



SLOVENSKI STANDARD

SIST EN 927-13:2019

01-november-2019

Nadomešča:

SIST-TS CEN/TS 16700:2014

Barve in laki - Premazi in premazni sistemi za zaščito lesa za zunanjo uporabo - 13. del: Ocenjevanje odpornosti premazov proti udarcu

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

Beschichtungsstoffe - Beschichtungsstoffe und Beschichtungssysteme für Holz im Außenbereich - Teil 13: Beurteilung der Schlagfestigkeit einer Beschichtung auf einem Holzsubstrat

Peintures et vernis - Produits de peinture et systèmes de revêtements pour le bois en extérieur - Partie 13 : Evaluation de la résistance au choc d'un revêtement sur un subjectile en bois

Ta slovenski standard je istoveten z: EN 927-13:2019

ICS:

71.100.50	Kemikalije za zaščito lesa	Wood-protecting chemicals
87.040	Barve in laki	Paints and varnishes

SIST EN 927-13:2019

en,fr,de

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EUROPEAN STANDARD

EN 927-13

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2019

ICS 87.040

Supersedes CEN/TS 16700:2014

English Version

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

Peintures et vernis - Produits de peinture et systèmes de peinture pour le bois en extérieur - Partie 13 : Évaluation de la résistance au choc d'un revêtement sur un substrat en bois

Beschichtungsstoffe - Beschichtungsstoffe und Beschichtungssysteme für Holz im Außenbereich - Teil 13: Beurteilung der Schlagfestigkeit einer Beschichtung auf einem Holzsubstrat

This European Standard was approved by CEN on 28 July 2019.

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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 CEN-CENELEC Management Centre has the same status as the official versions.

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

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European foreword

This document (EN 927-13:2019) 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 March 2020, and conflicting national standards shall be withdrawn at the latest by March 2020.

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 CEN/TS 16700:2014.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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EN 927-13:2019 (E)**Introduction**

During the use coated wood surfaces are exposed to various impacts. A suitable resistance of a coating on wood to impact is of importance to keep the substrate further protected with intact coating without cracks or flakes. The simple method described in this document provides quick information if a coating on wood is capable to withstand impacts without cracks or not. A similar method exists in ISO 4211-4 for furniture surfaces in interior use but in the present document the procedure is adopted and description of a carefully selected substrate is added to enable testing of coating materials and coating systems for exterior wood. The method should preferably be used on coatings that have not been exposed to weathering but it can also be applied after ageing of the coating or under different climatic conditions to gain additional experience.

The nature of the substrate will have a major effect on the results obtained in the test. Therefore, the use of any other substrate than the one specified should be clearly stated in the test report.

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1 Scope

This document specifies a test method for assessing the resistance of a coating to impact on a defined and carefully selected wooden substrate for coatings on wood components in exterior use.

The method is preferably used on coatings that have not been exposed to weathering. The method is suitable for use either as a means of comparing different coating systems or as a quality control test to ensure that a specified performance level is being achieved or maintained.

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

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 terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at <http://www.electropedia.org/>

— ISO Online browsing platform: available at <https://www.iso.org/obp>

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3.1

coating

layer formed from a single or multiple application of a coating material to a substrate

[SOURCE: EN ISO 4618:2014, 2.50.1]

3.2

impact resistance

ability of a coating to resist deformation from a sudden blow without damage

3.3

cracking

rupturing of a dry film or coat

[SOURCE: EN ISO 4618:2014, 2.65, modified — Notes have not been included.]

3.4

flaking

detachment of small parts of a coating due to a loss of adhesion

[SOURCE: EN ISO 4618:2014, 2.114]

EN 927-13:2019 (E)

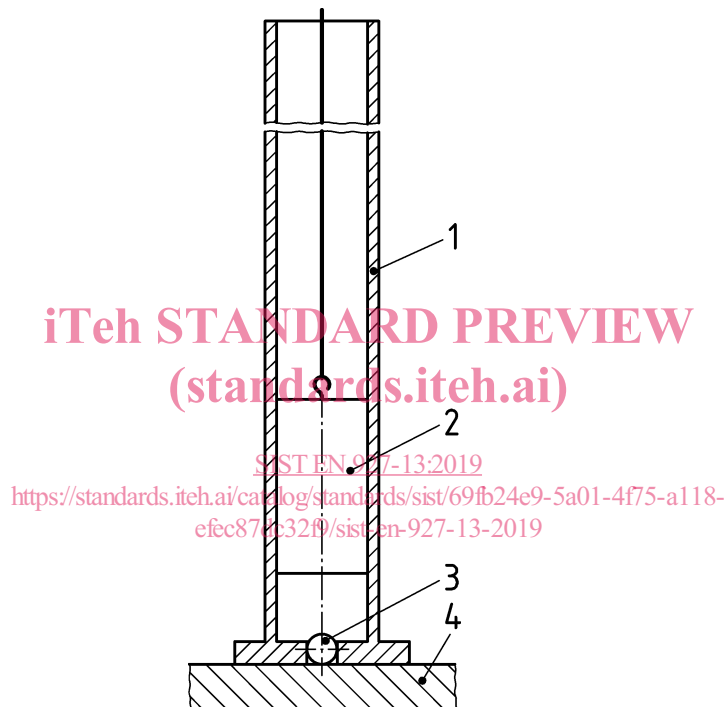
4 Principle

A cylindrical steel weight is dropped from specified heights through a vertically-mounted guide onto a steel ball of specified diameter and hardness positioned on the test panel. The degree of damage to the test area is assessed by reference to a descriptive numerical rating code.

5 Apparatus and materials

5.1 Horizontal base which provides rigid support for the test panel.

5.2 Vertically-mounted guide tube with an inside diameter of (40 ± 5) mm (1 in Figure 1). A $(10,0 \pm 0,5)$ mm thick disc with a centre hole of diameter $(14,25 \pm 0,25)$ mm for the ball (5.4) shall be attached to the bottom end of the guide tube.



Key

- 1 vertically-mounted guide tube
- 2 cylindrical steel weight
- 3 steel ball
- 4 test panel

Figure 1 — Impact on surface

5.3 Cylindrical steel weight (2 in Figure 1) with a mass of (500 ± 5) g and a diameter that is approximately 1 mm less than the inside diameter of the guide tube. This weight shall be made of softer alloy than the ball, so that it will not make indentations on the ball. Provision shall be made for the weight to be raised and lowered.

5.4 Steel ball (3 in Figure 1) with a diameter of 14 mm and Rockwell hardness of 60 HRC to 66 HRC (see EN ISO 6508-1), a rolling bearing ball for example (see ISO 3290-1).

5.5 Microscope (magnifier) with a magnification of at least $\times 10$ for the assessment of surface defects.

6 Procedure

6.1 Wood panels

Boards of Norway spruce (*Picea abies* [L]. Karst) are selected with normal growth rate (i.e. 3 annual rings to 8 annual rings per 10 mm), a density between $0,4 \text{ g/cm}^3$ and $0,5 \text{ g/cm}^3$ (measured after conditioning) and straight grain. The wood shall be free from blue stain and evidence of surface or bulk fungal infection. Abnormal porosity (caused by bacterial attack) shall be avoided (see EN 927-3:2019, A.10). From these boards, panels with the minimum dimensions $170 \text{ mm} \times \text{min. } 70 \text{ mm} \times (20 \pm 2) \text{ mm}$ free from knots, cracks and resinous streaks are produced so that the inclination of the growth rings to the test surface is 60° to 90° . The panels shall be planed to a smooth and uniform finish. In order to avoid aged wood surface, the panels shall be hand sanded (mesh 150) immediately before coating.

The wood shall be conditioned at $(20 \pm 2)^\circ\text{C}$ and a relative humidity of $(65 \pm 5)\%$ in accordance with ISO 554 to an equilibrium moisture content of $(13 \pm 2)\%$. After conditioning wood density is determined according to ISO 13061-2.

6.2 Coating application

For each system, select three panels on a random basis from the available supply. Apply the coating system to the front side of one panel using the method specified by the manufacturer to give a wet film thickness corresponding to the mean value $\pm 20\%$ of the manufacturer's recommended spreading rate. Record the quantity of coating applied. The values should be stated preferably in grams per square metre, but may also be expressed as wet film thickness (in micrometres).

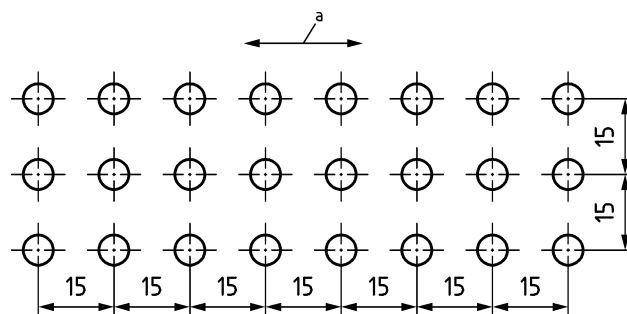
After coating application, age the panels for 21 days in the controlled environment at $(20 \pm 2)^\circ\text{C}$ and a relative humidity of $(65 \pm 5)\%$ in accordance with ISO 554.

6.3 Assessment of resistance to impact

6.3.1 General

No impact point shall be less than 15 mm from any edge of the test panel. The centres of impact points shall not be less than 15 mm apart. If the grid pattern method detailed in 6.3.2 is to be used, then eight lines spaced at least 15 mm apart shall be marked out on the surface that is to be tested. The lines shall be perpendicular to the direction of grain. Three impact points spaced at least 15 mm apart shall be marked off along each line (see Figure 2).

Dimensions in millimetres



Key

a direction of grain