

Paints and varnishes - Coating materials and coating systems for exterior wood - Part 3: Natural weathering test

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

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English Version

## Paints and varnishes - Coating materials and coating systems for exterior wood - Part 3: Natural weathering test

Peintures et vernis - Produits de peinture et systèmes de peinture pour le bois en extérieur - Partie 3 : Essai de vieillissement naturel

Beschichtungsstoffe - Beschichtungsstoffe und Beschichtungssysteme für Holz im Außenbereich - Teil 3: Freibewitterung

This European Standard was approved by CEN on 21 July 2019.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
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EUROPÄISCHES KOMITEE FÜR NORMUNG

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<b>Contents</b>	<b>Page</b>
European foreword.....	3
<b>1 Scope</b> .....	<b>4</b>
<b>2 Normative references</b> .....	<b>4</b>
<b>3 Terms and definitions</b> .....	<b>5</b>
<b>4 Principle</b> .....	<b>5</b>
<b>5 Apparatus and materials</b> .....	<b>6</b>
<b>6 Coating sampling</b> .....	<b>6</b>
<b>7 Test panel selection</b> .....	<b>6</b>
<b>7.1 Wood reference species</b> .....	<b>6</b>
<b>7.2 Preparation and selection of wood panels</b> .....	<b>7</b>
<b>7.3 Preparation of coated panels</b> .....	<b>8</b>
<b>8 Procedure</b> .....	<b>10</b>
<b>8.1 General</b> .....	<b>10</b>
<b>8.2 Examination before exposure</b> .....	<b>10</b>
<b>8.3 Exposure</b> .....	<b>10</b>
<b>8.4 Examination after exposure</b> .....	<b>10</b>
<b>9 Precision data</b> .....	<b>11</b>
<b>10 Expression of results and test report</b> .....	<b>11</b>
<b>Annex A (normative) Details of test methods</b> .....	<b>12</b>
<b>Annex B (normative) Assessment requirements for panels of test coatings and WRM</b> .....	<b>15</b>
<b>Annex C (informative) Example format for a test report</b> .....	<b>16</b>
<b>Annex D (informative) Optional tests including variations to standard weathering test procedure to obtain additional information on coating performance</b> .....	<b>19</b>
<b>Annex E (informative) Explanatory notes</b> .....	<b>22</b>
<b>Annex F (informative) Precision data</b> .....	<b>23</b>
<b>Annex G (normative) Guidance on typical properties for some common wood species</b> .....	<b>25</b>
<b>Annex H (informative) Determination of adhesive strength of tape on test surface</b> .....	<b>29</b>
<b>Annex I (informative) Thermal or chemical modification to protect the wood</b> .....	<b>30</b>
<b>Bibliography</b> .....	<b>32</b>

## European foreword

This document (EN 927-3:2019) 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 EN 927-3:2012.

The main technical changes in comparison with the previous edition are:

- a) the provision for using alternative wood species has been updated;
- b) the Internal Comparison Product (ICP) has been replaced by a nominated reference material as Weathering Reference Material (WRM);
- c) mould growth assessment has been extended to visual disfigurement by microorganisms;
- d) former Annex A was deleted;
- e) new Annex G for typical properties for common wood species was added;
- f) new Annex H for adhesive tape testing was added;
- g) new Annex I for thermal/chemical modification of wood was added;
- h) standard editorially revised.

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.

## 1 Scope

This document specifies a natural weathering test for exterior wood coating systems mainly intended for decoration and protection of planed and sawn wood.

The test provides a means of evaluating the performance of a wood coating system during outdoor exposure. It forms the basis for the performance specification in accordance with EN 927-2. It also facilitates the comparison of coating systems performance on different substrates including the wood species, or other wood modifications.

## 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 927-2, *Paints and varnishes — Coating materials and coating systems for exterior wood — Part 2: Performance specification*

EN 16492, *Paints and varnishes — Evaluation of the surface disfigurement caused by fungi and algae on coatings*

EN ISO 1513, *Paints and varnishes — Examination and preparation of test samples (ISO 1513)*

EN ISO 2409, *Paints and varnishes — Cross-cut test (ISO 2409)*

EN ISO 2808:2007, *Paints and varnishes — Determination of film thickness (ISO 2808:2007)*

EN ISO 2810, *Paints and varnishes — Natural weathering of coatings — Exposure and assessment (ISO 2810)*

EN ISO 2813, *Paints and varnishes — Determination of gloss value at 20°, 60° and 85° (ISO 2813)*

EN ISO 4628-1:2016, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 1: General introduction and designation system (ISO 4628-1:2016)*

EN ISO 4628-2, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 2: Assessment of degree of blistering (ISO 4628-2)*

EN ISO 4628-4, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 4: Assessment of degree of cracking (ISO 4628-4)*

EN ISO 4628-5, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 5: Assessment of degree of flaking (ISO 4628-5)*

EN ISO 4628-6, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 6: Assessment of degree of chalking by tape method (ISO 4628-6)*

EN ISO 15528, *Paints, varnishes and raw materials for paints and varnishes — Sampling (ISO 15528)*

EN ISO 11664-4, *Colorimetry — Part 4: CIE 1976 L\*a\*b\* Colour space (ISO 11664-4)*

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

ISO 18314-1, *Analytical colorimetry — Part 1: Practical colour measurement*

### 3 Terms and definitions

For the purposes of this document, the following term and definition applies.

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>

#### 3.1

#### **Weathering Reference Material**

#### **WRM**

coating material of known aging performance

### 4 Principle

The resistance to natural weathering of the coating system under test, applied to a specified wood substrate, is assessed. Durability is evaluated by determining the changes in decorative and protective properties of coatings after 12 months of exposure.

The reference test substrate is *Pinus sylvestris* (European redwood or Scots pine, subsequently referred to as pine) in order to obtain comparative results more rapidly. The sapwood, which is usually present in joinery timber, was chosen as the substrate reference instead of heartwood, because paint failure is more evident on the former. However heartwood and other grain orientations may be used as alternatives.

Differences in nature and quality of wood, and in the weather and site conditions, are recognized and allowed for in the method by comparing the test system with a nominated WRM<sup>1)</sup>. The WRM is subject to agreement by the customer and test institution and could be a nominated commercial product.

The standard test substrate is pine sapwood. Performance on substrates additional to pine can be carried out using the same test method principles on a nominated substrate (or substrates), e.g. alternative wood species, wood pre-treatments, and wood modifications. The results can be assessed by the criteria of EN 927-2 and subject to meeting them, conformity claimed for the tested substrate/coating combination.

Optional tests are described in Annex D. They can provide valuable additional information. However to facilitate comparisons the standard requires that pine panels are included as part of each exposure series. An alternative version of the test panel has a machined water-trap. This can accelerate some types of failure.

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1) Previous versions of EN 927-3 have used a tightly specified semi-transparent wood stain as the WRM and known as the Internal Comparison Product (ICP). It has proved increasingly difficult to source the raw materials for the ICP and legislation has made some materials unavailable. The ICP was primarily used to assess the severity of the climatic exposure at the weathering site but proved to be relatively insensitive to location. Interpretation of this revised Standard places more emphasis on the absolute test result but allows manufacturers and research organisations to make comparison with tried and tested compositions.