BS EN 117:2012

BSI Standards Publication

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

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National foreword

This British Standard is the UK implementation of EN 117:2012. It supersedes BS EN 117:2005 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee B/515, Wood preservation.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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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of an identical text or by endorsement, at the latest by April 2013, and conflicting national standards shall be withdrawn at the latest by April 2013.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)].

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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.

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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.

In the case of water-soluble preservatives, for example salts and organic chemicals which are being studied as active substances, calculate the mass of active matter retained by each test specimen from the mass of solution absorbed and its concentration.[7)]

In the case of organic formulations and organic water-dispersible formulations the retention is expressed for each test specimen in terms of the corresponding mass of the formulation retained but, if a concentration is supplied, the retention is expressed in terms of the solution prepared ready for use as specified by the supplier.

Calculate the mass of preservative retained per unit volume of wood in kilograms per cubic metre, for each test specimen.

8.1.3 Drying and conditioning of the test specimens after treatment[8)]

Arrange the impregnated test specimens treated with each preservative concentration on their narrow faces, resting on two glass rods, not touching each other in the drying vessel (5.3.6). Place the cover on the drying vessel. Place the drying vessel in the conditioning chamber (5.3.2). Invert the test specimens twice each week during the subsequent drying period, temporarily removing the cover to perform these operations.

To prevent mould growth on test specimens treated with water-diluted preservatives, place a small dish containing the xylene (5.2.2) in the drying vessel (5.3.6).

During the first two weeks retain the cover on the drying vessel.

During the third week uncover the drying vessel progressively each day to allow the test specimens to dry steadily.

From the beginning of the fourth week leave the drying vessel fully open. Drying shall be complete at the end of the fourth week.

In the same way, place the test specimens impregnated with water-insoluble preservatives in the drying vessel for one week and then open it gradually throughout the second week. From the beginning of the third week leave the vessel fully open.

If, in case of slow drying products, the conditioning period is extended, the extended conditioning periods shall be stated in the test report.

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7) When dealing with preservative formulations whose constituents can be selectively absorbed by wood, it is necessary to carry out chemical analysis of the solution before and after impregnation. Similarly, analysis is also recommended if very dilute solutions are used.

8) Drying and conditioning of the test specimens depend on the nature of the product under test and on the solvent or diluent used. It may be necessary to modify the conditioning procedure but, if so, this should be stated in the test report.

8.2 Exposure of the test specimens to the insects

8.2.1 Collecting and selecting the termites

Pick up the insects individually using the instrument (5.3.11). Make up groups of 250 workers, rejecting insects which are moulting (indicated by the dull white colour of the abdomen) also those which appear to be wounded or remain motionless. To each group made up in this way add a number of soldiers corresponding to the proportion found in the colony from which the workers were taken: add a corresponding proportion of nymphs (1 % to 5 %).

The number of colonies to be prepared as indicated above is equal to the number of test specimens to be subjected to attack by the termites.

If the required number of termites is more than that in a single culture, the control series and test series shall contain the same number of groups from each colony. Termites from different colonies shall not be mixed in a single group.

8.2.2 Installation of the termites

8.2.2.1 With sand

In a separate test container (5.3.12), remoisten the adequate quantity of sand for the test by introducing first the water (5.2.3) and then the sand (5.2.1.1) in the proportions of one volume of water to four volumes of sand.

In each test container (5.3.12) form a layer of remoistened, non-compacted sand 40 mm to 60 mm thick.

At the (approximate) centre of the test container, place some wood from the original culture (approximately 0,5 g) and push it down to the bottom of the test container.

In each test container, place a glass ring (5.3.13) against one of the vertical walls of the test container and in the middle of this wall; place it in the substrate so that it just protrudes the surface. Distribute a group of termites made up as indicated in 8.2.1 in each test container, spreading them carefully over the entire substrate (see Figure 1).

Close each test container by means of its lid and place it in the testing chamber (5.3.4).

8.2.2.2 With aluminium-iron-magnesium silicate

Prepare enough aluminium-iron-magnesium silicate (5.2.1.2) with a moisture content of about 300 % by mass (for example 300 ml of water to 100 g of substrate) either in bulk or for individual test containers. It is essential that there is no free water in the substrate. This quantity is enough to provide a layer 40 mm to 60 mm deep in the test containers, without compacting.

Place some wood from the original culture (approximately 0,5 g) in the centre at the bottom of the test container (5.3.12).

In each test container, place a glass ring (5.3.13) against one of the vertical walls of the test container and in the middle of this wall; place it in the substrate so that it just protrudes the surface. Distribute a group of termites made up as indicated in 8.2.1 in each test container, spreading them carefully over the entire substrate (see Figure 1).

Close each test container by means of its lid and place it in the testing chamber (5.3.4).

8.2.2.3 With polyurethane foam

Place approximately 240 cm³ of polyurethane foam in each test container (5.3.12) by cutting three pieces or four pieces from the sheets of polyurethane foam (5.2.1.3).

If the mouths of the test containers are smaller than the cross-section of these pieces, fragments of polyurethane foam can be used. If so, a sheet of polyurethane foam 13 cm x 13 cm (= 240 cm³) should be cut or broken into small pieces.

In each test container press a glass ring (5.3.13) into the polyurethane foam and against the walls of the test container so that it just protrudes above the surface. Place some wood from the original culture (approximately 0,5 g) in the polyurethane foam approximately in the centre at the bottom of the test container.

Moisten the polyurethane foam with approximately 50 ml of water (5.2.3) and put in the termites (see Figure 1).

Close the test containers and put them in the testing chamber (5.3.4).

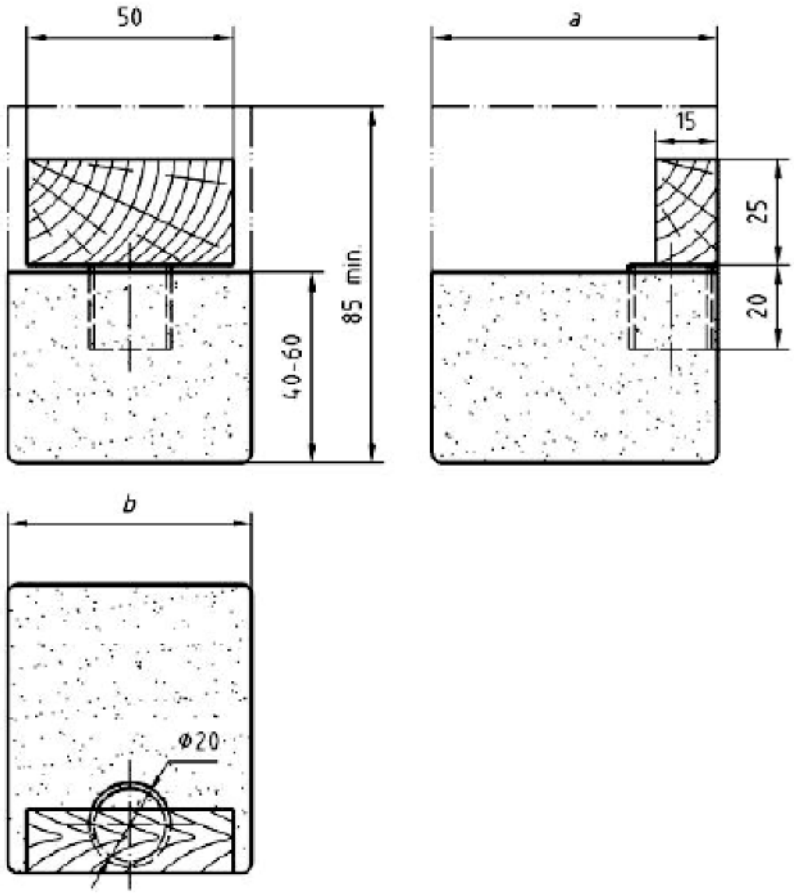
8.2.3 Exposure

Over a period of two days to four days after setting up the colonies, keep them under observation and confirm that the termites have settled in properly, which is indicated by their being distributed throughout the substrate and by their active movement, which is easily visible through, in particular, the bottom of the container and the lower part of the side walls.

Remove test containers in which the termites cannot be regarded as having established themselves properly, and replace them by test containers housing well-established populations.

Write on each test container the number of the single test specimen to be placed in it. Open the test container and carefully place the test specimen on the glass ring so that it just does not touch the substrate surface. The side resting on the ring shall be one of the narrow longitudinal sides, with a wide longitudinal side in contact with the wall of the test container (see Figure 1). Close the test containers.

Dimension in millimetres



Key

3 500 mm² ≤ (a · b) ≤ 6 000 mm²

Figure 1 — Example showing exposure of the test specimens to the colonies

8.3 Conditions and duration of the test

8.3.1 Exposure

Place the test containers (8.2) in the testing chamber (5.3.4) and leave them there for eight weeks.

It is recommended that, throughout the duration of the test, each colony be inspected at regular intervals, the results of the inspection recorded on a special card and any necessary action taken to maintain the colonies in the best possible condition without disturbing their activity.

NOTE 1 These inspections cover in particular:

— presence, location and activity of the termites (tunnelling in the substrate along the visible walls, construction of shafts and movement of the insects);

— approach to and enveloping of the test specimen, writing down, should this happen, the date of first contact and subsequent apparent activity of the insects around the test specimen.

NOTE 2 Action can be taken:

— if the termites are escaping;

— to maintain the moisture content.

8.3.2 Maintaining of moisture content

8.3.2.1 General

Changes in moisture content of the substrate in which the colonies are established depend on its nature; any action to be taken to maintain an optimum level of moisture content, therefore, varies according to the substrate used.

8.3.2.2 Sand

The sand substrate has to be periodically re-moistened; the change in colour due to drying indicates when it is necessary to re-moisten[9]. It is better to maintain the moisture content by frequent addition of small quantities of water (5.2.3) with the aid of a pipette rather than by a single large addition which might result in serious damage to the colony, particularly by flooding.

NOTE A check can also be made by weighing.

8.3.2.3 Aluminium-iron-magnesium silicate

Add the water (5.2.3) necessary to maintain the appropriate moisture content; changes in the appearance and cohesion of the particles of this substrate indicate the need for re-moistening.

NOTE A check can also be made by weighing.

8.3.2.4 Polyurethane foam

The requirements for sand also apply to polyurethane foam.

8.4 Examination of the test specimens and colonies

8.4.1 Assessments

8.4.1.1 General

At the end of the test, remove the test specimens from the test containers and carefully free them from all particles of substrate and other substances adhering to their surface. Carry out a visual examination as described below.

In addition, count as carefully as possible the total number of termites still living in each test container and determine the survival level of the workers.

Record, where appropriate, the presence of living soldiers and/or nymphs.

9) Moist sand has a dark colour whereas dry sand is light in colour.

8.4.1.2 Visual examination

Carry out a visual examination of each test specimen and classify any evidence of attack by its locality, its extent and its depth. Express the results of this examination in accordance with the following schedule:

0) no attack;

1) attempted attack:

   i) superficial erosion of insufficient depth to be measured on an unlimited area of the test specimen; or

   ii) attack to a depth of 0,5 mm provided that this is restricted to an area or areas not more than 30 mm^2 in total; or

   iii) combination of i) and ii);

2) slight attack:

   i) erosion of 1 mm in depth limited to not more than 1/10 of the surface area of the test specimen; or

   ii) single tunnelling to a depth of up to 3 mm; or

   iii) combination of i) and ii);

3) average attack:

   i) erosion of < 1 mm in depth over more than 1/10 of the surface area of the test specimen; or

   ii) erosion of > 1 mm to < 3 mm in depth limited to not more than 1/10 of the surface area of the test specimen; or

   iii) isolated tunnelling of a depth > 3 mm not enlarging to form cavities; or

   iv) any combination of i), ii) or iii);

4) strong attack:

   i) erosion of > 1 mm to < 3 mm in depth of more than 1/10 of the surface area of the test specimen; or

   ii) tunnelling penetrating to a depth > 3 mm and enlarging to form a cavity in the body of the test specimen; or

   iii) combination of i) and ii).

8.4.1.3 Validity of the tests

The test is valid if the three untreated virulence control test specimens correspond to level 4 when visually examined according to 8.4.1.2 and if the corresponding colonies have at least 50 % survivors. However, it is permissible for a single control test specimen not to meet this requirement, provided the cause of this abnormal behaviour can be explained, for example, by the development of moulds.

9 Expression of results

Report the results of the visual examination.

Also record the survival rate of the workers and the presence, if any, of living soldiers and/or nymphs at the end of the test.

The toxic values of a preservative fall between the two limiting values which correspond:

— the lowest concentration which protects the wood, i.e. the concentration at which none of the five test specimens show a degree of attack greater than level 2 with only one test specimen showing a degree of attack of level 2;

— the next lowest concentration in the series used and at which the wood is no longer sufficiently protected, i.e. the concentration at which at least two test specimen show a degree of attack of level 2 or greater.

Express the toxic values by these limiting values in kilograms of preservative per cubic metre of wood, and also state the corresponding concentrations of the preservative in the solvent or diluent.

10 Test report

The test report shall give the following (see also Annex A for an example):

a) number and date of this document;

b) name of the supplier;

c) name and type of the preservative under test;

d) specific and unique name or code of the preservative tested, with an indication of whether or not the composition has been declared;

e) density of the preservative;

f) solvent or diluent used;

g) species of wood used;

h) concentrations, expressed as mass fraction, of the preservative tested;

i) date of impregnation;

j) minimum, maximum and mean masses, in grams of solution absorbed for each concentration;

k) the corresponding mean mass per unit volume, expressed in kilograms per cubic metre, of the preservative;

l) method of drying the test specimens;

m) if applicable, any ageing procedures applied detailing the nature, conditions and duration, if possible by reference to a standard;

n) termite species used in the test and locality of origin;

o) date on which the termites were brought into contact with the test specimen;

p) date of examination of the test specimens;

q) results of the visual examination for each test specimen including for each test specimen the survival rate of the termites at the end of the test and the degree of attack on the test specimen;

r) quantities of preservative tested, expressed in kilograms per cubic metre of wood, between which the toxic values lie and the corresponding concentrations of the solutions as percentage by mass;

s) following note:

”The interpretation and the practical conclusions that can be drawn from this report demand a specialised knowledge of the subject of wood preservation and, for this reason, this test report cannot of itself constitute an approval certificate.”

The test report shall also mention all the optional operational details and those not provided for in the method, as well as any factors that may have influenced the results.

Annex A
(informative)

Example of a test report

Number and date of this document	EN 117:2012
Name of supplier	company X
Name and type of preservative	Z-preservative in the form of organic-soluble material composition declared.
Density	0,84 g/ml
Name and concentration of active ingredient	W mass fraction 10 %
Solvent or diluent used	xylene
Species of wood used	Scots pine *(Pinus sylvestris* Linnaeus)
Concentrations of preservative tested	see Table A.1
Date of impregnation	2004-06-21
Mass of solution absorbed and retention of preservative	see Table A.1
Method of drying	as specified in the document
Ageing tests applied	none
Termite specification	*Reticulitermes santonensis,* Ile d'Oléron,F
Date of exposure	2004-07-26
Date of final examination of the test specimens	2004-09-20
Results	see Table A.1
Toxic values	x,xx kg/m^3 to y,yy kg/m^3
This report has been prepared by	Laboratory L
Location and date	Y 2004-11-04
Name and signature of the officer(s) in charge	Mr Z

NOTE The interpretation and the practical conclusions that can be drawn from this report demand a specialised knowledge of the subject of wood preservation and, for this reason, this test report cannot of itself constitute an approval certificate.

Table A.1 — Product Z — Organic solution

Concentrations tested	Reference number of test specimens	Absorption of solution by test specimen	Retention of preservative		Results of examinations		
			Per test specimen	Mean	Survival of workers	Living soldiers (S) and/or nymphs (N)	Visual examination
Mass fraction in %		g	kg/m^3	kg/m^3	Rounded %		
(0) xylene	1	8,2	0	0	88	S – N	4
	2	7,8	0		73		4
	3	7,7	0		84		4
1,6	4	7,5	6,4	6,3	42	S – N	4
	5	7,8	6,6		24		3
	6	7,2	6,1		32		3
	7	7,1	6,2		35		3
	8	7,6	6,3		30		4
2,5	9	8,1	10,8	10,5	17	S – N	3
	10	7,6	10,1		15		3
	11	7,9	10,5		10		2
	12	7,8	10,3		12		2
	13	8,0	10,6		16		2
4,0	14	7,4	15,8	16,4	9	N	1
	15	7,9	16,8		3		1
	16	8,0	17,0		1		0
	17	7,5	16,3		5		1
	18	7,7	16,0		12		2
6,3	19	8,0	26,9	26,0	2	0	0
	20	7,5	25,2		0		0
	21	7,8	26,2		0		0
	22	7,7	25,8		0		0
	23	7,9	26,0		3		1
10,0	24	7,3	38,9	40,7	0	0	0
	25	7,6	40,5		0		0
	26	8,1	43,1		0		0
	27	7,9	39,7		0		0
	28	7,5	41,5		0		0
0 Non-impregnated control test specimen	29	-	- -		85	S – N	4
	30	-	- -	-	70		4
	31	-	- -		69		4

NOTE The toxic value of preservative Z against *Recticulitermes santonensis* is between 16,4 kg/m^3 and 10,5 kg/m^3 corresponding respectively to mass fractions of 4 % and 2,5 %.

Annex B
(informative)

Example of a method of culturing termites

The culturing of *Reticulitermes spp* is easy because the species essentially reproduces in neotenic royal pairs.

Colonies can quite easily be found in infested areas (in France, for example, in the Departments of Charente and Charente Maritime) by setting 'traps' (groups of small planks made from species of wood highly susceptible to termite attack, these being either buried in a forest in areas known to be highly infested or else set among material infested by termites).

It is necessary to avoid the collection of 'traps' in which ants have settled as this would seriously endanger the success of the culture.

Laboratory culturing is done in tubs (cement, moulded fibre glass or laminated polyester) in the bottom of which three or four holes are made in order to drain off the excess water (closed either by means of a fibre glass pad or a very fine woven stainless steel wire mesh).

Approximately 1 m high, these tubs are firstly filled with a layer of coarse gravel to about 10 cm, then with a second layer of fine gravel of the same depth and, lastly, a layer of about 50 cm of compost to which fine sand has been added (25 % by volume).

The tubs are stored in the dark in a ventilated air conditioned room at (26 ± 2) °C and at (70 ± 5) % minimum relative humidity.

Storage in the dark seems to prevent emigration.

The moisture level of the earth is maintained by frequent but light watering.

The termite-infested 'traps' collected are buried, but not covered, near the side of the tubs.

Around these 'traps' small planks of an easily attackable species (dry Pine sapwood or Ilomba) about 30 cm to 40 cm long, 20 cm to 25 cm wide and 1 cm thick, arranged touching end-to-end, are half buried width-wise.

Several groups of planks can be placed around the 'traps' in the same tub; it is from these planks that the insects are then taken for the tests.

As long as the planks retain some strength they can be returned to the culturing tubs; it is from the planks that have lost all their strength that the fragments of wood from the original culture are then taken when the test colonies are made up.

Annex C
(informative)

Environmental, health and safety precautions within chemical/biological laboratory

When preparing this document, consideration was given to the minimisation of environmental impacts caused by the use of the methods of testing.

It is the users' responsibility to use safe and proper techniques in handling materials in the methods of testing specified in this document.

The following list is not exhaustive but users of this document may use it as a guide to the use of safe and proper techniques. They should:

— investigate if European Directives, transposed European legislation and national laws, regulations and administrative provisions apply;

— consult manufacturers/suppliers for specific details such as material safety data sheets and other recommendations;

— use safety equipment and wear protective clothing, usually goggles and coats, appropriate for the test product and the test chemicals, in all laboratory areas, to ensure the safety of the operator;

— be careful about flammable materials and substances that are toxic and/or human carcinogens and generally take care during transportation, decanting, diluting and dealing with spillages;

— use a fume cupboard during preparation of organic solvent solutions;

— store, handle and dispose of chemicals in a safe and environmentally satisfactory manner: including chemicals for laboratory test, test specimens, unused solvents and reagents that have to be disposed of.

Bibliography

[1] EN 73, *Wood preservatives — Accelerated ageing of treated wood prior to biological testing — Evaporative ageing procedure*

[2] EN 84, *Wood preservatives — Accelerated ageing of treated wood prior to biological testing — Leaching procedure*

[3] EN 212, *Wood preservatives — General guidance on sampling and preparation for analysis of wood preservatives and treated timber*

[4] EN 1001-1, *Durability of wood and wood-based products — Terminology — Part 1: List of equivalent terms*

[5] EN ISO 844, *Rigid cellular plastics — Determination of compression properties (ISO 844)*

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