

Durability of wood and wood-based products - Testing and classification of the durability to biological agents of wood and wood-based materials

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 350:2016 sisaldab Euroopa standardi EN 350:2016 ingliskeelset teksti.	This Estonian standard EVS-EN 350:2016 consists of the English text of the European standard EN 350:2016.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 17.08.2016.	Date of Availability of the European standard is 17.08.2016.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 79.040

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:

Aru 10, 10317 Tallinn, Eesti; koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Aru 10, 10317 Tallinn, Estonia; homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

English Version

**Durability of wood and wood-based products - Testing and
classification of the durability to biological agents of wood
and wood-based materials**

Durabilité du bois et des matériaux dérivés du bois -
Méthodes d'essai et de classification de la durabilité
vis-à-vis des agents biologiques du bois et des
matériaux dérivés du bois

Dauerhaftigkeit von Holz und Holzprodukten - Prüfung
und Klassifikation der Dauerhaftigkeit von Holz und
Holzprodukten gegen biologischen Angriff

This European Standard was approved by CEN on 18 June 2016.

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 CEN-CENELEC Management Centre 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 the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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 United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents	Page
European foreword	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	6
4 Sampling of wood and wood-based materials to be tested	8
4.1 Testing wood species	8
4.1.1 General	8
4.1.2 Sampling logs	8
4.1.3 Sampling sawn timber	9
4.2 Testing of sets of wood	9
4.3 Testing of wood-based materials	9
5 General principles for testing and classification	9
5.1 General principles for testing wood specimens	9
5.2 General principles for the classification of durability	10
6 Test methods and classification system	11
6.1 Durability to wood-destroying fungi	11
6.1.1 General	11
6.1.2 Testing durability against basidiomycete and soft-rot fungi	12
6.2 Durability to larvae of dry wood-destroying beetles	14
6.3 Durability to termites	14
6.4 Durability to marine organisms	15
Annex A (informative) Example of scheme for sampling heartwood	16
A.1 Logs	16
A.2 Central boards	17
Annex B (informative) Guide to biological durability and treatability of wood species marketed in Europe	18
B.1 General	18
B.2 Wood species	18
B.3 Sapwood/heartwood	19
B.4 Treatability	19
B.5 Additional notes in Tables B.1, B.2, and B.3	20
B.6 Convention on International Trade in Endangered Species (CITES)	20
B.7 Adding new wood species or adjust data in Table B.1	20
Annex C (informative) Classification of treatability with aqueous wood preservatives	58
Annex D (informative) Classification of permeability to water	60
D.1 General	60
D.2 Principles for classification of permeability to water	60

Annex E (informative) Testing durability to disfiguring fungi.....	61
E.1 General	61
E.2 Testing durability to disfiguring fungi.....	61
E.3 Classification of durability to disfiguring fungi	61
Annex F (informative) Classification of performance	62
F.1 General	62
F.2 Principles of the assessment of performance	62
F.3 Principles of the classification of performance	63
Annex G (informative) Form to be used for the inclusion of new data on wood species / wood-based material.....	64
Bibliography	67

European foreword

This document (EN 350:2016) 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 February 2017, and conflicting national standards shall be withdrawn at the latest by February 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 350-1:1994 and EN 350-2:1994.

Wood durability is an important factor that influences the service life of a wood product. This standard provides input to service life prediction of wood and wood-based products. It's intended to give guidance on using wood products appropriate for different end-uses avoiding excessive requirements. It also ranks durability against wood-decay organisms of various wood species thereby allowing species of appropriate durability to be selected for a particular use. It will however be emphasized that the biological durability rating of wood species given in Annex B cannot be regarded as any guarantee of performance in service.

There are many other factors influencing service life of a wood product, such as the principles of good design, use conditions, climate, maintenance which should be taken into consideration.

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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.

1 Scope

This European Standard gives guidance on methods for determining and classifying the durability of wood and wood-based materials against biological wood-destroying agents.

The methods can be applied either to individual wood species, batches of wood and processed wood-based materials, including heat-treated, preservative-treated wood and modified wood. However, this standard is not intended to replace testing of the efficacy of biocides.

The wood-destroying agents considered in this standard are:

- wood-decay fungi (basidiomycete and soft-rot fungi);
- beetles capable of attacking dry wood;
- termites;
- marine organisms capable of attacking wood in service.

Data on the biological durability of selected wood species considered of economic importance in European countries are presented in Annex B (informative), which also provides information relating to their geographical origin, density, sapwood width and treatability.

NOTE Treatability, durability to disfiguring fungi, permeability to water and performance in use of wood and wood-based materials are also important issues. However, because standardized methods aiming to assess and classify these factors do not exist and/or have not been extensively experienced yet, preliminary guidance is given in Annex C (informative) for the classification of wood treatability with aqueous wood preservatives, Annex D (informative) for the classification of the permeability to water, Annex E (informative) for the durability to disfiguring fungi, and Annex F (informative) for the classification of performance.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 20-1, *Wood preservatives - Determination of the protective effectiveness against Lyctus Brunneus (Stephens) - Part 1: Application by surface treatment (laboratory method)*

EN 46-1, *Wood preservatives - Determination of the preventive action against recently hatched larvae of Hylotrupes bajulus (Linnaeus) - Part 1: Application by surface treatment (laboratory method)*

EN 49-1, *Wood preservatives - Determination of the protective effectiveness against Anobium punctatum (De Geer) by egg-laying and larval survival - Part 1: Application by surface treatment (Laboratory method)*

EN 117, *Wood preservatives - Determination of toxic values against Reticulitermes species (European termites) (Laboratory method)*

EN 252, *Field test method for determining the relative protective effectiveness of a wood preservative in ground contact*

EN 275, *Wood preservatives - Determination of the protective effectiveness against marine borers*

ENV 12038, *Durability of wood and wood-based products - Wood-based panels - Method of test for determining the resistance against wood-destroying basidiomycetes*

EN 13556, *Round and sawn timber - Nomenclature of timbers used in Europe*

CEN/TS 15083-1, *Durability of wood and wood-based products - Determination of the natural durability of solid wood against wood-destroying fungi, test methods - Part 1: Basidiomycetes*

CEN/TS 15083-2, *Durability of wood and wood-based products - Determination of the natural durability of solid wood against wood-destroying fungi, test methods - Part 2: Soft rotting micro-fungi*

EN 16449, *Wood and wood-based products - Calculation of the biogenic carbon content of wood and conversion to carbon dioxide*

ISO 13061-2, *Physical and mechanical properties of wood — Test methods for small clear wood specimens — Part 2: Determination of density for physical and mechanical tests*

3 Terms and definitions

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

3.1

wood species

trade name according to EN 13556 which can on occasion include more than one botanical tree species

Note 1 to entry: E.g. European oak which comprises both *Quercus robur* and *Q. petraea*.

3.2

pilot name for a wood species

result of a consensual choice due to practical considerations retaining the usual name under which the wood is the most widely commercialised, adopted either by the main exporting country or by the main importing country

Note 1 to entry: Pilot names are established since 1954 in the nomenclature of the ATIBT.

3.3

set

clearly identifiable collection of units of wood or wood-based products, originating from a commercial supply of a defined origin (single or not) and likely comprising only some of the variability of the wood species or of the wood-based material

Note 1 to entry: E.g. wood species sourced from a restricted geographical area.

3.4

wood-based material

any processed matrix containing and/or made of a specific percentage of wood

Note 1 to entry: Wood-based materials are those derived from trees and include amongst others heat-treated wood and any other material modified by chemical, physico-chemical or physical process, glue-laminated wood, wood-based panels, wood polymer composites and treated with wood preservatives. This standard is not meant to test all ligno-cellulosic materials (e.g. bamboo, reed, straw, flax) as such and would require methodological adaptations to do so.