SLOVENSKI STANDARD
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Pohištveno okovje - Preskusne metode in vrednotenje odpornosti okovja proti koroziji

Hardware for furniture - Test and evaluation methods for the corrosion resistance of furniture fittings

Möbelbeschläge - Prüf- und Bewertungsverfahren für die Korrosionsbeständigkeit von Möbelbeschlägen

Quincaillerie d'ameublement Méthodes d'essai et d'évaluation de la résistance à la corrosion des ferrures de meubles

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97.140	Pohištvo	Furniture

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Hardware for furniture - Test and evaluation methods for the corrosion resistance of furniture fittings

Quincaillerie d'ameublement ¿ Méthodes d'essai et d'évaluation de la résistance à la corrosion des ferrures de meubles

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

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European foreword

This document (prEN 17737:2021) has been prepared by Technical Committee CEN/TC 207 “Furniture”, the secretariat of which is held by UNI.

This document is currently submitted to the CEN Enquiry.

1 Scope

This document specifies test methods for the determination of corrosion resistance of furniture fittings as ready-to-use assemblies or their individual parts.

It applies to the optical assessment of surface changes for the following materials:

- Metals and their alloys;
- Metal coatings with anodic or cathodic properties;
- Conversion coatings;
- Anodic oxide layers;
- Organic coatings on metallic materials.

This document does not include any requirements regarding the corrosion resistance of furniture fittings. These can be given in the product specifications

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 ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests (ISO 9227)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1
R_P value
rating assigned to the strength of the coating to protect the base metal against corrosion

Note to 1 entry: As specified in ISO 10289.

3.2
R_A value
rating, which specifies the degree of optical change of the protective coating and the evaluation of its appearance

Note to 1 entry: As specified in ISO 10289.

4 Test equipment

Cleaning-brush: Bristles of polyamide, length 20 mm, thickness 0,4 mm, 40 bristles in each bundle.

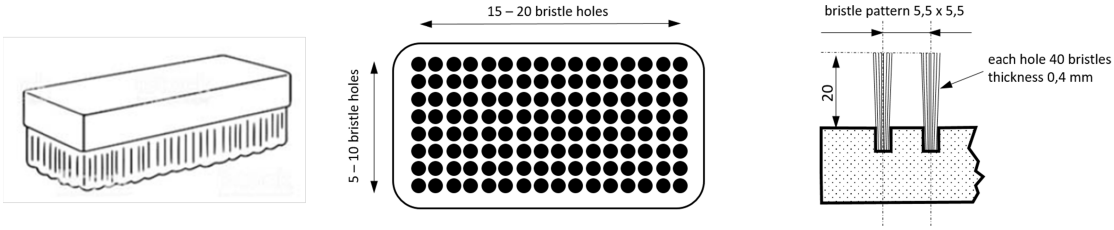

Figure 1 — Cleaning brush

5 Test methods

5.1 General

The test methods and evaluation criteria are based on the salt spray test according to EN ISO 9227 — NSS or an acetic acid salt spray test according to EN ISO 9227 — AASS or a condensation water test according to EN ISO 6270-2 — AHT. Each test is independently evaluated.

AHT test according to EN ISO 6270-2: Condensation water alternating climate test (AHT test) is the test method in which test samples in a test chamber are subjected to high humidity and periodically changing temperatures (20 °C to 40 °C) so that condensation water is continuously deposited on the test samples.

NSS test according to EN ISO 9227: Neutral salt spray test (NSS test) is the test method in which a 5 % sodium chloride solution is sprayed in a defined environment (test chamber).

AASS test according to EN ISO 9227: Acetic acid salt spray test (AASS test) shall be prepared in accordance with EN ISO 9227 so that the test solution has a pH value of 3,1–3,3. The test specimens shall be exposed to the test solution in a defined environment (test chamber).

5.2 Test set-up

The samples in the chamber shall be arranged so that they are not directly hit by the spray jet.

An inclination (ideally (20 ± 5)° to the vertical) shall ensure that the test liquid can run off continuously.

Samples shall be arranged so that they do not come into contact with the walls of the chamber. Samples may be placed in the chamber at different levels, provided that the liquid does not drip from samples or their supports onto lower positioned samples.

The supports for the samples shall be made of non-metallic and inert materials.

5.3 Test samples

For the evaluation of complete furniture fittings, the tests shall be carried out on the complete fitting which is not dismantled into its individual parts.

The test and evaluation procedures can also be applied to individual components. The test specimens shall not be cleaned before testing.

6 Visual inspection and assessment procedures after the corrosion tests

6.1 General

Corrosion products are assessed after testing and cleaning in accordance with ISO 10289 by specifying the surface characteristics R_A and R_P achieved.

6.2 Visual inspection

The assessment shall be done with the naked eye, at a distance of approximately 300 mm, without magnification, shall be subjected to a visual inspection with indirect, glare-free light with an illuminance of 700 lux to 1 000 lux for approximately 10 s.

The following criteria are not considered as defects:

a) Superficial, only adhering corrosion products or soiling;

b) Corrosion in places where the salt spray solution or liquid collects and concentrates before it drips off the test sample;

c) Cutting edges, screw slots, rivet heads, thread-surfaces, weld seams.

6.3 Cleaning procedure for R_A rating

Before the determination of the R_A value test related residues that adhere to the surface shall be removed. Rinse the samples with deionised/distilled water at a temperature not exceeding 40 °C and then immediately dry the samples in an air stream at an overpressure not exceeding 200 kPa and at a distance of about 300 mm.

Then the R_A rating is determined to describe the change in appearance due to corrosiveness of the protective coatings, e.g. white rust.

6.4 Cleaning procedure for R_P rating

Before the determination of the R_P rating, a second, more intensive cleaning with a brush and deionised/distilled water is carried out with the aim of removing the more adhering corrosion products in order to clearly identify only the damaged areas with base material corrosion.

Thoroughly clean the reference specimens with an appropriate organic solvent (such as a hydrocarbon with a boiling point between 60 °C and 120 °C), using a clean cleaning-brush (see Clause 4) or soft cloth, non-woven lint free cloth, that does not leave any remains, or an ultrasonic cleaning device. Carry out the cleaning in a vessel full of solvent. After cleaning, rinse the reference specimens with fresh solvent and then dry them.

6.5 Determination of R_A and R_P rating

The samples shall be evaluated/assessed within one hour of removal from the test chamber. The examination takes place after the cleaning procedure. The evaluation system for R_P and R_A base on the area of the protective coating (for R_A) or the base material (for R_P) on which corrosion occurs.

The evaluation bases on the formula:

$R_P = 3(2\text{-log A})$ or $R_A = 3(2\text{-log A})$

where

A is the percentage of the significant total area on which a visual change in the protective coating/corrosion of the base material occurs;

R_P and R_A are rounded to the next round figure, see Table 1.

Table 1 — Defective area (%) and assessment levels R_A and R_P

Defective area %	**Assessment levels R_A and R_P**
0	10
0 < A ≤ 0,1	9
0,1 < A ≤ 0,25	8
0,25 < A ≤ 0,5	7
0,5 < A ≤ 1,0	6
1,0 < A ≤ 2,5	5
2,5 < A ≤ 5,0	4
5,0 < A ≤ 10	3
10 < A ≤ 20	2
20 < A ≤ 50	1
50 < A	0

Example calculation of the assessment level R_A:

A surface of 20 cm^2 of a significant total area of 120 cm^2 has changed optically after the corrosion test (e.g. white rust).

Changed area A = (20 cm^2 × 100 %)/120 cm^2 = 16,7 %

R_A = 3 × (2-log A) = 3(2-log16,7) = 2,3

Rounded down to the next round figure, the result is level R_A = 2.

Each test shall take into account the test procedure and duration and the surface characteristics R_A and R_P to be achieved in accordance with ISO 10289.

The test name shall be composed of the test procedure and the test duration (in hours), e.g. AHT-72, NSS-12, AASS-4.

6.6 Test Report

The test report shall include information on the performance of the test procedure. This information may vary according to the purpose of the test and the instructions prescribed; a general list of the details to be required is as follows:

a) type of test method;

b) duration of test;

c) positioning of the test sample in the test chamber/test device;

d) description of cleaning method;

e) description of the tested material or product;

f) number of test samples representative of each material or product;

g) any deviation from the specified methods;

h) results of R_A and R_P.