



SLOVENSKI STANDARD

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Terenska preskusna metoda za ugotavljanje relativne preventivne učinkovitosti zaščitnega sredstva za les v stiku z zemljo

Field test method for determining the relative protective effectiveness of a wood preservative in ground contact

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Freiland-Prüfverfahren zur Bestimmung der relativen Schutzwirkung eines Holzschutzmittels im Erdkontakt

[SIST EN 252:2015](#)

Essai de champ pour déterminer l'efficacité protectrice relative d'un produit de préservation du bois en contact avec le sol

Ta slovenski standard je istoveten z: EN 252:2014

ICS:

71.100.50 Kemikalije za zaščito lesa Wood-protecting chemicals

SIST EN 252:2015

en,fr,de

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EUROPEAN STANDARD
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Field test method for determining the relative protective effectiveness of a wood preservative in ground contact

Essai de champ pour déterminer l'efficacité protectrice relative d'un produit de préservation du bois en contact avec le sol

Freiland-Prüfverfahren zur Bestimmung der relativen Schutzwirkung eines Holzschutzmittels im Erdkontakt

This European Standard was approved by CEN on 30 August 2014.

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

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EN 252:2014 (E)**Foreword**

This document (EN 252:2014) 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of an identical text or by endorsement, at the latest by May 2015 and conflicting national standards shall be withdrawn at the latest by May 2015.

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 252:1989.

In relation to the previous version of the standard, the following main modifications have been made:

- change in the assessment criteria for fungal decay;
- minor changes in the description of termite attack;
- the addition of informative annexes concerning the determination of strength characteristics in wood stakes by measuring the modulus of elasticity; the characterization of field test sites and the setting-out of the test stakes in the field test sites.

According to the CEN-CENELEC Internal Regulations, the national standards organizations 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

The method is primarily concerned with protection against microbial attack. However, it is also capable of being used in areas where a termite hazard exists. It should also be noted that microbial decay may alter the resistance of a stake to termite attack and that termite attack may obliterate evidence of microbial decay.

This field method provides one criterion by which the effectiveness of a wood preservative product can be assessed in a ground contact situation (Use Class 4 according to EN 335).

The main objective of the method described is to evaluate the effectiveness of a preservative relative to a reference material.

For this reason permeable timbers are used throughout so that the protective efficacy of various retentions of wood preservative can be determined.

NOTE Informative Annex A gives guidance for testing wood or wood based products in ground contact that have or have not been treated with a wood preservative.

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EN 252:2014 (E)**1 Scope**

This European Standard specifies a field test method for evaluating the effectiveness of wood preservatives in a ground contact situation. Wood treated with a reference preservative is included for comparison.

The protective effect of the test preservative is assessed in relation to the effect of a reference wood preservative applied by a specified treatment.

2 Principle

Wooden stakes are treated with preservative solutions to give a range of preservative retentions. After drying and, if necessary, an appropriate fixation period, the stakes are partially buried in soil in selected test fields in the open.

The stakes are regularly inspected and their condition compared with that of untreated controls and that of a group of stakes treated with a reference preservative both of which indicate the aggressiveness of the individual field.

The different agents of attack and their respective intensities are recorded.

3 Wood specimens

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3.1 Wood species

Susceptible wood species that can be completely penetrated with preservative shall be chosen as follows:

- for every test the sapwood of Scots Pine (*Pinus sylvestris* (L)), shall be used,
- it is recommended that a hardwood species of local importance is included if the preservative is expected to be used in this type of wood;
- if desired other wood species may be incorporated in the test.

3.2 Wood quality

The wood shall be straight-grained and free from knots, cracks, stain, decay, insect holes, reaction wood or other defects. Test stakes with a resinous appearance shall be avoided. The wood shall not have been water-stored, floated, chemically treated or steamed or dried at a temperature above 60 °C.

The Scots Pine sapwood shall show an average rate of growth of 2,5 to 10 annual rings per 10 mm.

If additional wood species are to be used the range in the number of annual rings per 10 mm for each species shall be mentioned in the report.

The test report shall also include the mean density and moisture content for the wood used in the preparation of the stakes.

3.3 Characteristics and dimension of stakes

The boards shall be conditioned at (20 ± 2) °C, (65 ± 5) % relative humidity.

Stakes for test shall be cut from the test wood(s) as follows:

- Each stake shall be planed to within the thickness tolerance indicated. When viewed at the cross-cut end, the rings shall be oriented tangentially to one of the 50 mm edges within the limits $(0 \pm 25)^\circ$;
- The dimensions shall be: (500 ± 2) mm x (50 ± 1) mm x $(25 \pm 0,5)$ mm when measured at a moisture content of (12 ± 2) % (mass fraction).

Each test shall be carried out with stakes of comparable density and any stakes in a test batch which have densities outside the range of 15 % of the mean density shall be rejected.

Additional stakes of different dimensions may also be included in the tests.

3.4 Number of Stakes

At least 10 stakes per field for each wood preservative and retention shall be tested.

A greater number of stakes shall be treated so that stakes with deviating retentions can be rejected (5.3).

Additional stakes may also be included for chemical analysis, to aid determination of retentions and/or penetration/distribution (see 5.3).

To assess the virulence of the field conditions a series of at least 10 untreated control stakes shall be included in each field (see Clause 7).

Include in each field at least two series of 10 standard reference stakes of Scots Pine treated according to 5.2 with a reference preservative (see Clause 6).

3.5 Labelling of stakes

Each stake shall be labelled with an inert, long-lasting label or tag.

NOTE A map of the position of each stake within the site is desirable.

4 Sample of wood preservative

The sample shall be representative of the wood preservative to be tested. It shall be stored and handled in accordance with written recommendations from the manufacturer.

It is recommended to chemically quantify the active ingredients content.

5 Conditioning and treatment of the stakes

5.1 Conditioning

The stakes should be conditioned in conditions to reach constant mass at (20 ± 2) °C and (65 ± 5) %RH.

The stakes shall be air-dried indoors, to a moisture content at which a good penetration of the wood preservative can be obtained. For vacuum / pressure processes the moisture content of the specimens shall be (12 ± 2) % (mass fraction).

5.2 Treating process

For the reference stakes and unless otherwise specified for the test stakes a full-cell process is to be used. A typical full-cell process has an initial vacuum which shall be less than 10 kPa (0,10 bar) and maintained for at

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least 30 min. Pressure of at least 1 MPa (10 bar) shall be applied for at least 90 min. Complete records of treatment shall be made for each charge.

5.3 Determination of retention of wood preservative product

Calculate the volume of each stake before treatment from its dimensions (see Clause 3). If shaped to a point before treatment this shall be taken into account in the calculation.

Determine the mass of each stake by weighing to the nearest 0,5 g.

After treatment, allow the stake to drain for several minutes. Reweigh each stake to the nearest 0,5 g to determine the mass of treatment solution absorbed.

Calculate the retention value of each stake from the mass of treatment solution absorbed, the concentration of the treating solution and the calculated stake volume. Express the retention of the wood preservative product as kilograms per cubic metre of wood. Calculate the mean retention for each series of test stakes.

Stakes with individual retentions deviating by more than 10 % from the mean value shall be rejected.

5.4 Range of preservative retention

Test each preservative with at least three and preferably five different retention levels. These different levels shall be achieved by using fresh preservative solutions at different dilutions and without varying the treatment conditions.

Use a fresh solution at each dilution; the dilution of a quantity of solution which has been used already may be unsatisfactory because preferential absorption may have occurred during the previous treatment schedule.

5.5 Post treatment conditioning of stakes

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For those products requiring a fixation period the recommendations of the wood preservative manufacturer should be followed.

For the reference preservatives the stakes shall first be close-stacked, each retention group separately, and kept wrapped for an appropriate period (at least 3 weeks) at room temperature (above 15 °C) in polyethylene or similar non water permeable material to avoid rapid drying.

For drying after fixation, make open piles protected from rain and frost, with inert spacers to allow air flow between the stakes.

6 Reference stakes**6.1 Reference preservative**

Stakes of Scots Pine sapwood shall be treated according to 5.2 using the reference preservative, with the following composition:

$\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$	35,0 % mass fraction
$\text{K}_2\text{Cr}_2\text{O}_7$	45,0 % mass fraction
$\text{As}_2\text{O}_5 \cdot 2\text{H}_2\text{O}$	20,0 % mass fraction

Chemical purity of individual components should be at least 98 %.

Two dry salt retentions shall be used approximating to 2 kg/m^3 , and 9 kg/m^3 respectively. The precise retentions obtained will be dependent on the concentration and uptake of the treating solution.

NOTE 1 Alternative raw materials could be used providing the same metal balance is achieved. In terms of elemental metal these retentions equate to the following:

- 2 kg/m^3 dry salt retention: $0,18 \text{ kg/m}^3$ copper, $0,32 \text{ kg/m}^3$ chromium, $0,23 \text{ kg/m}^3$ arsenic;
- 9 kg/m^3 dry salt retention: $0,80 \text{ kg/m}^3$ copper, $1,43 \text{ kg/m}^3$ chromium, $1,02 \text{ kg/m}^3$ arsenic.

NOTE 2 It is possible to use a third concentration at 6 kg/m^3 to provide additional information.

As a result of the implementation of the Biocidal Products Directive 98/8/EC there are restrictions in the use of chromium- containing wood preservatives.

6.2 Alternative reference preservative

If it is not possible to use a wood preservative containing arsenic the reference stakes shall be treated with an alternative preservative.

This preservative shall have the following composition:

$\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$	50,0 % mass fraction
$\text{K}_2\text{Cr}_2\text{O}_7$	48,0 % mass fraction
CrO_3	2,0 % mass fraction

Chemical purity of individual components should be at least 98 %.

Two dry salt retentions shall be used approximating to 4 kg/m^3 and 17 kg/m^3 respectively. The precise retentions obtained will be dependent on the concentration and uptake of the wood preservative treatment solution.

NOTE Alternative raw materials could be used providing the same metal balance is achieved. In terms of elemental metal these retentions equate to the following:

- 4 kg/m^3 dry salt retention: $0,51 \text{ kg/m}^3$ copper, $0,72 \text{ kg/m}^3$ chromium;
- 17 kg/m^3 dry salt retention: $2,16 \text{ kg/m}^3$ copper, $3,06 \text{ kg/m}^3$ chromium.

7 Untreated control stakes

A series of at least 10 untreated control stakes shall be included in each test field.

These stakes shall be interspersed between the stakes treated with the wood preservative product(s).

8 Condition of the test field

In order to promote reproducibility and to reduce variation in the test results, avoid overabundant vegetation on the field.

The vegetation shall be cut by physical means and in such a way that the buried stakes remain untouched. Chemicals to control the growth of vegetation (herbicides) may affect the fungal attack and shall therefore not be used.