



SLOVENSKI STANDARD

SIST EN 118:1995

01-januar-1995

Zaščitna sredstva za les - Določanje preventivnega delovanja proti *Reticulitermes santonensis* de Feytaud - Laboratorijska metoda

Wood preservatives - Determination of preventive action against *Reticulitermes santonensis* de Feytaud (Laboratory method)

Holzschutzmittel - Bestimmung der vorbeugenden Wirkung gegenüber *Reticulitermes santonensis* de Feytaud (Laboratoriumsverfahren)

Produits de préservation des bois - Détermination de l'efficacité préventive contre *Réticulitermes santonensis* de Feytaud (Méthode de laboratoire)

[https://standards.iteh.ai/catalog/standards/sist/5722dcc1-f315-4602-9d6f-](https://standards.iteh.ai/catalog/standards/sist/5722dcc1-f315-4602-9d6f-2c592f28b03d/sist-en-118-1995)

Ta slovenski standard je istoveten z: **EN 118:1990**

ICS:

71.100.50 Kemikalije za zaščito lesa Wood-protecting chemicals

SIST EN 118:1995

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 118:1995

<https://standards.iteh.ai/catalog/standards/sist/5722dcc1-f315-4602-9d6f-2c592f28b03d/sist-en-118-1995>

EUROPEAN STANDARD

EN 118 Rev.

NORME EUROPEENNE

EUROPAISCHE NORM

March 1990

UDC 674.048.4:620.1:615.285.7.025

Supersedes EN 118:1981

Key words: Wood preservatives, xylophagous animals, termites, analysis methods, determination, effectiveness limit, prevention, test equipment, test specimen, test specimen conditioning, tests, testing conditions, visual inspection, test results, animal husbandry

English version

Wood preservatives - Determination of preventive action against *Reticulitermes santonensis* de Feytaud (Laboratory method)

Produits de préservation des bois - Détermination de l'efficacité préventive contre *Reticulitermes santonensis* de Feytaud (Méthode de laboratoire)

Holzschutzmittel - Bestimmung der vorbeugenden Wirkung gegenüber *Reticulitermes santonensis* de Feytaud (Laboratoriumsverfahren)

This European Standard was accepted by CEN on 1989-09-28. CEN members are bound to comply with the requirements of the CEN/CENELEC Common Rules 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 CEN Central Secretariat or to any CEN member.

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 CEN Central Secretariat has the same status as the official versions.

CEN members are the national standards organizations 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 Bréderode 2, B-1000 Brussels

(c) CEN 1990 Copyright reserved to all CEN members

Ref. No. EN 118:1990 E

BRIEF HISTORY

This European Standard was drawn up by the Technical Committee CEN/TC 38 "Durability of wood and wood products" the Secretariat of which is held by AFNOR.

In accordance with the Common CEN/CENELEC Rules, the following countries are bound to implement this European Standard :

Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxemburg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 118:1995](#)

<https://standards.iteh.ai/catalog/standards/sist/5722dcc1-f315-4602-9d6f-2c592f28b03d/sist-en-118-1995>

Contents	Page	Page	
Introduction	4	7. Procedure	5
1. Scope	4	8. Expression of results	7
2. Field of application	4	9. Test report	7
3. Principle	4	Annex A. Example of a test report	8
4. Test materials	4	Annex B. Example of a method of culturing termites	9
5. Sample of the preservative	4		
6. Test specimens	4		

iTeh STANDARD PREVIEW **(standards.iteh.ai)**

SIST EN 118:1995

<https://standards.iteh.ai/catalog/standards/sist/5722dcc1-f315-4602-9d6f-2c592f28b03d/sist-en-118-1995>

Introduction

This European Standard describes a laboratory test method which gives a basis for the assessment of the effectiveness of a wood preservative against *Reticulitermes santonensis*, when applied as a surface treatment.

This laboratory method provides one criterion by which the value of a product can be assessed, and also its suitability, when applied to the surface, for preventive protection of the wood. 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.

1. Scope

This European Standard specifies a method for the determination of the effectiveness of a wood preservative against *Reticulitermes santonensis* de Feytaud¹⁾ when the preservative is applied as a surface treatment to wood.

2. Field of application

This method is applicable to :

- 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, where it is necessary to carry out the treatment on dry wood.

It therefore does not apply to soaking and diffusion products for damp wood.

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

3. Principle

Surface treatment of blocks of a susceptible wood species with the preservative or, if a concentrate is being used, with known dilutions of the preservative.

Dividing the blocks into two test specimens.

Exposure of the test specimens to specified colonies of *Reticulitermes santonensis* and assessment of the attack suffered after exposure in specified conditions and after a specified period of time. Comparison of these results with those obtained from untreated control specimens.

4. Test materials

4.1 Biological material

Reticulitermes santonensis de Feytaud, workers, soldiers and nymphs.

The termites used shall be taken from colonies; Annex B describes an example of a method of culture.

4.2 Products and reagents

4.2.1 *Substrate for establishing the colonies.* A choice of:

4.2.1.1 *Fine white quartz sand* consisting of grains of crystallized silica, very pure (99,5 % silica), and free from any organic substance²⁾.

4.2.1.2 *An hydrated, laminar, aluminium-iron-magnesium silicate* exfoliated to give particles of 1 mm to 3 mm with an apparent density of 80 kg/m³ to 90 kg/m³. 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.

4.2.1.3 *Rigid polyurethane foam* with open pores having a mass per unit of volume of 14 kg/m³ and a compressive strength³⁾ of 0,02 N/mm² to 0,03 N/mm². It is advisable to cut the foam into sheets 15 mm thick.

4.2.2 *Adhesive* which cannot be attacked by the termites and is non-toxic, for securing the tubes. This adhesive shall also not react with the preservative applied to the wood.

4.2.3 *Sealant*, for example pure gelatine, for the transverse section surfaces.

4.2.4 *Distilled or demineralized water*, especially in order to moisten the substrate.

4.3 Apparatus

4.3.1 *Culturing chamber*, (incubator or room) with air circulation, controlled at between 26 °C and 28 °C with a tolerance of ± 1 °C and a minimum of 75 % r.h.

4.3.2 *Conditioning chamber*, well ventilated and controlled at 20 ± 2 °C and at 65 ± 5 % r.h.⁴⁾.

4.3.3 *Laboratory work area*, well ventilated, where treatment of the test specimens is carried out⁵⁾.

4.3.4 *Testing chamber*, protected from light, ventilated and controlled at a temperature between 26 °C and 28 °C with a tolerance of ± 1 °C and at a minimum of 75 % r.h.

4.3.5 *Ordinary laboratory equipment* for application by brushing or by pipette of a liquid preservative product and including an analytical balance.

4.3.6 *Protective gloves*

4.3.7 *Instruments* for handling the termites (e.g. forceps)

4.3.8 *Glass tubes* open at both ends, one end being ground:
interior diameter: 25 mm
length: 110 mm

5. Sample of the preservative

The sample shall be representative of the product under test.

6. Test specimens

6.1 *Species of wood.* The reference species is Scots Pine, *Pinus sylvestris* Linnaeus.

Additional tests using other species are permitted but, if so, this shall be stated in the test report.

6.2 *Quality of wood.* Use only sound sapwood, straight grained, without knots and with a low resin content.

Average growth rate: 2,5 to 8 annual rings per centimetre.

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

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

3) Determined in accordance with ISO 844.

4) The conditioning of test specimens after treatment is permissible in the laboratory work area (4.3.3) provided that this meets the conditions specified for the conditioning chamber (4.3.2).

5) It is essential to follow proper safety measures for handling flammable or toxic materials. It is essential that operators avoid excessive exposure to solvents or their vapours.

The proportion of summer wood in the annual rings shall not exceed 30 % of the whole.

The wood shall have been neither floated nor stored in water nor dried at a temperature higher than 60 °C nor subjected to any chemical treatment.

6.3 Provision of blocks for test specimens. Cut the blocks from strips having a nominal cross-section 40 mm x 10 mm (at 12 % moisture content). The strips shall not be planed but sawn to give a smooth, clean surface.

The annual rings shall form an angle of $45 \pm 15^\circ$ with the edge of the longitudinal face.

Take the blocks required for each test from three lots each from a different tree, and at random from within each of these lots.

6.4 Dimensions of blocks and test specimens. The nominal dimensions of each block measured at 12 % moisture content shall be:

200 mm x 40 mm x 10 mm⁶⁾.

The test specimens shall be taken, in the case of treated test specimens, from the treated blocks which are divided into two.

The surface area of each block is theoretically 80 cm² but to find the actual surface area, the dimensions of each block shall be carefully checked.

6.5 Number and sub-division of test specimens. The test specimens shall be divided as follows:

treated test specimens: these are the treated specimens which are exposed to attack by *Reticulitermesantonensis*; use at least 6 treated test specimens (2 from each lot).

untreated control specimens for checking the virulence of the termites taken for the test: these untreated specimens are exposed to attack by *Reticulitermesantonensis*; for each series of tests use at least 3 control specimens (1 from each lot).

6.6 Inserts. The inserts are discs of untreated Scots Pine sapwood, $1 \pm 0,2$ mm thick and having a diameter about 1 mm to 2 mm less than the interior diameter of the tubes (4.3.8), so that they fit snugly into the tubes after moistening.

7. Procedure

7.1 Preparation of the test specimens

7.1.1 Conditioning of the blocks prior to treatment. Allow the blocks to reach equilibrium in the conditioning chamber (4.3.2).

7.1.2 Sealing of the transverse surfaces. Seal the transverse surfaces using the sealer (4.2.3).

7.1.3 Treatment of the blocks

7.1.3.1 Preparation of treatment solutions. Use the preservative either without further preparation other than any necessary stirring or, in the case of a concentrate, dilute with the diluent to the required working concentration, as specified by the manufacturer.

Treatment solutions shall be freshly prepared.

7.1.3.2 Treatment. Evenly apply to within $\pm 5\%$ the required amount of the preservative over one of the large faces of the block either by brushing or from a pipette moved transversely across the surface. Check by weighing that the correct quantity of preservative has been applied.

Several applications may be necessary to obtain the required amount. In this case, they shall be applied sufficiently quickly to avoid any solidification of certain substances which may impede the penetration of further coats.

The amount retained is expressed for each block in a corresponding mass and volume of the product in the ready to use condition, in the specified dilution, for concentrates.

Calculate the mass and volume of preservative retained per unit area of wood surface.

7.1.4 Drying and conditioning of the blocks after treatment. After treatment, dry the blocks for at least four weeks in the conditioning chamber (4.3.2), placing them in a horizontal position, the large untreated surface resting on two supports, such as glass rods.

7.1.5 Cutting the test specimens. Cut the blocks into two equal parts.

7.2 Exposure of the test specimens to the insects

7.2.1 Collecting and selecting the termites. Pick up the insects individually using forceps with parallel ends (4.3.7), taking hold of each insect by its abdomen and taking care not to press too hard. Make up groups of 250 workers, rejecting those 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 %).

Each group is intended to form a colony; the number of groups is determined by the number of colonies necessary for the test.

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. It is however, recommended that a few additional ones are prepared so as to ensure that a sufficient number of colonies in perfect condition is available to receive the test specimens.

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.

7.2.2 Securing the tubes (see figure 1). Attach with adhesive (4.2.2) the ground glass end of one tube (4.3.8) at the centre of the treated surface of each treated test specimen and at the centre of one of the large surfaces of each virulence control test specimen⁷⁾.

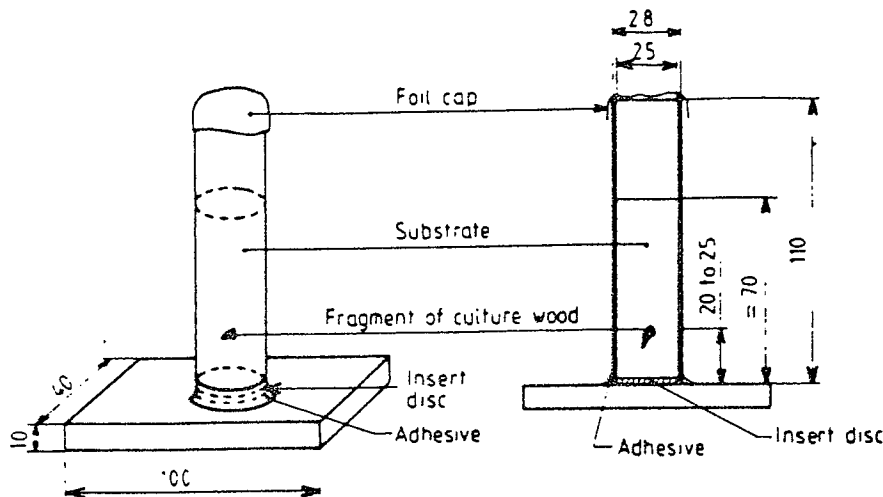
Introduce into each tube an insert (6.6) and place it on the surface of the test specimen.

6) If the test specimens are to undergo ageing treatment, it is advisable to take from each lot 2 blocks 400 mm long, from which can be obtained by sawing transversely into four:

a 100 mm control test specimen for checking virulence

a 300 mm test specimen for treatment and, after conditioning, division into three 100 mm test specimens, one to be tested unaged, a second to be tested after leaching and the third to be tested after evaporative ageing. Each 100 mm test specimen can receive 1 colony

7) If it is found to be unnecessary, it is permissible not to use adhesive to secure the tube to rigid polyurethane foam.



Dimensions in mm

Figure 1a. Test assembly to show positioning of colony on test specimen

Dimensions in mm

Figure 1b. Section of test assembly to show position of components

7.2.3 Installation of the termites (see figure 1)

7.2.3.1 With sand. Into each tube pour some sand (4.2.1.1), previously remoistened using water (4.2.4) in the proportion of 1 volume of water to 4 volumes of sand. The quantity of sand, which shall not be pressed down into the tube, shall occupy at least two-thirds of the volume of the tube, that is it should rise to a height of about 7 cm.

Roughly along the central axis of each tube, bury some wood from the original culture (approximately 0,5 g) about halfway down the sand.

Distribute in each tube a group of termites made up as described in 7.2.1.

7.2.3.2 With aluminium-iron-magnesium silicate. Prepare enough aluminium-iron-magnesium silicate (4.2.1.2) with a moisture content of about 300 % (for example 300 ml of water to 100 g of substrate), either in bulk or for individual containers. It is essential that there is no free water in the substrate. Fill about one-third of each tube with the substrate, place some wood from the original culture (approximately 0,5 g) on the substrate and then add substrate until the tube is about two-thirds full.

Into each tube, introduce a group of termites and cover it with a piece of aluminium foil or a small sheet of glass to prevent evaporation of water and escape of termites.

7.2.3.3 With polyurethane foam. Using the glass tube (4.3.8) cut discs (6 per tube) from the foam sheets (4.2.1.3). Insert 5 discs in each tube leaving a space of about 5 mm between the bottom disc and the bottom end of the tube. Place some wood from the original culture (approximately 0,5 g) in the foam through the upper opening in the tube about halfway down the foam. Moisten the foam by pouring 17 ml of water (4.2.4) on it. Using an iron wire (diameter approximately 2 mm) make a hole in the foam from top to bottom along the wall of the tube. Introduce a group of termites (7.2.1) into each tube and close the tubes with a foam disc briefly dipped into water (4.2.4).

7.3 Conditions and duration of the tests. Place the test assemblies on individual trays to prevent any escape of termites and keep them in the testing chamber (4.3.4) for 8 weeks.

It is recommended that, throughout the duration of the test, each colony be inspected daily, 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.

These inspections cover, in particular, the presence, location and activity of the termites (tunnelling in the substrate near the walls of the tube, construction of shafts, movement of the insects).

Action may be taken:

- if the termites are escaping
- to maintain the moisture content.

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.

7.3.1 Sand. The sand substrate has to be periodically remoistened; the change in colour due to drying indicates when it is necessary to re-moisten⁸¹. It is better to maintain the moisture content by frequent addition of small quantities of water (4.2.4) using a pipette rather than by a single large addition which might result in serious damage to the colony, particularly by flooding.

7.3.2 Aluminium-iron-magnesium silicate. Add the water (4.2.4) 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. A check can also be made by weighing.

7.3.3 Polyurethane foam. The requirements for sand also apply to polyurethane foam.

7.4 Examination of the test specimens and the colonies. At the end of the test:

- unseal the tubes; count the number of live termites in each tube
- determine the survival rate of the workers in each of the tubes on each specimen and record, where appropriate, the presence of living soldiers and/or nymphs.

7.4.1 Visual examination. Examine the treated surface of the test specimen, after carefully removing any material

⁸¹ Moist sand is dark in colour whereas dry sand is light in colour.

which the termites may have deposited and determine the depth of any attacks. Describe the attacks on the exposed surface by using the following levels:

- 0 – no attack
- 1 – attempted attack: superficial gnawing or nibbling of insufficient depth to be measured.
- 2 – slight attack: surface attack (< 1 mm), limited in extent to a maximum of a quarter of the exposed surface, or a single tunnelling to a depth of less than 3 mm with no other sign of attack.
- 3 – average attack: surface attack (< 1 mm), extending over more than a quarter of the exposed surface or erosion (1 mm to 3 mm) on an area equal to or less than a quarter of the exposed surface or tunnelling at points greater than 3 mm but not leading to cavities and not traversing the test specimen.
- 4 – strong attack: erosion on more than a quarter of the exposed surface or attack penetrating greater than 3 mm leading to cavities in the main body of the test specimen, or not leading to cavities but traversing the test specimen.

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

8. Expression of results

Report the results of the visual examination. Record also the survival rate of the workers and the presence, if any, of living soldiers and/or nymphs after the test.

9. Test report

The test report shall give the following ⁹⁾:

- a) the number of this European Standard;
- b) the name and type (see clause 2) of the product tested;
- c) the density of the preservative;
- d) any solvent or diluent used, and if necessary, the dilution used for the test;
- e) the species of the wood used;
- f) the loadings of the product tested, expressed in grams per square metre and correspondingly in millilitres per square metre;
- g) the date of application of the product;
- h) the exact amount of the product absorbed by each specimen, expressed in grams per square metre and correspondingly in millilitres per square metre;
- i) if applicable, any ageing procedure applied, detailing the nature, conditions and duration, if possible by reference to a standard;
- j) the date of exposure of the test specimens to the termites;
- k) the date of examination of the test specimens;
- l) for each colony:

- the rate of survival at the end of the test and, if any, the presence of living soldiers and/or nymphs
- the degree of attack on each test specimen;
- m) the following note:

'The interpretation of this report and the practical conclusions that can be drawn from it demand a specialized 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 optional operational details and those not provided for in the method as well as any factors which may have influenced the results.

9) An example of a test report is given in annex A.