SIST

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Metode preskušanja zaščitnih sredstev za les - Laboratorijska metoda za določanje preventivne učinkovitosti zaščitnega sredstva proti glivam modrivkam - 2. del: Vsi postopki nanašanja, razen premazovanja

Test methods for wood preservatives - Laboratory method for determining the protective effectiveness of a preservative treatment against blue stain in service - Part 2: Application by methods other than brushing

Prüfverfahren für Holzschutzmittel - Laboratoriumsverfahren zur Bestimmung der vorbeugenden Wirksamkeit einer Schutzbehandlung von verarbeitetem Holz gegen Bläuepilze - Teil 2: Anwendung durch andere Verfahren als Streichen

Méthodes d'essais des produits de préservation des bois - Méthode de laboratoire pour déterminer l'efficacité préventive d'un traitement de protection du bois ouvré contre le bleuissement fongique - Partie 2: Application par des méthodes autres que le brossage

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English version

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Méthodes d'essais des prouits de préservation des bois; Méthode de laboratoire pour déterminer l'efficacité preventive d'un traitement de protection du bois ouvré contre le bleuissement fongique; Partie 2: Application par des méthodes autres que le brossage

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European Committee for Standardization
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B R I E F H I S T O R Y

This European Standard was drawn up by the Technical Committee CEN/TC 38 "Methods of test for wood preservatives", the Secretariat of which is held by AFNOR.

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C O N T E N T S

0 INTRODUCTION

The test method described in this European Standard is a laboratory method combined with natural weathering, which provides a basis for assessment of the effectiveness of a wood preservative in preventing the development of blue staining fungi in wood in service where disfigurement may be considered important, such as external decorative timber and joinery. The method permits the determination of the effectiveness of undiluted preservatives applied to the wood by specified methods other than superficial treatments such as brushing (1).

The method may also be used to test preparations in which the proportions of the individual components have been varied and so establish for the active ingredients the limit of their effectiveness.

The method is only suitable for testing preparations which are intended to prevent the occurence of blue staining fungi in wood in service. It is not suitable for assessing the temporary preventive effectiveness of anti-stain preservatives on roundwood or on freshly cut wood. The method does not permit the determination of the fungicidal properties of the surface coating applied to the wood after the priming coat.

It should be used to assess the value of the protection, taking into account the method of application in question 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.

1 OBJECT

This European Standard lays down a method for determining the effectiveness of water-borne and oil-solvent type wood preservatives applied by methods other than brushing in preventing blue stain fungi in wood in service. This method is applicable to preservatives applied by immersion processes, soaking, double vacuum or vacuum pressure techniques. It is also applicable where a primer paint is used in conjunction with the preservative system (2).

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(1) Part 1 of this standard lays down the method for determining the effectiveness of a wood preservative applied against blue stain by brushing.

(2) The method may also be used in conjunction with first coat (primer) paints required to give protection during storage of components on site. These are to be applied as specified coatings as defined for preparations of type B.

2 FIELD OF APPLICATION

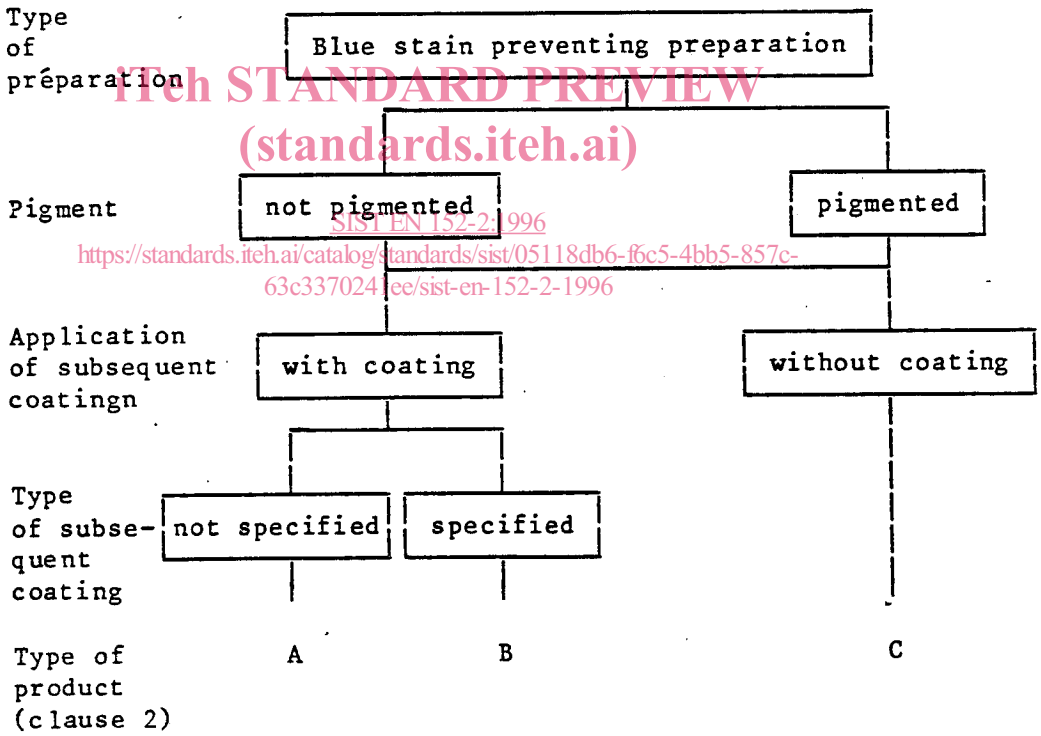
This method is applicable to the following types of preparations applied by methods other than brushing or similar superficial treatment resulting in an equivalent retention of preservative (Figure 1) :

A fungicidal preparations with or without pigment, used in conjunction with unspecified varnishes or paint coatings,

B fungicidal preparations with or without pigment, used in conjunction with specified varnishes or paint coatings,

C fungicidal preparations with or without pigment, used without subsequent varnish or paint coatings.

FIGURE 1 - DESIGNATION OF DIFFERENT TYPES OF PREPARATIONS FOR PREVENTING BLUE STAIN IN SERVICE



It is also possible to test the effectiveness of a combined protective system which involves the application of one preparation by one of the non-brushing techniques prescribed in Part 2 followed by a subsequent application of a different preparation by the brushing procedures prescribed in Part 1.

3 WORKING PRINCIPLE

The basic principles of the test method are to provide for infection by blue-stain fungi into the treated face and into the untreated part behind the treated one and observe the development of infection into the treated face. In order to achieve this a twin panel form of test assembly has to be used incorporating an untreated backing panel affixed to the panel which receives the specified treatment (see Annex A for Glossary).

Treatments according to the specified methods are applied to "treatment sticks" from which the treated test panels are subsequently cut. The treatment differs according to the type of preparation and method of application (clause 2) :

Type A Preparations designed to be used with unspecified varnish or paint coatings are tested using the application rate appropriate to the preparation 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 or as otherwise specified by the manufacturer followed by a surface coating strictly according to the manufacturers specification

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

Since the efficacy of the treating schedule used can be judged only on the basis of the uptake of treatment by each "treatment stick" it is essential that each treatment stick be accurately cut to the specified dimensions and shall not contain heartwood.

The "treated sticks" are cross cut to yield the "weathering blocks" from which, after weathering, the "treated test panels" are prepared. These after being joined with untreated "backing panels" make up the "twin panel assemblies" which are then exposed in suitable test vessels to attack by a mixed culture of blue stain fungi.

A comparison of the extent of blue staining of these test assemblies with control assemblies which were not treated with a wood preservative shows the effectiveness of the preparation under test.

For purposes of comparison it is recommended that an appropriate reference product of known performance be included in the test.

4 MATERIALS

4.1 BIOLOGICAL MATERIAL

The test fungi to be used in all tests are (3) :

- Aureobasidium pullulans (de Barry) Arnaud, strain P 268 (4) Source Hann Münden

- Sclerophoma pithyophila (Corda) v. Höhn, strain S 231 (5) - 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.

If desired, spore suspensions of further 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.

4.2 CHEMICALS

4.2.1 Nutrient medium

For the preparation of a spore suspension of test fungi a solution of malt buffered to pH 4.2 with citric acid shall be used. It shall contain 20 g/l concentrated malt extract or dried malt with a nitrogen content of 0,9 ± 0,3 % m/m (See Annex B example of a nutrient solution,).

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(3) 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 Materialprüfung, Unter den Eichen 87, D - 1000 BERLIN 45 and from Commonwealth Mycological Institute, Ferry Lane, Kew, London UK.

(4) Identical to strain N° IMI 269 216 of culture deposited at CMI, Kew.

(5) Identical to strain n° IMI 269 217 of culture deposited at CMI, Kew.

4.2.2 Coating material

Unpigmented varnish based on low viscosity, long oil alkyd resin, with driers and without any fungicidal or fungistatic components (see Annex C).

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

4.2.3 Priming coating material for control specimens

Linseed oil varnish based on water-free and filtered sample (see Annex C).

4.2.4 White spirit

For the characteristics of the white spirit, see Annex C.

4.2.5 End sealer

Any appropriate material which is resistant to the solvents employed and to the weathering procedure. The varnish (4.2.2) is suitable for oil solvent systems. With water-borne solutions certain 2-component epoxy resins resist swelling of the treatment sticks.

4.2.6 Sterilant (if necessary see 7.3.2)

An ethylene oxide-based sterilant or propylene oxide (see Annex D).

4.2.7 Adhesive for "twin-panel assembly"

eg 2-component resorcinol phenol formaldehyde adhesive or similar adhesive capable of resisting distortion of twin panels due to changes in moisture content.

4.2.8 An hydrated, laminar, aluminium-iron-magnesium silicate 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, to ensure the absence of free water and prevent any significant agglomeration of the particles.

4.3 APPARATUS

4.3.1 Incubation room with the following climatic conditions : 22 $\pm$ 1 °C and 70 $\pm$ 5 % relative humidity.

4.3.2 Conditioning room at 20 $\pm$ 2 °C and 65 $\pm$ 5 % relative humidity.

In place of a conditioning room, a closed vessel containing a saturated ammonium nitrate solution with solid material at 20 $\pm$ 2 °C can be used.

4.3.3 Weathering site for open air weathering of wood Specimens in special racks :

- Weathering racks : frames to take the weathering blocks on horizontal bars at 45° (see figure 3 in Annex E). The frames shall be constructed of inert material (eg plastics, aluminium). In the racks the wood specimens shall be free on all sides and be secured against slipping.

- 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.

- 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 specimens shall face the direction in which the exposure conditions are expected to be most severe. In Central Europe and France, this is to the South West and in UK to the South.

. the wood specimens shall be placed 1 m to 1,5 m above the ground.

. the wood specimens shall be situated at least 0,5 m above any possible vegetation.

4.3.4 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 E an example of culture vessel).

4.3.5 Sterilizer

- Apparatus for chemical sterilizaton or access to ionizing radiation service (Annex D).

- Autoclave, adjustable up to 120 °C, or if no autoclave is available : steaming chamber.

4.3.6 Measuring magnifying glass with reading accuracy of 0,5 mm.

4.3.7 Usual laboratory equipment, especially :

- top-pan balance with accuracy 0,001 g
- various brushes
- abrasive paper, grit size 80 and 180
- viscometer (outlet tube 4, ISO 2431 (6))
- drying oven, adjustable up to 150 °C.

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(6) ISO 2431 (1984) "Paints and varnishes - Determination of flow time by use of flow cups".

4.3.8 Racks to hold "treatment sticks" during drying (see Figure 4)

To be made of inert material and designed :

- to carry at least 6 treatment sticks in such a way that they are separated from one another and their sides do not make contact with the container into which the rack will be placed

- so that the treatment sticks are held only at a distance of 1 cm from each end (the regions which will be discarded when the weathering blocks are prepared)

- to be turned through 180° without loss of function.

4.3.9 Container of inert material of size adequate to contain the drying rack (4.3.8) and capable of being securely closed. A thirty litre glass reinforced plastics tank with glass lid cut to shape so that it can be secured with adhesive tape has proved suitable.

4.4 OTHER MATERIALS

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

5 SAMPLE OF WOOD PRESERVATIVE

The sample shall be representative of the preparation to be tested.

6 WOOD SPECIMENS

6.1 WOOD SPECIES

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

- obligatory for every test : pine sapwood (Pinus sylvestris Linnaeus)

- if desired, other susceptible wood species may be used in additional series of tests.

6.2 WOOD QUALITY

Sound, straight grain, knot-free and uniformly grown wood shall be used exclusively. The wood shall be stain free. Wood with a resinous appearance shall be avoided.

Wood from the immediate vicinity of the top or the lowest 1 m of the trunk is unsuitable.

Average width of annual rings : 2,5-8 annual rings/cm.

The proportion of latewood shall be less than 30 %.