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REPORT of the
LEACHING WORKSHOP
(open session)

Arona, Italy, 13 and 14 June 2005

A workshop for technical experts evaluating wood preservatives for the Competent Authorities implementing the Biocidal Products Directive, Directive 98/8/EC, assessing the leaching from treated wood to the environment.

Erik van de Plassche and Kirsten Rasmussen

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Introduction

Directive 98/8/EC of the European Parliament and of the Council on the placing on the market of biocidal products was adopted in 1998. Two basic principles of the Directive are:

- Active substances have to be assessed and the decision on their inclusion into Annex I of the Directive shall be taken at Community level;
- Member States shall authorise the biocidal products in accordance with the rules and procedures set in Annex VI of the Directive. They can only authorise products which contain active substances included in Annex I.

The time limit for transposition of the Directive in Member States was 14 May 2000. Active substances introduced on the market after this date are new active substances which can only be placed on the market after an evaluation according to the provisions of the Directive. This same date is also the starting date for a 10-year review program of active substances already on the market (so-called existing active substances) with the aim to assess all active substances that were already on the market before 14 May 2000. Guidance on the assessment of active substances and biocidal products is laid down in the so-called Technical Notes for Guidance (TNsG), which are published on the ECB web page at <http://ecb.jrc.it/biocides/>.

Active substances used in rodenticides (product type (PT) 14) or in wood preservatives (PT08) are assessed first in the review program. Applicants who have notified these substances, had to submit the supporting documentation before 28 March 2004. After this date the evaluation process of the Rapporteur Member State (RMS) started, leading eventually to a decision on Annex I inclusion in the Competent Authorities meeting.

The assessment of environmental risks consists of an exposure and effects assessment, which are then compared in the risk characterization. For wood preservatives the emission from treated wood is critical in the exposure assessment. Within the review program the guidance produced by the OECD entitled “Emission Scenario Document for Wood Preservatives” is used (OECD, 2002). A critical input parameter for estimating the emission from treated wood is the leaching rate, which is part of the additional data set for PT08.

The progress of the review program is discussed in the Biocides Technical Meeting (TM). At these TMs the assessment of the leaching rate for wood preservatives based on the information submitted by the applicants, was discussed several times. All the member states (MS) identified problems around this issue, partly because several test guidelines are available, none of which is an OECD or EU test guideline. Therefore, and taking into account the development of test guidelines on the estimation of emissions from preservative-treated wood to the environment by OECD and CEN, it was decided at the TM of 1-3 March 2005 to organise a Leaching Workshop.

The Leaching Workshop took place at 13-14 June 2005. The program of the workshop is given in Annex I and the documents distributed for the workshop are listed as part of the workshop program.

The workshop was divided into an open and closed session. In the open session, general questions distributed to the workshop participants were discussed with the technical experts both from the MS, industry, and the OECD. The objective was to obtain agreement on a harmonized approach in the assessment of the evaluation of the information provided by the applicant on leaching from treated wood. It was considered important that any test guideline for estimating the leaching rate recommended or used by the MS, is appropriate to the intended use pattern and hazard classes (HC) for that wood preservative.

In the closed session questions posed by MS on the leaching studies from dossiers submitted by the applicant to the RMS, were discussed. These discussions are not presented in this workshop report due to the confidential nature of the information. However, the general conclusions drawn from these discussions are reflected in this workshop report.

The meeting was chaired by K. Rasmussen from the European Chemicals Bureau (ECB). Rapporteur was E. van de Plassche from the ECB.

A draft of the Leaching Workshop report was discussed at the CA meeting of 4-5 July 2005 and at the TM of 10-12 October 2005. At this TM several follow-up issues were discussed based on document presented to the TM. Decisions taken at both CA and TM level are incorporated in this report.

The participants are listed in Annex II.

Setting the scene

The participants were welcomed by the chair K. Rasmussen. Especially the presenters were welcomed.

The following presentations were given:

- “Leaching Data for Wood Preservatives – a UK Regulatory Perspective” by D. Traynor from the HSE, UK;
- “CEN/OECD leaching test methods” by U. Schoknecht from Federal Institute for Materials Research and Testing (BAM), Germany;
- “Issues in the Environmental Risk Assessment of Wood Preservatives” by D. Aston from European Wood Preservatives Manufacturers Group (EWPM).

These presentations give:

- (1) an overview of the experience from the MS in evaluating the dossiers, exemplified by the UK experience; and
- (2) a description of the outcome of the research project “Inter-laboratory Evaluation of Laboratory Test Methods to estimate the Leaching from Treated Wood” related to validation of the draft test guidelines developed by the OECD and including a comparison of the laboratory data obtained with the OECD draft guideline with (semi)field studies; and
- (3) EWPM interests in having realistic test results, based on the fact that 70-80 % of the wood in use is used in hazard class 3.

The presentations are attached in Annex III.

Assessment of leaching rates for wood preservatives

In the workshop the following questions were discussed, based on a number of general questions put forward in one of the background documents for the workshop. In the next sections these questions are presented one by one together with the discussions and conclusions of the workshop.

Question 1

Is a leaching study a mandatory core data requirement or can extrapolation from physical chemical properties be used:

- a. what properties can be used?
- b. how can these be used – are there any approaches available or accepted?

The workshop discussed if it is possible to predict the leaching rate for wood preservatives from physico-chemical properties of the substance. It has been tried to establish a relationship between the sorption properties of wood preservatives expressed as Koc and the leaching rate. Up to now a meaningful relation could not be established.

It was concluded that as at the moment no reliable method exists to predict the leaching rate based on physico-chemical properties of wood preservatives, leaching studies are required.

It was mentioned that ECN¹ in The Netherlands is developing a model for calculating leaching rates for wood preservatives assuming that the process is driven by diffusion. This might be a promising approach for the future assessment of wood preservatives.

Question 2

Where ‘other tests’ may be used should we have an agreed ‘tiered approach’ depending on hazard class and use pattern:

- a. field data (preferred)
- b. laboratory study (OECD/EN84 accepted ?)
- c. ‘other’ (calculation model or other extrapolation; as screen using worst case assumptions)

There was general agreement at the workshop on the use of a tiered approach and the following steps were agreed:

- Tier 1: worst-case assumption where 100% of the substance is assumed to leach in the first 30 days;

¹ Energy Research Centre of the Netherlands

- Tier 2: laboratory tests. These can either be tests performed according to the draft OECD guidelines on estimation of emissions from preservative treated wood to the environment, EN guidelines or in-house methods. For the future, in-house methods should be replaced by standardized test methods.
- Tier 3: (semi-)field tests.

The following remarks were made with respect to the different tiers:

- Tier 1: although this is a worst-case assumption the full service life should also be considered, if necessary;
- Tier 2: the present draft OECD guidelines possibly need some further modifications. However, at the moment – considering the time schedule for the review program under the BPD with respect to wood preservatives – laboratory studies have to be accepted, at least at the Annex I inclusion stage for the active substances, and a case-by-case decision has to be taken on their validity. This implies that maximal use should be made of the information available on leaching for the wood preservatives in the review program. When the product authorization starts, after Annex I inclusion of the active substance, this would be the point in time to apply the modified draft OECD guidelines.
- Tier 3: these studies may be used to target the conclusions from laboratory studies. Difference in climate should be considered: for example in Southern Europe temperatures are higher and dry periods longer, leading to on average high emissions in the first rainfall. For some of the wood preservatives in the review program these studies are available.

A question was raised if it possible to identify ‘substances of concern’ with the present information on leaching. As the applicants may use representative formulations (‘dummy’ formulations) at the Annex I inclusion step, this could be very difficult. At the product authorization step the Member States can, however, request additional leaching studies where ‘substances of concern’ may be identified if this is needed.

Question 3

Validation of current OECD guideline is required as a matter of urgency, how?

- a. issue with current guideline
- b. key parameters
- c. standard conditions
- d. acceptability of leaching rate test results from either OECD or other tests (EN84 etc.) for Annex I/product authorisation.

The status of the draft OECD guidelines was discussed. It was stated that these draft guidelines are not validated yet. The OECD stated that by taking on board the results and conclusions from the EU project “Inter-laboratory Evaluation of Laboratory Test Methods to estimate the Leaching from Treated Wood” and experience in the USA, will hopefully lead to adoption of the draft OECD guidelines.

There was general agreement at the workshop that part 2 of the OECD draft guideline “Laboratory method for wooden commodities exposed in use class 4 and 5 (in contact with the ground, fresh water or sea water)” is adequate for leaching tests for use classes 4 and 5.

Therefore, the discussion mainly focused on part 1 of the OECD draft guideline: “Laboratory method for wood held in storage yard after treatment, and for wooden commodities exposed in use class 3 (not covered, not in contact with the ground)”. The most important question was if the proposed immersion time scheme in the draft guideline – three times one minute per day with rainfall events – reflects a realistic worst case situation for hazard class 3?

In the EU project “Inter-laboratory Evaluation of Laboratory Test Methods to estimate the Leaching from Treated Wood” also an immersion time scheme of two times 60 minutes was used. The following remarks were made in the discussions:

- One of the main conclusions of the EU project is that the amount of rainfall is the most important parameter in leaching tests and this parameter should be standardised to a normal year rainfall to allow comparisons between tests;
- There appears to be little scientific basis to prefer one of the schemes (3 times 1 minute or 2 times 60 minutes), although some moisture content measurements in the wood specimens indicate that 2 times 60 minutes are more related to a ‘complete immersion in water situation’ or ‘permanent heavy rainfall’ and therefore may overestimate the leaching rate for hazard class 3. On the other hand, the Danish studies (Danish Technological Institute) clearly show that the 3 times 1 minute test give lower leaching values than the semi-field studies, giving a scientific basis for preferring the 2 times 60 minutes as being nearer to a worst case situation;
- Results from research performed by the Danish Technological Institute on the comparison of laboratory testing with semi-field testing shows that an immersion time scheme of 3 times one minute is not reflecting a realistic worst case situation as leaching rates were around an order of magnitude higher in the semi-field studies. It was therefore recommended to use 2 times 60 minutes immersion;
- Some wood preservatives will not survive (as they will hydrolyse) a 60 minutes immersion event. For these type of wood preservatives the 3 times one minute immersion time scheme has to be used.

Several options to test leaching were proposed for hazard class 3:

- Use the immersion time scheme of 3 times one minute;
- Use the immersion time scheme of 3 times one minute and apply an assessment factor on the experimentally derived leaching rate. This assessment factor can be based on a comparison of the results from existing laboratory and semi-field leaching studies;
- Use the immersion scheme of 2 times 60 minutes;
- Use a permanent immersion test design and apply an extrapolation method to shorter exposure. It was generally agreed that this approach is not possible as

wood preservatives (active substances and products) for hazard class 3 are not formulated for permanent immersion.

The majority of the workshop participants preferred the immersion time scheme of 2 times 60 minutes for hazard class 3. It was also agreed that the 3 times 1 minute immersion time scheme could still be used if an assessment factor would be applied to the results. Subsequently, the recommendations to applicants if the RMS considers a laboratory leaching test is needed, with the exception of wood preservatives which will not survive in a 60 minutes immersion event, would be that either test could be submitted.

It was proposed that the uncertainty of using a laboratory test to predict environmental concentrations should be addressed by using an assessment factor. This is an approach routinely used for the effects assessment but does allow for additional data to be gathered in order to refine the endpoint used where unacceptable risks are predicted from the use of the assessment factor.

The available data are too limited to derive clear relationships between the different laboratory leaching test guidelines currently available or to compare the results between the laboratory and field. Therefore, in the absence of further data, a conservative approach has been taken to protect the environment.

In order to derive a suitable leaching rate for use in the exposure assessments of wood preservatives used on wood restricted to hazard class 3, the following steps were agreed for use on laboratory leaching test endpoints:

1. **immersion scheme of 3 times 1 minute:** an assessment factor (AF) of **10** should be applied.
2. **immersion scheme of 2 times 60 minutes:** an AF of **5** should be applied, unless there is sufficient scientific evidence to apply no AF.
3. **EN 84:** no AF needs to be applied provided the study is considered to be scientifically valid.
4. **In-house procedures (including artificial rainfall experiments):** the use of an AF must be decided on a case-by-case basis depending on the scientific validity of the study and expert judgment.

In all cases, where there is sufficient doubt regarding the reliability or validity of a leaching study, higher AFs may be applied. It is also possible that these AFs can be refined on a case-by-case basis as more data become available to increase the confidence in the use of laboratory determined leaching rates used to predict realistic worst-case environmental concentrations.

Question 4

Issues regarding the acceptability of leaching test parameters have raised several issues of concern regarding their impact on leaching, which are (not exhaustive):

The following parameters were discussed:

a. Effect of wood treatment application method

Wood can be treated using a penetration treatment process (for example vacuum pressure impregnation) or a superficial treatment process, which may be with a dip, spray or brush.

The following issues were discussed in relation to the application methods:

1. Which method or process does reflect a reasonable worst case situation?
2. Is it possible to extrapolate from a penetration treatment process to a superficial treatment process (or vice versa)?
3. Is there a need for leaching tests for a superficial treatment process for a water and a solvent based formulation of a wood preservative?

Issue 1: there was general agreement of the workshop participants that superficial treatment processes result in higher leaching rates. However, it should be considered that the leaching rate pattern for both processes is different over time: superficial treatment processes result in an initial high leaching rate while penetration treatment processes result in a more constant leaching rate over time.

In addition, it was recommended by some of the participants to test the representative process and/or use a tiered approach rather than the realistic worst case, or leave this issue up to the applicant. However, as several wood preservative application processes are mentioned in many of the dossiers without an indication of the representative one, there was general agreement that there is a need for a leaching rate test with the realistic worst case process.

Issue 2: extrapolation from a penetration treatment process to a superficial treatment process (or vice versa) is impeded by the fact that penetration treatment is expressed on a volume basis in kg/m^3 while superficial treatment is expressed in litres/m^2 . Subsequently, a default value for the penetration of the wood preservative in the penetration treatment process has to be set in order to extrapolate. Although an approach may be to use the penetration classes from the CEN standards for efficacy testing, there was general agreement that no valid extrapolation method is available at the moment. Therefore, if both processes are mentioned in the dossier the applicant should provide a test with the penetration treatment process and the superficial treatment process.

Issue 3: there was general agreement that if an applicant indicates several options, e.g. either water or solvent based preservative applied either by superficial treatment or in a penetration process, there is a need for a leaching test for both water and solvent based formulations as well as both penetration and superficial application methods, as applicable for the wood preservative. This implies that if for example an applicant applies

for a water and solvent based formulation using both methods for Annex I inclusion, he has to submit four different leaching tests. In general solvent based formulations will penetrate deeper into the wood.

b. Effect of application rate used (what if this is different to product applied for or efficacy claim?)

There was general agreement that the leaching test should be carried out with the maximum application rate based on information from the efficacy testing and the label claim. The question was raised if it is possible to extrapolate from a low application rate used in the leaching test submitted to the maximum application rate?

There was general agreement there will be no linear relationship as this depends on the number of binding sites available in the wood. The following scheme was agreed on:

- If the application rate is 10 times lower than the maximum application rate: a new leaching test should be submitted using the maximum application rate;
- If the application rate is between 2 and 10 times lower than the maximum application rate linear extrapolation and an additional assessment factor shall be applied. The existing information on leaching tests can be used to derive the value for this assessment factor.
- If the application rate is less than 2 times the maximum application rate, linear extrapolation can be used.

As an alternative approach it was suggested to use an assessment factor of 10 as a first screening. If the risk assessment shows that the PNEC is exceeded, the applicant can carry out a new leaching test.

c. Effect of wood dimensions/surface area/species

One participant indicated that data were available which showed a difference in leaching rates of around 3 orders of magnitude between two wood species with an equal retention. Although other participants confirmed that the wood species used in the leaching test do influence the outcome of the test, a difference of 3 orders of magnitude could not be confirmed.

It was stated that there is a difference between leaching rates for sapwood and hardwood, while in most cases in the dossiers submitted in the review program there is only a test available for sapwood. It was considered not appropriate to ask for a test using hardwood and the workshop recommended that such a test can be asked for at product authorisation stage, if considered necessary by the MS.

It was decided that the aspect should be considered again at a later stage in the review program.

d. Effect of orientation of wood in ‘rain’ simulation tests

There was general agreement that a horizontal orientation should be regarded as the realistic worst case situation.

- e. Effect of formulation (non active substances)
- f. Effect of transformation and binding in wood
- g. Extrapolations from field studies to take account of standard weather conditions such as humidity, temperature, pH and rainfall (TGD 700 mm per annum)
- h. Effect of hazard class in particular the limitations of field studies for hazard classes 4 and 5

These parameters were not discussed.

Question 5

Extrapolation of leaching up to 30 days and longer term i.e. 10 years:

- a. What is the risk assessment benefit from 10-year assessment if shorter-term assessments are acceptable and there is no risk of accumulation?
- b. How realistic is the assessment (i.e. will the assessment predict a greater loss to the environment than active substance applied in the first instance)?

There was general agreement that a leaching profile is needed for two time periods: 30 days and a longer period. This is especially needed for wood preservatives with a low biodegradation potential and high bioaccumulation potential like PBT (Persistent, Bioaccumulative and Toxic) and vPvB (very Persistent and very Bioaccumulative) substances². The value for the longer period should depend on the service life of the wood, which again depends on the treatment application method or process used. The following values were agreed:

Application method / process	Hazard class	Default service life (years)
Vacuum pressure treatment	4a	20
Vacuum pressure treatment	4b	20
Vacuum pressure treatment	3	20
Double vacuum pressure treatment	3	20
Flow coating treatment	3	15
Spraying and dipping	3	15
Brushing, solvent based	3	5
Brushing, water based	3	5

² In the assessment according to the OECD ESD for Wood Preservatives in the environmental exposure assessment, removal processes like (bio)degradation will be taken into account when calculating the PEC.

The values for vacuum pressure treatment for hazard class 4 are equal (and not less than) to the values for hazard class 3, because it is assumed that for hazard class 4 normally a higher retention is used of the wood preservative.

The default service life values should be used in the scenarios from the ESD as follows. If for example, the applicant has applied for vacuum pressure treatment and dipping treatment for hazard class 3, two leaching rates will be available. Both leaching rates should subsequently be used in the scenarios leading to different emissions to the environment for the two treatments.

It was noted that these default service life values should not be regarded as a kind of product guarantee scheme. Furthermore, it was agreed that these default values need further discussion in the future.

The leaching rate will decrease over time. The question is if and how extrapolation can be carried out from the information from the laboratory or (semi-)field tests available. In the draft OECD guidelines it is stated that: “the duration of the test must be sufficient to enable a flux profile against time to be determined (e.g. “time necessary to reach steady state or minimum of 30 days”) to allow extrapolations of flux for longer periods (e.g. 1 year, 10+ years)”. However, several participants stated that in the tests they received no equilibrium was reached after a certain point of time. The following proposals were made to carry out the extrapolation for these types of situations:

- Use the method described in Appendix 2 of the OECD ESD for Wood Preservatives using the lowest leaching rate from the laboratory or (semi)-field tests. Some participants stated they tried to apply this method, but due to the high variation of the leaching test results it was impossible to obtain valid results. It was recommended to plot the leaching curves on a log-log scale;
- Use 10 times cumulative leaching after 30 days;
- Use the lowest leaching rate from the laboratory and (semi)-field tests and divide this rate by an assessment factor;
- Asking for a test with aged wood pre-conditioned according to EN 84. Some of the participants considered this as an option, which should be further investigated. It was recommended to take the experience from a CEN project on how to establish pre-conditioned wood specimens has to be taken into account. Industry will provide further information on this.

Care should be taken when carrying out the extrapolation as this may result in a cumulative leaching being higher than the amount originally applied or the calculated retention. For superficial treatment processes the probability that this will occur is higher than for penetration treatment processes. In this case, it was recommended to divide the result by the (default) service life for obtaining a daily leaching value. The amount originally applied or the calculated retention can be used in this case in the wood in service scenario from the OECD Emission Scenario Document.

Conclusions

The open session of the workshop reached the following conclusions:

- The Leaching Workshop was held to facilitate the review program for wood preservatives evaluation process and harmonise the approach taken by the Member States with regard to the methodology used to describe leaching of wood preservatives;
- Representatives from most of the Member States, OECD and the wood preservatives manufacturers industry were present, providing a good basis for intensive and productive discussions and results;
- Decisions were taken on several critical outstanding issues on evaluation of data from leaching tests;
- It was concluded that as at the moment no reliable method exists to predict the leaching rate based on physico-chemical properties of wood preservatives, leaching studies are required;
- It was agreed that the following tiered approach would be taken:
 - Tier 1: worst-case assumption where 100% of the substance is assumed to leach in the first 30 days;
 - Tier 2: laboratory tests;
 - Tier 3: (semi-)field tests;
- There was general agreement at the workshop that part 2 of the OECD draft guideline “Laboratory method for wooden commodities exposed in use class 4 and 5 (in contact with the ground, fresh water or sea water)” is adequate for leaching tests for use classes 4 and 5;
- The majority of the workshop participants preferred the immersion time scheme of two times 60 minutes for hazard class 3. It was also agreed that the three times one minute immersion regime could still be used if an assessment factor was applied to the results. Subsequently, the recommendation to applicants if the RMS considers a laboratory leaching test is needed, with the exception of wood preservatives that will not survive in a 60 minutes immersion event, would be that either test could be submitted;
- There was general agreement of the workshop participants that superficial treatment processes result in higher leaching rates. However, it should be considered that the leaching rate pattern for both processes is different over time: superficial treatment processes result in an initial high leaching rate while penetration treatment processes result in a more constant leaching rate over time;
- A leaching test will be required for each general application method (penetration and superficial) by which the wood preservative is to be applied. In addition, a leaching test will also be required for each formulation type (water and solvent based) of the wood preservative;
- There was general agreement that the leaching test should be carried out with the maximum application rate based on information from the efficacy testing and the label claim. The question was raised if it is possible to extrapolate from a low application rate used in the leaching test submitted to the maximum application

rate? There was general agreement that there will be no linear relationship as this depends on the number of binding sites available in the wood;

- In order to derive a suitable leaching rate for use in the exposure assessments of wood preservatives used on wood restricted to hazard class 3, the following steps were agreed for use on laboratory leaching tests:

- **Application rate:** the application rate of the wood tested should be the same as that applied for in the product. Where this differs a **correction** for this must be applied (in addition to any subsequent assessment factors (AF));
- **Immersion scheme of 3 times 1 minute:** an AF of **10** should be applied;
- **Immersion scheme of 2 times 60 minutes:** an AF of **5** should be applied, unless there is sufficient scientific evidence to support the use of no AF being used;
- **EN 84:** no **AF** needs be applied provided the study is considered to be scientifically valid;
- **In-house procedures (including artificial rainfall experiments):** the use of an AF must be decided on a case-by-case basis depending on the scientific validity of the study and expert judgment;
- In all cases, where there is sufficient doubt regarding the reliability or validity of a leaching study, higher AFs may be applied. It is also possible that these AFs can be refined on a case-by-case basis as more data become available to increase the confidence in the use of laboratory determined leaching rates used to predict realistic worst-case environmental concentrations.

- It is expected that as more experience will be obtained in the review programme the evaluation of leaching tests can be further refined and optimized in the future;
- A clear need to finalise the OECD guidelines, including validation was identified.

References

- Development of a method characterising: leaching of active ingredients from preservative-treated timber. Stage 2 & 3: laboratory testing and comparison with semi-field testing. Danish Technological Institute. Nordtest project 1622-03. Nordtest Technical Report. Final report February 2003.
- Directive 98/8 of the European Parliament and of the Council of February 1998 concerning the placing of biocidal products on the market. [Official Journal No L 123, 24/04/1998, p. 0001-0063.](#)
- [Emission Scenario Document for Wood Preservatives. OECD Series on Emission Scenario Documents Number 2.](#)
- Issues in the environmental risk assessment of wood preservatives. European Wood Preservative Manufacturers Group (EWPM). Prepared for the Leaching Workshop to be held in Arona on June 13th 2005.
- OECD draft test guideline “Estimation of Emissions from Preservative Treated Wood to the Environment: Laboratory 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 ground)”. January 2003.
- OECD draft test guideline “Estimation of Emissions from Preservative Treated wood to the Environment: Laboratory Method for wooden commodities exposed in Use Class 4 or 5 (in contact with the ground, fresh water or seawater)”. January 2003.
- OECD draft test guideline “Estimation of Emissions from Preservative Treated Wood to the Environment: Laboratory 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 ground), and for wooden commodities exposed in Use Class 4 or 5 (in contact with the ground, fresh water or seawater)”. March 2004.
- [Report on the Action “Inter-laboratory evaluation of laboratory test methods to estimate the leaching from treated wood”. Agreement number 04/375757/C4. April 2005.](#)
- Technical notes for guidance in support of Directive 98/8/EC concerning the placing of biocidal products on the market. Guidance on data requirements for active substances and products.

Annex I: Workshop program

12 May 2005

LEACHING WORKSOP

A workshop for technical experts evaluating wood preservatives for the Competent Authorities implementing the Biocides Directive, assessing the leaching from treated wood to the environment.

Arona, Italy, 13 June to 14 June (morning), 2005

INTRODUCTION

AT TMI05, 1-3 March 2005, several member states presented data and problems relating to assessing the leaching of the active substance used as wood preservative from treated wood. All the member states identified problems around this issue and the TM recommended that a Leaching Workshop should be held in connection with the next TM to arrive at conclusions for the leaching issues.

It is very important that any leaching guideline recommended or used by the Member States, is appropriate to the intended use pattern and hazard classes (HC) for that wood preservative.

Parts of the TM had proposed that the workshop would address both leaching and efficacy testing, but it appears to be too big an exercise to include the efficacy testing in the workshop. Therefore efficacy testing is placed on the agenda of the TM.

GENERAL PROGRAMME

The Leaching Workshop has two parts: an open session where the Industry invited and in which general problems can be raised, and a closed session where the member states can discuss confidential information, i.e. the studies submitted for the substances.

The workshop will start with the open session Monday morning and it will include lunch. The closed session in which member states have the possibility to discuss substance specific problems is Monday afternoon and Tuesday morning.

The questions that should be answered in the open session are attached as appendix 1.

For the closed session some of these questions will be raised and answered for the individual substances, and Member States have forwarded short descriptions of the issues that they want to raise for each substance; some of these documents were also distributed for TMI05.

In the closed session all the submitted leaching tests should be looked at and compared, as there was no agreed guideline at the time of dossier submission. When this comparison of the different tests takes place the relevant test parameters have to be considered e.g.: impregnation method, formulation, dose of active substance and the fixation time before water is added.

It is assumed that an artificial rainfall test is likely to provide a more realistic leaching scenario for Hazard Class 3, and test protocols were proposed by the industry and CEN about 5 years ago. However, the group

realised that it was impossible to reproduce the results from these tests (when the tests were repeated the results were different). Therefore it was decided to use the dipping test in the new draft proposal. The Commission co-financed a comparison study between the laboratory tests and field studies with the aim to obtain more data for evaluating how realistic the outcome of the laboratory tests are, and whether they over or underestimate the leaching rate.

In addition the Danish authorities financed a study with 3 active substances, also comparing results obtained from the draft OECD leaching test with semi-field test; the comparison was made with the same formulations, dose, fixation time etc., with the aim to evaluate which of the draft OECD test guidelines would give the most realistic result when compared with field testing.

EXPECTED OUTCOME OF THE WORKSHOP

The purpose of the workshop is to provide decisions on what data or estimation methods are acceptable for use in the environmental risk assessments for wood preservatives. The outcome of the workshop should provide guidance to all RMSs as to the acceptability of their current packages and agreed solutions as to how incomplete data packages can be addressed within the timetable of the current review. This should include the issue of Annex I inclusion where the risk assessment tools are not sufficiently developed to refine the data available.

DOCUMENTS

The documentation for the workshop includes:

- (1) The original information received from the member states on the test they have received in the dossiers. The information received is listed in appendix 2. (not included)
- (2) The draft minutes of the discussion at TMI05 as background information. (not included)
- (3) A number of back ground documents will also be relevant for the workshop, especially the descriptions of the proposed draft test guidelines from CEN/OECD distributed at the 7th Biocides Steering Group meeting.
- (4) Report on the Action. Inter-laboratory Evaluation of Laboratory Test Methods to estimate the Leaching from Treated Wood by U. Schoknecht et al.
- (5) the emission scenario document for wood preservatives published also on the ECB web page at <http://ecb.jrc.it/biocides> (please download this yourself).
- (6) As part of the workshop will focus on the studies actually submitted for the purposes of the evaluation of the active substances, the contributions from each member state are sent in original version. From the documentation received an overview of the tests actually used for each substance was produced as well as an overview of the application methods (e.g. vacuum pressure or brushing) proposed for the products. This is given in appendix 3. (not included)

APPENDIX 1

GENERAL QUESTIONS:

A list of relevant, general questions posed by the member states have been used to formulate the following series of questions which should be answered by the workshop participants as given below:

1. Is a leaching study a mandatory core data requirement or can extrapolation from physical chemical properties be used?
 - a. What properties can be used?
 - b. How can these be used – are there any approaches available or accepted?
2. Where ‘other tests’ may be used should we have an agreed ‘tiered approach’ depending on hazard class and use pattern:
 - a. Field data (preferred)
 - b. Laboratory study (OECD/EN84 accepted ?)
 - c. ‘Other’ (calculation model or other extrapolation; as screen using worst case assumptions)
3. Validation of current OECD guideline is required as a matter of urgency, how?
 - a. Issue with current guideline
 - b. Key parameters
 - c. Standard conditions
 - d. Acceptability of leaching rate test results from either OECD or other tests (EN84 etc.) for Annex I/product authorisation.
4. Issues regarding the acceptability of leaching test parameters have raised several issues of concern regarding their impact on leaching, which are (not exhaustive):
 - a. Effect of wood treatment application method
 - b. Effect of application rate used (what if this is different to product applied for or efficacy claim?)
 - c. Effect of wood dimensions/surface area/species
 - d. Effect of orientation of wood in ‘rain’ simulation tests
 - e. Effect of formulation (non active substances)
 - f. Effect of transformation and binding in wood
 - g. Extrapolations from field studies to take account of standard weather conditions such as humidity, temperature, pH and rainfall (TGD 700 mm per annum)
 - h. Effect of hazard class in particular the limitations of field studies for hazard classes 4 and 5
5. Extrapolation of leaching up to 30 days and longer term i.e. 10 years
 - a. What is the risk assessment benefits from 10-year assessment if shorter-term assessments are acceptable and there is no risk of accumulation?
 - b. How realistic is the assessment (i.e. will the assessment predict a greater loss to the environment than active substance applied in the first instance)?
6. How can the average daily flux rate be calculated (mg/m²/d) for the OECD ESD if it is not reported in the OECD test?

7. Can we accept interpolation results (not required in OECD), which give a higher cumulative value if used?
8. What is a realistic worst-case leaching result?
 - a. On what parameters is it based?
 - b. Which tests provide this?
 - c. How can endpoints from other tests be used?
9. How are metabolites accounted for, as these may be formed on/in the surfaces of the wood post-treatment?
10. How is post treatment of wood accounted for in the risk assessment
 - a. Painting or over coating can decrease the leaching
 - b. Sawing may increase the leaching

SELECTION OF LEACHING RATES FOR RISK ASSESSMENT

The purpose of the risk assessment is to inform MSs as to the acceptability of a substance for Annex I. The workshop participants may wish to consider the following:

- What level of risk assessment is needed for regulatory assessment for inclusion to Annex I? (E.g. how far do we need to go in terms of use patterns wood type etc or should much of this be left to member states at the product authorisation stage)
- Can Annex I inclusion be agreed where only lower tier testing or other data approaches have been used (e.g. K_{OC} values).

Such that the outcome of the workshop should be to address the following:

- Criteria of acceptability: what is an acceptable risk assessment for Annex I, how does this affect product authorisation by MSs?
- Criteria of unacceptability: what is an unacceptable risk assessment where Annex I inclusion will not be allowed?

APPENDIX 2

DOCUMENT LISTS

1. CONTRIBUTION FROM THE MEMBER STATES

Not included.

2. DRAFT TEST GUIDELINIES AND REPORTS

- BSG7_EU_Evaluation_Wood_leaching.doc
- BSG7_WG27N049_UC3_vJan03.doc [OECD draft test guideline “Estimation of Emissions from Preservative Treated Wood to the Environment: Laboratory 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 Ground)”].
- BSG7_WG27N050_UC4_vJan03.doc [OECD draft test guideline “Estimation of Emissions from Preservative Treated wood to the Environment: Laboratory Method for wooden commodities exposed in Use Class 4 or 5 (in contact with the ground, fresh water or Seawater)”].
- Revised-OECD/CEN test-guideline.pdf
- DK_final report 05.pdf (not included)
- EU leaching report.pdf [Report on the Action. Inter-laboratory Evaluation of Laboratory Test Methods to estimate the Leaching from Treated Wood by U. Schoknecht et al.]
- TMI05ENV-item1a-DE-leaching-testing1.pdf
- TMI05ENV-item1a-DE-leaching-testing2.pdf
- TMI05-extract-of-minutes.doc (not included)
- The emission scenario document for wood preservatives published also on the ECB web page at <http://ecb.jrc.it/biocides> (please download this yourself).

APPENDIX 3

SELECTION OF LEACHING RATES FOR RISK ASSESSMENT

The leaching rates are important input for the environmental risk assessment and the Dutch authorities submitted the following considerations relating to this.

In TNsG on data requirements chapter 2.5 the following 5 the following data on leaching rates are requested:

1. leaching during storage of freshly preserved wood,
2. leaching from wood above ground with risk of wetting,
3. leaching from wood in contact with water,
4. leaching from wood in contact with soil and
5. volatilisation from wood in contact with air

Additionally in the TNsG it is commented that “Release rates to be given can be either default estimates or measured leaching rates”.

Question:

1. Are there any “default estimates” for leaching rates? (they are not included in the ESD’s nor in the TGD)..

In the TNsG on data requirements chapter 2.5 it is noted that:

[Evaluation methods for leaching from treated wood and related risk assessment guidance are being developed in some Member States and e.g. in the framework of the COST E2 project “Wood durability”. Related to this project a protocol for the quantification of the emission fluxes has been developed by the European Wood Preservation Manufacturers’ Group.]

Question:

2. Is it possible to obtain additional information on these evaluation methods and protocols developed within COST E2 project “Wood durability”?

The Netherlands proposes the following:

1. For the risk assessment of active substances leaching from treated products it is proposed to use worst case leaching rates (e.g. derived from tests with continuously watered wood). In case this leads to unacceptable risks, then more specified tests can be performed or the practical use should be restricted.
2. If after evaluation of the studies no valid leaching rates appear to be available we propose a worst case leaching scenario assuming a leaching rate of 100% of the applied active substance after 1 month. In case this leads to unacceptable risks, then more specified tests can be performed or the practical use should be restricted.
3. To prevent innumerable testing for leaching rates, to incorporate all the different variables, it is considered as important to develop a worst case standard test and translation tables with extrapolation factors for different uses.

Another fundamental question posed by DK is with regard to the use of the risk assessment: In light of the fact that there is still no established validated leaching methodology can we allow annex 1 entry to a participant who has not produced leaching data and if we do at what level do we set the amount of data justification that a participant must provide. DK believes that this would be very difficult.

Annex II: List of participants

AT	Margrit GRIMM
AT	Marianne KECK
AT	Edmund PLATTNER
AT	Elisabet DRS
BE	Frédéric LEFEBVRE
CZ	Hana KRYSOVA
DK	Jørgen LARSEN
DE	Jürgen FISCHER
DE	Ute SCHOKNECHT
EE	Riina LAHNE
EL	Joanna KARANIKOLOU
ES	Maria Amparo HARO,
ES	Carmen RAMOS
ES	José Luis TADEO
FI	Sanna SIRKKA
FR	Sandrine ANDRES
FR	Aurélie CHEZEAU
FR	Véronique POULSEN,
IE	Brendan DOLAN
IT	Ettore CAPRI
HU	Attila BALOGH
LV	Jolanta GREIDANE
NL	Jan LINDERS
NL	Peter OKKERMAN
PT	Teresa Maria BORGES
PT	Elsa CASIMIRO
PT	Susana PESTANUDO
SE	Carina NÄF
SE	Jenny RÖNNGREN
SK	Otilia FOLDESOVA
SK	Petra KRIZKOVA
UK	Jennifer HOPKINS
UK	Deborah TRAYNOR
NO	Christian DONS
OECD	Wanda JAKOB
IND	David ASTON
IND	Charles ATKIN
IND	Wendelin HETTLER
IND	Rolf WILMES
IND	Bernd SEIDEL

COM
COM
COM
COM

Bobby ARASH
Kirsten RASMUSSEN
Erik van de PLASSCHE
George FOTAKIS

Annex III: Presentations

Presentation 1:

“Leaching Data for Wood Preservatives – a UK Regulatory Perspective” by D. Traynor from the HSE, UK;

Presentation 2:

“CEN/OECD leaching test methods” by U. Schoknecht from Federal Institute for Materials Research and Testing (BAM), Germany;

Presentation 3:

“Issues in the Environmental Risk Assessment of Wood Preservatives” by D. Aston from European Wood Preservatives Manufacturers Group (EWPM).

PRESENTATION 1

Leaching Data for Wood Preservatives – a UK Regulatory Perspective

Presented by Deborah Traynor

Overview

- Summary of UK leaching data evaluations
- UK perspective of the key issues
 - ◆ purpose of workshop – *in a regulatory context*
 - ◆ leaching studies & default estimates, guidelines & risk assessment
 - ◆ need a practical & agreed way forward!
- Summary of presentation

Purpose of this workshop – *in a regulatory context*

- to provide **pragmatic & agreed guidance** for assessing leaching data for wood preservatives for the **current reviews** to **enable an active substance**, with a representative biocidal **product**, to **gain entry onto Annex 1**

Generic Risk Assessments

- can be refined at **product authorisation stage**
- in meantime **can place restrictions** on how a wood preservative can be used
- for **Annex 1 listing**
 - ◆ **do not want to be over prescriptive** with what we require
 - ◆ just need to know that it **can be used safely**

UK CA leaching data evaluations under current BPD reviews

- 2 anti-sapstain wood preservatives
- intended use pattern for both preservatives:
 - ◆ up to Hazard Class 3 (wood out-of-ground & water contact but exposed to weathering)

Summary of Leaching Rate Submissions to the UK CA

	'Wood preservative 1'	'Wood preservative 2'
Leaching Studies or Argument Submitted	Argument based on leaching rates & Koc values of 4 active substances (not including the a.s. in 'WP 1')	<ul style="list-style-type: none"> • OECD leaching study (3x1min; 2x1h) • BAM project report (Modified EN 84 method; 2 Artificial rainfall experiments (ARF))
UK CA comments	Argument considered not acceptable	<ul style="list-style-type: none"> • OECD study considered not applicable • Modified EN 84 method considered to overestimate leaching rate • ARF considered to provide the most realistic leaching rate estimate • EN84 & ARF both used in RA • correction factor also employed

Leaching Rates - studies

- For **current reviews**:
 - ◆ Need **flexibility** regarding the **acceptability of studies**
 - ◆ **If study scientifically robust, may have to be accepted** (but **MUST** have confidence in the results!)
- Possible **legal & regulatory implications**

Leaching Rates - default estimates

- Extrapolation from physical-chemical properties – but which ?
- Calculation models ?
- If nothing else, can we use a default of 100% loss over a set time period ?

Hierarchy of Leaching Approaches

- UK preferred order of data :
 - ◆ Lab study
 - ◆ Field study
 - ◆ Model calculation / extrapolation / default 100% loss (as a worst case screen)
- benefits & limitations for both lab & field studies
- study type chosen should depend on the hazard class & intended use pattern

Current OECD Guidance

- Needs to be validated - urgently!
- What are the limitations & critical parameters of the OECD guidelines ?
- If we know/agree on these, then we can better assess studies conducted to OECD & other guidelines

What is a realistic worst case leaching result?

- No single answer –
 - ◆ case-by-case
 - ◆ needs to be tailored to HC & intended use pattern
- Many parameters need to be considered
- Need to be pragmatic!

Risk Assessment

If: **PEC / PNEC < 1**

Then: **have confidence to recommend entry onto Annex 1!**

Summary

- for the current reviews :
 - ◆ **MUST have pragmatic & agreed guidance for assessment of leaching rate data by the end of this workshop!**
 - ◇ including order of preference for leaching rate approaches
 - ◆ **for leaching studies need flexibility**
 - ◇ if the study is scientifically robust & done to guideline (where applicable), **may need to accept**
 - ◇ if not, **potential regulatory & legal implications**
- **OECD guidelines need to be validated - urgently!**

PRESENTATION 2:

CEN/OECD leaching test methods

Ute Schoknecht

Federal Institute for Materials Research and Testing (BAM)
Berlin, Germany

Leaching Workshop, Arona, 13-14 June 2005



Overview

- **Research projects on leaching tests for wood preservatives**
- **Test procedures, critical parameters and report of test results**
- **Comparability of different test procedures**
- **Application of laboratory data**

Leaching Workshop, Arona, 13-14 June 2005



Objectives of research projects

- **Suitability of leaching guideline procedures**
Different types of wood preservatives:
CCB, Cu/tebuconazole, Cu-organic, propiconazole
- **Influence of test parameters**
Basis: comments of OECD experts
and experiences from former investigations
- **Application of laboratory data**
Outdoor experiments
Modelling

Leaching Workshop, Arona, 13-14 June 2005



Guideline 1: Occasional water contact

3 immersion events of 1 min per immersion day
alternatively:
2 immersion events of 60 min per immersion day

Samples of each immersion day are pooled
Selected samples are analysed for active ingredients

Every third day is assumed to be a day of rainfall

Leaching Workshop, Arona, 13-14 June 2005



Guideline 2: Permanent water contact

Water is replaced several times

All samples are analysed for active ingredients

Variation of test parameters:

- specimens (size, surface, number)
- pH
- stirring
- time schedule
- water volume/surface area
- repeatability between laboratories

Leaching Workshop, Arona, 13-14 June 2005



Comments on guideline 1

- Low concentrations of active ingredients
- Time-consuming
- Water volume/surface area has to be defined
- 7 immersion days within 30 days
- Relationship between immersion scheme and days of rainfall depends on the substance

Leaching Workshop, Arona, 13-14 June 2005



Comments on guideline 2

- Time schedule of water replacements should be defined
- Test period of 21 days (6 replacements) is sufficient
- Comparable to other test procedures that are already used to describe leaching from different materials (i.e. relevant for Construction Products Directive 89/106/EC)

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Critical test parameters

- Water volume per surface area
- Duration of leaching periods (time schedule)
- Probably more important for organic substances than for inorganic components
 - Relevant if test data are applied for the calculation of PEC-values!

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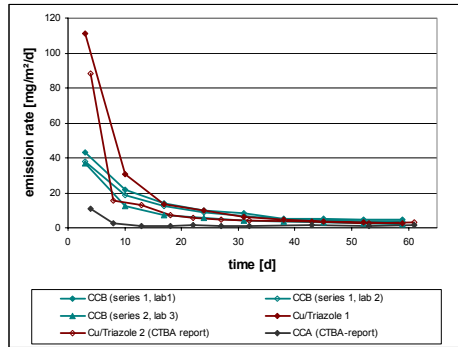
Presentation of test results

- Presentation of data should reflect decreasing flux rates
- Graphs presented on a log-log-scale comprise more information than linear scaling

Leaching Workshop, Arona, 13-14 June 2005



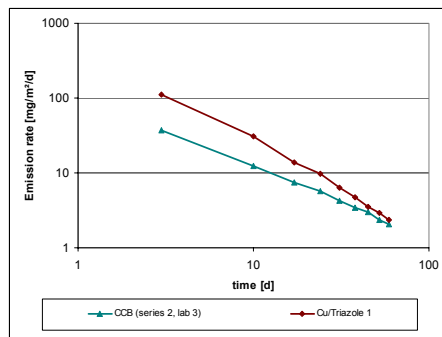
Emission rates of copper from different preservatives in guideline 2 experiments



Leaching Workshop, Arona, 13-14 June 2005



Emission rates of copper as a function of time presented on a log-log scale

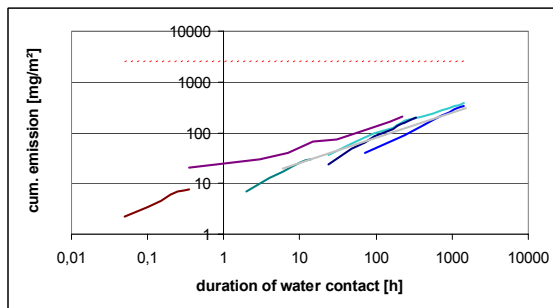


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Emission of Propiconazole in leaching experiments

guideline 1: 1 min and 60 min
 guideline 2: timetable 1 and 2, EN84, ENV-1250-2
 red line: total amount of propiconazole, grey line: slope = 0.5



Leaching Workshop, Arona, 13-14 June 2005



Application of laboratory tests

- **Laboratory tests describe intrinsic properties of active ingredients rather than processes under environmental conditions**
 - allow comparison of 'leachability' of products
 - provide data for predictive models
- **Leaching processes can be investigated**
 - i.e. coelution with DOC
 - **relevant for risk assessment**
- **Limitations**
 - No constant relationship with variable environmental conditions
 - Related to the wood that has been tested
 - species, sapwood, distribution of active ingredient

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Prediction of emissions based on laboratory data

- **Diffusion model of Waldron and Cooper, University of Toronto, Canada**
 - detailed investigation of processes that occur in treated wood
 - **Description of intrinsic leaching parameters, Van der Sloot et al., ECN Petten, NL**
 - chemical factors controlling release
 - predominant leaching mechanism
 - material characteristics
- **Scenario descriptions with ORCHESTRA Software**

Leaching Workshop, Arona, 13-14 June 2005



Conclusions

- OECD guideline procedures can be performed
- Recommendations for final versions of guidelines
- Data from alternative test procedures with permanent water contact can be accepted
- PEC-values calculated with $Q_{\text{leach,time}}$ -data are not reliable
- Prediction of environmental concentrations based on diffusion models seems to be promising
- Expert judgement of risk assessments is necessary

Leaching Workshop, Arona, 13-14 June 2005



Participants

- A HFA Wien
- CZ ICT Praha
- D HFA Hamburg, MPA Eberswalde, BAM
- DK DTI Taastrup
- ES INIA Madrid
- F CTBA Bordeaux
- I University Perugia
- NL ECN Petten
- Industry

Leaching Workshop, Arona, 13-14 June 2005



PRESENTATION 3:

ISSUES IN THE ENVIRONMENTAL RISK ASSESSMENT OF WOOD PRESERVATIVES

Workshop on Leaching
PT8 Wood preservatives
June 13-14 2005, Arona, Italy



EUROPEAN WOOD PRESERVATIVE MANUFACTURERS GROUP

This presentation is made on behalf of the EWPM

•The EWPM represents the interests of wood preservative formulators and the active substance suppliers who operate in Europe

•Its members have activities in one or more product types and application processes and may be national, European or world wide in their operations

•It is a forum where health, safety, environmental and standards are discussed and common positions and actions sought

•It has close links with the WEI who represent the interests of the timber treating companies

•It is an Associate member of the European Biocide Producers Forum (EBPF)



Environmental benefits of wood preservatives

- Wood is a renewable construction material
- Enhances natural durability of the wood
- Optimises the use of timber resources
- Energy efficiency in buildings
- Ultimately bio-degradable
- Recovery of embodied energy in the wood
- Recovered wood fibre can be recycled into board and other materials

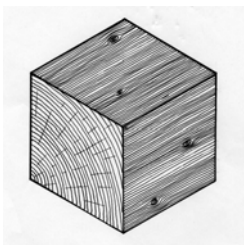


WOOD MOISTURE

- 'Free water'- present in the cell lumens
- 'Bound water'- water bound into the cell wall as an integral part of the cell wall structure
- 'Fibre saturation point' – point at which all free water has been lost to the atmosphere and the only bound water remains. Usually at a wood moisture content of 25-30%



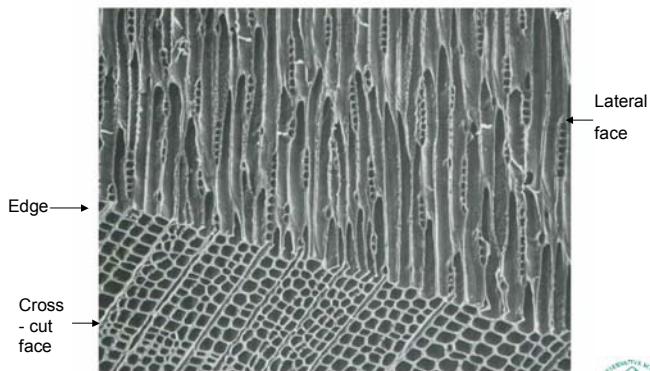
Softwood

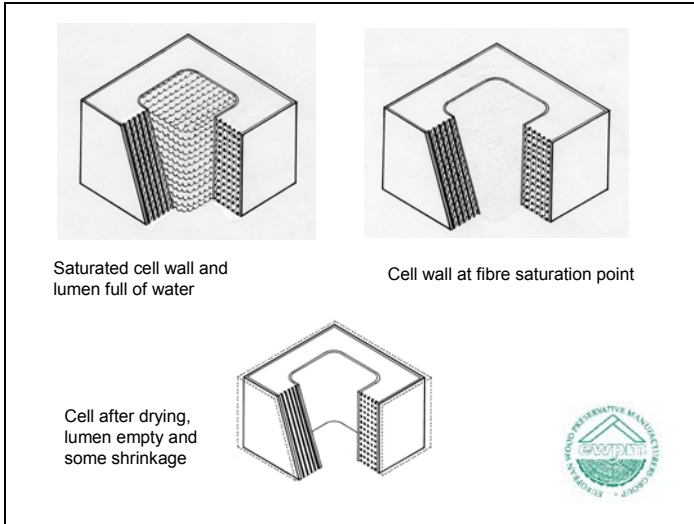


2 mm cube



Softwood micro-structure





Physical and chemical factors

- Wetting of the wood and Penetration of free water into the wood void space
 - Wood permeability
 - Surface wetting properties
 - Orientation to weather
 - Type of exposure



Physical and chemical factors

- Dissolving / dissociation or precipitates or reacted components into free water in the cell lumens to the limits of their solubility under the exposure conditions
 - Creates a concentration gradient between the wood surface and its interior



Physical and chemical factors

- Diffusion of the preservative components to the wood surface under a concentration gradient depends on
 - Wood permeability
 - Direction of water movement in the wood
 - Moisture content of the wood
 - Dimensions of timber
 - Nature of the diffusing species
 - Concentration gradient established
 - ‘Sink’ for the water to go to



Additional factors

- Dissolved organic carbon
- Degradation of wood surface by UV light
- Degradation of wood surface by freezing and thawing
- Incident temperature to the wood surface
- Construction design
- *It is impossible to take all these factors be taken into account, therefore only the parameters that can be controlled should be used in a reproducible, cost effective laboratory test method*



Use Class	Hazard In MC terms	Typical Service Situation	Typical examples of timber end-uses
1	Above ground, covered, permanently dry MC permanently <10%.	Internal timbers with no risk of condensation.	All timbers in normal pitched roofs except valley gutters and tiling battens; floorboards, architraves and internal joinery timbers not built into solid external walls.
2	Above ground, covered, Occasional risk of wetting, MC sometimes >20%.	Internal timbers with risk of wetting or condensation.	Frame timbers in timber frame houses; timbers in flat roofs; ground floor joists above d.p.c. (damp proof course).
3	Above ground, not covered, exposed to frequent wetting, MC often >20%.	A. External, above d.p.c and coated. B. External above dpc and uncoated	External joinery, bargeboards, fascias, valley gutter timbers. Fence rails, gates, deck boards, cladding. Noise barriers.
4	In contact with the ground or fresh water. Permanently exposed to wetting and MC permanently >20%.	A. Soil contact – timbers in permanent contact with ground or below dpc. B. Fresh water contact (permanent) C. Cooling towers	Fence posts, gravel boards, transmission poles, playground equipment, motorway and highway fencing. Lock gates and revetments. Cooling tower packing
5	Permanently exposed to salt water, MC always >20%.	All components in permanent contact with sea water.	Marine piling, jetties, dock gates



Realistic worst case leaching result

- The OECD ESD scenarios are realistic worst case in terms of application methods and representative end uses
- Reasonable worst case defined as representative of the high end of actual releases, 90th percentile often used
- First 30 days of accumulative leaching from the wood could be considered to represent a realistic worst case leaching result to model reasonable worst case scenarios in a Tier 1 risk assessment, but more likely a 'transient worst case'



Emission test methods

- Should
 - Reflect the wood moisture relations especially with respect to the range of moisture content to be found in the end uses
 - Reflect the moisture content profiles to be found, especially in Use Class 3
 - Reflect the wetting and drying cycles of treated wood exposed in service, especially in Use Class 3
 - Water relations data in the Schoknecht et al report can be used to assess whether the exposure regime will reproduce the appropriate wood moisture relations
 - Samples used should be representative of the timbers that will be used in practice

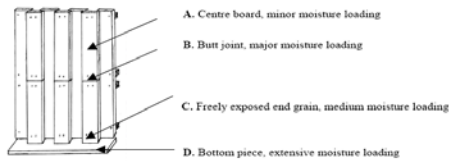


Figure 1. Test specimens exposed outdoors – specimens treated with a wood preservative. The specimen represents different weathering

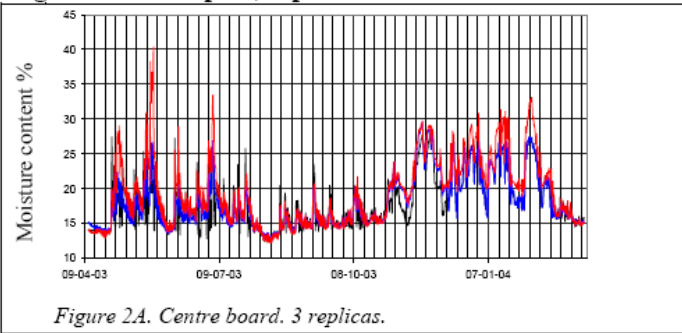


Figure 1. Test racks at the field test area of the Danish Technological Institute. Immediately after installation.

Taken from Lindegaard &
Morsing (2004)
IRG / WP 04-20304



Figure 2. Scotch pine, sapwood. Untreated



Guideline 1 Use Class 3 and treated timber in storage scenarios

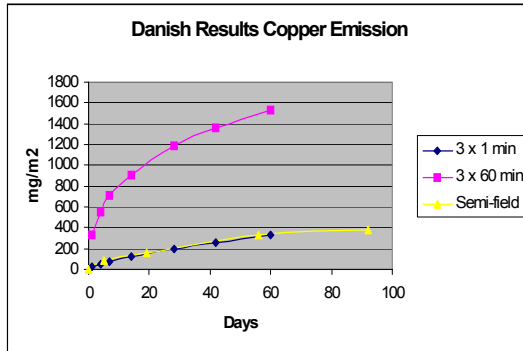
- 3 x 1 minute immersion regime gives moisture content values found in outdoor exposure trials, especially in the outer layers
- 2x 60 minute immersion regime gave moisture content regime where a substantial cross section of test samples were saturated with water, therefore giving too severe leaching
- Industry experience shows that the 3 x 1 minute regime experimental design can be improved to make it practicable



Guideline 1 acceptance

- Industry believes this method should be used as it mimics wood moisture relations in UC3
- 3 x 1 minute regime is representative, whilst 2 x 60 minutes is shown to overestimate
- Shown to be very reproducible in laboratories
- 70-80% of treated timber in EU is used in UC3





Copper azole commercial product
 UC3 cladding
 DTI laboratories



Guideline 2- Use Classes 4 and 5

- By Day 21 the overall MC of most samples is 60-70%, which means most of the wood in the samples is saturated.
- This condition would only arise when the timber is continually immersed in water
- In ground contact wood is unlikely to be in continual contact with water, note 4A (soil) and 4B (fresh water) categories
- Amount and rate of emission from Use Class 4 and 5 ESD scenarios will be overestimated

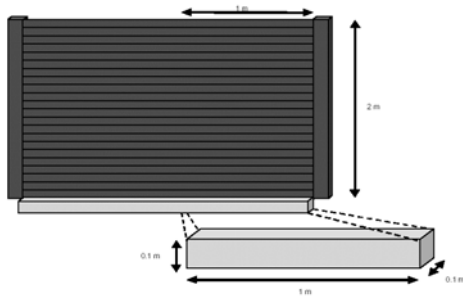


Receiving Compartment Sizes

- The OECD ESD states: “A fundamental issue considered in the development of this ESD was the size of the receiving environmental compartment. There are no agreed scientific criteria for choosing this and, although there was no unity within the Expert Group, most members agreed to use the values proposed by the Secretariat which appear in this document. These default values are not “fixed in concrete” and if users of this ESD have other, more valid values, then these should be used instead.”



Fence scenario from OECD ESD on wood preservatives



Increasing the receiving compartment size from 10cm x 10cm to 50cm x 50cm reduces the PEC by x25 times



Any signs of detrimental environmental effects?
How big is the real environmental compartment?



Disturbance during construction





Where is the soil?

Emissions from concrete, tarmac and salt off the road plus emissions from car, lorries etc. are much more significant to the environment



The Issue

- Ecological / environmental relevance of the compartment sizes in the ESD?
- In the scenarios the chosen dimensions will be well within the areas affected by man's activities during the installation or erection of the structure.
- Activities may be being done on reclaimed land
- The PEC should relate to an undisturbed compartment for the risk assessment is to be made
- Need to have a 'zone of mixing' or 'zone of influence'
- Issue needs to be addressed urgently



Treated timber in storage scenario

- Does not take into account the fact that
 - Treatment plant operations have to be authorised under pollution control regimes
 - Operated on a 'total containment' basis
 - Many types of wooden products must be kept dry and protected e.g. joinery products and are not stacked out in the open storage yard
 - Therefore it is inappropriate to apply this scenario to all wood preservative products and industrial application processes.



To Conclude

- Need to focus on understanding the moisture relations of wood in service
- Need to retain Guideline 1 to represent UC3 applications
- Receiving compartment sizes still a key issue to be resolved
- First 30 days PEC may represent reasonable worst case situation for tier 1 modelling, but more likely a 'transient worst case' scenario
- Important to recognise that wood preservatives can be complex products, formulated for very specific applications and end uses. Some of the model scenarios are not appropriate
- Some products and process applications cannot be replicated in the lab. so must have the option to use well described representative samples from commercial processing
- Implications of decisions for the Construction Products Directive and its implementation

