SLOVENSKI STANDARD
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Trajnost lesa in lesnih proizvodov - Preskusna metoda proti glivam odprtotrosnicam - 2. del: Ocenjevanje naravne ali izboljšane trajnosti

Durability of wood and wood-based products - Test method against wood destroying basidiomycetes - Part 2: Assessment of inherent or enhanced durability

Dauerhaftigkeit von Holz und Holzprodukten - Prüfverfahren gegen Holz zerstörende Basidiomyceten - Teil 2: Bewertung der natürlichen oder verbesserten Dauerhaftigkeit

Durabilité du bois et des matériaux dérivés du bois - Méthode d'essai vis-à-vis des champignons basidiomycètes - Partie 2 : Détermination de la durabilité inhérente ou améliorée

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Durability of wood and wood-based products - Test method against wood destroying basidiomycetes - Part 2: Assessment of inherent or enhanced durability

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 113-2:2018) 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 document is currently submitted to the CEN Enquiry.

This document will supersede CEN/TS 15083-1:2005

This document will supersede EN 113:1996 and EN 113:1996/A1:2004.

Compared to current EN 113, the following modifications are:

— a second part has been included;

— this second part corresponds to the CEN/TS 15083-1:2005 document;

— the two parts of the new EN 113 deal with similar testing but relate to a different scope.

Introduction

This document specifies a laboratory method of test which gives a basis for the assessment of the biological durability of a sample of wood or wood product against attack by wood-destroying basidiomycetes. Specifically the natural durability of a wood species can vary depending on the conditions of growth such as climate and soil type. For this reason, the durability established using the method described in this document will relate only to the sample of timber tested. Guidance on sampling is given in Annex A.

This laboratory method provides one criterion by which the durability of the timber can be assessed. It is recommended that this information is supplemented by data from other relevant tests, and above all by practical experience.

The procedures described in this standard method are intended to be carried out by suitably trained and/or supervised specialists.

1 Scope

This document specifies a method of test for determining the natural durability of a timber against wood-destroying basidiomycetes cultured on a malt extract agar medium. The method is applicable to all timber species.

Furthermore this method can be used to test modified or treated wood. The test method described in this part 2 of EN 113 can be applied to specific wood species, commercial supplies of sawn timber, wood-based materials, wood treated with preservatives and modified wood including heat-treated wood. However, this standard is not intended to determine the effectiveness of wood preservatives used to prevent decay.

NOTE 1 Determining the efficacy of wood preservatives used to prevent decay is the scope of EN 113-1.

NOTE 2 This method can be used in conjunction with an ageing procedure, for example EN 73 or EN 84.

Annex A (informative) contains a guidance on sampling.

Annex B (informative) contains some methods of sterilization.

Annex C (informative) contains information on the test vessels.

Annex D (informative) contains an example of a test report.

Annex E (informative) contains information on the test fungi.

Annex F (informative) contains the assessment of the results.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
supplier
sponsor of the test (person or company providing the sample of timber to be tested)

4 Principle

Test specimens of the timber under test and reference timber test specimens are exposed to attack by pure cultures of basidiomycetes. After a prescribed period of incubation under defined conditions, the percentage loss in dry mass of the test specimens is used to establish the timber durability classification of the timber under test.

5 Test material and apparatus

5.1 Biological material

5.1.1 Test fungi and virulence control timbers

5.1.1.1 General

The test fungi to be used are as follows and relate to corresponding virulence control timbers.

It is required that the virulence control timbers used shall show a mass loss of at least 30 % with one of the test fungi.

5.1.1.2 Hardwoods: beech as virulence control timber

Obligatory fungi:

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

Loss in mass of beech in 16 weeks: minimum 20 %.

— *Trametes versicolor* (L.) Lloyd (CTB 863A):

Loss in mass of beech in 16 weeks: minimum 20 %.

5.1.1.3 Softwoods: Scots pine sapwood as virulence control timber

Obligatory fungi:

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

Loss in mass of Scots pine sapwood in 16 weeks: minimum 20 %.

— *Rhodonia placenta* (Fr.) Niemelä, K.H. Larss. and Schigel (FPRL 280):

Loss in mass of Scots pine sapwood in 16 weeks: minimum 20 %.

5.1.1.4 Modified wood: both beech and Scots pine sapwood as virulence control timber

Obligatory fungi:

— *Coniophora puteana* (Schumacher ex Fries) Karsten (BAM Ebw. 15) for both softwoods and hardwoods:

Loss in mass of Scots pine sapwood in 16 weeks: minimum 20 %.

Loss in mass of beech in 16 weeks: minimum 20 %.

— *Rhodonia placenta* (Fr.) Niemelä, K.H. Larss. and Schigel (FPRL 280) for softwoods:

Loss in mass of Scots pine sapwood in 16 weeks: minimum 20 %.

— *Trametes versicolor* (L.) Lloyd (CTB 863A) for hardwoods:

Loss in mass of beech in 16 weeks: minimum 20 %.

5.1.1.5 Maintenance of strains

The strains shall be maintained and treated so that its virulence is conserved and ensured (see Annex E).

The strains shall be maintained and treated (frequency of subculturing, alternation of culture media, etc.) in accordance with the instructions of their laboratory of origin (see E.2).

NOTE The parent strain is maintained in the laboratory of its origin so as to conserve and to ensure its vigour.

If tests are not undertaken regularly or if a strain shows signs of degeneration a new standard culture of the strain should be obtained from the laboratory of its origin for each test (see E.2).

When new strains are received, the virulence shall be tested to ensure the strain can achieve the minimum loss in mass (see 5.1.1.2 and 5.1.1.3).

5.1.2 Virulence control timbers

5.1.2.1 Species used for the tests

— scots pine sapwood (*Pinus sylvestris* Linnaeus) for tests with softwoods;

— beech (*Fagus sylvatica* Linnaeus) for tests with hardwoods;

— for modified wood both Scots pine sapwood and beech should be used.

5.1.2.2 Wood quality

The wood shall be free from cracks, stain, decay, insect damage or other defects. The wood shall not have been water-stored, floated, chemically treated or steamed.

NOTE Wood that has been kiln dried at temperatures not above 60 °C can be used.

The Scots pine shall be exclusively sapwood containing little resin and having between 2,5 and 8 annual growth rings per 10 mm. The proportion of latewood in the annual rings shall not exceed 30 % of the whole.

The beech shall be even-grained, free from tyloses, discolouration and red heart. It shall have between 2 and 6 annual growth rings per 10 mm.

5.1.2.3 Provision of virulence control specimens

Prepare planed strips having a cross-section of (25 ± 0,5) mm x (15 ± 0,5) mm. The longitudinal faces shall be parallel to the direction of the grain. The annual rings shall not be parallel to the broad faces (contact angle to be greater than 5) but otherwise may run in any direction. Make transverse cuts, neatly to give sharp edges and a fine-sawn finish to the end-grain surfaces, to give virulence control specimens (50 ± 0,5) mm long.

The virulence control 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 and originating from at least five planks.

5.1.2.4 Dimensions and density of virulence control specimens

The dimensions of each reference timber virulence control specimen at (12 ± 2) % moisture content or conditioned at 65 ± 5 % RH and 20 ± 2 °C for at least 2 weeks, shall be (50 ± 0,5) mm x (25 ± 0,5) mm x (15 ± 0,5) mm.

NOTE A two-prong electrical conductivity moisture meter is suitable for assessing moisture content.

In a batch of virulence control specimens, the density of an individual is permitted to differ from the mean value of the batch by ± 10 %.

5.1.2.5 Number and distribution of virulence control specimens

Use at least 10 reference timber virulence control specimens for each test fungus. Mark each viruelence control specimen so that it can be identified throughout the test.

5.2 Products and reagents

5.2.1 Culture medium

The culture medium shall be 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;

— de-ionized water; quantity to make up to 1000 g.

NOTE Preferably use water conforming to grade 3 of ISO 3696.

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

Place in each culture vessel (5.3.1) 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 5.3.1 and sterilize in an autoclave at 121 °C for 20 min. Let the vessels cool in their in-use position.

5.3 Apparatus

5.3.1 Culture vessels

Kolle flasks or equivalent 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 and allowing air exchange.

NOTE 1 Examples of suitable vessels are given in Annex C.

NOTE 2 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 pierced with a round hole of up to 15 mm diameter and plugged with a wad of cotton wool.

5.3.2 Drying oven

Capable of being controlled at (103 ± 2) °C.

5.3.3 Desiccators

With efficient desiccant (silica gel for example).

5.3.4 Conditioning chamber

Well ventilated and controlled at (20 ± 2) °C and (65 ± 5) % relative humidity.

5.3.5 Culture chamber

Incubator or room, dark and controlled at (22 ± 2) °C and (70 ± 5) % relative humidity.

5.3.6 Test specimens 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 of modifying itself. 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.

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.

NOTE Supports can be capable of holding either one or two test specimens.

5.3.7 Equipment for steam sterilization or access to a radiation source

See Annex B.

5.3.8 Ordinary laboratory equipment

Including a balance capable of weighing to an accuracy of 0,01 g.

6 Test specimens

6.1 Species and source of wood

Ensure that the species of each plank or log to be tested has been identified correctly and record both the botanical and the trade name. Obtain as much information as possible on the origin and history of the sample (see Annex A). The sample of timber shall be free from penetrating wood preservative treatments, for example anti-stain products.

NOTE 1 Commercial samples of timber can contain more than one botanical species.

NOTE 2 Guidance on sampling is given in Annex A.

6.2 Wood quality

Record the physical characteristics of the timber sample, for example the sizes of logs/planks, the presence of resin pockets, cross-grain, knots, sapwood and where possible record the widths of annual rings and the proportion of latewood. For logs, record the position in the trunk if known.

The wood shall be free from cracks, stain, decay, insect damage or other defects. The wood shall not have been water-stored, floated, chemically treated or steamed.

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

6.3 Provision of the test specimens

Reject at least the outer 10 mm from lateral faces of planks and 50 mm from the end grain; reject at least 50 mm from the end grain of logs.

Condition the wood to (12 ± 2) % (*m/m*) moisture content or conditioned at 65 ± 5 % RH and 20 ± 2 °C for at least 2 weeks. Prepare planed strips having a cross-section of (25 ± 0,5) mm x (15 ± 0,5) mm which avoid all obvious defects and which are entirely heartwood or entirely sapwood. The longitudinal faces shall be parallel to the direction of the grain. The annual rings shall not be parallel to the broad faces (contact angle to be greater than 5°) but otherwise may run in any direction. Transverse cuts shall be made neatly to give sharp edges and a fine-sawn finish to the end-grain surfaces, to give timber 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 and originating from at least five planks. Concerning modified wood the test specimens should be taken from three batches or manufacturing lots.