SLOVENSKI STANDARD
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Zaġḷ itna sredstva za les - Ugotavljanje preventivne uḷ inkovitosti zaġḷ itnega sredstva proti glivam modrivkam - Laboratorijska metoda

Wood preservatives - Determination of the protective effectiveness of a preservative treatment against blue stain in wood in service - Laboratory method

Holzschutzmittel - Bestimmung der vorbeugenden Wirksamkeit einer Schutzbehandlung von verarbeitetem Holz gegen Blaüepilze - Laboratoriumsverfahren

Produits de préservation du bois - Détermination de l'efficacité préventive d'un traitement de protection du bois mis en œuvre contre le bleuissement fongique - Méthode de laboratoire

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71.100.50 Kemikalije za zaġḷ ito lesa Wood-protecting chemicals

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English Version

Wood preservatives - Determination of the protective effectiveness of a preservative treatment against blue stain in wood in service - Laboratory method

Produits de préservation du bois - Détermination de l'efficacité préventive d'un traitement de protection du bois mis en œuvre contre le bleuissement fongique - Méthode de laboratoire

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 38.

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Foreword

This document (prEN 152:2010) has been prepared by Technical Committee CEN/TC 38 “Durability of wood and wood-based products”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 152-1:1988, EN 152-2:1988.

Significant technical differences between this standard and EN 152-1 and 2:1988 are as follows:

a) introduction of a new harmonised specification for the test specimens used in the diverse biological tests;

b) merging of the Part 1 relating to the brushing procedure and the Part 2 concerning the application by methods other than brushing;

c) taking into account of the terms given in EN 1001-1 and the definitions of EN 1001-2;

d) introduction of an informative Annex to take account of consideration for minimisation of environmental and health hazards caused by the use of this biological test.

Introduction

The test method described in this European Standard is a laboratory method combined with pre-conditioning (natural or artificial weathering), which provides a basis for assessment of the effectiveness of a wood preservative or wood preservative systems in preventing the development of blue stain fungi in wood in service where disfigurement can be considered important, such as external decorative timber and joinery. The method permits the determination of the effectiveness of undiluted preservatives and may also be used to test preparations in which the proportions of the individual components (active ingredients) have been varied and so establish for the active ingredients the limit of their effectiveness.

It should be used to assess the value of the protection, taking into account the method of application and in particular the manufacturers specifications. It is recommended that the results of these tests should be supplemented by further suitable tests and especially by practical experience.

Suitable precautions should include the use of separate rooms, areas within rooms, extraction facilities, conditioning chambers and special training for personnel. (also see Annex H for environmental, health and safety precautions).

1 Scope

This European Standard specifies a method which is only suitable for testing preparations and systems which are intended to prevent the occurrence of blue stain fungi in wood in service. It is not suitable for assessing the temporary preventive effectiveness of anti-stain preservatives on round wood or on freshly cut wood. The method is not intended for the determination of the fungicidal properties of the surface coating applied to the wood after the priming coat.

This European Standard lays down a method for determining the effectiveness of a preparation applied by e.g. brushing, spraying, spraying tunnel, dipping or vacuum and pressure treatments resulting in an equivalent retention of product in preventing the development of blue stain fungi in wood in service. It is also applicable where a primer paint is used in conjunction with the preservative system [1)].

This method is applicable to the following types of preparations or systems:

— Type A: fungicidal preparations with or without pigment, used in conjunction with unspecified varnishes or paint coatings;

or

— Type B: fungicidal preparations with or without pigment, used in conjunction with specified varnishes or paint coatings;

or

— Type C: fungicidal preparations with or without pigment, used without subsequent varnish or paint coating (e.g. stains).

NOTE It is also possible to test the effectiveness in preventing blue stain in service of a combined protective system which involves the application of one preparation by a penetrating treatment technique followed by a subsequent application of a different preparation by a superficial treatment method.

2 Normative references

The following referenced documents are indispensable for the application 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 1001-2, *Durability of wood and wood-based products — Terminology — Part 2: Vocabulary*.

EN ISO 3696, *Water for analytical laboratory use — Specification and test methods (ISO 3696:1987)*.

EN 927-3:2004, *Paints and varnishes — Coating materials and coating systems for exterior wood — Part 3: Natural weathering test*.

EN 927-6:2004, *Paints and varnishes — Coating materials and coating systems for exterior wood — Part 6: Exposure of wood coatings to artificial weathering using fluorescent UV lamps and water*.

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1) The method may also be used for first coat (primer) paints required to give protection during storage of components on-site (see annex E). These are tested as for preparations of type C.

3 Terms and definitions

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

3.1
representative sample
sample having its physical and/or chemical characteristics identical to the volumetric average characteristics of the total volume being sampled.

[EN 1001-2, 4.71]

3.2
supplier
sponsor of the test (person or company providing the sample of wood preservative to be tested).

[Adapted from EN 1001-2, 4.83]

4 Principle

The basic principles of the test method are to provide the conditions for infection by blue stain fungi into the treated face and into the untreated part behind the treated face and to observe the development of infection into the treated face.

— A series of blocks of the given timber species are treated with the preparation under test on all faces except the end-grain faces. Subsequently the blocks are cut in fibre direction leading each to two specimens with an untreated back. The treatment differs according to the type of preparation (clause 2) (Annex E, Table E.1) and specifications for its use:

Type A Preparations designed to be used with unspecified varnish or paint coatings are tested using the application rate appropriate to the preparation (Annex E, Table E.2) or as otherwise specified by the manufacturer followed by the standard test varnish.

Type B Preparations designed to be used with specified varnish or paint coatings are tested using the application rate appropriate to the preparation (Annex E, Table E.2) or as otherwise specified by the manufacturer followed by a surface coating strictly according to the manufacturer's specification.

Type C Preparations designed to be used without subsequent varnish or paint coatings are tested using the application rate appropriate to the product (Annex E, Table E.2) or as otherwise specified by the manufacturer but with no subsequent application of coating.

— Treated test specimens are exposed to pre-conditioning (natural or artificial weathering).

— Weathered test specimens are then exposed in the laboratory to the action of a mixed culture of two fungi causing blue stain in service.

5 Test materials

5.1 Biological material

The test fungi to be used in all tests are [2)]

— *Aureobasidium pullulans* (de Bary) Arnaud, strain P 268 [3)], source Hann. Münden

— *Sydowia polyspora* (Bref. & Tavel) E. Müller (syn. *Sclerophoma pithyophila* (Corda) v. Höhnel) strain S 231 [4)], source Hann. Münden

Use the test fungi as a mixed culture in the form of a spore suspension. The technique for the preparation of this spore suspension is described in Annex B.

NOTE If desired, spore suspensions of other blue stain fungi of national importance can be used in additional series of tests. The type and extent of the growth of these fungi are to be described in the test report.

5.2 Products and reagents

5.2.1 Nutrient medium

A nutrient medium of malt buffered to pH 4,2 shall be used for the preparation of a spore suspension (see 8.3.4) of the test fungi. It shall contain 20 g/l dried malt or an equivalent amount of concentrated malt extract with a nitrogen content of mass fraction of (0,9 ± 0,3) % The buffer shall be a citrate buffer solution composed of:

— Citric acid monohydrate, (analytical reagent grade) 12,5 g

— 1 mol/l NaOH 120 ml

— 0,1 mol/l HCl 390 ml

— water to make up 1000 ml

5.2.2 Coating material

5.2.2.1 General

Tests can be performed for a specific coating material which has been specified by the supplier.

Otherwise a generic coating material can be used as detailed under 5.2.2.2 and 5.2.2.3 below.

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2) Maintain the strains on 2 % malt agar and subculture them at intervals not exceeding 6 months. Obtain new cultures if there is evidence of degeneration such as loss of pigmentation or the ability to produce conidia. Cultures can be obtained from Bundesanstalt für Materialforschung und -prüfung, Unter den Eichen 87, 12205 Berlin or from the CABI Bioscience, Bakeham Lane, Egham, Surrey TW20 9TY UK.

3) Identical to strain no. IMI 269 216 of culture deposited at CABI Bioscience, Egham.

4) Identical to strain no. IMI 269 217 of culture deposited at CABI Bioscience, Egham.

5.2.2.2 For organic solvent preservative products

An unpigmented varnish based on low viscosity, long oil alkyd resin, with driers and without any fungicidal or fungistatic components (see A.2). Two options are provided whether or not UV protection is present.

NOTE The varnish may be stored unopened for up to 2 years, but once the container has been opened, unused quantities should not be stored longer than 1 week for further use.

5.2.2.3 For waterborne preservative products

An unpigmented varnish based on low viscosity acrylic resin, with an in-can preservative for the resin (see A.3).

NOTE The varnish may be stored unopened for up to half a year, but once the container has been opened, unused quantities should not be stored longer than 1 week for further use.

5.2.3 Priming coating material for control test specimens

The priming product under test without the active ingredient(s) (see Annex A).

5.2.4 Solvents and diluents

5.2.4.1 White spirit

For the characteristics of the white spirit see Annex A (A.2.1.2).

5.2.4.2 Water

Complying with grade 3 of EN ISO 3696.

5.2.5 End sealer

The end sealer is necessary to prevent the product to penetrate the end grain. Any appropriate material which is resistant to the solvents employed during treatment. A material resistant to the penetration of the test product and the test fungi, or separate materials for each, and without any fungistatic or fungicidal activity within the test specimen.

NOTE Three brush coats of a 2-component epoxy lacquer, with drying between each application, have been found to be suitable.

5.2.6 Sterilant (see 9.3.2)

Access to radiation sterilisation facilities or autoclave available.

5.2.7 Hydrated, laminar, aluminium-iron-magnesium silicate (e.g. vermiculite)

Exfoliated to give particles of 1 mm to 3 mm with an apparent density of 80 kg/m^3 to 90 kg/m^3. Particles of less than 1 mm shall be eliminated by sieving prior to use.

NOTE The water holding capacity of the vermiculite should allow the wood moisture content to stay below 100 % at any time.

5.2.8 Reference product

The reference product used shall comply with the composition or equivalent specified in Table 1.

Table 1 — Composition of the reference product

Component	Quantity (mass fraction in %)
Vialkyd VAF 4349/80 K-60	5,00
Dowanol PM	3,00
Preventol A 4 S (87,5 – 92,5 % DCFN [a]	0,55 (approx. 0,49 DCFN)
Methylethylketoxim	0,20
Octa Soligen Trockner 69	0,10
Shellsol D 60	91,15
[a] DCFN = dichlofluanide.	

The product containing dichlofluanide at this concentration shall be applied at 100 g/m^2. If an alternative reference product is used, the concentration chosen should provide a performance equivalent to the specified concentration of DCFN. Evidence of equivalence shall be recorded in the test report.

NOTE Trade names of products are examples of suitable products available commercially. This information is given for the convenience of users of this EN 152 standard and does not constitute an endorsement by CEN of these products.

5.2.9 Fumigant (if necessary)

Xylene technical grade.

5.3 Apparatus

5.3.1 Incubation room, with the following climatic conditions: (22 ± 2) °C and (70 ± 5) % relative humidity.

5.3.2 Conditioning room at (20 ± 2) °C and (65 ± 5) % relative humidity.

5.3.3 Saw with blades giving a fine-sawn finish

5.3.4 Weathering site for open air weathering of wood specimens in special racks:

— weathering racks: frames to take the wood specimens at 45° (see figure 3 in Annex D). The frames shall be constructed of inert material (e.g. plastics, aluminium). In the racks the wood test specimens shall be free on all sides and be secured against being dislodged.

— as a weathering site, any free area without extremes of environmental conditions with regard to humidity, dryness, UV radiation or industrial pollution is suitable. The site shall be free from tall vegetation (max. 0,5 m).

— erection of the weathering racks, the following are to be observed:

  — they shall at no time be in the shade of trees, houses or other structures;

  — the wood test specimens shall face the direction in which the exposure conditions are expected to be most severe;

  NOTE In Central Europe and France this is to the South West and in the UK to the South.

  — the wood test specimens shall be placed 1 m to 2 m above the ground .

5.3.5 Device for artificial weathering (UV equipment with spray option, UVS)

A device providing spray of demineralised water of approximately 4 l/min and UV-light at a wave length of 340 nm (UVA), preferable produced by fluorescent tubes, programmable for different weathering cycles including alternating UV-radiation, spraying and condensation of different duration and controllable temperature during the radiation and the condensation periods.

5.3.6 Culture vessels with a capacity of 400 cm^3 to 600 cm^3 and an internal area of base of 90 cm^2 to 120 cm^2 (see in Annex D an example of culture vessel).

5.3.7 Sterilisers

— access to ionising-radiation services (Annex C).

— autoclave, adjustable at (102 ± 2)°C and (121 ±1)°C, and, if the autoclave is not adjustable at (102 ± 2)°C, a steaming chamber (Annex C).

5.3.8 Measuring magnifying glass with reading accuracy of 0,1 mm.

5.3.9 Usual laboratory equipment, especially:

— analytical balance with accuracy 0,01 g

— various brushes

— abrasive paper, grit size 120 and 180

— protective gloves;

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

5.4 Other material

Corrosion resistant nails of length 30 mm and diameter 1,5 mm to support wood specimens during weathering (see figure D.3).

6 Sampling

The sample of preservative shall be representative of the product to be tested. Samples shall be stored and handled in accordance with any written recommendations from the supplier.

NOTE For the sampling of preservatives from bulk supplies, the procedure given in EN 212 should be used.

7 Test specimens

7.1 Species of wood

A species of wood that is very susceptible to blue stain shall be used:

obligatory for every test is Scots pine sapwood *(Pinus sylvestris* Linnaeus).

NOTE Additional tests may be carried out using other species but, if so, this should be stated in the test report.