

SLOVENSKI STANDARD

SIST-TS CEN/TS 15083-1:2006

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Trajnost lesa in lesnih proizvodov - Ugotavljanje naravne trajnosti masivnega lesa za zaščito proti lesnim gobam, preskusne metode - 1. del: Glive odprtostnice

Durability of wood and wood-based products - Determination of the natural durability of solid wood against wood-destroying fungi, test methods - Part 1: Basidiomycetes

Dauerhaftigkeit von Holz und Holzprodukten - Bestimmung der natürlichen Dauerhaftigkeit von Vollholz gegen holzerstörende Pilze, Prüfverfahren - Teil 1: Basidiomyceten

Durabilité du bois et des matériaux dérivés du bois - Détermination de la durabilité naturelle du bois massif vis-à-vis des champignons lignivores, méthodes d'essai - Partie 1: Basidiomycetes

Ta slovenski standard je istoveten z: CEN/TS 15083-1:2005

ICS:

79.040	Les, hlodovina in žagan les	Wood, sawlogs and sawn timber
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English version

**Durability of wood and wood-based products - Determination of
the natural durability of solid wood against wood-destroying
fungi, test methods - Part 1: Basidiomycetes**

Durabilité du bois et des matériaux dérivés du bois -
Détermination de la durabilité naturelle du bois massif vis-
à-vis des champignons lignivores, méthodes d'essai -
Partie 1: Basidiomycètes

Dauerhaftigkeit von Holz und Holzprodukten - Bestimmung
der natürlichen Dauerhaftigkeit von Vollholz gegen
holzerstörende Pilze, Prüfverfahren - Teil 1:
Basidiomyceten

This Technical Specification (CEN/TS) was approved by CEN on 1 March 2005 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

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Foreword

This document (CEN/TS 15083-1:2005) 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 consists of two parts. Part 1 is required to determine the natural durability of solid wood against wood destroying basidiomycetes fungi and Part 2 against soft rotting micro-fungi.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this CEN Technical Specification: 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 the United Kingdom.

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Introduction

This CEN Technical Specification specifies a laboratory method of test which gives a basis for the assessment of the natural durability of a sample of timber against attack by wood-destroying basidiomycetes. The natural durability of a species of timber 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 be supplemented by data from other relevant tests, for example CEN/TS 15083-2, 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.

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1 Scope

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

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

2 Normative reference

The following referenced document is indispensable for the application of this document. 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 3696:1987)

3 Terms and definitions

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

3.1

supplier

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

4 Principle

Test specimens prepared from the timber under test and reference timber test specimens are exposed to attack by pure cultures of wood-destroying basidiomycete fungi. After a prescribed period of incubation under defined conditions, the percentage loss in dry mass of the test specimens is used to estimate the resistance of the test timber to attack by the test fungi and as the basis of a provisional durability rating.

5 Test materials and apparatus

5.1 Biological material

5.1.1 Test fungi

The test fungi to be used are as follows.

5.1.1.1 Obligatory fungus in all cases: *Coniophora puteana* (Schumacher ex Fries) Karsten (BAM Ebw. 15).

Loss in mass of Scots pine sapwood in 16 weeks: minimum 30 %.

Loss in mass of beech in 16 weeks: minimum 30 %.

5.1.1.2 Obligatory fungi for particular timbers:

— *Poria placenta* (Fries) Cooke sensu J. Eriksson (FPRL 280) for soft woods.

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

— *Coriolus versicolor* (Linnaeus) Quélet (CTB 863A) for hardwoods.

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

5.1.1.3 Maintenance of strains

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 B.2). The parent strain shall be maintained in the laboratory of its origin so as to conserve and to assure its vigour.

NOTE 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 B.2).

When new strains are received, the virulence shall be tested to ensure the strain can achieve the minimum loss in mass (see 5.1.1.1 and 5.1.1.2).

5.1.2 Reference 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.

5.1.2.2 Wood quality

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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.

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 and discolouration. It shall have between 2 and 6 annual growth rings per 10 mm.

5.1.2.3 Provision of reference timber test specimens

Prepare planed strips having a cross-section of $(25 \pm 0,5)$ mm x $(15 \pm 0,5)$ 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 reference timber test specimens $(50 \pm 0,5)$ mm long.

The test specimens shall originate from a minimum of three trees or shall be taken 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 reference timber test specimens

The dimensions of each reference timber test specimen at a mass fraction of (12 ± 2) % moisture content shall be $(50 \pm 0,5)$ x $(25 \pm 0,5)$ mm x $(15 \pm 0,5)$ mm.

NOTE A moisture meter of the two-pronged electrical conductivity type is suitable for assessing moisture content.

In a batch of test specimens, the density of an individual is permitted to differ from the mean value of the batch by $\pm 10\%$.

5.1.2.5 Number and distribution of reference timber test specimens

Use at least 10 reference timber test specimens for each test fungus. Mark each test 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: $(50 \pm 0,5)$ g;

in powder form: $(40 \pm 0,5)$ g.

— agar causing no inhibition of growth of fungi:

$(20 \pm 0,5)$ g to $(30 \pm 0,5)$ g.

— water conforming to grade 3 of EN ISO 3696:

quantity to make up to 1 000 ml.

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 $121\text{ }^{\circ}\text{C}$ 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 cm^2 and 120 cm^2 for the medium.

NOTE 1 Examples of suitable vessels are given in EN 113.

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 $(103 \pm 2)\text{ }^{\circ}\text{C}$.

5.3.3 Desiccators, with efficient desiccant (silica gel for example).

5.3.4 Conditioning chamber, well ventilated and controlled at $(20 \pm 2)\text{ }^{\circ}\text{C}$ and $(65 \pm 5)\%$ relative humidity.

5.3.5 Culture chamber, (incubator or room) dark and controlled at $(22 \pm 2)\text{ }^{\circ}\text{C}$ and $(70 \pm 5)\%$ 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 in itself being modified.

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

The supports are used to prevent direct contact of the test specimens with the culture medium, but shall not separate them from it by more than 3 mm.

5.3.7 Ordinary laboratory equipment, including a balance capable of weighing to an accuracy of 0,01 g and an autoclave.

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 Clause 9). The sample of timber shall be free from penetrating wood preservative treatments, for example boron-based 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.

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.

Prepare planed strips having a cross-section of $(25 \pm 0,5)$ mm x $(15 \pm 0,5)$ 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. Make transverse cuts, neatly to give sharp edges and a fine-sawn finish to the end-grain surfaces, to give timber test specimens $(50 \pm 0,5)$ mm long.

6.4 Dimensions of test specimens

The dimensions of each timber test specimen at a mass fraction of (12 ± 2) % moisture content shall be:

$(50 \pm 0,5)$ mm x $(25 \pm 0,5)$ mm x $(15 \pm 0,5)$ mm.

NOTE 1 A moisture meter of the two-pronged electrical conductivity type is suitable for assessing moisture content.

NOTE 2 The nominal volume of each test specimen is $18,75 \text{ cm}^3$.

6.5 Number and distribution of test specimens

The timber test specimens are divided into:

e_1 Test specimens:

these are the test specimens of the test timber subjected to attack by the wood-destroying basidiomycete fungi. Use at least 30 test specimens for exposure to each test fungus, obtained from a minimum of five logs or planks (see Annex A).

e_2 Moisture content test specimens:

these are test specimens of the test timber which are used to establish the moisture content of the timber following conditioning to constant mass, to allow calculation of the initial dry mass of the test specimens. Use at least 10 moisture content test specimens and a minimum of one from each log or plank.

Mark each test specimen so that it can be identified throughout the test.

7 Procedure

7.1 Preparation of the timber test specimens

7.1.1 Reference timber

Place the numbered reference timber test specimens in the oven (5.3.2) and leave them there for 18 h to 24 h. Cool to room temperature in a desiccator (5.3.3) and weigh to the nearest 0,01 g to determine the initial dry mass (m_0). Place the test specimens in the conditioning chamber (5.3.4) until they need to be sterilized.

7.1.2 Test timber

NOTE If the test specimens are to be subjected to an ageing procedure, the procedure should be carried out prior to conditioning to constant mass to avoid the need to establish changes in mass due to the ageing procedure.

Place the numbered timber test specimens (e_1) and the moisture content test specimens (e_2) in the conditioning chamber (5.3.4) until weighings of sample test specimens at 24 h intervals are within $\pm 0,01$ g. Weigh the timber test specimens and the moisture content test specimens and record the initial conditioned mass (m_1).

Calculate the mean density of the timber test specimens using the mean conditioned mass and the nominal volume (see 6.4).

Place the moisture content test specimens in the oven (5.3.2) and leave them there for 18 h to 24 h. Cool to room temperature in a desiccator (5.3.3) and weigh to the nearest 0,01 g to determine the oven dry mass (m_0).

Calculate the moisture content of each moisture content test specimen by expressing the mass of water ($m_1 - m_0$) as a percentage of the oven dry mass (m_0).

Calculate the mean moisture content (MC) of the moisture content test specimens. Use the mean moisture content to calculate the initial dry mass (m_i) of each timber test specimen using the equation:

$$m_i = m_1 \times \frac{100}{100 + MC}$$