SLOVENSKI STANDARD
SIST EN 20-2:1996

01-marec-1996

Zaščitna sredstva za les - Določanje učinkovitosti preventivne zaščite proti rjavemu parketarju Lyctus brunneus (Stephens) - 2. del: Globinska impregnacija lesa - Laboratorijska metoda

Wood preservatives - Determination of the protective effectiveness against Lyctus brunneus (Stephens) - Part 2: Application by impregnation (Laboratory method)

Holzschutzmittel - Bestimmung der vorbeugenden Wirkung gegenüber Lyctus brunneus (Stephens) - Teil 2: Anwendung durch Volltränkung (Laboratoriumsverfahren)

Produits de préservation du bois - Détermination de l'efficacité protectrice vis-a-vis de Lyctus brunneus (Stephens) - Partie 2: Application par traitement en profondeur (Méthode de laboratoire)

Ta slovenski standard je istoveten z: **EN 20-2:1993**

ICS:

71.100.50 Kemikalije za zaščito lesa Wood-protecting chemicals

SIST EN 20-2:1996 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 20-2:1993

April 1993

UDC 674.048.4:620.193.8

Descriptors: Wood, wood preservatives, pesticides, insecticides, pest control, lyctus, prevention, determination, effectiveness, laboratory tests

English version

Wood preservatives - Determination of the protective effectiveness against Lyctus brunneus (Stephens) - Part 2: Application by impregnation (Laboratory method)

Produits de préservation du bois - Détermination de l'efficacité protectrice vis-à-vis de Lyctus brunneus (Stephens) - Partie 2: Application par traitement en profondeur (Méthode de laboratoire)

Holzschutzmittel - Bestimmung der vorbeugenden Wirkung gegenüber Lyctus brunneus (Stephens) - Teil 2 : Anwendung durch Volltränkung (Laboratoriumsverfahren)

This European Standard was approved by CEN on 1993-04-02. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Contents list

Page

Foreword 3

Introduction 4

1 Scope 4

2 Normative reference 4

3 Definitions 5

4 Principle 5

5 Test materials and apparatus 5

6 Sampling 7

7 Test specimens 7

8 Procedure 8

9 Validity of test 11

10 Expression of results 11

11 Test report 12

Annex A (informative) Example of a test report 14

Annex B (informative) Technique for culturing Lyctus Brunneus 16

Annex C (informative) Principal parasites and predators of Lyctus 20

Annex D (informative) Bibliography 21

FOREWORD

This Part of this European Standard has been drawn up by the "Lyctus" Expert Group of CEN/TC 38 "Durability of wood and wood-based products" with AFNOR as secretariat.

This Part of EN 20 together with EN 20-1 replaces EN 20:1974.

This Part of EN 20 is required to enable effectiveness assessments of preservatives which are intended to be applied by impregnation.

This Part of 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 October 1993 1993, and conflicting national standards shall be withdrawn at the latest by October 1993

This part of this European Standard was adopted by CEN and in accordance with the Common CEN/CENELEC Rules, the following countries are bound tto implement this part of the European Standard : Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kindgom.

INTRODUCTION

This Part of this EN 20 describes a laboratory method of test which gives a basis for assessment of the effectiveness of a wood preservative, against Lyctus brunneus. It allows the determination of the concentration at which the preservative completely prevents the development of infestation from egg-laying in fully impregnated wood of susceptible species.

The species Lyctus brunneus is chosen because of its particular practical relevance and because it can be used easily in laboratory tests. The method can be used with other lyctid species, but the results may not be comparable with those obtained with Lyctus brunneus.

The test specimens are enriched with a defined nutrient solution, before exposure to egg-laying, in order to ensure uniformity of nutrient quality of test specimens between different laboratories.

This laboratory method provides one criterion by which the value of a product can be assessed. In making this assessment the methods by which the preservative may be applied should be taken into account. It is further recommended that results from this test should be supplemented by those from other appropriate tests, and above all by comparison with practical experience.

When products which are very active at low concentrations are used it is very important to take suitable precautions to isolate and separate, as far as possible, operations involving chemical products, other products, treated wood, laboratory apparatus and clothing. Suitable precautions should include the use of separate rooms, areas within rooms, extraction facilities, conditioning chambers and special training for personnel.

1 SCOPE

This Part of EN 20 specifies a method for the determination of the protective effectiveness or the toxic values of a wood preservative against infestation by Lyctus brunneus (Stephens) in wood which has been treated previously by full impregnation.

This method is applicable to :

- water-insoluble chemicals which are being studied as active insecticides, or,
- organic formulations, as supplied or as prepared in the laboratory by dilution of concentrates.

This method is not applicable to water-based preservatives

NOTE : - This method may be used in conjunction with ageing procedures which do not remove the added nutrient.

2 NORMATIVE REFERENCE

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

ISO 3696:1987 Water for analytical laboratory use – Specification and test methods

3 DEFINITIONS

For the purposes of this Part of EN 20, the following definitions apply

3.1 representative sample

A sample having its physical or chemical characteristics identical to the volumetric average characteristics of the total volume being sampled.

3.2 supplier

The sponsor of the test.

4 PRINCIPLE

Depending on the test being carried out either

a set of test specimens of a susceptible wood species is impregnated with a nutrient solution and then impregnated with a solution of the preservative ; or

if toxic values are to be determined, several sets of test specimens of a susceptible wood species are impregnated with a nutrient solution and then impregnated with a series of solutions in which the concentration of preservative is ranged in a given progression.

The treated test specimens are exposed to adult Lyctus brunneus and the resulting attack compared to that in untreated controls. If the preservative has been prepared in the laboratory by dilution of a concentrate or by dissolution of a solid, the resulting attack is also compared to that in solvent or diluent treated controls.

5 TEST MATERIALS AND APPARATUS

5.1 Biological material

Lyctus brunneus (Stephens), insects emerged from cultures not more than 48 h before use in the test, reared for at least two generations on non-enriched oak or no more than three generations on enriched oak.

NOTE : The culturing of Lyctus brunneus requires care in order to obtain a regular supply of adults which have not already laid eggs.
The culturing technique, which experience has shown to be suitable, is described in annex B.

5.2 Products and reagents

5.2.1 Paraffin wax, for sealing the relevant surfaces of test specimens treated with solutions.

NOTE : Paraffin wax with a setting point of 52 °C to 54 °C has been found to be suitable.

5.2.2 Filter paper, ordinary quality medium-fast grade.

5.2.3 Paste, for securing filter paper. The paste shall be starch-free, non-toxic to Lyctus and insoluble in the product under test.

NOTE : Sodium carboxymethyl cellulose, food grade, has been found suitable.

5.2.4 **Water**, complying with grade 3 of ISO 3696.

5.2.5 **Solvent or diluent**, a volatile liquid that will dissolve or dilute the preservative but does not leave a residue in the wood at the end of the post-treatment conditioning period that has a toxic effect on the insects.

CAUTION : Do not use benzene or other solvents which pose a health risk.

5.2.6 **Peptone** prepared as an enzymatic hydrolysate of meat

5.2.7 **D (+)-glucose**

5.2.8 **Fine cloth**,of cotton or linen, with a mesh aperture of less than 0,3 mm.

5.3 Apparatus

5.3.1 **Culturing chamber**, with air circulation, controlled at (26 ± 1)°C, and at relative humidity (75 ± 5)%.

5.3.2 **Conditioning chamber**, well ventilated, controlled at (20 ± 2)°C and relative humidity (65 ± 5)%.

NOTE : The conditioning of specimens may be carried out in the laboratory work area (see 5.3.4) provided that this has the conditions specified for the conditioning chamber (see 5.3.2).

5.3.3 **Drying chamber**, well ventilated, controlled at (30 ± 2)°C.

5.3.4 **Laboratory work area**, well ventilated, where treatment of the test specimens is carried out.

CAUTION : It is essential to follow safety procedures for handling flammable and toxic materials. Avoid excessive exposure of operators to solvents or their vapours.

5.3.5 **Testing chamber**, with conditions identical to those of the culturing chamber (see 5.3.1).

5.3.6 **Treatment vessels**, of material that does not react with the preservative under test ; for example of glass for organic products.

5.3.7 **Vacuum vessel(s)**, fitted with stopcocks.

5.3.8 **Vacuum pump**, fitted with a pressure gauge and capable of maintaining a pressure of 700 Pa (1).

5.3.9 **Weights** to provide ballast for the test specimens
The weights shall not react with any materials with which they come into contact during the test.

5.3.10 **Safety equipment and protective clothing**, appropriate for the test product and the test solvent, to ensure the safety of the operator.

5.3.11 **Test containers**, suitable for holding the test specimens and of material resistant to the solvents used.

---

(1) 100 Pa = 1 mbar

NOTE : Jars of approximately 60 mm diameter and 100 mm height have been found to be suitable.

5.3.12 Drying vessel(s), capable of holding sets of five test specimens (7.4), provided with a close-fitting cover and containing supports that will give minimum contact with treated test specimens to be placed on them. The vessels and supports shall be of materials that do not react with the preservative under test, for example glass.

5.3.13 Ordinary laboratory equipment, including a balance capable of weighing to an accuracy of 0,01 g.

5.3.14 X-ray apparatus, (optional) with tungsten target and beryllium window, with voltage and current continuously variable in the ranges :

. Voltage : 10 kV to 50 kV,

. Current : 0 mA to 15 mA.

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

The test shall be carried out on European oak. This shall comprise sessile oak, Quercus petraea (Mattuschka) Lieblin, and/or pedunculate oak, Quercus robur Linnaeus.

7.2 Quality of wood

Use only sound sapwood with between 2 annual growth rings per 10 mm and 10 annual growth rings per 10 mm, straight-grained without knots. The wood, having few tyloses, shall not have been floated or subjected to any chemical treatment and shall be dried without delay as described in 7.3.

7.3 Provision of the test specimens

Remove the bark from the freshly cut billets and then cut them into lengths (from which strips 25 mm x 15 mm in cross-section will be cut). Immediately place the billets in the drying chamber (5.3.3) stacked with spaces between individual billets so as to allow movement of air through the stack. Retain the billets in the drying chamber until their moisture contents are reduced to 15 % (m/m) .

NOTE : Moisture contents may be assessed in accordance with ISO 3130. In addition moisture meters of the two pronged electrical conductivity type are also suitable.

Cut the sapwood of the dried billets into planed strips 25 mm x 15 mm cross section and with the wide longitudinal faces oriented tangentially. Cut the specimens for test from the planed strips. The individual specimens for test shall be cut cleanly and shall have sharp edges.

The specimens required for a test shall be taken either from at least two lots each corresponding to a different tree or two sapwood strips taken from diametrically opposed positions in the same log. The specimens from the two sources shall be combined and the test specimens taken at random from them.

7.4 Dimensions of test specimens

The dimensions of each specimen after one week in the conditioning chamber (5.3.2) shall be :

$$(50 \pm 0,5) \text{ mm} \times (25 \pm 0,5) \text{ mm} \times (15 \pm 0,5) \text{ mm}$$

For the purposes of calculating the mass of preservative retained per unit volume of wood (8.3.2) the nominal volume of each test specimen shall be taken as 18,75 cm^3.

Mark each specimen so that it can be identified throughout the test.

7.5 Number of test specimens

Use :

a) for each preservative and each concentration : five specimens (see 7.4),

b) for a complete test of any given preservative : five untreated control specimens (see 7.4),

c) if a solvent or diluent is used : five control specimens (7.4) treated with that solvent or diluent (5.2.4 or 5.2.5).

8 PROCEDURE

8.1 Prior impregnation of the test specimens with a nutrient solution

8.1.1 Composition of the nutrient solution

Dissolve 2 g of the peptone (5.2.6) and 10 g of the glucose (5.2.7) in 100 ml water (5.2.4).

8.1.2 Method of impregnation of nutrient solution

Weigh each test specimen, place them in a beaker and ballast them with weights (5.3.9) to prevent them floating. Place the beaker in the vacuum vessel (5.3.7), and reduce the pressure using the vacuum pump (5.3.8) to 700 Pa. Observe the proper safety measures for vacuum vessels. Hold the specimens at this pressure for 15 min. Allow the nutrient solution (8.1.1) into the beaker so as to cover the specimens. Bring the specimens back to atmospheric pressure, adding further solution if necessary to keep the specimens covered.

Leave the specimens immersed for 1 h in the solution and then reweigh them after draining for 1 min.

Determine the uptake of nutrient solution for each test specimen.

Retain for testing only test specimens absorbing between 300 kg/m3 and 600 kg/m3 of nutrient solution.

8.1.3 Drying of test specimens

Dry the specimens in the drying chamber (5.3.3) at (30 ± 2)°C for one week.

8.2 Conditioning of specimens before treatment

Transfer the dried test specimens to the conditioning chamber (5.3.2) and condition them for one week.

8.3 Treatment of the test specimens

8.3.1 Preparation of treatment solution

8.3.1.1 Solid preservatives

Dissolve the preservative in an appropriate solvent (5.2.5) to the required concentration, or to a series of concentrations if toxic values are to be determined.

All treatment solutions shall be freshly prepared.

8.3.1.2 Liquid preservatives

If appropriate, use the preservative without further preparation other than any necessary stirring. If it is a concentrate, or if toxic values are to be determined, dilute the preservative with the diluent to the required working concentration, using the procedure specified by the supplier.

All treatment solutions shall be freshly prepared.

8.3.1.3 Toxic values

If toxic values are to be determined, prepare a series of at least five concentrations by mass, distributed evenly about the expected toxic values. A solvent or diluent control, i.e. treatment at concentration = 0, shall also be used. If the approximate toxic values are unknown, the concentrations shall from a widely spaced geometric progression for a first test and a more closely spaced geometric or arithmetic progression for subsequent tests.

All treatment solutions shall be freshly prepared.

8.3.2 Impregnation

Carry out impregnation in ascending order of concentration, starting with the solvent control (concentration = 0).

The following procedure ensures the required complete impregnation of test specimens by the test solutions.

For each concentration weigh each specimen, to the nearest 0,05 g, and then stack the specimens in one of the treatment vessels (5.3.6) so that as much of their surface as possible is exposed (e.g. by piling them crosswise). Ballast the stack of specimens with the weights (5.3.9) to prevent them floating later when the liquid is admitted.

Place each treatment vessel in one of the vacuum vessels (5.3.7), attach the vacuum pump (5.3.8) and reduce the pressure to 700 Pa. Maintain this vacuum for 15 min. Observe the proper safety measures for vacuum vessels. After this period, close the stopcock to the vacuum pump (5.3.8) and open the other stopcock to allow the solution of preservative to be drawn into the treatment vessel. Keep the specimens covered completely by the solution throughout the remainder of the impregnation process.

Next, admit air to bring the vacuum vessel back to atmospheric pressure, remove the treatment vessel with its submerged specimens from the vacuum vessel, cover it and leave it for 2 h, adding further solution as necessary to keep the specimens fully covered by liquid.

After this impregnation treatment, remove the test specimens one by one, remove the excess liquid from their surfaces by lightly blotting with filter paper (5.2.2) and immediately weigh each to the nearest 0,05 g.