

Wood preservatives — Test method for determining the protective effectiveness against wood destroying basidiomycetes — Determination of the toxic values

The European Standard EN 113:1996, with the incorporation of amendment A1:2004, has the status of a British Standard

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee B/515, Wood preservation, upon which the following bodies were represented:

- British Telecommunications plc
- British Wood Preserving and Damp-proofing Association
- Chemical Industries' Association
- Creosote Council
- Department of the Environment (Building Research Establishment)
- Timber Research and Development Association
- Timber Trade Federation
- Wood Panel Industries Federation

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- Association of Consulting Scientists
- Council of the Forest Industries of British Columbia
- Imperial College of Science and Technology
- Institute of Wood Science

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National foreword

This British Standard has been prepared by Technical Committee B/515 and is the English language version of EN 113:1996, *Wood preservatives — Test method for determining the protective effectiveness against wood destroying basidiomycetes — Determination of the toxic values*, including amendment A1:2004, published by the European Committee for Standardization (CEN). EN 113:1996 was prepared as a result of discussion in CEN Technical Committee 38, Durability of wood and wood-based products, in which the United Kingdom participated.

This British Standard supersedes BS 6009:1982 which is withdrawn.

This British Standard differed slightly from the English language version of EN 113:1996 when it was originally published. Amendment No. 1 removed these changes to ensure that the text was identical to the English language version of EN 113:1996.

Amendment No. 2 implements CEN amendment A1. The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1** **A1**. Tags indicating changes to CEN carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by **A1** **A1**.

Cross-references

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 23 and a back cover.

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Wood preservatives — Test method for determining the protective effectiveness against wood destroying basidiomycetes — Determination of the toxic values

(includes amendment A1:2004)

Produits de préservation du bois — Méthode d'essai pour déterminer l'efficacité protectrice vis-à-vis des champignons basidiomycètes lignivores — Détermination du seuil d'efficacité (inclut l'amendement A1:2004)

Holzschutzmittel — Prüfverfahren zur Bestimmung der vorbeugenden Wirksamkeit gegen holzzerstörende Basidiomyceten — Bestimmung der Grenze der Wirksamkeit (enthält Änderung A1:2004)

This European Standard was approved by CEN on 1996-09-02, and amendment A1 was approved by CEN on 2003-11-28. CEN members are bound to comply with the CEN/CENELEC Internal Regulations 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 Central Secretariat or to any CEN member.

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CEN

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Comité Européen de Normalisation
Europäisches Komitee für Normung

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 38, Durability of wood and derived materials, the Secretariat of which is held by AFNOR.

This European Standard supersedes EN 113:1980, EN 113:1980/A1:1981 and EN 113:1980/A2:1985.

The significant technical differences between this edition and EN 113:1980 are as follows:

- application to water-dispersible formulations;
- the use of only one fungus but *Coriolus versicolor* being only used for particular hazards;
- the taking into account of the correction value for the loss in mass;
- new criteria of validity of test and interpretation of results;
- complement to annex regarding test fungi.

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 March 1997, and conflicting national standards shall be withdrawn at the latest by March 1997.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Foreword to amendment A1

This document (EN 113:1996/A1:2004) has been prepared by Technical Committee CEN/TC 38, Durability of wood and derived materials, the Secretariat of which is held by AFNOR.

This Amendment to the European Standard EN 113:1996 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2004 and conflicting national standards shall be withdrawn at the latest by July 2004.

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

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Introduction

This European Standard specifies a laboratory method of test which gives a basis for the assessment of the effectiveness of a wood preservative against wood destroying basidiomycetes. By using this method it is possible to determine the loading at which impregnated wood of a susceptible species may be regarded as adequately protected under the conditions of test.

This laboratory method provides one criterion by which the value of a product can be assessed, and this criterion should be used to judge the value of the preservative taking into account the methods of application likely to be used.

The procedures described in this standard method are intended to be carried out by suitably trained and/or supervised specialists. Appropriate safety precautions should be observed throughout the use of the standard. Any deviation, however small, from the procedures given in this standard can influence the results, so it is important that the procedures given in this method are followed precisely.

1 Scope

This European Standard specifies a method for determining the toxic values of wood preservatives previously introduced into the wood by full impregnation against wood destroying basidiomycetes cultured on an agar medium.

This method is applicable to products which are capable of achieving uniform and complete penetration of the test specimens including:

- water-insoluble chemicals which are being studied as active ingredients; or
- organic water-insoluble 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 which are capable of achieving uniform and complete penetration of test specimens (see Clause 7) by the procedure described in 8.2.2; or
- water-soluble products, for example salts.

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

2 Normative reference

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revisions. For undated references the latest edition of the publication referred to applies.

ISO 3696:1987, *Water for analytical laboratory use — Specification and test methods*.

3 Definitions

For the purposes of this standard, the following definitions apply:

3.1

representative sample

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

3.2

supplier

the sponsor of the test

4 Principle

Impregnation of several series of test specimens of a susceptible wood species with solutions in which the concentrations of preservative are ranged in a given progression.

Exposure of these test specimens to attack by basidiomycetes in pure culture to establish the toxic values of the product under test.

5 Test materials and apparatus

5.1 Biological material

The test fungi to be used as follows:

5.1.1 *Obligatory fungus in all cases* (see also Annex D)

— *Coniophora puteana* (Schumacher ex Fries) Karsten (BAM Ebw.15) on softwood.

Loss in mass in percentage in 16 weeks of Scots pine sapwood specimens: minimum 20 % (m/m).

5.1.2 *Obligatory fungus for particular hazards* (see also Annex D)

— *Coriolus versicolor* (Linnaeus) Quélet (CTB 863 A) on hardwood and/or on softwood, as appropriate.

Loss in mass in percentage in 16 weeks of beech specimens: minimum 20 % (m/m); of Scots pine sapwood specimens: minimum 15 % (m/m).

5.1.3 *Two species to be used compulsorily on the basis of the nature of the product*

(see also Annex D)

For creosotes and similar products:

— *Lentinus lepideus* Fries ex Fries (BAM Ebw. 20) on softwood.

Loss in mass in percentage in 16 weeks of Scots pine sapwood specimens: minimum 20 % (m/m);

— *Lentinus cyathiformis* (Schaeffer ex Fries) Bresadola (CTB 67-02 B) on hardwood.

Loss in mass in percentage in 16 weeks of beech specimens: minimum 20 % (m/m).

For all other products:

— *Poria placenta* (Fries) Cooke sensu J. Eriksson (FPRL 280) on softwood.

Loss in mass in percentage in 16 weeks of Scots pine sapwood specimens: minimum 20 % (m/m);

— *Gloeophyllum trabeum* (Persoon ex Fries) Murrill (BAM Ebw. 109) on softwood.

Loss in mass in percentage in 16 weeks of Scots pine sapwood specimens: minimum 20 % (m/m).

5.1.4 For specific regional uses or conditions, it is also possible to select other fungi on an optional basis¹⁾.

5.1.5 Maintenance of strains. The strains shall be maintained and treated (that is frequency of subculturing, alternation of culture media, etc.) in accordance with the instructions from their laboratory of origin (see Annex D.2). The parent strain shall be maintained in the laboratory of its origin such that its vigour is conserved and assured.

5.2 Products and reagents

5.2.1 *Culture medium*

The culture medium is a malt agar medium with the following composition:

— malt extract

in concentrated form: (50 ± 0,5) g,

in powder form: (40 ± 0,5) g;

— agar causing no inhibition of growth of fungi: (20 ± 0,5) g to (30 ± 0,5) g;

— water conforming to grade 3 of ISO 3696; quantity to make up to 1 000 ml.

Prepare this medium by warming the mixture in a boiling water bath or a steam bath, stirring until completely dissolved.

¹⁾ See Annex E for a recommended but non-comprehensive list of optional fungi.

Place in each culture vessel a sufficient quantity of the medium to provide a minimum depth of 3 mm to 4 mm when in its in-use position. Close the vessels as specified in 5.3.9 and sterilize in the autoclave at 121 °C for 20 min. Let the vessels cool in their in-use position.

5.2.2 Solvents and diluents

For water soluble preservatives:

- water conforming to grade 3 of ISO 3696.

For preservatives to be diluted or dissolved in an organic solvent:

- suitably volatile liquids that leave no residue in the wood that would have a toxic effect on the fungi at the end of the post-treatment conditioning period.

NOTE Toluene and xylene of recognized analytical grade have been found suitable.

5.2.3 Fumigant (if necessary)

Xylene technical grade.

5.3 Apparatus

5.3.1 Conditioning chamber, well ventilated and maintained at (20 ± 2) °C and (65 ± 5) % relative humidity.

5.3.2 Culture chamber, (incubator or room), dark and maintained at (22 ± 2) °C and (70 ± 5) % relative humidity.

5.3.3 Drying oven, maintained at (103 ± 2) °C.

5.3.4 Treatment vessels, of a material that does not react with their contents, for example of glass for organic products and of plastics materials for salts containing fluorine.

5.3.5 Ballast, to prevent floating of test specimens. The ballast shall not react with any materials with which they come into contact during the test.

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

5.3.7 Vacuum vessels, fitted with stopcocks.

5.3.8 Vacuum pump, fitted with a pressure gauge and capable of maintaining a pressure of $(0,7 \pm 0,1)$ kPa²⁾

5.3.9 Kolle flasks or equivalent culture vessels, with a capacity of between 400 ml and 650 ml, providing a flat surface area of between 85 cm² and 120 cm² for the medium (see Figure C.1, Figure C.2 and Figure C.3) and allowing air exchange.

NOTE Kolle flasks are usually plugged with a wad of cotton wool. Other culture vessels are usually fitted with leakproof lids, the centres of which are to be pierced with a round hole of up to 15 mm diameter and plugged with a wad of cotton wool.

5.3.10 Test specimen supports, made of glass, stainless steel or any other inert material, that is to say, with no risk of having any effect on the culture medium, the fungus, the wood or the product impregnated, or of being itself modified. The supports are used to prevent direct contact of the specimens with the culture medium, but shall not separate them from it by more than 3 mm.

NOTE If abnormally high moisture contents are experienced consistently, use of specimen supports of approximately 5 mm thick may help to control the problem. If thicker specimen supports are used, this should be recorded in the test report.

5.3.11 Drying vessel(s), provided with a close-fitting cover and containing supports that will give minimum contact with the treated test specimens to be placed on them. The vessels and supports shall be of materials that do not react with the test solvent or test preservative, for example glass for organic products or plastics material for salts containing fluorine.

5.3.12 Equipment for chemical gas or steam sterilization or access to a radiation source (see Annex B).

5.3.13 Ordinary laboratory equipment, including a balance capable of weighing to an accuracy of 0,01 g and a desiccator with an efficient desiccant (for example, silica gel).

²⁾ 100 kPa = 1 bar.