



SLOVENSKI STANDARD

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Nadomešča:
SIST EN 927-5:2007

Barve in laki - Premazi in premazni sistemi za zaščito lesa za zunanjo uporabo - 5. del: Ocenjevanje prepustnosti vode

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

Beschichtungsstoffe - Beschichtungsstoffe und Beschichtungssysteme für Holz im Außenbereich - Teil 5: Beurteilung der Wasserdurchlässigkeit

Peintures et vernis - Produits de peinture et systèmes de peinture pour le bois en extérieur - Partie 5 : Détermination de la perméabilité à l'eau liquide

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ICS:

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87.040	Barve in laki	Paints and varnishes

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EUROPEAN STANDARD

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

Peintures et vernis - Produits de peinture et systèmes de peinture pour le bois en extérieur - Partie 5 : Détermination de la perméabilité à l'eau liquide

Beschichtungsstoffe - Beschichtungsstoffe und Beschichtungssysteme für Holz im Außenbereich - Teil 5: Beurteilung der Wasserdurchlässigkeit

This European Standard was approved by CEN on 30 April 2023.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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European foreword

This document (EN 927-5:2023) 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of an identical text or by endorsement, at the latest by December 2023, and conflicting national standards shall be withdrawn at the latest by December 2023.

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 927-5:2006.

EN 927-5:2023 includes the following significant technical changes with respect to EN 927-5:2006:

- the selection and preparation of test panels has been clarified;
- Annex A has been rewritten to better describe the link between water absorption and end use categories.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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EN 927-5:2023 (E)**Introduction**

The treatment of exterior wood surfaces has both aesthetic and protective functions. A vital purpose of a coating system is to protect the wood against aesthetic deterioration (e.g. blue stain attack) and dimensional changes. Because such attacks are mainly caused by high moisture contents in the wood, a knowledge of the relative water permeability properties of coating materials applied to exterior wood is helpful in selecting products for particular end-use applications, as described in EN 927-1.

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1 Scope

This document specifies a test method for assessing the liquid water permeability of coating systems for exterior wood.

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 2808:2019, *Paints and varnishes — Determination of film thickness (ISO 2808:2019)*

ISO 554, *Standard atmospheres for conditioning and/or testing — Specifications*

3 Terms and definitions

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

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

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

3.1

water absorption

ability of a coated or uncoated wood panel to absorb water from liquid or vapour

3.2

water permeability

ability of a coating system to allow the transmission of water as liquid or vapour

[SOURCE: EN 927-1:2013, 3.13]

3.3

stable mass

mass achieved when the difference between two subsequent weighings within 24 h does not exceed 0,2 %

4 Principle

Water permeability is assessed by measuring the water uptake over a 72 h period of a coated test panel exposed to liquid water.

The coating under test is applied to the face of a defined test panel where the remaining face and sides are carefully sealed using a sealer of a defined mandatory low permeability.

Results are expressed as water absorption of coated wood panels in grams per square metre test surface per 72 h.

5 Test panels

5.1 Wood

The wood shall be spruce (*Picea abies*) that has been selected to be free from knots and cracks, to be straight-grained and of normal growth rate (i.e. between 3 and 8 annual rings per 10 mm). The inclination of the growth rings to the test face shall be $(45 \pm 10)^\circ$. See Figure 1.

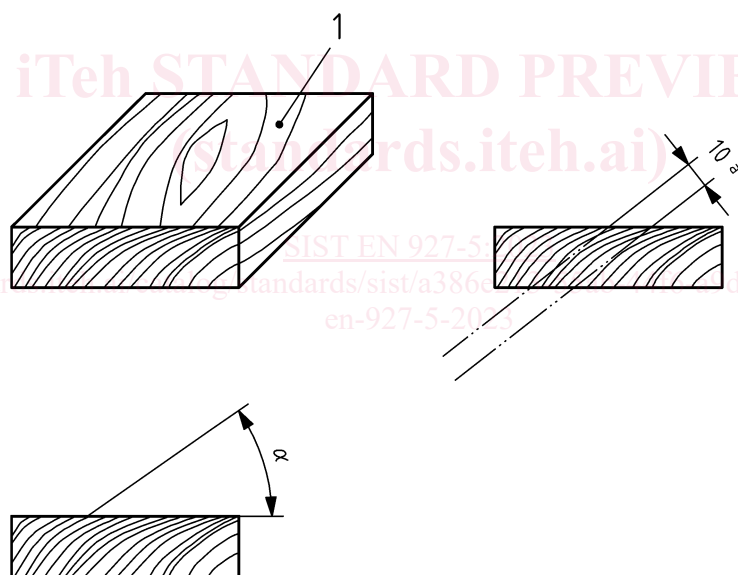
The wood shall be free from blue stain and evidence of surface or bulk infection. Abnormal porosity (caused by bacterial attack) shall be avoided.

Abnormally porous wood can be detected qualitatively by the rapid absorption of a drop of propan-2-ol (isopropanol) applied to the surface; the drop should not be absorbed in less than 30 s by normal wood. The test should be carried out at not less than six places, widely separated on the rear face of the test panel.

The density of the wood shall be between $0,4 \text{ g/cm}^3$ and $0,5 \text{ g/cm}^3$ when measured at an equilibrium moisture content of approximately 12 %. The measured density shall be recorded.

Condition the wood prior to conversion into test panels in accordance with ISO 554 at $(20 \pm 2)^\circ\text{C}$ and a relative humidity of $(65 \pm 5) \%$.

Dimensions in millimetres



Key

- 1 front of panel (test face)
- ^a min. 3, max. 8 growth rings/10 mm
- α angle of growth rings to test face min. 35° , max. 55°

Figure 1 — Selection of wood

5.2 Preparation and selection of test panels

Convert the conditioned wood into panels $(340 \pm 2) \text{ mm} \times (70 \pm 2) \text{ mm} \times (20 \pm 2) \text{ mm}$ in size. It is intended that after coating one panel 150 mm in length will be cut from each end of this 340 mm long panel. This will leave an off-cut approximately 35 mm in length from the middle of the panel, to be used in due course for the determination of film thickness (see 5.3.5 and Figure 2).

The panels shall be planed all round to a smooth and uniform finish. Any panels showing surface splitting shall be rejected.

5.3 Preparation of coated and sealed panels

5.3.1 Wood conditioning

Prior to coating, condition the panels to constant mass in accordance with ISO 554 at $(20 \pm 2) \text{ }^\circ\text{C}$ and a relative humidity of $(65 \pm 5) \%$. Panels shall be weighed at intervals of not less than one day until they have reached a stable mass (see 3.3).

5.3.2 Panel selection

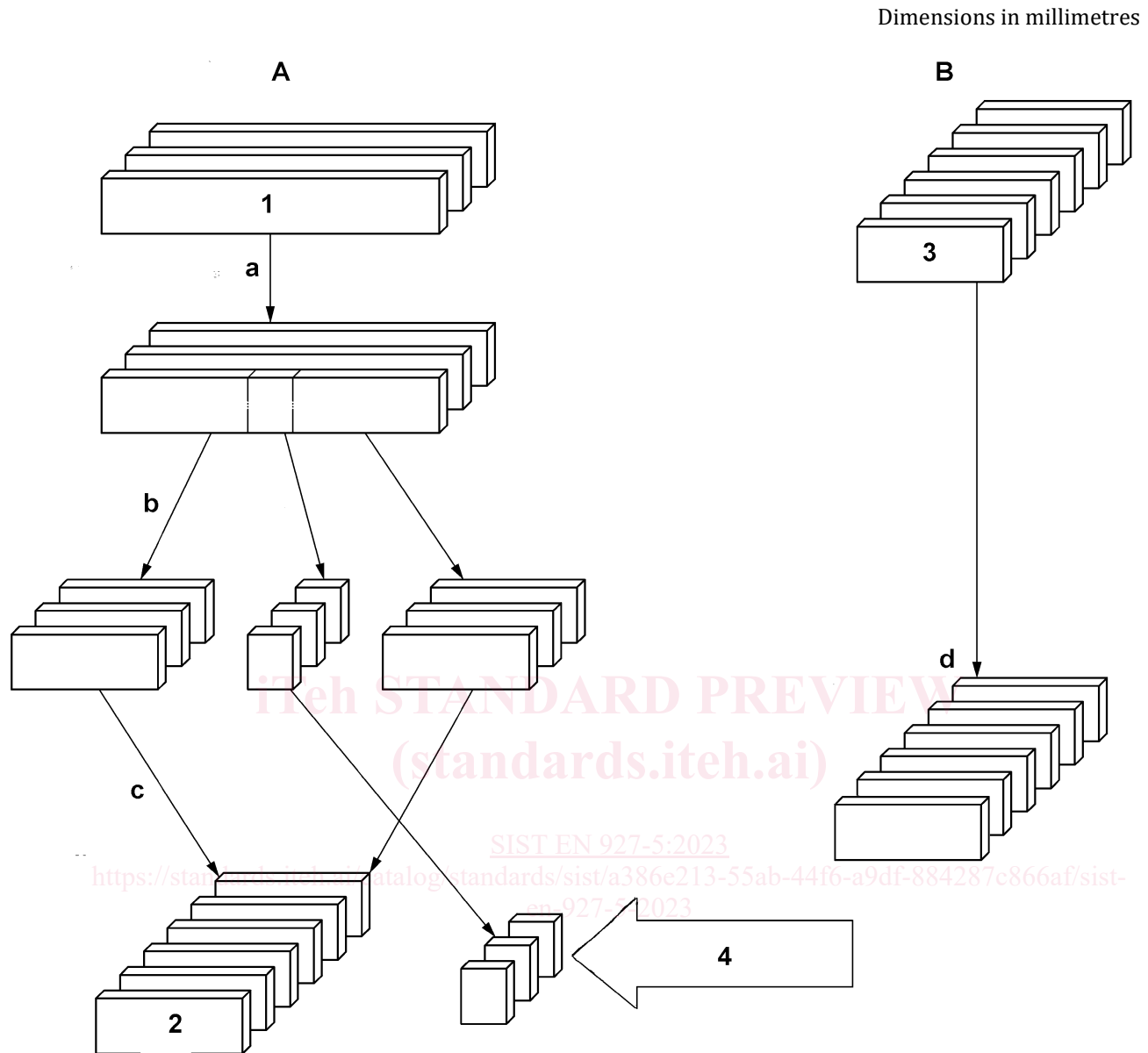
Select three panels $(340 \text{ mm} \times 70 \text{ mm} \times 20 \text{ mm})$ for each of the coatings to be tested. Select six panels $(150 \text{ mm} \times 70 \text{ mm} \times 20 \text{ mm})$ for testing the sealer product; this set of panels will serve as sealed controls (see Figure 2).

Mark each panel to identify the test face as that convex to the annual rings.

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**Key**

- A preparation of coated samples
- B preparation of sealed samples
- 1 3 panels (340 × 70 × 20)
- 2 6 panels (150 × 70 × 20)
- 3 6 panels (150 × 70 × 20)
- 4 3 off-cuts appr. (35 × 70 × 20) for measurements of paint film thickness
- a coating of front sides
- b cutting
- c sealing of edges and back sides
- d Sealing of all sides and edges.

Figure 2 — Cutting of test panels

5.3.3 Coating application

Coating systems shall be applied according to the manufacturer's specifications.

Apply each test coating system to the test face only (convex side of the panels' growth rings). Each coating system under test requires 3 test panels (340 mm × 70 mm × 20 mm).

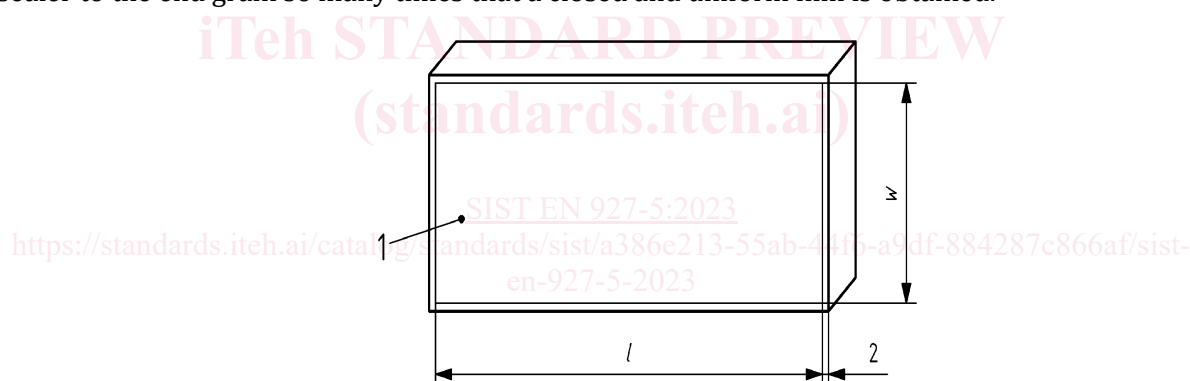
When the coating systems have dried, cut a test panel 150 mm in length from both ends of each long panel (see Figure 2).

The three small coated off-cuts are used for the determination of film thickness. Six additional panels (150 mm × 70 mm × 20 mm) are required to check the test face with the selected sealer. This sealer and the number of layers should be identical with the later on used sealer for sealing the test panels (150 mm × 70 mm × 20 mm). The liquid water permeability of the sealer shall not exceed 30 ml/m² in 72 h (see Figure 2).

Additional information is given in Annex B.

5.3.4 Sealing and conditioning

Panels shall be sealed in the same way whether they are applied for test coatings or control of sealer. Seal the sides, end-grains and reverse faces of the panels against water entry using at least two coats of a flexible coating with low moisture permeability, for example a solvent-free epoxy or polyurethane paint. The sealer shall cover the edges completely and overlap the test face by 2 mm (see Figure 3). Apply the sealer to the end grain so many times that a closed and uniform film is obtained.



Key

- 1 test face
- 2 2 mm
- l* length of the test face
- w* width of the test face

Figure 3 — Sealing of panels

After sealing, condition the panels in the controlled environment (see 5.3.1) until constant mass is achieved (for typically 7 to 28 days). After drying of the sealer measure and record the actual test area of each panel (see Figure 3).