



SLOVENSKI STANDARD

SIST-TS CEN/TS 16700:2014

01-november-2014

Barve in laki - Premazi in premazni sistemi za zunanjo zaščito lesa - Ocenjevanje odpornosti premaza proti udarcu

Paints and varnishes - Coating materials and coating systems for exterior wood - Assessment of resistance to impact of a coating on a wooden substrate

Beschichtungsstoffe - Beschichtungsstoffe und Beschichtungssysteme für Holz im Außenbereich - Beurteilung der Schlagfestigkeit einer Beschichtung auf Holzsubstrat

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

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Ta slovenski standard je istoveten z: **CEN/TS 16700:2014**

ICS:

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

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en,fr,de

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TECHNICAL SPECIFICATION
SPÉCIFICATION TECHNIQUE
TECHNISCHE SPEZIFIKATION

CEN/TS 16700

August 2014

ICS 87.040

English Version

**Paints and varnishes - Coating materials and coating systems
for exterior wood - Assessment of resistance to impact of a
coating on a wooden substrate**

Peintures et vernis - Produits de peinture et systèmes de
revêtements pour le bois en extérieur - Evaluation de la
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bois

Beschichtungsstoffe - Beschichtungsstoffe und
Beschichtungssysteme für Holz im Außenbereich -
Beurteilung der Schlagfestigkeit einer Beschichtung auf
Holzsubstrat

This Technical Specification (CEN/TS) was approved by CEN on 17 May 2014 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (CEN/TS 16700:2014) has been prepared by Technical Committee CEN/TC 139 "Paints and Varnishes", the secretariat of which is held by DIN.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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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 may also be applied after ageing of the coating or under different climatic conditions to gain additional experience.

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1 Scope

This Technical Specification 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.

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

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.

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

ISO 3131, *Wood — Determination of density for physical and mechanical tests*

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3 Terms and definitions **(standards.iteh.ai)**

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

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

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[SOURCE: FprEN 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: FprEN ISO 4618:2014, 2.65, modified — Notes have been left out]

3.4 flaking

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

[SOURCE: FprEN ISO 4618:2014, 2.114]

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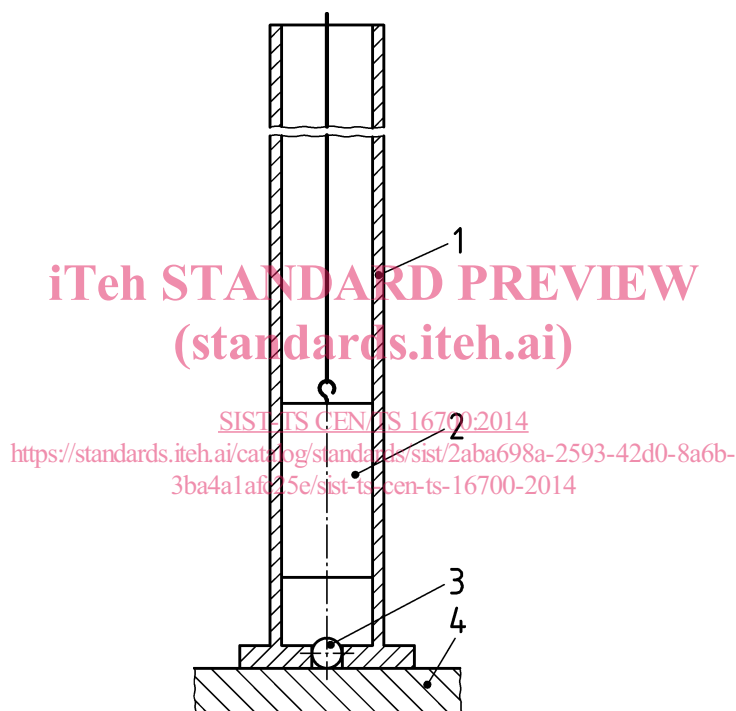
4 Principle

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 $(10 \pm 0,5)$ 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 927-3:2012, B.10). From these boards panels with the dimensions min. 170 mm × min. 70 mm × (20 ± 2) 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 3131.

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).

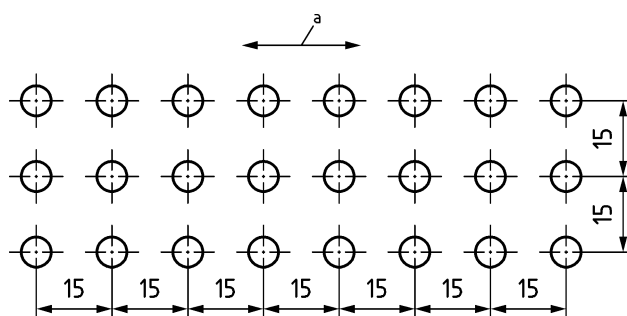
After coating application, age the panels for 21 days in the controlled environment at $(20 \pm 2)^\circ\text{C}$ and a relative humidity of $(65 \pm 5)\%$ in accordance with ISO 554.

6.3 Assessment of resistance to impact

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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).



Key

a direction of grain

Figure 2 — Impact points on surface