



BSI Standards Publication

<http://www.china-gauges.com/>

Durability of wood and wood-based products — Determination of treatability of timber species to be impregnated with wood preservatives — Laboratory method

National foreword

This British Standard is the UK implementation of EN 14734:2022, incorporating corrigendum January 2023. It supersedes PD CEN/TR 14734:2004, which is withdrawn.

The start and finish of text introduced or altered by corrigendum is indicated in the text by tags. Text altered by CEN corrigendum January 2023 is indicated in the text by AC.

The UK participation in its preparation was entrusted to Technical Committee B/515, Weir preservation.

A list of organizations represented on this committee can be obtained on request to its committee manager.

Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

© The British Standards Institution 2023
Published by BSI Standards Limited 2023

ISBN 978 0 539 14041 5

ICS 79.040

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 January 2023.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

EUROPEAN STANDARD

EN 14734

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2022

ICS 79.040

Supersedes (EN) TR 14734:2004

English Version

Durability of wood and wood-based products -
Determination of treatability of timber species to be
impregnated with wood preservatives - Laboratory
method

Durabilité du bois et des matériaux dérivés du bois -
Détermination de l'imprégnabilité d'essences de bois
par des produits de préservation - Méthode de
laboratoire

Dauerhaftigkeit von Holz und Holzprodukten -
Bestimmung der Tränkbarkeit von Holzarten zur
Tränkung mit Holzschutzmitteln - Laborverfahren

This European Standard was approved by CEN on 20 April 2022 and includes the Corrigendum issued by CEN on 11 January 2023.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, 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: Rue de la Science 23, B-1040 Brussels

Contents		Page
European foreword		3
Introduction		4
1	Scope	5
2	Normative references	5
3	Terms and definitions	5
4	Principle	5
5	Reagents	5
5.1	Copper sulfate pentahydrate, at least 99% pure, solution of 50 g/kg	5
5.2	Indicator solution	5
5.3	Sealing compound	5
6	Apparatus	6
7	Preparation of test specimens	7
8	Procedure	7
8.1	Moisture content and density determination	7
8.2	Impregnation of test specimens (standard procedure)	7
8.3	Measurement of penetration	8
9	Data handling	9
9.1	Treatability classes for individual test samples	9
9.2	Differentiation between treatability classes 3 and 4	10
9.3	Assignment of a treatability class to a set of specimens	10
10	Test report	11
Annex A (informative) Guidance on sampling		12
A.1	General	12
A.2	Origin of the material	12
A.3	Homogeneity of the sample	12
A.4	Heartwood	12
A.5	Saw pattern	13
A.6	Seasoning	13
A.7	Grading	13
Annex B (informative) Example of a test report		14
Bibliography		16

European foreword

This document (EN 14734:2022+AC:2023) has been prepared by Technical Committee CEN/TC 38 “Durability of wood and wood-based products”, the secretariat of which is held by SIS.

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 December 2022, and conflicting national standards shall be withdrawn at the latest by December 2022.

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 CEN/TR 14734:2004.

This document includes the corrigendum EN 14734:2022/AC:2023 which corrects the last sentence of the fourth paragraph of 8.2.

The start and finish of text introduced or altered by corrigendum is indicated in the text by tags AC AC.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Introduction

The basis for this document was prepared as being part of the work for SMT project MAT-CT 94061 project number 3307: Improvement of CEN standards by short term methods for testing the natural durability and treatability of solid wood and wood based panel products.

It provides the means whereby the treatability of sapwood or heartwood of different wood species can be determined in order to determine likely reaction to impregnation with wood preservatives. Such an assessment provides data for use in EN 351-1 which establishes a system for specifying the treatment of wood with wood preservatives based upon the penetration and retention of preservatives achieved by the treatment process. EN 351-1 recognizes that different wood species respond to treatment differently depending on their ability to absorb preservative, and requires a different level of compliance depending on the treatability of the wood concerned. While EN 350 includes a subjective classification of the treatability of different wood species using a four class system, the method described in this document provides the means to determine the treatability objectively.

Although the method described uses an aqueous solution as the impregnating liquid, the method can be modified using other preservative types, e.g. organic solvent or emulsion preparations, if the response of the wood to a specific preservative is required. However, the method does not take account of preservative formulations where the active ingredients are selectively adsorbed on to the wood substrate resulting in the solvent penetrating more deeply than the biocides.

1 Scope

This document specifies a laboratory method for the determination of the treatability of wood in order to determine the likely reaction of different wood species to impregnation with wood preservatives. It is also applicable to investigate variation between samples of the same species but of different origin.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

4 Principle

After moisture and density determination of each of the test specimens, a set of test specimens is impregnated with copper sulfate solution in accordance with a standard test procedure. After application of an indicator solution to the exposed cross-section and to one of the exposed longitudinal surfaces of each of test specimens, the lateral and axial penetration is measured and the treatability class is evaluated.

5 Reagents

5.1 Copper sulfate pentahydrate, at least 98 % pure, solution of 50 g/kg

Dissolve 50 g of copper sulfate pentahydrate ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$) in 950 g water, preferably deionized.

NOTE The volume of copper sulfate solution required will depend on the capacity of the impregnation apparatus.

5.2 Indicator solution

For the indication of the penetration an indicator solution, e.g. chrome azurol S, can be used. Dissolve 0,5 g chrome azurol S and 5 g sodium acetate in 100 ml water.

Other indicators can be used but should have at least the same sensitivity to copper as chrome azurol S.

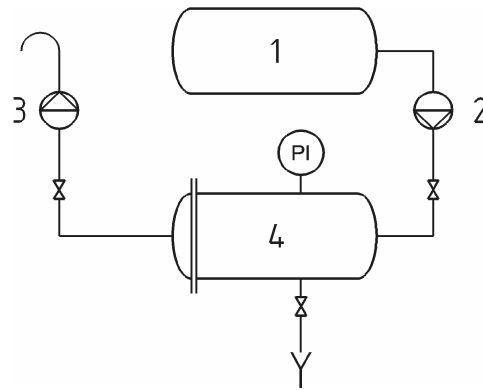
5.3 Sealing compound

A sealing compound which is inert to the copper sulfate solution (5.1) and unaffected by the test conditions.

6 Apparatus

Ordinary laboratory apparatus and:

- 6.1 Balance**, capable of weighing with maximum permissible error of 0,01 g.
- 6.2 Conditioning chamber**, well ventilated and controlled at $(20 \pm 2) ^\circ\text{C}$ and $(65 \pm 5) \%$ relative humidity.
- 6.3 Measuring devices**, capable of measuring the dimensions of test sample size of up to 40 mm and 1000 mm, respectively, and to a maximum uncertainty of measurement of 0,1 mm.
- 6.4 Drying oven**, capable of being controlled at $(101 \pm 2) ^\circ\text{C}$.
- 6.5 Desiccator**, with efficient desiccant (silica gel for example).
- 6.6 Treatment vessel**, consisting of a chamber and header tank with ancillary vacuum and pressure pumps capable of exerting a vacuum of $(1 \pm 0,5) \text{ kPa}$ and a pressure of $(10 \pm 1) \times 10^2 \text{ kPa}$. The pipe work between the treatment vessel and the pumps shall be designed so that adding or draining treatment solutions can be achieved while maintaining the existing pressure in the vessel. A typical treatment vessel with connected pumps and storage tank is shown in Figure 1.



Key

- 1 storage tank
- 2 pump
- 3 vacuum pump
- 4 treatment vessel (chamber)
- PI pressure gauge

Figure 1 — Typical treatment vessel (with connected pumps and storage tank)

7 Preparation of test specimens

Prepare a minimum of ten test specimens, each from a different plank of the wood species under test (see also 8.2). The test specimens shall be characterized and marked appropriately so that a distinction between heartwood and sapwood zones are made. The wood shall be sound, straight-grained and without knots and the visible features of the wood shall be given for example: resin pockets, cross-grain, widths of annual rings and proportion of latewood. At the time of test, the moisture content of the test specimens shall be between 13 % and 18 %.

NOTE It is important that the timber tested is representative of the population from which it comes. Guidance on the sampling of timber is provided in Annex A.

20 test specimens should be used to take into account variability between specimens.

From each plank, prepare a strip having a length of at least 800 mm and a cross-section of $(40 \pm 0,3) \text{ mm} \times (40 \pm 0,3) \text{ mm}$. When the sapwood zone is less than 40 mm wide it can be necessary to limit the cross-section of each strip. The lateral surfaces shall be planed and shall be true radial and tangential surfaces. Cross cut 15 mm to 20 mm from one end and discard. Cross cut a $(10 \pm 0,1) \text{ mm}$ long sample from the same end, for moisture content and density determination (see 8.1). Trim the other end of the remaining length to give a test specimen $(750 \pm 1) \text{ mm}$ long for impregnation. Number both test specimens so as to retain the identity of the plank. Apply the sealing compound (5.3) to one cross-section end of each test specimen for impregnation and allow to set. Inspect the end seal to ensure that it completely covers the end grain and apply a second coat if required.

It is recommended that neither dimension of the cross-section is less than 20 mm.

8 Procedure

8.1 Moisture content and density determination

Weigh each test specimen for moisture content determination to the nearest 0,01 g using the balance (6.1), to determine the initial mass (m_0). Transfer the test specimens to the drying oven (6.4). Dry the test specimens for 18 h to 24 h at $(103 \pm 2) \text{ }^\circ\text{C}$, cool to room temperature in a desiccator (6.5), weigh each test specimen to the nearest 0,01 g and record the final mass (m_1). Calculate the moisture content of each test specimen by expressing the water content ($m_0 - m_1$) as a percentage of the dry mass (m_1). Calculate the density of each test specimen, expressed as kilograms per cubic metre, using the oven dry mass (m_1) and the measured volume.

8.2 Impregnation of test specimens (standard procedure)

Place the test specimens in the treatment vessel (6.6) in such a way that they do not touch each other and that they do not float when the vessel is filled with the copper sulfate solution (5.1).

NOTE 1 A suitable arrangement can be achieved by separating the stacked test specimens with small sticks and either tying down the test specimens or placing weights on the top of the stack.

Seal the treatment vessel and by means of the vacuum pump, reduce the pressure to $(1,0 \pm 0,5) \text{ kPa}$. Maintain this vacuum for 45 min. Then, with the vacuum pump running, introduce the copper sulfate solution (5.1) so that the treatment vessel and the header tank are completely filled. Release the vacuum so that the pressure in the vessel returns to atmospheric pressure. Apply a pressure of $(10 \pm 1) \times 10^2 \text{ kPa}$ and maintain for 120 min. Release the pressure so that the treatment vessel returns to atmospheric pressure. Drain the copper sulfate solution from the chamber.

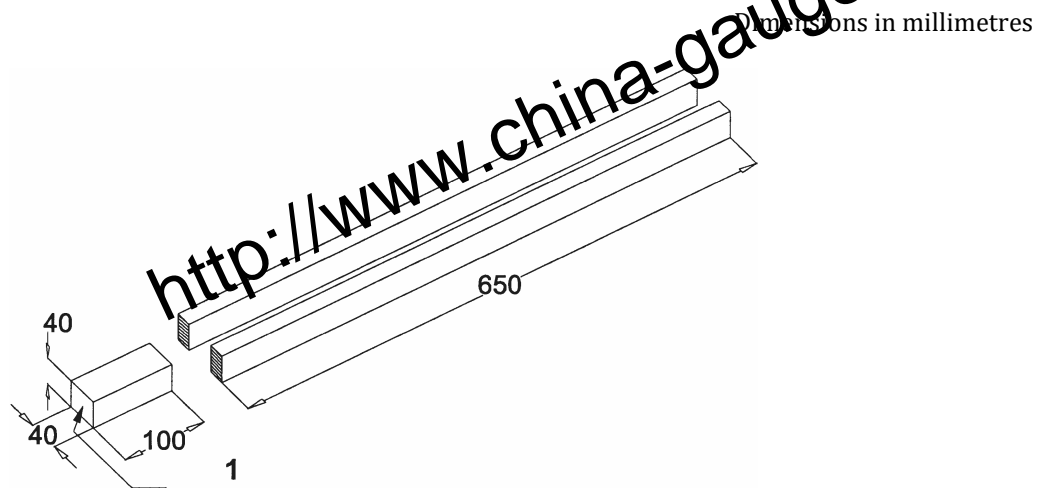
Remove the test specimens from the vessel and stack in a well-ventilated area to allow drying to take place. Allow to dry for at least 24 h $\langle \text{AC} \rangle$ and $\langle \text{AC} \rangle$ until the moisture content of the test specimens is below the fibre saturation point.

NOTE 2 A moisture meter of the two-pronged electrical conductivity type is suitable for this purpose.

8.3 Measurement of penetration

Cut each test specimen according to the pattern given in Figure 2, using equipment which provides a fine-sawn finish. The sample is to be split in half in longitudinal direction and the exposed cross section and the exposed longitudinal surface should be labelled as such.

The cutting should be in the radial plane and should be from the end that was nearest the end seal.



Key

1 end-sealed cross-section

Figure 2 — Cutting of the samples

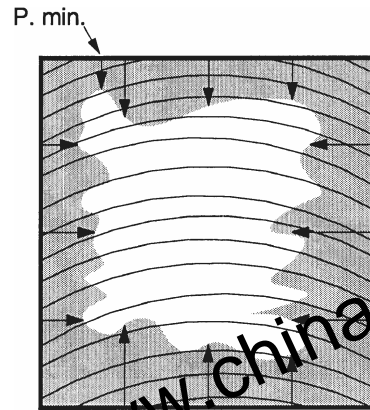
Apply the indicator solution (5.2) to the exposed cross-section (see Figure 2) of each test specimen using either a spray technique or a paint brush. Similarly apply the reagent to one of the exposed longitudinal surfaces (see Figure 2) of each test specimen.

NOTE The wood penetrated by the copper sulfate solution will become deep blue if chrome azurol S is used: the remainder will be coloured red.

When the reagent has dried enough for the specimens to be handled, measure both the minimum and average lateral penetration and the minimum axial penetration of the copper sulfate solution into the test specimens.

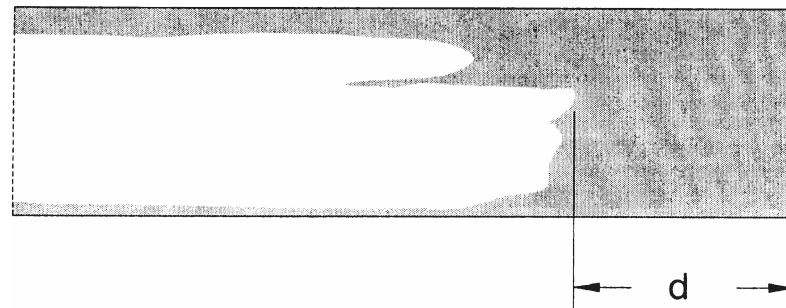
Measure the lateral penetration at the centre and approximately 10 mm either side of the centre of each radial and tangential edge of the exposed cross-section (see Figure 3). If the penetration does not exceed 10 mm at any point, calculate the mean of all the values and record as the average lateral penetration. If the penetration exceeds 10 mm at any point, calculate the average lateral penetration using only the readings taken at the centre of each edge and indicate the method of calculation in the test report. Additionally, measure the minimum penetration achieved at any point on the cross-section.

Measure the minimum axial penetration which is the distance from the unsealed end to which the copper sulfate solution has penetrated across the complete width of the exposed surface (d in Figure 4).



Key
P. min minimum penetration depth

Figure 3 — Measuring points of lateral penetration on cross-section



Key
 d minimum axial penetration depth

Figure 4 — Assessment of axial penetration on longitudinal plane

9 Data handling

9.1 Treatability classes for individual test samples

The treatability of the wood species under test shall be evaluated according to a four-class system as defined in Table 1.

Each timber specimen is individually assessed and this information shall be presented in the final report.

The measurements of penetration taken from the test specimens shall be used to determine whether the wood belongs to class 1, class 2, or whether it belongs to one of classes 3 and 4.

Table 1 — Treatability classes

Impregnation procedure	Minimum lateral penetration	Average lateral penetration	Treatability class
Standard	≥ 15 mm	nr	1
Standard	≥ 3 mm	≥ 6 mm	2
Extra long ^a	≥ 1 mm	nr	3
Extra long ^a	< 1 mm	nr	4
nr = no requirement.			
^a See 9.2.			

NOTE Although axial penetration does not affect the designation of the penetration class, measurements are included in the test report for additional information.

9.2 Differentiation between treatability classes 3 and 4

If it is concluded that the wood species belongs to treatability classes 3 or 4 and it is necessary to differentiate between these two, the complete laboratory test method shall be repeated with a second set of test specimens and a modified impregnation cycle. This cycle is the same as the standard procedure except that the pressure of $(10 \pm 1) \times 10^2$ kPa is maintained for 16 h. The cutting and measurement procedures are carried out as before, the resulting measurements allowing the wood species to be assigned to treatability class 3 or 4 by reference to Table 1.

9.3 Assignment of a treatability class to a set of specimens

An overall treatability class is assigned to the set of specimens. The treatability class assigned to the set will be that treatability class (when measured on the basis of lateral penetration) for which no more than 10 % of individual specimens have been assigned a lower treatability.

Where 90 % or more specimens belong to a treatability class but 50 % or more of the specimens assigned within or higher than the treatability class above, then the treatability class of the set shall be expressed as a range between two classes.

NOTE 1 For example, if 90 % or more of specimens are assigned to treatability class 3 or better, and 50 % or more are treatability class 2 or better, then the set would be assigned the treatability class 2-3.

If individual specimens exist as part of the set which differ from the assigned set treatability class by more than one class (when measured on the basis of lateral penetration), then the letter “v” shall be appended to the class number to indicate the variability.

NOTE 2 For example, a set that has 90 % or more specimens conforming to treatability class 1, but includes one or more test specimens that conform to treatability class 3, would be assigned an overall treatability of class 1v.

10 Test report

The test report shall include at least the following information (see also Annex B for an example):

- a) the number and publication year of the European standard used;
- b) the dates the test was started and finished;
- c) the wood species under test;
- d) the known history of the timber, for example country and district of origin, method of drying, storage conditions;
- e) a description of visible features of the timber, for example heartwood zones (if mainly sapwood) or sapwood zones (if mainly heartwood), resin pockets, cross-grain, widths of annual rings, proportion of latewood, impossibility to distinguish between sapwood and heartwood;
- f) the oven dry density of the timber and the moisture content at the time of treatment of each specimen, as determined using the additional sample for this purpose;
- g) treating parameters used;
- h) comments on the distribution of the wood preservative, for example even, spots and stripes, poor penetration of the earlywood;
- i) the frequency of the test specimens in each treatability class;
- j) the minimum and mean lateral penetration for each specimen;
- k) the minimum longitudinal penetration for each specimen;
- l) the treatability class of each test specimen;
- m) the treatability class assigned to the set of specimens;
- n) the following note:

“this distribution provides a general indication of the treatability of a wood species for the purposes of specifying the treatment of wood with wood preservatives according to EN 351-1. It does not indicate specifically how the wood would react to other impregnating liquids or processes nor does it necessarily provide information on the distribution of active preservative ingredients in the wood following treatment. The findings only relate to timber originating from the source indicated in this report. Timber grown under different conditions can have a different treatability class”;

- o) The test report shall also list any deviation from the described test method as well as any factors that can have influenced the results.

Annex A (informative)

Guidance on sampling

A.1 General

Recommendations on sampling and wood quality for test specimens extraction are presented in A.2 to A.7.

A.2 Origin of the material

- trees, logs or boards;
- depending on the objective of the test, material can be obtained either from full trees, logs or cut boards;
- preferably the material should be obtained in a way that the position in the original tree can be identified. When only a mixture of square-edged boards is available, a more random approach instead of a systematic sampling is necessary;
- samples should be taken from at least five original trees;
- sampling shall be systematic and be representative of the commercial material normally supplied. For instance the respective amount of inner or outer heartwood should correspond with the respective volumes used in commercial packages.

A.3 Homogeneity of the sample

In order to avoid high variability due to normal natural biological variation, material representative of the particular wood species should be selected. Material showing obviously abnormal features should be avoided. Colour, density and growth ring width (mean and variation) are characteristics which can be used in selection to optimize homogeneity of the sample. Visual characteristics alone cannot be relied upon for the purpose of assessing treatability.

A.4 Heartwood

Heartwood and sapwood should be distinguished when sampling. Where heartwood only is to be sampled, material close to the pith or near to the sapwood should be avoided. The pith itself can be identified in the cross section of boards with 'boxed pith'. In the absence of obvious pith, the approximate location of it can be determined by observing inner growth rings with marked curvature. The zone near to the sapwood or outer wood is more difficult to determine; the presence of 'wane' on some parts of a board can be an indicator. In species without distinct heartwood and sapwood, samples should be taken well away from the likely boundary zone to avoid wood with intermediate characteristics.

A.5 Saw pattern

Internal stresses can be relieved by through and through sawing symmetrically either side of the pith. To minimize cross-cutting of vessels, tracheids and fibres, and to optimize true tangential and radial planes, logs should be sawn longitudinally parallel to the conical form of the log. Bow, spring and cup can be avoided by quarter sawn sawing patterns.

A.6 Seasoning

Test specimens should ideally be cut after drying or seasoning. Air seasoning of material for sampling is preferable to kiln-drying. Higher temperature drying should be avoided unless this is a specific objective within the test. If kiln-drying is necessary to yield material in a short period of time, temperatures should not exceed 60 °C. Slow drying and/or the use of de-humidifiers is preferred; drying defects including warping, cupping, bowing, spring or twist, as well as collapse, case-hardening, honeycombing etc should be avoided.

Such defects are most likely with material containing cross or interlocking grain and in reaction wood (tension or compression wood).

A.7 Grading

Only clear and sound wood should be used for test specimens unless defects are intended to be part of the test. Even small blemishes should be avoided as far as possible. In any case the following features should be avoided:

- inclusions of phloem, bark, resin pockets;
- knots, burrs;
- decay or borer holes;
- stained or discoloured wood;
- obvious and marked grain distortion (inter locked, curved grain);
- defects arising from machining;
- reaction wood.

If relevant to the purposes of the test, material showing any of the recognized defects should be tested separately.

Annex B
(informative)

Example of a test report

European Standard:	EN 14734:2022
The wood species under test:	<i>Persea carolinensis</i> L. heartwood
History of the timber:	Origin Southern Greenland; Harvested in April 2021; Kiln dried to 16 % moisture content
Visible features of the wood:	Width of annual rings 0,25 mm; Proportion of latewood 0,8; Straight grain
Density of each test specimen:	see Table B.1
Moisture content of each test specimen:	see Table B.1
Treatment parameters	
Distribution of the wood preservative:	see Table B.1
Minimum and mean lateral penetration:	see Table B.1
Minimum axial penetration:	see Table B.1
Treatability class of each test specimen:	see Table B.1
Frequency of the test specimens in each treatability class:	see Table B.2
This test report has been prepared by:	RISE Research Institutes of Sweden
Location and date: Stockholm	2021-10-30
Name and signature of the officer in charge:	Karl Karlsson

Table B.1 — Detailed results

Test specimen No.	Moisture content of test specimen %	Density of test specimen (kg/m ³)	Lateral penetration (mm)		Minimum Axial penetration (mm)	Class	Remarks on patterns
			min	mean			
1	17,5	456	2	3	20	3	spots
2	16,0	567	3	6	35	2	stripes
3	15,5	521	4	4	35	2	stripes
4	15,7	598	2	4	43	3	even
5	16,9	512	5	8	33	2	stripes
6	14,9	498	3	5	32	3	-
7	15,3	456	1	7	15	3	-
8	16,0	578	6	7	26	2	spots
9	16,1	601	4	5	27	3	-
10	16,1	548	15	17	28	1	even
11	16,2	523	3	7	30	2	stripes
12	15,9	489	4	5	25	3	stripes
13	14,8	478	2	5	34	3	-
14	16,6	532	0,5	7	35	4	-
15	16,5	591	0,5	3	31	4	-
16	15,8	573	2	3	32	3	even
17	16,4	473	4	5	33	3	-
18	16,1	498	3	4	24	3	-
19	15,9	455	2	3	35	3	even
20	15,7	466	3	5	35	3	even

Minimum lateral penetration was determined after prolonged over-pressure period according to 9.2.

Table B.2 — Frequency of the test specimens in each treatability class

Class	1	2	3	4
Frequency	5 %	25 %	60 %	10 %
Distribution pattern	even penetration with incidental stripes or spots			

NOTE This distribution provides a general indication of the treatability of a wood species for the purposes of specifying the treatment of wood with wood preservatives according to EN 351-1. It does not indicate specifically how the wood would react to other impregnating liquids or processes nor does it necessarily provide information on the distribution of active preservative ingredients in the wood following treatment.

Bibliography

- [1] EN 350, *Durability of wood and wood-based products — Testing and classification of the durability to biological agents of wood and wood-based materials*
- [2] EN 351-1, *Durability of wood and wood-based products — Preservative-treated solid wood — Part 1: Classification of preservative penetration and retention*

<http://www.china-gauges.com/>

<http://www.china-gauges.com/>

British Standards Institution (BSI)

BSI is the national body responsible for preparing British Standards and other standards-related publications, information and services.

BSI is incorporated by Royal Charter. British Standards and other standardization products are published by BSI Standards Limited.

About us

We bring together business, industry, government, consumers, innovators and others to shape their combined experience and expertise into standards-based solutions.

The knowledge embodied in our standards has been carefully assembled in a dependable format and refined through our open consultation process. Organizations of all sizes and across all sectors choose standards to help them achieve their goals.

Information on standards

We can provide you with the knowledge that your organization needs to succeed. Find out more about British Standards by visiting our website at bsigroup.com/standards or contacting our Customer Services team or Knowledge Centre.

Buying standards

You can buy and download PDF versions of BSI publications, including British and adopted European and international standards, through our website at bsigroup.com/shop, where hard copies can also be purchased.

If you need international and foreign standards from other Standards Development Organizations, hard copies can be ordered from our Customer Services team.

Copyright in BSI publications

All the content in BSI publications, including British Standards, is the property of and copyrighted by BSI or some person or entity that owns copyright in the information used (such as the international standardization bodies) and has formally licensed such information to BSI for commercial publication and use.

Save for the provisions below, you may not transfer, share or disseminate any portion of the standard to any other person. You may not adapt, distribute, commercially exploit or publicly display the standard or any portion thereof in any manner whatsoever without BSI's prior written consent.

Storing and using standards

Standards purchased in soft copy format:

- A British Standard purchased in soft copy format is licensed to a sole named user for personal or internal company use only.
- The standard may be stored on more than one device provided that it is accessible by the sole named user only and that only one copy is accessed at any one time.
- A single paper copy may be printed for personal or internal company use only.

Standards purchased in hard copy format:

- A British Standard purchased in hard copy format is for personal or internal company use only.
- It may not be further reproduced – in any format – to create an additional copy. This includes scanning of the document.

If you need more than one copy of the document, or if you wish to share the document on an internal network, you can save money by choosing a subscription product (see 'Subscriptions').

Reproducing extracts

For permission to reproduce content from BSI publications contact the BSI Copyright and Licensing team.

Subscriptions

Our range of subscription services are designed to make using standards easier for you. For further information on our subscription products go to bsigroup.com/subscriptions.

With **British Standards Online (BSOL)** you'll have instant access to over 55,000 British and adopted European and international standards from your desktop. It's available 24/7 and is refreshed daily so you'll always be up to date.

You can keep in touch with standards developments and receive substantial discounts on the purchase price of standards, both in single copy and subscription format, by becoming a **BSI Subscribing Member**.

PLUS is an updating service exclusive to BSI Subscribing Members. You will automatically receive the latest hard copy of your standards when they're revised or replaced.

To find out more about becoming a BSI Subscribing Member and the benefits of membership, please visit bsigroup.com/shop.

With a **Multi-User Network Licence (MUNL)** you are able to host standards publications on your intranet. Licences can cover as few or as many users as you wish. With updates supplied as soon as they're available, you can be sure your documentation is current. For further information, email cservices@bsigroup.com.

Revisions

Our British Standards and other publications are updated by amendment or revision.

We continually improve the quality of our products and services to benefit your business. If you find an inaccuracy or ambiguity within a British Standard or other BSI publication please inform the Knowledge Centre.

Useful Contacts

Customer Services

Tel: +44 345 086 9001

Email: cservices@bsigroup.com

Subscriptions

Tel: +44 345 086 9001

Email: subscriptions@bsigroup.com

Knowledge Centre

Tel: +44 20 8996 7004

Email: knowledgecentre@bsigroup.com

Copyright & Licensing

Tel: +44 20 8996 7070

Email: copyright@bsigroup.com

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK