SLOVENSKI STANDARD
oSIST prEN 927-2:2021

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Barve in laki - Premazi in premazni sistemi za zaščito lesa za zunanjo uporabo - 2. del: Specifikacija lastnosti

Paints and varnishes - Coating materials and coating systems for exterior wood - Part 2: Performance specification

Beschichtungsstoffe - Beschichtungsstoffe und Beschichtungssysteme für Holz im Außenbereich - Teil 2: Leistungsanforderungen

Peintures et vernis - Produits de peinture et systèmes de peinture pour le bois en extérieur - Partie 2: Spécifications de performance

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Paints and varnishes - Coating materials and coating systems for exterior wood - Part 2: Performance specification

Peintures et vernis - Produits de peinture et systèmes de peinture pour le bois en extérieur - Partie 2: Spécifications de performance

Beschichtungsstoffe - Beschichtungsstoffe und Beschichtungssysteme für Holz im Außenbereich - Teil 2: Leistungsanforderungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 139.

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

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Foreword

This document (prEN 927-2:2021) has been prepared by Technical Committee CEN/TC 139 “Paints and varnishes”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 927-2:2014.

The following significant technical changes have been made with respect to EN 927-2:2014:

a) test profiles for the three main end-use categories (as defined in EN 927-1) have been updated to include additional test methods;

b) Annex A has been deleted; further information on test methods is found in Clause 5, or the referenced test methods themselves.

EN 927 consists of the following parts under the general title *Paints and varnishes — Coating materials and coating systems for exterior wood,*

— *Part 1: Classification and selection*

— *Part 2: Performance specification*

— *Part 3: Natural weathering test*

— *Part 5: Assessment of the liquid water permeability*

— *Part 6: Exposure of wood coatings to artificial weathering using fluorescent UV lamps and water*

— *Part 7: Assessment of knot staining resistance of wood coatings*

— *Part 8: Determination of the adherence of paint on wood by means of a double X-cut test*[1]

— *Part 9: Determination of pull-off strength after water exposure*[1]

— *Part 10: Resistance to blocking of paints and varnishes on wood*

— *Part 11: Assessment of air inclusions/microfoam in coating films*

— *Part 12: Ultraviolet and visible radiation transmittance* [2]

— *Part 13: Assessment of resistance to impact of a coating on a wooden substrate*

Other parts are under preparation in CEN/TC 139/WG2 in 2021. They have not yet been assigned a number in the 927-series: Assessment of tannin staining, Assessment of film extensibility by indentation of a coating on a wooden substrate, Assessment of end grain sealing performance, Determination of tensile properties of a coating film.

[1] The method has the status of a technical specification (TS) in 2021.

[2] The method has the status of a prEN in 2021.

Introduction

This document is one of a number of parts of EN 927. EN 927-1 addresses the issue of terminology for the wide variety of exterior coatings for wood that are now available. EN 927-1 also provides a framework for communicating information on the suitability of a coating for particular specific end-use categories. Improved communication is beneficial in the removal of technical barriers to trade. However, there remains the problem of comparing products tested, or likely to be exposed, in different climatic regions, and the relevance of tests for different categories of end-use. This document addresses these issues and sets a limited number of mandatory performance criteria combined with optional tests that can provide additional information to a standardized format.

1 Scope

This document addresses performance criteria for coating systems on exterior wood. Performance requirements are specified according to three categories of end use (defined in EN 927-1) in terms of two mandatory tests, namely natural weathering performance testing carried out in accordance with EN 927-3, and water permeability in accordance with EN 927-5. Additional optional tests (non-mandatory) are tabled which can be used by suppliers, or for specification purposes, to provide additional information, to a standardized format, on aspects of performance relevant to specific situations. The majority of test methods are drawn from EN 927 (all parts), but where relevant additional tests from other national and international sources are used.

Requirements for claiming conformity with this document are defined and provide flexibility for different situations and can also provide a basis for certification.

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 927-1:2013, *Paints and varnishes - Coating materials and coating systems for exterior wood - Part 1: Classification and selection*

EN 927-3:2019, *Paints and varnishes - Coating materials and coating systems for exterior wood - Part 3: Natural weathering test*

EN 927-5, *Paints and varnishes - Coating materials and coating systems for exterior wood - Part 5: Assessment of the liquid water permeability*

EN 927-6, *Paints and varnishes - Coating materials and coating systems for exterior wood - Part 6: Exposure of wood coatings to artificial weathering using fluorescent UV lamps and water*

EN 927-7, *Paints and varnishes - Coating materials and coating systems for exterior wood - Part 7: Assessment of knot staining resistance of wood coatings*

CEN/TS 927-8, *Paints and varnishes - Coating materials and coating systems for exterior wood - Part 8: Determination of the adhesion on wood after water exposure by a double-X-cut test*

CEN/TS 927-9, *Paints and varnishes - Coating materials and coating systems for exterior wood - Part 9: Determination of pull-off strength after water exposure*

EN 927-10, *Paints and varnishes - Coating materials and coating systems for exterior wood - Part 10: Resistance to blocking of paints and varnishes on wood*

EN 927-11, *Paints and varnishes - Coating materials and coating systems for exterior wood - Part 11: Assessment of air inclusions/microfoam in coating films*

prEN 927-12, *Paints and varnishes - Coating materials and coating systems for exterior wood Part 12: Ultraviolet and visible radiation transmittance*

EN 927-13, *Paints and varnishes - Coating materials and coating systems for exterior wood - Part 13: Assessment of resistance to impact of a coating on a wooden substrate*

EN 16492, *Paints and varnishes - Evaluation of the surface disfigurement caused by fungi and algae on coatings*

CEN/TS 16360, *Paints and varnishes - Coating materials and coating systems for exterior wood - Assessment of film extensibility by indentation of a coating on a wooden substrate*

CEN/TS 16498, *Paints and varnishes - Coating materials and coating systems for exterior wood - Assessment of tannin staining*

EN ISO 4618, *Paints and varnishes - Terms and definitions (ISO 4618)*

EN ISO 7783, *Paints and varnishes - Determination of water-vapour transmission properties - Cup method (ISO 7783)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 927-1 and EN ISO 4618 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

4 Performance tests – Testing profiles

EN 927-1 classifies exterior wood coatings according to appearance (build, hiding power and gloss) and three broad end-use categories (stable, semi-stable and non-stable). Assessment of performance is carried out with reference to the end-use categories, which are grouped according to the extent to which wood movement shall be controlled. Performance will be strongly influenced by appearance (e.g. transparent versus opaque), by substrate (e.g. wood species) and by climatic and exposure conditions. It is open to suppliers or end-users to agree a combination of tests (see Table 1 and Table 2) that suit particular situations provided that testing is carried out according to the principles described in this document and includes the specified mandatory tests. Requirements for claiming conformity are described in Clause 7. When optional tests are carried out, they shall be reported according to the format described in this document.

Table 1 — Test methods

Property	Test method [a] (current ref.)	End-use category (see EN 927-1)		
		Stable	Semi-stable	Non-stable
Basic classification	EN 927-1	Mandatory	Mandatory	Mandatory
Natural weathering on pine	EN 927-3	Mandatory	Mandatory	Mandatory
Natural weathering on alternative substrates	EN 927-3	Optional	Optional	Optional
Natural weathering on alternative test piece	EN 927-3	Optional	Optional	Optional
Water-vapour transmission properties	EN ISO 7783	Optional	Optional	Optional
Water absorption	EN 927-5	Mandatory	Mandatory	Mandatory
Artificial weathering	EN 927-6	Optional	Optional	Optional
Knot staining	EN 927-7	Optional	Optional	Optional
Adherence by double X-cut test	CEN/TS 927-8	Optional	Optional	Optional
Pull-off strength after water exposure	CEN/TS 927-9	Optional	Optional	Optional
Blocking test	EN 927-10	Optional	Optional	Optional
Tannin staining	CEN/TS 16498	Optional	Optional	Optional
Microfoam	EN 927-11	Optional [b]	Optional	Optional
UV transmittance and transparency	prEN 927-12	Optional	Optional	Optional
Film extensibility	CEN/TS 16360	Optional	Optional	Optional
Impact resistance	EN 927-13	Optional	Optional	Optional
Fungal and algae growth	EN 16492	Optional	Optional	Optional

[a] The test method shall be in accordance with the standard listed.

[b] Mandatory only for spray applications.

5 Test overview

5.1 Natural weathering

5.1.1 General

The assessment of a coating material to this document will require a natural weathering test to be carried out in accordance with EN 927-3, using a flat wood panel of pine *(Pinus sylvestris)* with a planed surface. A manufacturer of a coating system that meets one or more of the performance criteria described in 5.1.2 can use this information as part of a claim to conformity with the specification, as described in Clause 7.

The external durability of the coating system under test is assessed by a number of performance criteria. Guide values enable an assessment to be made of the suitability of the system for the proposed end-use. Comparative trials have shown that conformity to the criteria outlined in 5.1.2 sets a repeatable and reproducible performance standard. The evaluation is further aided by comparing the performance of the system under test with a well-known coating system - a "WRM", Weathering Reference Material.

5.1.2 Performance criteria

The scores for the assessment criteria, blistering, cracking, flaking and adhesion in accordance with EN 927-3 are interpreted as meeting, or not meeting the required standard, relative to the end-use category, according to the criteria given in Table 3. These rankings are relative to the exposure test site and care should be taken not to transfer the results uncritically to other geographical areas.

Interpretation of criteria:

1) The first four values in each column each represent the maximum allowed for the arithmetic mean (to one decimal place) of the three replicates from the natural weathering test in accordance with EN 927-3;

2) the maximum sum value is the limit which shall not be exceeded for the sum of the 12 (4 × 3) individual results;

3) the maximum difference to qualify as valid test refers to the difference between the highest and lowest score in any of the individual test panels. If this value is exceeded the test is declared invalid and shall be repeated;

4) if a coating system exceeds the maximum sum value, or maximum difference for any end-use category, conformity may not be claimed for that category.

Table 2 — Limit values for performance criteria – Natural weathering

	Stable	Semi-stable	Non-stable
Blistering	0,3	0,7	1
Cracking	0,7	1,7	3
Flaking	0,3	0,7	1,3
Adherence	1	1	1
Maximum sum value	7	12	19
Maximum difference to qualify as valid test	2	3	4

NOTE Test precision: An estimate of the standard deviation of the weathering test method was made in a large comparative exercise carried out by members of the CEN Working Group. The findings of this exercise have been incorporated into the criteria matrix so that the underlying target values incorporate a tolerance to allow for variation in the performance of panel replicates. Attention has also been given to the expected distribution of results for a given test. Thus, for example an arithmetic mean criterion of 1,3 for cracking could be achieved as (1,1,2), (0,1,3) or (0,0,4). The maximum difference criterion considers the probability of such scores occurring and rules out those which are outside the expected distribution.

5.1.3 Exposure conditions

Exposure conditions during the test are recorded in Clause 7. The location of the exposure site shall be recorded and should ideally reflect the conditions expected in use (see EN 927-3:2019, Annex E).