SLOVENSKI STANDARD
SIST EN 16818:2018

01-december-2018

Trajnost lesa in lesnih izdelkov - Dinamika vlaženja lesa in lesnih izdelkov

Durability of wood and wood-based products - Moisture dynamics of wood and wood-based products

Dauerhaftigkeit von Holz und Holzprodukten - Feuchte-Dynamik von Holz und Holzprodukten

Durabilité du bois et des matériaux à base de bois - Cinétique d'humidification du bois et des produits à base de bois

Ta slovenski standard je istoveten z: **CEN/TS 16818:2018**

ICS:

79.040	Les, hlodovina in žagan les	Wood, sawlogs and sawn timber
79.080	Polizdelki iz lesa	Semi-manufactures of timber

SIST EN 16818:2018 **en,fr,de**

TECHNICAL SPECIFICATION

SPÉCIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION

CEN/TS 16818

August 2018

ICS 79.080

English Version

Durability of wood and wood-based products - Moisture dynamics of wood and wood-based products

Durabilité du bois et des matériaux à base de bois - Cinétique d'humidification du bois et des produits à base de bois

Dauerhaftigkeit von Holz und Holzprodukten - Feuchte-Dynamik von Holz und Holzprodukten

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. CEN/TS 16818:2018 E

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European foreword

This document (CEN/TS 16818:2018) has been prepared by Technical Committee CEN/TC 38 “Durability of wood and wood-based products”, the secretariat of which is held by AFNOR.

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Introduction

Moisture has a significant influence on the mechanical and physical properties and on the biological durability of wood and wood-based materials. The test method described in this Technical Specification is a laboratory method in which small samples are exposed to water. It provides a basis for assessment of the moisture dynamics of wood and wood-based materials in service. The method permits the determination of the water uptake and moisture release which may provide important information on the susceptibility to the onset of fungal attack in certain end uses.

It is recommended that the results of this test should be supplemented by further suitable tests and especially by practical experience.

1 Scope

This document details a method for determining the water uptake and the effectiveness of the drying process on solid wood, wood-based materials or coated wood by means of water absorption and water vapour desorption. This document lays down a method to assess the moisture dynamics of wooden products which can be a contributing factor to the susceptibility to wood decay.

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 3696, *Water for analytical laboratory use — Specification and test methods (ISO 3696)*

EN 13183-1, *Moisture content of a piece of sawn timber — Part 1: Determination by oven dry method*

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 http://www.iso.org/obp

3.1
supplier
sponsor of the test (person or company providing the samples or wood-based products to be tested)

3.2
residue
moisture content left in the test specimen after desorption as a percentage of the absorbed moisture

3.3
residual moisture content
increase in moisture content in the test specimen after desorption

3.4
absorption coefficient
slope of the fitted line for a plot of the water uptake per square metre against the square root of the elapsed time

3.5
treatment block
wood or wood-based product that is subsequently edge and end grain sealed to create the test specimen

4 Principle

Test specimens prepared from the wood or wood-based product under test are exposed to water by means of floating or submersion. During a prescribed wetting and drying period under defined conditions the mass of the specimens is registered. The mass gain and mass loss is used to estimate the residual moisture and thus the potential to reach and remain at a moisture content at which fungal decay can occur.

5 Test specimens

5.1 Quality

The wood and wooden products shall be free from cracks, stain, decay, insect damage or other defect. In case of timber, it shall be quarter sawn for provision of test specimens.

5.2 Provision of the test specimens (Annex A)

Condition the wood and wooden products at (65 ± 5) % and (20 ± 2) °C to constant mass (mass variation in consecutive measurements ± 0,01 g). Prepare planed strips having a cross section of (50 ± 0,5) mm and (25 ± 0,5) mm. The longitudinal faces of the wood samples shall be parallel to the direction of the grain. The annual rings shall not be parallel to the faces (contact angle > 10°) but otherwise can run in any other direction. Make transverse cuts, neatly to give sharp edges and a fine-sawn finish to the end grain surfaces, to give test specimens a length of (50 ± 0,5) mm for the floating test method or a length of (150 ± 0,5) mm long for the submersion test method.

The test specimens shall originate from a minimum of three planks or panels.

5.3 Dimensions of each test specimen

5.3.1 Floating test

The dimension of each test specimen at conditioned mass shall be (50 ± 0,5) mm × (50 ± 0,5) mm × (25 ± 0,5) mm or the thickness of the panel under test.

5.3.2 Submersion test

The dimension of each test specimen at conditioned mass shall be (150 ± 0,5) mm × (50 ± 0,5) mm × (25 ± 0,5) mm or the thickness of the panel under test.

5.4 Number of test specimens

Use at least three test specimens per plank or panel. This results in a minimum total of 9 test specimens.

5.5 Products and reagents

5.5.1 Water

Complying with grade 3 of EN ISO 3696.

5.5.2 End sealer

The end sealer is necessary to prevent water penetrating along the end grain. A two pack polyurethane finish (e.g. Sigmadur 520 (HB Finish))[1] or any appropriate material which is water resistant.

5.6 Apparatus

5.6.1 Conditioning room well ventilated and controlled at (20 ± 2) °C and (65 ± 5) % relative humidity.

5.6.2 Saw with blades giving a fine-sawn finish.

5.6.3 Test containers for demineralized water, of sufficient size to hold the specimens under test.

5.6.4 Usual laboratory equipment, especially:

— analytical balance with accuracy of 0,01 g;

— various brushes;

— drying oven, adjustable at (103 ± 2) °C;

— desiccator, with efficient desiccant (e.g. silica gel).

6 Procedure

6.1 Treatment of the wood test specimens

6.1.1 Sealing of the end grain and edges

The end grains and edges of the specimens are sealed by means of a paint roller using a two pack polyurethane finish (see 5.5.2) or a product with demonstrably similar performance. This is repeated three times with drying between each application, ensuring an adequate sealing of the edges. The surfaces are left uncoated.

NOTE To ensure adequate end sealing, it can be useful to apply the end sealer and overlap the edges 1 mm to 2 mm, e.g. by using a short dip of the cross sections in the sealant.

6.1.2 Conditioning of test specimens

The specimens are stored in a conditioning room (see 5.6.1) until a stable mass is achieved (mass variation in consecutive measurements ± 0,01 g).

6.2 Absorption cycle

6.2.1 Floating test

Weigh the test specimens to the nearest 0,01 g and record the initial mass (m_i).

Fill a container with demineralized water (5.5.1) and place in the conditioning room (5.6.1).

[1] Sigmadur 520 (HB Finish) is the trade name of a product supplied by Sigma Coatings. This information is given for the convenience of users of this Technical Specification and does not constitute an endorsement by CEN/TC 38 of the product named. Equivalent products may be used if they can be shown to lead to the same results.