



SLOVENSKI STANDARD
SIST-TS CEN/TS 16498:2014

01-februar-2014

Barve in laki - Premazi in premazni sistemi za zaščito lesa za zunanjo uporabo - Ocenjevanje odpornosti premazov proti obarvanju zaradi lesnih taninov

Paints and varnishes - Coating materials and coating systems for exterior wood - Assessment of tannin staining

Beschichtungsstoffe - Beschichtungsstoffe und Beschichtungssysteme für Holz im Außenbereich - Beurteilung von unerwünschten Verfärbungen aufgrund von Holzinhaltstoffen

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Peintures et vernis - Produits de peinture et systèmes de peinture pour le bois en extérieur - Évaluation des taches de tanin

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Ta slovenski standard je istoveten z: CEN/TS 16498:2013

ICS:

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

SIST-TS CEN/TS 16498:2014

en,fr,de

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TECHNICAL SPECIFICATION
SPÉCIFICATION TECHNIQUE
TECHNISCHE SPEZIFIKATION

CEN/TS 16498

November 2013

ICS 87.040

English Version

**Paints and varnishes - Coating materials and coating systems
for exterior wood - Assessment of tannin staining**

Peintures et vernis - Produits de peinture et systèmes de
peinture pour le bois en extérieur - Évaluation des taches
de tanin

Beschichtungsstoffe - Beschichtungsstoffe und
Beschichtungssysteme für Holz im Außenbereich -
Beurteilung von unerwünschten Verfärbungen aufgrund von
Holzinhaltsstoffen

This Technical Specification (CEN/TS) was approved by CEN on 12 February 2013 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
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (CEN/TS 16498:2013) has been prepared by Technical Committee CEN/TC 139 "Paints and varnishes", the secretariat of which is held by DIN.

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Introduction

Coatings on exterior wood surfaces have both decorative and protective functions. A valued function of the coating system is to protect against discoloration caused by the presence of wood extractives in the coating migrating from the wood material. Bleeding of extractives can occur at different stages, including shortly after coating application and at a later stages in use, when driving forces like fluctuating humidity are present.

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1 Scope

This Technical Specification specifies a test method for assessing the discoloration of coatings on wood by tannin staining due to wood extractives. The method uses an extract from Merbau wood as an indicator. Bleeding of wood extractives is assessed at two specified stages firstly after coating application and secondly after cyclic climate exposure. A qualification of colour differences that can be attributed to three different causes, bleeding of extractives, low opacity of the coating film or general yellowing in climate exposure, is included. This document does not specify acceptance values for colour differences that can be tolerated and it is not applicable to staining caused by knots for which there is a different test method (e. g. CEN/TS 16359).

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.

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

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

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

ISO 7724-2, *Paints and varnishes — Colorimetry — Part 2: Colour measurement*

3 Terms and definitions

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

3.1

tannin staining

appearance of discoloration on coated surfaces caused by wood extractives in the substrate

3.2

knot staining

appearance of discoloration on coated surfaces caused by wood extractives in knots

3.3

wood extractives

low-molecular weight wood components soluble in organic solvents or water

4 Apparatus and materials

4.1 1 l measuring cylinder.

4.2 Balance, with an accuracy of 0,01 g.

4.3 CIELAB Spectrophotometer, with d/8 geometry, D65 light source and 10° standard observer.

4.4 Chips of Merbau wood (*Intsia sp.*), produced by drilling.

4.5 1 l round bottom flask with a water cooled condenser.

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- 4.6 Round bottom heater.
- 4.7 Coating applicator, with a 60 µm gap and 40 mm to 100 mm width.
- 4.8 Equipment for coating application.
- 4.9 Black/white contrast cards.
- 4.10 Climate chamber to maintain (20 ± 2) °C and (65 ± 5) % relative humidity.
- 4.11 Climate chamber to maintain (60 ± 2) °C and (100 ± 5) % relative humidity.
- 4.12 Climate chamber to maintain (23 ± 2) °C and (50 ± 5) % relative humidity.

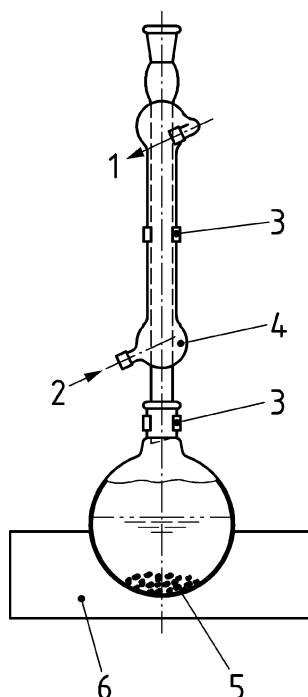
5 Procedure**5.1 Preparation of wood extract**

For each test a fresh wood extract solution with defined concentration is produced using the following procedure:

- weigh approximately 30 g of Merbau wood (*Intsia sp.*) wood chips in a 1 l round bottom flask equipped with a water cooled condenser (see Figure 1);
- add approximately 500 g deionised water;
- heat this mixture 8 h at 100 °C to boiling and let cool down 16 h. Repeat this cycle 3 times in total;
- cool the solution to room temperature and filter;
- on a sample of the solution measure the solid content in % (by mass) by evaporation;
- concentrate the solution by evaporation and dilution with water to a remaining solution of 3 % solid content.

The solution may be applied for a period of 1 month provided it is kept cool.

The extraction apparatus is shown in Figure 1.

**Key**

- 1 water out
- 2 water in
- 3 clamp
- 4 condenser
- 5 Merbau wood with deionised water
- 6 heat source

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Figure 1 — Extraction model

NOTE Merbau wood is a commercially used wood species that is known to have a very high amount of extractives compared to other wood species.

5.2 Wood panels, extract application and sealing

Boards of Beech wood (*Fagus sylvatica*) are selected with normal growth rate (i. e. 2 annual rings to 6 annual rings per 10 mm) and straight grain. From these boards panels with the dimensions 150 mm × 74 mm × 20 mm free from knots and cracks 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 an aged wood surface, the panels should be hand sanded (mesh 150) immediately before application of the Merbau wood extract.

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) until equilibrium has been reached, i. e. normally minimum for one month and maximally for 6 months. After conditioning, wood density is determined according to ISO 3131.

Apply a layer of the Merbau wood extract using a coating applicator with a gap size of 60 μm on 6 Beech wood panels across the grain (see Figure 2) and let the solution dry for min. 8 h at $(20 \pm 2) ^\circ\text{C}$ $(65 \pm 5) \%$ relative humidity. Repeat the application after drying.

Seal all sides except the test face of the panels with a sealer according to EN 927-5.