

Wood preservatives — Determination of the protective effectiveness against marine borers

The European Standard EN 275:1992 has the status of a
British Standard

UDC 674.048.4:620.193.85

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW



Document Sharing Hub

Cooperating organizations

The European Committee for Standardization (CEN), under whose supervision this European Standard was prepared, comprises the national standards organizations of the following countries:

Austria	Oesterreichisches Normungsinstitut
Belgium	Institut belge de normalisation
Denmark	Dansk Standardiseringsraad
Finland	Suomen Standardisoimislito, r.y.
France	Association française de normalisation
Germany	Deutsches Institut für Normung e.V.
Greece	Hellenic Organization for Standardization
Iceland	Technological Institute of Iceland
Ireland	National Standards Authority of Ireland
Italy	Ente Nazionale Italiano di Unificazione
Luxembourg	Inspection du Travail et des Mines
Netherlands	Nederlands Normalisatie-instituut
Norway	Norges Standardiseringsforbund
Portugal	Instituto Português da Qualidade
Spain	Asociación Española de Normalización y Certificación
Sweden	Standardiseringskommissionen i Sverige
Switzerland	Association suisse de normalisation
United Kingdom	British Standards Institution

This British Standard, having been prepared under the direction of the Technical Sector Board for Building and Civil Engineering (B/-), was published under the authority of the Standards Board and comes into effect on 15 November 1992

© BSI 01-2000

The following BSI references relate to the work on this standard:
Committee reference B/515
Draft for comment 90/50033 DC

ISBN 0 580 21047 2

Amendments issued since publication

Amd. No.	Date	Comments

Contents

	Page
Cooperating organizations	Inside front cover
National foreword	ii
Foreword	2
Text of EN 275	3
National annex NA (informative) Committees responsible	Inside back cover
National annex NB (informative) Cross-references	Inside back cover

National foreword

This British Standard has been prepared under the direction of the Technical Sector Board for Building and Civil Engineering and is the English language version of EN 275:1992 *Wood preservatives — Determination of the protective effectiveness against marine borers*, published by the European Committee for Standardization (CEN). EN 275:1992 was produced as a result of international discussion in which the United Kingdom took an active part.

CAUTION. Attention is drawn to the Health and Safety at Work etc. Act 1974, and the need for ensuring that the method specified in this British Standard is carried out with suitable precautions.

The procedure described in this British Standard is intended to be carried out by appropriately qualified and experienced persons or other suitably trained and/or supervised personnel.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 18, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

UDC 674.048.4:620.193.85

Descriptors: Wood, wood preservatives, pesticides, insecticides, pest control, crustaceans, mollusca, marine environment tests, effectiveness

English version

Wood preservatives — Determination of the protective effectiveness against marine borers

Produits de préservation du bois —
Détermination de l'efficacité protectrice
vis-à-vis des organismes térébrants marins

Holzschutzmittel —
Bestimmung der Schutzwirkung gegenüber
marinen Organismen

This European Standard was approved by CEN on 1992-09-25. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

© 1992 Copyright reserved to CEN members

Foreword

This European Standard was drawn up by the 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 March 1993, and conflicting national standards shall be withdrawn at the latest by March 1993.

This European Standard has been approved by CEN, and in accordance with the Common CEN/CENELEC Rules, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

Contents

	Page
Foreword	2
Introduction	3
1 Scope	3
2 Definitions	3
3 Principle	3
4 Apparatus	4
5 Sampling	4
6 Test specimens	4
7 Conditioning and treatment of the test specimens	5
8 Reference specimens	6
9 Untreated control test specimens	6
10 Test sites	6
11 Examination	7
12 Evaluation	7
13 Validity of test	8
14 Test report	9
Annex A (informative) Example of a test system suitable for regions with low tidal range	11
Annex B (informative) Example of the grading of molluscan borer attacks as they appear on the X-ray film	12
Annex C (informative) Example of a test report	13
Annex D (informative) Bibliography	17
Figure 1 — Specimen with an ideal orientation of the annual rings	4
Figure 2 — Overall ratings for the two types of attack	9
Figure C.1 — Overall ratings for the two types of attack	16
Table 1 — Rating system for attack by Teredinids and other molluscs	8
Table 2 — Rating system for attack by <i>Limnoria</i> and other crustaceans	8
Table C.1 — Results from XYZ on Scots pine after 5 years' exposure in the sea	14
Table C.2 — Grading system used in the evaluation	15

Introduction

This European Standard describes a marine test method which provides a basis for assessing the effectiveness of a wood preservative used to prevent attack of timber in sea-water by marine borers.

The method is only suitable for testing preservatives which are intended to prevent attack by marine wood-boring organisms of treated timber for use in more or less permanent contact with sea-water. It is not suitable for assessing the effectiveness of preservatives against microorganisms.

The main objective of the method described is to evaluate the relative effectiveness of a wood preservative applied by vacuum/pressure impregnation. For this reason permeable timbers are used throughout so that the protective efficacy of various retentions of the preservative can be determined.

However, it is recognized that modifications of the method may be used for other purposes, e.g. to determine the relative efficacy of a preservative treatment or to determine the natural durability of the heartwood and sapwood of a selected timber species.

The method is primarily intended for testing in temperate waters where teredine and Limnoriid borers dominate. However, it is also capable of being used in the tropics where attack by pholads and specific crustacean borers may be very destructive. The test is intended to run for a minimum period (5 years or until the point of failure) before any interpretation of the results can be made.

Variations in the test conditions can be expected from one test site to another depending on temperature, salinity, population density of the various borer species, etc. This will inevitably influence the general rate of attack. However, by comparing the results obtained for specimens treated with the test product with those obtained for specimens treated with a reference preservative and those obtained with untreated control specimens, the relative protective effectiveness of the product tested can be evaluated.

The procedures described in this standard method are intended to be carried out by suitably trained and/or supervised specialists. Appropriate safety precautions should be observed throughout the use of this standard.

1 Scope

This European Standard specifies a marine test method for the determination of the relative effectiveness of a wood preservative applied by vacuum/pressure impregnation or other processes which would lead to deep penetration of the test specimens in order to prevent attack of timber in sea-water by marine wood-boring organisms.

The protective effect is assessed in relation to that of a reference preservative applied by a standard treatment. It is important to realize that the relationship between the results of these marine tests and performance in service can still vary for different preservatives.

This method is applicable for testing any type of wood preservative, provided that complete penetration of the test specimen is achieved.

NOTE After suitable modification, it is possible to assess the effectiveness of a preservative product in other wood species or its effectiveness when applied by methods other than vacuum and pressure impregnation but only provided that a complete impregnation of the test specimens is achieved¹⁾.

2 Definitions

For the purposes of this standard, the following definitions apply.

2.1

representative sample

a sample having its physical or chemical characteristics identical to the volumetric average characteristics of the total volume being sampled

2.2

supplier

the sponsor of the test

3 Principle

Test specimens are vacuum/pressure impregnated with preservative solutions to a given range of preservative retentions. After drying and, if necessary, an appropriate fixation period, the test specimens are submerged in the sea at a location where marine wood borers are prevalent. A single test site is regarded as adequate provided molluscan and crustacean borers are both active in this site. Additional sites with different water and/or climate characteristics are optional.

¹⁾ The only specific European aspect of this standard lies in the choice of the obligatory reference species *Pinus sylvestris*. The method can be used with any other timber species of preference and is not specific to Europe in its field of application.

Removal of the test specimens from the water for inspection at regular intervals, with not more than 12 months between each inspection, and examination for marine borer attack, visually as well as by X-ray. The condition of the treated specimens is compared with that of untreated control test specimens and that of test specimens treated with a reference preservative, both of which indicate the aggressiveness of the individual site.

4 Apparatus

4.1 Ordinary laboratory equipment

4.2 X-ray apparatus, with tungsten target and beryllium window with voltage and current continuously variable in the following ranges:

Voltage: 10 kV to 50 kV

Current: 0 mA to 15 mA.

4.3 Treatment plant, capable of impregnating the timber (see 7.2).

5 Sampling

The sample of preservative shall be representative of the product to be tested. Samples shall be stored and handled in accordance with any written recommendations from the supplier.

NOTE For the sampling of preservatives from bulk supplies, the procedure given in EN 212 should be used.

6 Test specimens

6.1 Species of wood

For every test, the sapwood of *Pinus sylvestris* (Linnaeus) shall be used.

If additional wood species are to be used, they shall be susceptible to marine borer attack and the test specimens prepared from these species shall be capable of being completely penetrated with preservative.

NOTE It is recommended that a hardwood species of local relevance should be included if the preservative is expected to be used in hardwoods.

6.2 Quality of wood

The wood shall be of uniform growth, straight-grained and free from knots, cracks, stain, decay, insect holes or other defects. Test specimens of resinous appearance shall be avoided. The wood shall not have been water-stored, floated, chemically treated or steamed.

The *Pinus sylvestris* sapwood shall show an average rate of growth of 2,5 annual rings per 10 mm to 8 annual rings per 10 mm.

If additional wood species are to be used the variation in the number of annual rings for each species shall be mentioned in the test report.

The test report shall also include mean density for the wood used in the preparation of the test specimens.

6.3 Preparation of the test specimens

Each specimen shall be:

(200 ± 1) mm long (grain direction) $\times$
(75 ± 1) mm $\times$ (25 ± 1) mm at (14 ± 2) % (m/m) moisture content²⁾.

Each test shall consist of specimens of similar density and those which are outside the range of ± 15 % of the mean value of the density of the specimens in a test shall be rejected.

The specimen shall be prepared from sawn wood as delivered from the sawmill; no re-sawing or planing of the faces of the specimens shall be carried out.

The test specimen shall have an orientation of the annual rings similar to the ideal orientation (see Figure 1). The annual rings should be as parallel as possible to the 75 mm edge. The diameter of any attachment hole shall not exceed 25 mm and shall be taken into consideration when calculating the preservative retention.

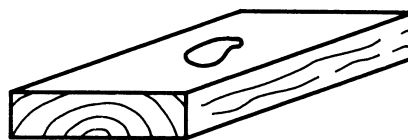


Figure 1 — Specimen with an ideal orientation of the annual rings

If an arrangement as described in Annex A is to be used the specimens are prepared with a hole of 25 mm diameter in the middle. See Annex A and Annex B. If test arrangements other than those described in Annex A are chosen the holes shall not exceed 25 mm and two in number.

6.4 Number of test specimens

The sea is a rough environment for long term testing of materials. Specimens may therefore be lost during the exposure period. This has to be taken into account when deciding the number of test specimens to be exposed.

At least five test specimens per site for each preservative and retention shall be tested. Treat extra specimens so that rejection of those having abnormal uptakes leaves sufficient for the test.

²⁾ As determined by ISO 3130.