SLOVENSKI STANDARD
oSIST prEN 927-2:2013

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Barve in laki - Premazi in premazni sistemi za zaščito lesa v zunanji uporabi - 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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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

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This document (prEN 927-2:2013) 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 927-2:2006.

prEN 927-2:2013 includes the following significant technical changes with respect to EN 927-2:2006:

a) test profiles for the three main end-use categories (as defined in prEN 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.*

Introduction

This document is one of a number of parts of EN 927. prEN 927-1 addresses the issue of terminology for the wide variety of exterior coatings for wood that are now available. prEN 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. EN 927-2 addresses these issues and sets a limited number of mandatory performance criteria combined with optional tests that can provide additional information to a standardised format.

1 Scope

This part of EN 927 addresses performance criteria for coating systems on exterior wood. Performance requirements are specified according to three categories of end use (defined in prEN 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 may be used by suppliers, or for specification purposes, to provide additional information, to a standardised 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 EN 927-2 are defined and provide flexibility for different situations and can if required provide a basis for certification.

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.

prEN 927-1:2011, *Paints and varnishes — Coating materials and coating systems for exterior wood — Part 1: Classification and selection*

EN 927-3:2012, *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*

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

CEN/TS 16358, *Paints and varnishes — Coating materials and coating systems for exterior wood — Assessment of air inclusions/microfoam in coating films*

CEN/TS 16359, *Paints and varnishes — Coating materials and coating systems for exterior wood — Assessment of knot staining resistance of wood 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*

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

FprCEN/TS 16499, *Paints and varnishes — Coating materials and coating systems for exterior wood — Resistance to blocking of paints and varnishes on wood*

EN ISO 4618:2006, *Paints and varnishes — Terms and definitions (ISO 4618:2006)*

EN ISO 4628-1, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 1: General introduction and designation system (ISO 4628-1)*

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 prEN 927-1:2011 and EN ISO 4618:2006 apply.

4 Performance tests – Testing profiles

prEN 927-1 classifies exterior wood coatings according to appearance (75 possibilities) and three broad end-use categories. 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) that suit particular situations provided that testing is carried out according to the principles described in this Standard 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 European Standard.

Table 1 — Test methods

Property	**Test method (current ref.)**	**End-use category (see prEN 927-1)**		
		Stable	**Semi-stable**	**Non-stable**
Basic classification	prEN 927-1	Mandatory	Mandatory	Mandatory
Natural weathering	EN 927-3	Mandatory	Mandatory	Mandatory
Alternative substrate	EN 927-3	Optional	Optional	Optional
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	CEN/TS 16359	Optional	Optional	Optional
Wet adherence (double-cross cut)	– [a]	Optional	Optional	Optional
Wet adherence (pull)	– [a]	Optional	Optional	Optional
Tannin staining	FprCEN/TS 16498 [a]	Optional	Optional	Optional
Microfoam	CEN/TS 16358	Optional [b]	Optional	Optional
Film extensibility	CEN/TS 16360	Optional	Optional	Optional
Blocking test	FprCEN/TS 16499 [a]	Optional	Optional	Optional
Impact resistance	– [a]	Optional	Optional	Optional
UV transmission	– [a]	Optional	Optional	Optional
End grain sealing	– [a]	Optional	Optional	Optional
Fungal and algae growth	prEN 16492 [a]	Optional	Optional	Optional

[a] European Standard or CEN/TS at draft stage or in preparation.

[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 European Standard will require a natural weathering test to be carried out in accordance with EN 927-3, using a flat wood panel of pine *(Pinus silvestris)* with a planned 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.

5.1.2 Performance criteria

The scores for the assessment criteria, blistering, cracking, flaking and adhesion in according to 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 2. These rankings are relative to the exposure test site, and judgement shall be used as to their applicability 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 according to 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 then the manufacturer cannot claim conformity 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
Adhesion	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 927-3:2012, Annex F).

5.1.4 Natural weathering – Alternative substrates

The weathering test may be carried on additional alternative substrates such as different wood species, heartwood, treated woods etc. performance assessment remains the same.

NOTE When optional tests are carried out, the recording of the results according to the test procedure is mandatory (see Clause 4); however, there are no performance criteria in terms of claiming conformity.

5.1.5 Natural weathering – Alternative test piece

As described in EN 927-3:2012, Annex E, a more severe form of the test with an additional challenge (water-trap) may be carried out. Performance assessment remains the same.

5.2 Water permeability

Water permeability shall be assessed in accordance with EN 927-5 and expressed as a water absorption value. The water absorption value is the maximum allowed for the arithmetic mean of the five replicates as determined by the procedure described in EN 927-5.

The criteria for each end-use category are given in Table 3.

Table 3 — Water absorption criteria for end-use categories

	Stable	Semi-stable	Non-stable
EN 927-5, water absorption value	30 g/m² to 175 g/m²	30 g/m² to 250 g/m²	> 30 g/m²

5.3 Artificial weathering

Coatings are exposed to UV light and water according to the procedure described in EN 927-6. After exposure, panels are assessed for flaking, cracking, blistering, chalking, adhesion and colour change. The results are reported.

5.4 Knot staining

Resistance of the coating system to the discoloration caused by wood extractives in knots is assessed according to the procedure described in CEN/TS 16359. Colour differences recorded after the test provide an indication of the effectiveness of the coating system to resist staining.

5.5 Wet adherence (double cross test)

The possible behaviour of the coating under wet conditions is assessed according to the upcoming CEN/TS (Assessment of adherence of wood coatings by double cross-cut test). After testing, the results are reported in accordance with EN ISO 4628-1.

NOTE The test can also be carried out under dry conditions.