SLOVENSKI STANDARD
oSIST prEN 460:2022

01-februar-2022

Trajnost lesa in lesnih izdelkov - Naravna trajnost masivnega lesa - Zahteve po trajnosti lesa, ki se uporablja v posameznih razredih ogroženosti

Durability of wood and wood-based products - Natural durability of solid wood - Guide to the durability requirements for wood to be used in hazard classes

Dauerhaftigkeit von Holz und Holzprodukten - Natürliche Dauerhaftigkeit von Vollholz - Leitfaden für die Anforderungen an die Dauerhaftigkeit von Holz für die Anwendung in den Gefährdungsklassen

Durabilité du bois et des matériaux dérivés du bois - Durabilité naturelle du bois massif - Guide d'exigences de durabilité du bois pour son utilisation selon les classes de risque

Ta slovenski standard je istoveten z: **prEN 460**

ICS:

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

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EUROPEAN STANDARD

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EUROPÄISCHE NORM

DRAFT
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ICS 79.040

Will supersede EN 460:1994

English Version

Durability of wood and wood-based products - Natural durability of solid wood - Guide to the durability requirements for wood to be used in hazard classes

Durabilité du bois et des matériaux dérivés du bois - Durabilité naturelle du bois massif - Guide d'exigences de durabilité du bois pour son utilisation selon les classes de risque

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 38.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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Contents

Page

European foreword

This document (prEN 460:2021) 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 EN 460:1994.

The main technical changes compared to the previous edition EN 460:1994 are the introduction of a decision process for performance specification of wood and wood-based products based on (i) materials and exposure, (ii) presentation of design life and (iii) articulation of consequence of failure.

Introduction

There is increasing need to understand the service life of wood products, especially in construction. Service life in the Construction Products Regulation: Regulation (EU) N°305/2011 (CPR) can be understood as performance within an economically acceptable period, under typical exposure and maintenance scenarios.

This document is concerned with the service life of wood products, especially in construction. The purpose of this document is to provide information that will help to guide the user to select an appropriate wood or wood-based material based on information about the end use environment and the target service life.

In many end uses, design, workmanship and maintenance will significantly influence the service life of the wood or wood based product.

The standard EN 350 is focused on the classification of durability of heartwood of different wood species. In practice, wood-based building products will also contain sapwood and often different treatments, like coatings, wood modification or wood preservation.

1 Scope

This document gives guidance on the selection of wood of wood and wood based products for use in situations where they may be subject to degradation by fungi or wood destroying insects. This guidance includes information on factors that can influence the service life of a wood or wood-based product when considering biological degradation. This document is a step toward the evaluation of the service life of a wood product.

This document does not consider:

1) the durability characteristics of the glue used in wood-based products;

2) the aesthetic function of wood products (discoloration, surface weathering, mould).

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1001-2 and the following apply.

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

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

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

3.1
coating
surface treatment intended to provide a physical protection of the wood surface normally applied in liquid form

3.2
component
product manufactured as a distinct unit to serve a specific function or functions

3.3
conferred durability
improved resistance of a wood species to biological degradants provided by a treatment process (chemical, physical, etc.) such as wood preservation or wood modification

3.4
consequence of failure (COF)
the significance of the product failure in service. The outcome of a failure can be expressed in terms of safety to personnel, economic loss, and/or damage to the environment

[SOURCE: EN 60300-3-11:2009, 3.1.23]

3.5
critical biological hazard
biological hazard or hazards that are most significant for the end use application and its geographical location

3.6
likelihood of failure
probability that a wood component will reach its limit state at a given time

3.7
limit state
point where a product is deemed to have failed

Note 1 to entry: The limit state is commonly reached before loss of function is complete.

3.8
material resistance
inherent ability of a material to endure a specific biological hazard through a combination of natural and/or conferred durability and moisture dynamic behaviour relevant for the different biological agents

3.9
moisture dynamics
physical characteristic of a wood material or wood product to respond to changing environmental conditions and take up and release moisture (vapour or liquid)

3.10
natural durability
inherent resistance of wood to attack by wood-destroying organisms

3.11
overlay
one or more sheets or films, for example impregnated paper, plastics, resin film, metal that protect a wood surface

3.12
performance
ability of a wood species or a wood-based material to withstand deterioration over time and fulfil essential function

3.13
permeability to water
ease with which water penetrates a wood-based matrix (wood of a particular species, wood-based material)

Note 1 to entry: The permeability to water of a wood species or a wood-based material can be tested using the method described in CEN/TS 16818.

3.14
service life
period of time after installation during which a building, structure or component parts meet or exceed the performance requirements

3.15
wood modification
non-biocidal process of a chemical, biological, or physical alteration of the cell wall substance of wood, resulting in a permanent desired property enhancement to primarily enhance biological durability and dimensional stability

Note 1 to entry: Examples are thermal or chemical modification.

3.16
wood preservative treatment
treatment to improve the resistance of wood to biodeterioration

Note 1 to entry: Application of wood preservative products in liquid form for the preventive treatment of wood resulting in a desired permanent improvement of their properties in order to protect them from degradation by wood destroying fungi, xylophagous insects (termites and beetles) or marine borers.

Note 2 to entry: The usual processes are surface treatment (soaking or spraying) or penetrating treatment (double vacuum autoclave or vacuum autoclave and pressure).

4 Performance

When wood-destroying organisms are likely to degrade wood in service, a suitable approach for meeting service life needs to be selected. There are principally two approaches:

1) by design - minimizing the moisture risk the wooden component is exposed to or by denying the access for organisms through construction measures;

2) by durability - either select a wood species of sufficient natural durability or ensure sufficient conferred durability by treatment with a wood preservative, wood modification or non-biocidal treatment to manage the challenge presented in the use environment.

Typically it is a combination of both.

4.1 General

A schematic diagram to illustrate the performance of a wood product is shown in Figure 1. The features defining the exposure of a material or product are multifacteted. An exposure when compared with the service life required for the product is the framework for identifiying suitable wood and wood based materials to meet these requirements.

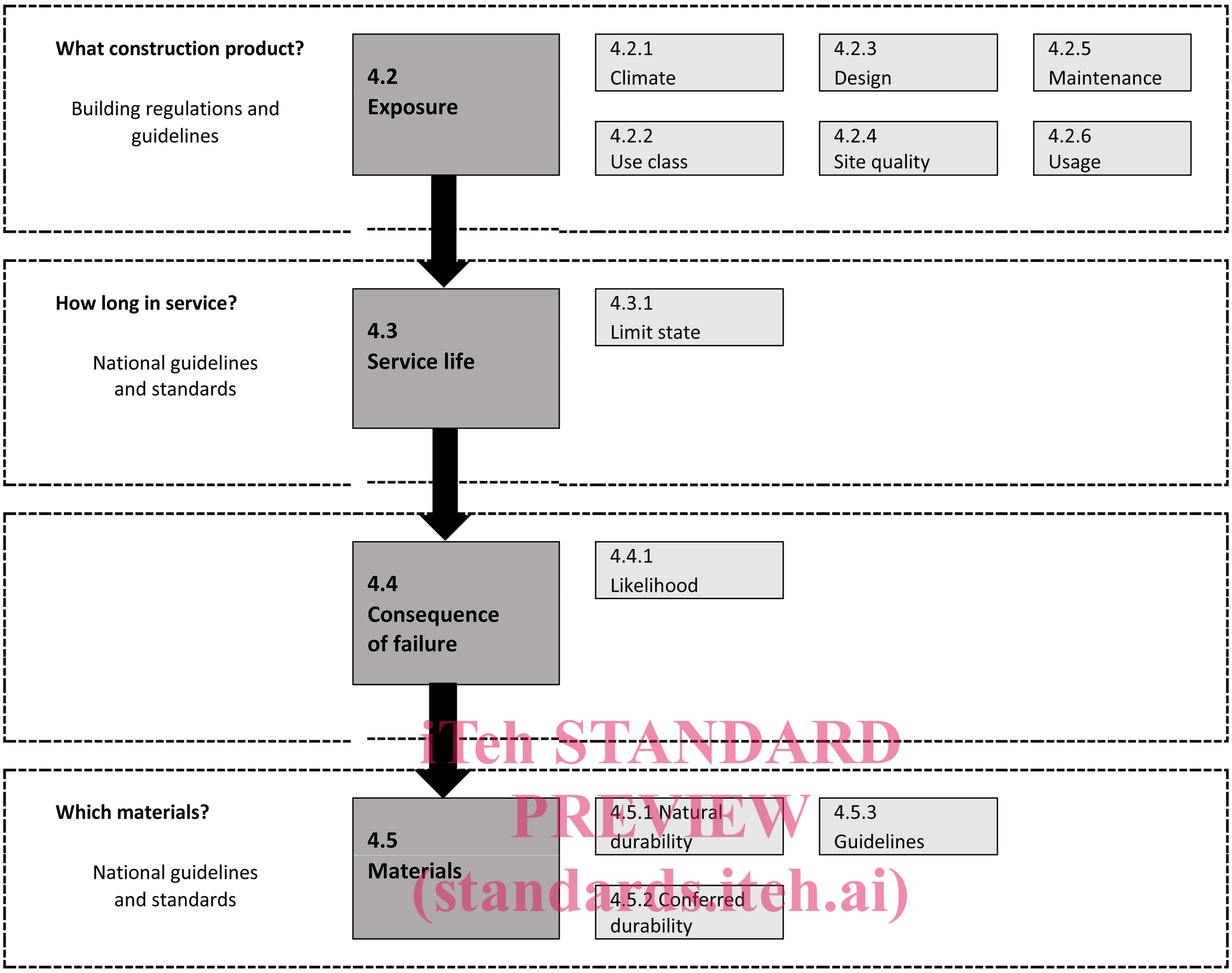

Figure 1 — Schematic illustration of a decision process for performance specification linked to clauses in this document

This document provides information to aid the user in the choice of a wood or wood-based material for a product, knowing its use class end use environment and the target service life. No attempt has been made to quantify the service life that could be expected from a particular combination. This is reflected in national interpretation documents.

4.2 Exposure

The exposure is the challenge presented to the wood material or product and comprises many features. Building guidelines and conventionally accepted performance (4.5.3), which should be respected in the design, often minimize the risk of a wood-destroying organism degrading wood in service. This can lead to lower requirements concerning durability to cover the residual risk.

The performance of each component will deteriorate at a rate depending on climate, use class, design, quality of site work, maintenance and useage.

4.2.1 Climate

The environment and particularly the moisture availability from local climate, temperature and proximity to sea all impact on the rate of deterioration of a wood material and components. Climate data are utilized in service prediction tools.

4.2.2 Use class

The service situations in which wood is susceptible to biological degradation have been divided into five use classes which are defined in EN 335. Guidance on the application of these use classes to solid wood is given in EN 335. (See ISO 15686-8:2008, Annex A, A.1.5 Factor D – Factor category – indoor environment and A.1.6 Factor E — Factor category: outdoor environment).

4.2.3 Design

The design detailing and workmanship of the wood material in a product has a significant impact on the performance of the product. Poor design features that enable water trapping increase exposure and can accelerate degradation whilst good design that excludes moisture ingress can reduce exposure and avoid degradation. National guidelines for product categories should be referred to for best practice design features. (See ISO 15686-8:2008, Annex A, A.1.3 Factor B — Factor category: design level).

Enhancing performance by design means taking planning, constructive, building physics and organizational measures which prevent or limit a reduction in the functionality of wood and wood-based materials, especially by fungi, insects or marine animals during their service life, and also prevent damage from excessive swelling and shrinkage of the wood and wood-based materials.

Some of these measures are enshrined in national building guidelines. Others restrict or limit access of humidity, insects or marine animals to wood and wood-based materials e.g. by covering or coating, calculations or simulations of moisture subject to climate conditions, protection against undesirable changes in the moisture content of the materials during storage, transport, assembly and installation.

In many cases the desired performance of any measures adopted, can only be ensured if the measures and the wooden component is maintained to an appropriate level (4.2.5).

4.2.4 Quality of site work

The activity of installing a wood product into service is known to have an impact on performance and national best practice construction site guidance is available. (See ISO 15686-8:2008, Annex A, A.1.4 Factor C — Factor category: work execution level).

4.2.5 Maintenance

Maintenance is the combination of technical, administrative and organizational measures during the life cycle of an object, which serve to maintain or restore its functional condition so that it can fulfil the required function.

Basic measures of maintenance are regular servicing (e.g. cleaning of surfaces and gutters), inspection, repair and improvement (EN 13306). A typical maintenance schedule, depending on the exposure and the actual component, could be:

— servicing and cleaning every half to one year;

— inspection by the user or owner when servicing and cleaning;

— professional inspection after 2-5 years in service and then annually;

— repair following inspection, e.g. for an exteriror wood coating this might be a 5 year redecoration cycle;

— improvement whenever necessary.

In many end uses, maintenance can significantly extend service life.

Regular inspection of wooden components can lead to the early detection of any detrimental changes, damage or consequential damage. The earlier changes or damage are detected, the lower the effort