SLOVENSKI STANDARD
SIST-TP CEN/TR 15119:2008

01-december-2008

Trajnost lesa in lesnih proizvodov - Ugotavljanje emisij iz zaġļ itenega lesa v okolje - Sveġe zaġļ iten les na skladiġļ ih in leseni izdelki v 3. razredu izpostavitve (nepokrito, ni v stiku z zemljo) in leseni izdelki v 4 in 5 razredu izpostavitve (les v stiku z zemljo, sladko ali morsko vodo) - Laboratorijska metoda

Durability of wood and wood-based products - Estimation of emissions from preservative treated wood to the environment - Wood held in the storage yard after treatment and wooden commodities exposed in Use Class 3 (not covered, not in contact with the ground), and wooden commodities exposed in Use Class 4 or 5 (in contact with the ground, fresh water or sea water) - Laboratory method

Dauerhaftigkeit von Holz und Holzprodukten - Abschätzung von Emissionen von mit Holzschutzmitteln behandelten Hölzern in die Umwelt - Laboratoriumsverfahren für Holz auf Lagerplätzen nach dessen Tränkung und Erzeugnissen aus Holz, die in Gebrauchsklasse 3 (nicht überdacht, nicht im Erdkontakt) und in Gebrauchsklasse 4 oder 5 (im Erdkontakt, Süßwasser oder Meerwasser) ausgesetzt sind

Durabilité du bois et des matériaux dérivés - Estimation des émissions dans l'environnement du bois traité avec des produits de préservation - Bois stocké en dépôt après traitement et articles en bois exposés en classe d'emploi 3 (non couverts, non en contact avec le sol) et articles en bois exposés en classe d'emploi 4 ou 5 (en contact avec le sol ,l'eau douce ou l'eau de mer)-Méthode de laboratoire

Ta slovenski standard je istoveten z: CEN/TR 15119:2005

ICS:

13.020.30	Ocenjevanje vpliva na okolje	Environmental impact assessment
71.100.50	Kemikalije za zaġļ ito lesa	Wood-protecting chemicals

SIST-TP CEN/TR 15119:2008 **en,de**

TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

CEN/TR 15119

May 2005

ICS 13.020.30; 71.100.50

English version

Durability of wood and wood-based products - Estimation of emissions from preservative treated wood to the environment - Wood held in the storage yard after treatment and wooden commodities exposed in Use Class 3 (not covered, not in contact with the ground), and wooden commodities exposed in Use Class 4 or 5 (in contact with the ground, fresh water or sea water) - Laboratory method

Durabilité du bois et des matériaux dérivés - Estimation des émissions dans l'environnement du bois traité avec des produits de préservation - Bois stocké en dépôt après traitement et articles en bois exposés en classe d'emploi 3 (non couverts, non en contact avec le sol) et articles en bois exposés en classe d'emploi 4 ou 5 (en contact avec le sol ,l'eau douce ou l'eau de mer)-Méthode de laboratoire

Dauerhaftigkeit von Holz und Holzprodukten - Abschätzung von Emissionen von mit Holzschutzmitteln behandeltem Holz an die Umwelt - Laborverfahren für Holz auf dem Lagerplatz nach der Behandlung und Holzprodukte in Gebrauchsklasse 3 (nichtabgedeckt, ohne Erdkontakt) sowie in den Gebrauchsklassen 4 und 5 (im Kontakt mit Erde, Süßwasser oder Meerwasser)

This Technical Report was approved by CEN on 3 April 2005. It has been drawn up by the Technical Committee CEN/TC 38.

CEN members are the national standards bodies of 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 United Kingdom.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. CEN/TR 15119:2005: E

Contents

Foreword

This document (CEN/TR 15119:2005) has been prepared by Technical Committee CEN/TC 38 “Durability of wood and derived materials”, the secretariat of which is held by AFNOR.

This Technical Report has been submitted to OECD as a draft Test Guideline, following a request from OECD for the development of an OECD wide environmental exposure scenario document for wood preservatives in the framework of the EU Biocides Directive 98/8/EC. The status of this document as Technical Report has been chosen because this document is still in development in the frame of OECD.

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

Introduction

The emissions from preservative treated wood to the environment need to be quantified to enable an environmental risk assessment of the treated wood. This document describes a laboratory method for the estimation of emissions from preservative treated wood in two cases

The first case is the case where the preservative treated wood is not covered and not in contact with the ground or the water. There are two situations in this case where emissions could enter the environment:

1) emissions from preservative treated wood stored outside in the storage yard of a preservative treatment site. Rain falling on the treated wood could produce emissions which run off into surface water and/ or soil;

2) emissions from treated wood used in commodities exposed in Use Class 3. This is the situation in which the wood or wood-based product is not covered and not in contact with the ground. It is either continually exposed to the weather or is protected from the weather but subject to frequent wetting. Use classes are defined in EN 335-1 and categorise the biological hazard to which the treated commodity will be subjected. The Use Classes also define the situation in which the treated commodity is used and determine the environmental compartments (air, water, soil) which are potentially at risk from the preservative treated wood. Rain falling on treated wood in Use Class 3 could produce emissions that run off into surface water and/ or soil.

The second case is the case where the preservative treated wood is not covered and is in contact with the ground, fresh water or sea water. There are three situations in this case where emissions could enter the environment:

3) Emissions from preservative treated wood in contact with the ground. Use Class 4A. Emissions from the surface of the treated wood could enter the soil via the soil water.

4) Emissions from treated wood in contact with fresh water. Use Class 4B. Emissions from the surface of the treated wood could enter the water.

5) Emissions from treated wood in contact with sea water. Use Class 5. Emissions from the surface of the treated wood could enter the sea

The methods are laboratory procedures for obtaining water samples (emissate) from treated wood exposed out of ground contact and treated wood exposed in contact with ground, surface water or sea water, at increasing time intervals after exposure. The quantities of emissions in the emissate are related to the surface area of the wood and the length of exposure, to estimate a flux in milligrams per square meter per day. The flux after increasing periods of exposure (e.g. 1 year, 10 years) can be estimated. The emissate can also be tested for ecotoxicological effects

The quantity of emissions can be used in an environmental risk assessment of the treated wood.

1 Scope

This Technical Report specifies two laboratory methods for obtaining water samples: one from preservative treated wood exposed out of ground contact (wood held in the storage yard after treatment and Use Class 3) and the other from treated wood which has been in continuous contact with ground or water (Use Class 4 or 5), at increasing time intervals after exposure.

2 Method for wood held in the storage yard after treatment and for wooden commodities exposed in Use Class 3 (not covered, not in contact with the ground)

2.1 General considerations

The principal agent for causing emissions from wood during open-air storage in the yard and in Use Class 3 is rainfall. Wood exposed in above ground situations is subjected to the intermittent wetting of rainfall and the drying of the wood surface between the rainfall events. This wetting and drying cycle is simulated in this document. It is assumed that emissions obtained by exposure to rainfall are identical to emissions obtained by immersion in water.

The wood, in the case of wood treated with a wood preservative, shall be representative of commercially used wood. It shall be treated in accordance with the preservative manufacturer's instructions and in compliance with appropriate standards and specifications. The parameters for the post-treatment conditioning of the wood prior to the commencement of the test shall be stated.

The test can be applied to wood treated using a penetrating process or superficial application, and to wood which has an additional surface treatment (e.g. paint).

The wood samples used shall be representative of the commodities used.

The composition, amount, pH value and the physical form of rainfall is important in determining the quantity, content and nature of emissions from wood. However, simulating a realistic rainfall regime in the laboratory is time-consuming, expensive and is likely to lack reproducibility, accuracy, precision and reliability. This method uses a 1 min immersion in water to simulate exposure to a rainfall event. There are three rainfall events per day and days of rainfall events are separated by at least two days without rainfall events.

The duration of the test shall be sufficient to enable a flux profile against time to be determined, (e.g. time necessary to reach steady state or maximum of 30 days) to allow extrapolations of flux for longer periods (e.g. 1 year, 10 years and more).

2.2 Principle

For obtaining water samples from treated wood exposed out of ground contact, at increasing time intervals after exposure, preservative treated wood test specimens are immersed in water for 1 min. The mass of water taken up by the test specimen is equivalent to 720 mm of rain per year. The test specimen is allowed to dry between immersions, simulating the wetting and drying cycle of natural exposure situations. Immersion is repeated at intervals over at least 30 days. The water (emissate) is collected and chemically analysed or tested for ecotoxicity at seven or more sample times over the 30 days. Tests with untreated samples can be discontinued if there is no background detected in the first three data points Emission rates in milligrams per square meter per day are calculated from analytical results.

A system with untreated wood specimens provides background levels for emissates from wood.

2.3 Product and reagent

2.3.1 Water

Deionized water is recommended. The pH value of the water shall be in the range 5 to 7. The pH value shall not be adjusted unless special conditions might justify setting the pH value to a specified value, between 5 and 7.

NOTE 1 Water complying with grade 3 of EN ISO 3696 is ideal but not necessary.

NOTE 2 Artificial rain, according to other OECD test guidelines, can be used.

Water temperature shall be (20 ± 2) °C and the measured pH value and water temperature shall be stated in the test report.

2.3.2 Preservative

The identity of the preservative product for treatment shall be stated in the test report. It shall state the name and other designation of the preservative, and the trade or common name of the active ingredient(s) with a generic description of the co-formulants (e.g. cosolvent, resin), and the composition in mass fraction of the ingredients.

2.4 Apparatus

2.4.1 Immersion container

The container is made of an inert material and is large enough to allow the test specimens to have all their faces exposed to water and to contain sufficient water for the ratio of the exposed surface area of the test specimen to the volume of water to which it is exposed, to be 40 (i.e. 40 m^2 x m^{-3} or 0,4 cm^2 x cm^{-3}).

NOTE For example, for five wood test specimens 25 mm wide by 50 mm long, 15 mm thick, end sealed, where the surface area exposed to water is 200 cm^2 the volume of water required is 500 ml.

2.4.2 Assembly for test specimens

The test specimens are supported on an assembly which exposes all of the exposed surfaces of the test specimens to contact with water

2.5 Test specimens

2.5.1 Species of wood

The wood species shall be typical of the wood species used for the efficacy testing of wood preservatives e.g. *Pinus sylvestris* (Linnaeus) (Scots pine).

NOTE Additional tests may be made using other species but, if so, this should be stated in the test report.

2.5.2 Quality of wood and wood moisture content

Use straight grained wood without knots. Material of a resinous appearance shall be avoided.

NOTE The wood should be typical of wood which is available commercially.

The source, density and number of annual growth rings per 10 mm shall be stated in the test report.

2.5.3 Size of test specimens

Wood test specimens have minimum dimensions of 25 mm wide by 50 mm in length, 15 mm thick, with the longitudinal faces parallel to the grain of the wood. Test specimens shall consist of 100 % sapwood. Each test specimen is marked so that it can be identified throughout the test.

The wood test specimens shall be "plain" sawn and the surfaces shall not be sanded.

2.5.4 Number of test specimens

Two sets of treated test specimens in two immersion containers (2.4.1) are used and the mean value taken as the emission value. One set of untreated test specimens in one immersion container is also used. The number of wood test specimens depends on the specimens size. The total surface of wood test specimens to be immersed in one immersion container is at least 200 cm^2, and the minimum number of test specimens per immersion container is three. For one test there is at least nine (three sets of three) test specimens: six test specimens are treated with preservative, three test specimens are untreated. Sufficient test specimens are prepared to allow selection of six

which are within 5% of the mean value of the retentions of the group of test specimens, and one for the estimation of the oven dry moisture content of the test specimens before treatment.

2.5.5 End seal

The wood test specimens are end sealed with a substance which prevents penetration of preservative into the test specimens.

NOTE Two coats of a silicone sealant have been found to be suitable.

2.6 Procedure

2.6.1 General

The test shall be carried out in a room which has a temperature of (20 ± 2) °C. The air humidity of the laboratory shall also be monitored.

2.6.2 Preparation of the treated test specimens

The wood test specimen to be treated with the preservative under test is treated by the method specified for the preservative, which can be by a penetrating treatment process or a superficial application process, which may be a dip, spray or brush.

2.6.3 Treatment process

Penetrating treatment process

Prepare a solution of the preservative, which will achieve the specified uptake or retention when applied using the penetrating treatment process. Weigh the wood test specimen and measure its dimensions. Carry out the penetrating treatment process. The process shall be as specified for the application of the preservative to wood out of ground contact. Weigh the test specimens after treatment. Calculate the retention of the preservative (in kilograms per cubic meter) from the equation:

$$\frac{m_2 - m_1}{V} x \frac{w}{100} \quad (1)$$

where

m_1 is the mass before treatment, in kilograms;

m_2 is the mass after treatment, in kilograms;

w is the solution concentration (mass fraction);

V is the volume of test specimen in cubic meters.

NOTE Timber treated in an industrial treatment plant (e.g. by vacuum pressure impregnation) may be used in this test.

A description of the procedures used shall be stated in the test report.

2.6.3.1 Superficial application processes

Carry out the superficial application process e.g. dip, spray or brush, to the wood test specimens. The process and application rate (e.g. litres per square meter) shall be as specified for the superficial application of the preservative. The procedures used, and the application rate or uptake shall be stated in the test report.

2.6.4 Conditioning(drying) of the test specimens after treatment

After treatment, condition the treated test specimen in accordance with the recommendations made by the supplier of the test preservative. A description of the procedures used shall be stated in the test report.

2.6.5 Preparation and selection of test specimens

After post treatment conditioning, calculate the mean retention of the group of test specimens and select at least six representative test specimens with a retention within ± 5 % of the mean for the group.

2.6.6 Immersion method

2.6.6.1 Preparation of apparatus

Fill each immersion container (2.4.1) with the required mass of water (2.3.1).

2.6.6.2 Obtaining of emissates

2.6.6.2.1 For an immersion event where the emissate will be retained for subsequent chemical analysis or ecotoxicity testing.

Weigh the wood test specimen and record the mass, date and time .Expose the immersion surface of the test specimens to water for 1 min. Remove the test specimens from the water and allow to drain for 10 s, allowing run-off to return to the water. Weigh the test specimens and then allow to dry.

2.6.6.2.2 For an immersion event where the emissate will be not retained.

Record the date and time and expose the immersion surface of the test specimens to water for 1 min Remove the test specimens from the water and allow to drain for 10 s, allowing run-off to return to the water. Allow the test specimens to dry.

2.6.6.3 Test method

There are three immersion events on an ‘immersion day’ (e.g. at 10h 00, 13h 00 and 16h 00). After an immersion day, allow the test specimens to dry for at least two days, but no more than four days, (‘drying days’) before the next immersion day.

NOTE Ideally it should be three rain events every third day.

The immersion regime and sampling regime is stated in the test report.

Maintain the immersion and drying regime for at least 30 days. Retain the "immersion day emissate" for subsequent chemical analysis or ecotoxicity testing on at least seven of the immersion days.

The method allows the individual samples taken on one day to be analysed or tested to give a profile of the quantity of emissions against time.

NOTE Alternatively samples taken on successive immersion days may be bulked. The water may need to be concentrated by an appropriate technique before analysis.

Store samples in a refrigerator in the dark to reduce microbial growth in the sample before analysis.

2.6.6.3.1 Test system: Treated

Collection of the water (emissate) in this system and subsequent analysis allow the estimation of the emission rate of the analysed materials from the preservative treated wood. Collection and analysis of the emissate after increasing time periods of exposure allow the rate of change of the emission rate with time to be estimated.

2.6.6.3.2 Test system: Untreated

Collection of the water (emissate) in this system and subsequent analysis allow the estimation of the emission rate of the analysed materials from untreated wood. Collection and analysis of the emissate after increasing time periods of exposure allow the rate of change of the emission rate with time to be estimated. This system is a control to determine background levels of substances which are then chemically analysed.

2.6.6.4 Water

Samples of the water used and subsequent analysis allow the estimation of the analysed substances in the water. This is a control to determine background levels of substances which are then chemically analysed, or for the presence of substances from water which are toxic in subsequent ecotoxicity tests.

2.7 Expressions of results

2.7.1 Chemical analysis

If the water (emissate) is chemically analysed, express the analytical result in appropriate units e.g. micrograms per millilitre. Convert the analytical result to the quantity in the emissate in milligrams per square meter using the volume of water, the quantity emitted in one immersion event and the surface area of the test specimen in square meters.

Calculate the emission flux for that day by taking the mean of two measurements taken on that day expressed in milligrams per square meter per day.

If the analysis of the samples from the untreated test specimen shows detectable levels of the analysed material, implying a background level obtained from untreated wood, it shall be subtracted from the analytical results for the treated test specimens.

If the analysis of the samples from the water shows detectable levels of the analysed material, implying a background level in the water, it shall be subtracted from the analytical results for the treated test specimens and the untreated test specimens.

2.7.2 Chemical analysis: bulked samples

If the collected samples are bulked to allow chemical analysis, calculate the quantity emitted in milligrams per square meter per day over the corresponding day period.

2.7.3 Recording

Record the results. The mean of the results obtained from the two replicates is the daily emission rate for that product in milligrams per square meter per day.

NOTE The Table A.1 shows an example of a suggested recording form for one set of treated test specimens, and the Table A.2 gives the summary table for calculating the mean daily values of emission .

2.8 Evaluation of samples other than analysis e.g. Ecotoxicity test

The samples can be tested for ecotoxicological effects. A sample is the emission from one immersion event. Bulking the three samples from one day gives a sample of the emissions from one day of exposure of an area of treated wood.