
Zaščitna sredstva za les - Določanje učinkovitosti preventivne zaščite proti navadnemu trdoglavcu *Anobium punctatum* (De Geer) glede na število položenih jajčec in preživelih ličink - 2. del: Način uporabe: Globinska impregnacija lesa - Laboratorijska metoda

Wood preservatives - Determination of the protective effectiveness against *Anobium punctatum* (De Geer) by egg-laying and larval survival - Part 2: Application by impregnation (Laboratory method)

iTeh STANDARD PREVIEW

Holzschutzmittel - Bestimmung der vorbeugenden Wirkung gegenüber *Anobium punctatum* (De Geer) durch Beobachten der Eiablage und des Überlebens von Larven - Teil 2: Anwendung durch Volltränkung (Laboratoriumsverfahren)

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Produits de préservation du bois - Détermination de l'efficacité protectrice vis-a-vis d'*Anobium punctatum* (De Geer) par l'observation de la ponte et du taux de survie des larves - Partie 2: Application par traitement en profondeur (Méthode de laboratoire)

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CONTENTS

FOREWORD	
INTRODUCTION	
1 SCOPE	4
2 NORMATIVE REFERENCES	5
3 DEFINITIONS	5
4 PRINCIPLE	5
5 TEST MATERIALS AND APPARATUS	6
6 SAMPLING	8
7 TEST SPECIMENS	8
8 PROCEDURE	10
9 VALIDITY OF TEST	14
10 EXPRESSION OF RESULTS	15
11 TEST REPORT	16
Annex A (informative) - Example of a test report	18
Annex B (informative) - Identification of sex of test insects (<i>Anobium punctatum</i>)	20
Annex C (informative) - Culturing technique for <i>Anobium punctatum</i>	21
Annex D (informative) - Bibliography	24

FOREWORD

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

This Part of EN 49 together with EN 49-1 replaces EN 49:1976.

This Part of EN 49 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of an identical text or by endorsement, at the latest by March 1993, and conflicting national standards shall be withdrawn at the latest by March 1993.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 to 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 Kingdom.

INTRODUCTION

This Part of EN 49 describes a laboratory method of test which gives a basis for assessment of the effectiveness of a wood preservative, against Anobium punctatum. It allows the determination of the concentration at which the product prevents the development of infestation from egg laying.

The results of this test complement those derived from testing by the larval transfer method (see EN 21). The method simulates conditions which can occur in practice on timber which has been treated some time previously with a deeply penetrating wood preservative and on which eggs of Anobium punctatum are laid.

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 49 specifies a method for the determination of the protective effectiveness or the toxic values of a wood preservative against Anobium punctatum (De Geer) by egg-laying and larval survival 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, or,
- organic water-dispersible formulations as supplied or as prepared in the laboratory by dilution of concentrates, or

- water-soluble materials, for example salts.

NOTE : This method may be used in conjunction with an ageing procedure, for example EN 73.

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 49, 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 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 series of solutions in which the concentration of preservative is ranged in a given progression.

The treated test specimens are exposed to gravid females of Anobium punctatum. The numbers of eggs laid, the numbers of eggs hatched, and the numbers of surviving larvae are observed and compared with those 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

5.1.1 Anobium punctatum (De Geer)

Adult males and females in good condition.

Adults to be used in the test shall be collected at daily intervals from naturally infested wood or laboratory culture (see annex C).

Use recently emerged adults which have been recently collected ; kept overnight in quarantine (see C.6) ; and then checked to ensure that they are undamaged, active, and free from any infestation by mites. Determine the sex (see annex B) of the collected and checked adults and place the males and females in separate containers.

NOTE : The proportion of males and females varies during the emergence period.

5.2 Products and reagents

5.2.1 Paraffin wax, for sealing the end sections of test specimens.

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

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

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

5.2.3 Xylene, technical grade, mixed isomers.

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 Filter paper, ordinary quality, medium-fast grade.

5.2.7 Fine cloth, of cotton or linen, with a mesh aperture of 0,3 mm to 0,6 mm.

5.3 Apparatus

5.3.1 **Culturing chamber**, with air circulation, controlled at $(21 \pm 1)^\circ\text{C}$, and at relative humidity $(80 \pm 5)\%$.

5.3.2 **Conditioning chamber**, well ventilated, controlled at $(20 \pm 2)^\circ\text{C}$ and relative humidity $(65 \pm 5)\%$.

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 **Treatment vessels**, of a material that does not react with the preservative under test, for example of glass for organic products and of polyethylene for salts containing fluorine.

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).

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5.3.6 **Drying vessel(s)**, capable of holding sets of five test specimens (7.5), 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 a material that does not react with the preservative under test, for example glass for organic compounds and polyethylene for products containing fluorine.

5.3.7 **Vacuum vessel(s)**, fitted with stopcocks, capable of receiving the treatment vessels (5.3.3)

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, and fitted with perforated covers to provide a good exchange of air.

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

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

5.3.13 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. [SIST EN 49-2:1995](https://standards.iteh.ai/catalog/standards/sist/b27fdbf4-7a34-4617-a28d-b099061f67de/sist-en-49-2-1995)

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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.

Additional tests may be made with other timber species (2) but, if so, this shall be stated in the test report.

7.2 Quality of wood

Use only sound sapwood, straight-grained and without knots and bark (3).

(2) The growth of young larvae of Anobium punctatum is slow in specimens from resinous wood. Results from test specimens in resinous wood should not be compared with those obtained from oak specimens.

(3) It is not essential in this test for the starch content of the wood to be high.

The growth rate shall be between 2 annual growth rings per 10 mm and 10 annual growth rings per 10 mm.

NOTE : It is recommended to use test specimens of similar growth rate within a single test.

Take the test specimens from trees felled preferably in winter. They shall be cut immediately after felling and rapidly air-dried. The wood shall have been neither floated nor subjected to chemical or heat treatment. It shall not have been stored for more than three years.

7.3 Provision of test specimen

Cut the test specimens from planed strips having a cross section 25 mm x 15 mm (4) with the larger longitudinal faces tangentially oriented. The transverse faces shall be cut neatly and have sharp edges. Take the specimens required for one test at random from a batch of specimens originating from at least three trees.

7.4 Dimensions of test specimens

The dimensions of each specimen two weeks in the conditioning chamber (5.3.2) shall be

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

NOTE : The volume of each test specimen is theoretically 18,75 cm³.

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 (water included) is used : five control specimens (7.4) treated with that solvent or diluent (5.2.4 or 5.2.5).

It is advisable to treat more than the specified number of test specimens so that, after weighing, any specimens with abnormally high or low retentions can be rejected from the batch.

(4) These specimens may be taken from the trunk of the tree or the large branches.