SLOVENSKI STANDARD
SIST EN 117:2013

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Nadomešča:
SIST EN 117:2005

Zaščitna sredstva za les - Ugotavljanje toksičnih vrednosti proti Reticulitermes santonensis (evropskim termitom) (laboratorijska metoda)

Wood preservatives - Determination of toxic values against Reticulitermes species (European termites) (Laboratory method)

Holzschutzmittel - Bestimmung der Giftwirksamkeitswerte gegenüber europäischen Recticulitermesarten (Laboratoriumsverfahren)

Produit de préservation des bois - Détermination des valeurs toxiques contre les espèces Reticulitermes (termites européens) (Méthode de laboratoire)

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71.100.50 Kemikalije za zaščito lesa Wood-protecting chemicals

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EUROPEAN STANDARD

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Wood preservatives - Determination of toxic values against Reticulitermes species (European termites) (Laboratory method)

Produit de préservation du bois - Détermination du seuil d'efficacité contre les termites européens du genre Reticulitermes (Méthode de laboratoire)

Holzschutzmittel - Bestimmung der Grenze der Wirksamkeit gegenüber Reticulitermes-Arten (Europäische Termiten) (Laboratoriumsverfahren)

This European Standard was approved by CEN on 24 September 2012.

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Foreword

This document (EN 117:2012) 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 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of an identical text or by endorsement, at the latest by April 2013, and conflicting national standards shall be withdrawn at the latest by April 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 117:2005.

Significant technical differences between this document and EN 117:2005 are as follows:

a) the number of treated test specimens was changed to at least five test specimens for each concentration of the product;

b) the limiting values to determine the toxic values of a preservative were changed.

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

Introduction

This document describes a laboratory method of testing which gives a basis for assessment of the effectiveness of a wood preservative against the *Reticulitermes* species of European termites. It allows the determination of the concentration at which the product completely prevents attack by these insects of impregnated wood of a susceptible species.

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 can be applied should be taken into account. It is further recommended that results from this 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 (see also Annex C for environmental, health and safety precautions).

1 Scope

This European Standard specifies a method for the determination of the toxic values of a wood preservative against the *Reticulitermes* species of European termites[1)].

This method is applicable to:

— water-insoluble chemicals which are being studied as active insecticides;

— organic water-dispersible formulations as supplied or as prepared in the laboratory by dilution of concentrates; and

— water-soluble materials, for example salts.

NOTE This method can be used in conjunction with an ageing procedure, for example EN 73 or EN 84.

2 Normative reference

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

3 Terms and definitions

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

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

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

4 Principle

Impregnation of several sets of test specimens of susceptible wood with a series of solutions in which the concentration of preservative is ranged in a given progression.

Exposure of these test specimens to specified colonies of *Reticulitermes*[2)] and assessment of the attack suffered after exposure under fixed conditions and over a fixed period.

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1) The method can be applied not only to different species of *Reticulitermes*, but also to other species of the family of the *Rhinotermitidae*, adapting the conditions of temperature and humidity where necessary to the specific requirements of the species concerned.

2) In providing biological validation of individual species, it is essential that the locality of origin of each test termite species is given. The description of the locality should at least include the district name.

Comparison of these results with those obtained with untreated and solvent or diluent-treated control test specimens.

Derivation of the toxic values of the product under test.

5 Test materials

5.1 Biological material

Workers, soldiers and nymphs of an identified termite species of *Reticulitermes*.

The termite species and the locality of origin should be stated in the test report and their identification should be proved.

The termites should be obtained from colonies reared as described in Annex B.

5.2 Products and reagents

5.2.1 Substrate for establishing the colonies. A choice of:

5.2.1.1 Fine white quartz sand consisting of grains of crystallised silica, very pure (99,5 % silica), and free from any organic substances [3].

5.2.1.2 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.

5.2.1.3 Rigid polyurethane foam with open pores of mass per unit of volume of 14 kg/m^3 and compressive strength [4] of 0,02 N/mm^2 to 0,03 N/mm^2.

It is advisable to cut the foam into sheets 15 mm thick.

5.2.2 Fumigant (if necessary) xylene, technical grade, mixed isomers.

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

5.2.4 Solvent or diluent, a suitable volatile liquid that will dissolve or dilute the preservative but does not leave a residue in the wood which would have a toxic effect on the insect at the end of the conditioning period.

5.2.5 Filter paper, ordinary quality, medium-fast grade.

5.3 Apparatus

5.3.1 Culturing chamber, with air circulation, controlled at (26 ± 2) °C and at a minimum relative humidity of (70 ± 5) %.

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

3) In France Fontainebleau sand, of which more than 97 % of the particles are between 75 µm and 300 µm in size, provides these features.

4) Determined in accordance with EN IS0 844.

5.3.3 Laboratory work area, well ventilated, where treatment of the test specimens is carried out[6)].

5.3.4 Testing chamber, protected from light, ventilated and controlled at (26 ± 2) °C and at a minimum relative humidity of (70 ± 5) %.

5.3.5 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.

5.3.6 Drying vessel(s), capable of holding sets of three 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 Weights, to provide ballast for the test specimens.

The weights shall not react with any materials with which they come in contact during the test.

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

5.3.9 Vacuum vessels, fitted with stopcocks, capable of receiving the treatment.

5.3.10 Vacuum pump, fitted with a pressure gauge and capable of maintaining a pressure of 700 Pa.

5.3.11 Instruments, adapted for termite manipulation (aspirator, forceps).

5.3.12 Test containers, suitable for holding the test specimens and of material resistant to the product used, and fitted with perforated cover to provide a good exchange of air.

Base area	35 cm^2 to 60 cm^2
Minimum height	8,5 cm
Volume	500 cm^3 to 1 000 cm^3

5.3.13 Glass rings, 20 mm high, 20 mm in diameter and with a wall thickness of at least 1 mm.

5.3.14 Protective gloves

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

6 Sampling

The sample of preservative shall be representative of the product to be tested. Samples should 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 will be used.

5) The conditioning of test specimens after treatment can be carried out in the laboratory work area (5.3.3) provided that this meets the conditions specified for the conditioning chamber (5.3.2).

6) It is essential to follow safety procedures for handling flammable and toxic materials. Excessive exposure of operators to solvents or their vapours should be avoided.

7 Test specimens

7.1 Species of wood

The reference species is Scots pine (*Pinus sylvestris* Linnaeus).

Additional tests can be carried out using other species but, if so, this should 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.

NOTE Wood that has been kiln dried at temperatures below 60 °C can 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.

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

7.3 Provision of test specimens

Prepare planed strips having a cross-section of (25 ± 0,5) mm x (15 ± 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 greater than 10° to the broad faces of the test specimens. Make transverse cuts, neatly to give sharp edges and a fine-sawn finish to the end grain surfaces, to give test specimens (50 ± 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 ± 0,5) mm x (25 ± 0,5) mm x (15 ± 0,5) mm.

For the purposes of calculating the mass of preservative retained per unit volume of wood (8.1.2.2) the nominal volume of each test specimen shall be taken as 18,75 cm^3.

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

7.5 Number and distribution of test specimens

The test specimens shall be divided as follows:

a) treated test specimens: these are the test specimens which are impregnated and subject to attack by *Reticulitermes,* use at least five test specimens for each concentration of the product;

b) untreated control test specimens for checking the virulence of the termite taken for the test: these non-impregnated test specimens are subjected to attack by *Reticulitermes*; they are three in number;

c) solvent or diluent treated control test specimens subjected to attack by Reti*culitermes*; they are three in number.

8 Procedure

8.1 Preparation of test specimens

8.1.1 Conditioning of test specimens prior to treatment

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

8.1.2 Treatment of test specimens

8.1.2.1 Preparation of treatment solutions

8.1.2.1.1 Solid preservatives

Water-soluble preservatives: dissolve the preservative in water (5.2.3) to the required concentration.

Non-water-soluble preservatives: dissolve the preservative in an appropriate solvent (5.2.4) to the required concentration.

8.1.2.1.2 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 to the required working concentration, using the procedure specified by the supplier.

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 form 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.

8.1.2.2 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 test specimen to the nearest 0,05 g, and then stack the test specimens in one of the treatment vessels (5.3.5) so that as much of their face as possible is exposed (e.g. by piling them crosswise). Ballast the stack of test specimens with weights (5.3.7) to prevent them from floating later when the liquid is admitted.

Place each treatment vessel in one of the vacuum vessels (5.3.9), and reduce the pressure to 700 Pa. Maintain this for 15 min. Observe the proper safety measures for vacuum vessels. After this period, close the stopcock to the vacuum pump (5.3.10) and open the other stopcock to allow the solution of preservative to be drawn into the treatment vessel. Keep the test 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 test specimens from the vacuum vessel, cover it and leave it for 2 h, adding further solution if necessary to keep the test specimens fully covered by the liquid.

After this impregnation treatment remove the test specimens one by one, remove the excess liquid from their faces by lightly blotting with filter paper (5.2.5), and immediately weigh to the nearest 0,05 g.