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Wood preservatives - Determination of the preventive action against *Hylotrupes bajulus* (Linnaeus) - Part 2: Ovicidal effect (laboratory method)

Holzschutzmittel - Bestimmung der vorbeugenden Wirkung gegenüber *Hylotrupes bajulus* (Linnaeus) - Teil 2: Ovizide Wirkung (Laboratoriumsverfahren)

Produits de préservation du bois - Détermination de l'action préventive contre *Hylotrupes bajulus* (Linnaeus) - Partie 2 : Effet ovicide (Méthode de laboratoire)

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English Version

Wood preservatives - Determination of the preventive action  
against *Hylotrupes bajulus* (Linnaeus) - Part 2: Ovicidal effect  
(laboratory method)

Produits de préservation du bois - Détermination de l'action  
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Effet ovicide (Méthode de laboratoire)

Holzschutzmittel - Bestimmung der vorbeugenden Wirkung  
gegenüber *Hylotrupes bajulus* (Linnaeus) - Teil 2: Ovizide  
Wirkung (Laboratoriumsverfahren)

This European Standard was approved by CEN on 23 January 2006.

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This European Standard exists 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.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document (EN 46-2:2006) has been prepared by Technical Committee CEN/TC 38 “Durability of wood and derived materials”, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by September 2006, and conflicting national standards shall be withdrawn at the latest by September 2006.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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## Introduction

This test method describes a laboratory method of test which gives a basis for the assessment of the preventive action of a wood preservative, when applied as a surface treatment for timber, against eggs of *Hylotrupes bajulus*.

In combination with EN 46-1 it provides a means of checking whether larvae may hatch from eggs laid on the treated wood surface and whether they are capable of boring through the treated surface and of surviving in the untreated part of the wood.

When products which are very active at very low concentration 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 (also see Annex C for environmental, health and safety precautions).

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## 1 Scope

This part of EN 46 specifies a method for the determination of the preventive action of a wood preservative against eggs of *Hylotrupes bajulus* (Linnaeus) when the preservative is applied as a surface treatment to wood.

This method is applicable to:

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

The method is applicable whether or not the test specimens have been subjected to appropriate ageing procedures.

## 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 46-1, *Wood preservatives - Determination of the preventive action against Hylotrupes bajulus (Linnaeus) - Part 1: Larvicidal effect (Laboratory method)*

EN 73, *Wood preservatives - Accelerated ageing of treated wood prior to biological testing - Evaporative ageing procedure*

EN 84, *Wood preservatives - Accelerated ageing of treated wood prior to biological testing - Leaching procedure*

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

## 3 Terms and definitions

For the purposes of this European Standard, 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 1001-2:2005, 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

In this laboratory method treated wood panels are offered to freshly mated *Hylotrupes bajulus* females. The hatching ability of the larvae on the treated timber is examined. When the ovicidal action is insufficient, the mortality of the hatched larvae on and/or in wood treated with the same formulation is also established according to EN 46-1.

## 5 Test materials

### 5.1 Biological material

#### 5.1.1 *Hylotrupes bajulus* (Linnaeus) females

#### 5.1.2 Source of females

The insects shall preferably be obtained from cultures reared as e.g. described in annex B.

Use only sound and lively insects.

### 5.2 Products and reagents

**5.2.1 Paraffin wax**, for fixing the glass plate in all cases and for sealing the end faces of test specimens to be treated with solutions in all cases in which water is the continuous phase.

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

**5.2.2 Gelatin**, for sealing the end faces of test specimens to be treated with solutions in which an organic solvent is the continuous phase.

**5.2.3 Water**, complying with grade 3 of EN ISO 3696.

**5.2.4 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.**

### 5.3 Apparatus

**5.3.1 Culturing chamber**, with air circulation, and controlled at  $(28 \pm 2)$  °C and at relative humidity  $(70 \pm 5)$  %.

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

NOTE The conditioning of test specimens may be carried out in the laboratory work area (see 5.3.3) provided that this has the conditions specified for the conditioning chamber (see 5.3.2).

**5.3.3 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.**



**5.3.4 Testing chamber**, ventilated and air-conditioned. Controlled at  $(22 \pm 2) ^\circ\text{C}$  and at relative humidity between  $(70 \pm 5) \%$  .

**5.3.5 Petri dishes** of glass or polyvinylchloride (PVC), diameter ca. 9 cm for mating the insects and for egg-laying.

**5.3.6 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.

**5.3.7 Safety equipment, protective clothing and (protective) gloves**, appropriate for the test product and the test solvent, to ensure the safety of the operator.

**5.3.8 Glass plates**, 48 mm long and 25 mm wide, intended to provide a lateral slit on the test specimens.

**5.3.9 Ordinary laboratory equipment**, including a balance capable of weighing to an accuracy of 0,01 g and equipment for applying a liquid product by brushing or by pipette.

## 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.

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## 7 Test specimens

### 7.1 Species of wood

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The reference species is Scots pine (*Pinus sylvestris* Linnaeus)<sup>1)</sup>.  
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Note Additional tests may be carried out using other species but, if so, this shall be stated in the test report.

### 7.2 Wood quality

The wood shall be free from visible cracks, stain, decay, insect damage and other defects. The wood shall not have been water-stored, floated, chemically treated or steamed. The wood shall originate from trees preferably felled in winter. The wood shall not have been stored for more than five years.

NOTE 1 Wood that has been kiln dried at temperatures below  $60 ^\circ\text{C}$  may be used.

The wood shall be exclusively sapwood containing little resin and having between 2,5 annual rings per 10 mm and eight annual rings per 10 mm. The proportion of latewood in the annual rings shall not exceed 30 % of the whole.

NOTE 2 It is recommended to use test specimens of similar growth rate within a single test.

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1) In southern European countries the pine species most frequently infested by *Hylotrupes bajulus* may be used as an alternative, provided that the suitability of the species for use in the tests specified in this standard has been demonstrated in all aspects (development of larvae, resistance of impregnation etc...).

### 7.3 Provision of test specimens <sup>2)</sup>

Prepare planed strips having a cross-section of  $(25 \pm 0,5)$  mm  $\times$   $(15 \pm 0,5)$  mm removing a minimum of 2 mm from any surfaces exposed during drying. The longitudinal faces shall be parallel to the direction of the grain. The annual rings shall have a contact angle of  $(45 \pm 15)^\circ$  to the broad faces. Make transverse cuts, neatly to give sharp edges and a fine-sawn finish to the end-grain surfaces, to give test specimens  $(50 \pm 0,5)$  mm long.

The test specimens shall originate from a minimum of three trees or shall be taken at random from a stock originally of more than 500 test specimens.

### 7.4 Dimensions of test specimens

The dimensions of each test specimen after reaching equilibrium in the conditioning chamber (5.3.2) shall be  $(50 \pm 0,5)$  mm  $\times$   $(25 \pm 0,5)$  mm  $\times$   $(15 \pm 0,5)$  mm.

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

### 7.5 Number of test specimens

#### 7.5.1 Test specimens for egg-laying

- six treated test specimens (2 of each subset, see 7.3) for each preservative concentration or retention to be tested.
- three control test specimens (1 of each subset, see 7.3) for each test series, treated with the preservative containing no active ingredients.
- three untreated control test specimens (1 of each subset, see 7.3).

#### 7.5.2 Test specimens for checking the tunnelling ability and the mortality of the larvae

In addition to the test specimens for egg-laying at least six test specimens shall be prepared for each preservative concentration and retention for checking the tunnelling ability and the mortality of the newly hatched larvae.

## 8 Procedure

### 8.1 Preparation of the test specimens

#### 8.1.1 Conditioning of the test specimens prior to sealing

Allow the test specimens to condition in the conditioning chamber (5.3.2) for a minimum of two weeks.

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2) For special tests, test specimens may be obtained according to a given series. As a result, it may be preferable to take test specimens from pretreated strips.

## 8.1.2 Sealing of the transverse faces

Seal the transverse faces as follows:

**8.1.2.1 For tests with preservative solutions in which water is the continuous phase**, apply three coats of the paraffin wax (5.2.1) at about 90 °C so that the first coat adheres closely to the wood and the successive coatings bond to one another. Condition the sealed test specimens in the conditioning chamber (5.3.2) for at least one day.

**8.1.2.2 For tests with preservative solutions in which the continuous phase is an organic solvent** that dissolves paraffin wax, use the gelatine (5.2.2): apply the first coat as an aqueous solution of 200 g/l at 40 °C, then after a minimum of 8 h of drying, apply two further coats of an aqueous solution of 300 g/l at 50 °C. Condition the sealed test specimens in the conditioning chamber (5.3.2) for at least one day.

## 8.1.3 Treatment of the test specimens

### 8.1.3.1 Preparation of the treatment solutions

#### 8.1.3.1.1 Solid preservatives

— Water-soluble preservatives:

dissolve the preservative in the water (5.2.3) to the concentration recommended by the manufacturer.

— Non-water-soluble preservatives:

dissolve the preservative in an appropriate solvent (5.2.4) to the concentration recommended by the manufacturer.

All treatment solutions shall be freshly prepared.

#### 8.1.3.1.2 Liquid preservatives

If appropriate, use the preservative without further preparation other than any necessary stirring. If it is a concentrate, dilute the preservative with the diluent specified by the manufacturer to the required working concentration.

A formulation of the preservative to be tested without active ingredients shall also be included in the test.

All treatment solutions shall be freshly prepared.

### 8.1.3.2 Treatment by brushing or by pipette

In the laboratory work area (5.3.3) apply the preservative either by brushing or by pipette to the surface pointing to the exterior of the trunk or by dipping.

Depending on the type of treatment, the volume (application by pipette) or mass (application by brushing) of the treatment solution shall be determined to obtain the surface application specified by the manufacturer. Apply preservative uniformly to the horizontal surfaces of the test specimens.

When the preservative is applied by brush, place the test specimens on a balance while being brushed to determine the amount of preservative applied to the nearest 0,01 g.

When the preservative is applied by pipette, move the pipette across the fibre direction and the amount of preservative applied shall be determined to the nearest 0,01 g.