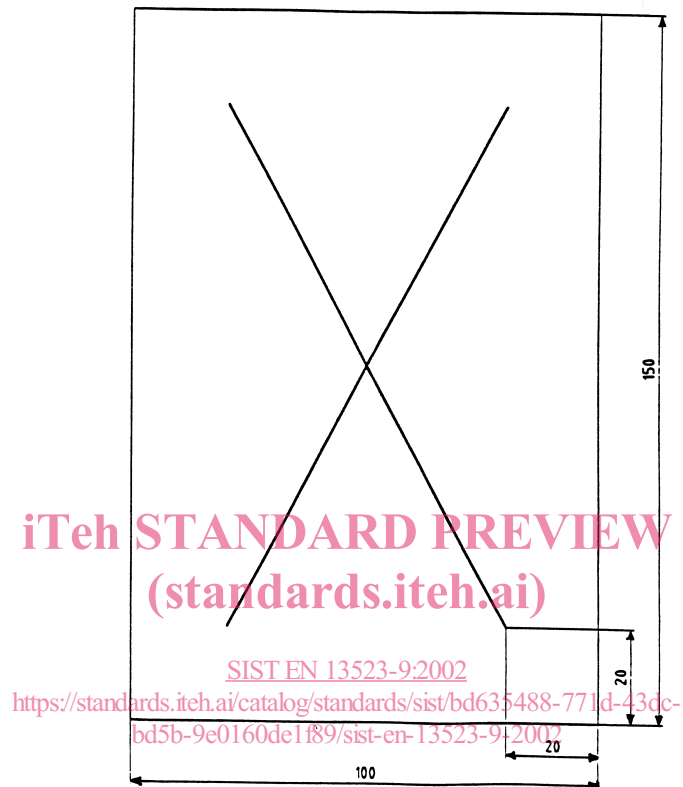
The test report shall contain at least the following information:

- a) all details necessary to identify the product tested;
- b) a reference to this Part of EN 13523. (EN 13523-9);
- c) whether the top edge and/or one side edge have been protected;
- d) the duration of the test;
- e) the results of the test, as indicated in clause 9;
- f) any deviation from the test method specified;
- g) the date of the test.

**Annex A (normative)**  
**Scribing of test specimens**

Scribe the test specimens as shown in figure A.1.

Dimensions in millimetres



**Figure A.1**

### **Bibliography**

EN 1396 : 1996

Aluminium and aluminium alloys – Coil coated sheet and strip for general applications – Specifications

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 2812-2

Paints and varnishes – Determination of resistance to liquids – Part 2: Water immersion method (ISO 2812-2:1993)

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