

Conditions for approval of wood preservatives for industrial wood preservation in the Nordic countries

Part 1: Pine and other permeable softwoods

NWPC Document No. 2:1998

**Nordic Wood Preservation Council
2003**

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Part 1: Pine and other permeable softwoods

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Contents

1	Introduction	4
2	Scope	4
3	References	4
4	Definitions	5
5	Requirements and application	5
5.1	General	5
5.2	Applicant	5
5.3	Trade name of the product	5
5.4	Wood preservation class	5
5.5	Characterization of the preservative	5
5.6	Biological tests	6
5.6.1	General	6
5.6.2	Wood preservation classes B and AB	6
5.6.3	Wood preservation class A	7
5.6.4	Wood preservation class M	7
5.7	Methods for chemical analysis and for checking compliance of the treated wood	7
5.8	Treatability properties	8
5.9	Technical data sheets	9
6	Procedure	9
6.1	Application	9
6.2	Confidentiality	9
6.3	Approval	9
6.4	Certificate of approval	9
6.5	List of approved preservatives	9
6.6	Communication	10
7	Evaluation	10
8	Approval	10
9	Marking	10
10	Control	11
11	Renewal	11
12	Transition conditions	11
13	Revision and withdrawal	11

Annex 1 (normative):	NWPC Certificate	12
Annex 2 (normative):	Application for Approval of Wood Preservatives	13
Annex 3 (informative):	Minimum requirements for fungal tests	16
Annex 4 (informative):	Guidelines for Technical Data Sheets	17

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Part 1: Pine and other permeable softwoods

1 Introduction

NWPC Document No. 2:1998 supersedes NWPC Document 1.2.1./89 "Conditions for approval of wood preservatives for industrial use", which has been withdrawn owing to the withdrawal of the Nordic Standard INSTA 140:1989 and the implementation of EN 351 and EN 599 in Denmark, Finland, Iceland, Norway and Sweden.

The official language of this Document is English.

2 Scope

This document comprises the Nordic Wood Preservation Council's (NWPC) conditions for approval of wood preservatives for the production of quality certified treated wood according to NWPC Document No. 1:1998. The conditions are based on EN 599 and applicable to industrial treatment of pine and other permeable softwoods.

The approval of wood preservatives according to this document is restricted (see EN 599) to,

- Wood preservative products supplied for application in liquid form.
- The preventive treatment of permeable softwoods against biological deterioration.

The approval scheme is operated by the NWPC and a certificate, see Annex 1, confirms the approval of a wood preservative. The approval is valid in Denmark, Finland, Iceland, Norway and Sweden.

3 References

See EN 599-1, paragraph 2 "Normative references", and additionally:

NWPC Document No. 1:1998	Nordic Wood Preservation Classes. Part 1. Pine and other permeable softwoods
NWPC Document No. 3:1998	Conditions for quality control and marking of preservative-treated wood in the Nordic countries. Part 1. Pine and other permeable softwoods
ENV 12037, 1996	Wood preservatives - Field test method for determining the relative protective effectiveness of a wood preservative exposed out of ground contact - Horizontal lap-joint method

4 Definitions

See EN 599-1, paragraph 3, "Definitions".

5 Requirements and application

5.1 General

The approval is applicable to wood preservative products only. It is not applicable to single active ingredients. The application for approval of a wood preservative for the production of quality certified preservative-treated wood must be completed on a special form, see Annex 2, and submitted to the NWPC Secretariat.

The application form is available from the NWPC Secretariat, see 6.1.

5.2 Applicant

The applicant shall be the producer of the preservative or shall have all rights needed to seek approval. Where the applicant is not the data holder for the dossier associated with the required documentation, a letter of access will be required for each document in the dossier.

5.3 Trade name of the product

The trade name of the product must be unambiguous. The NWPC can accept that a particular product is marketed with different trade names in the Nordic countries, provided all trade names are stated in the application and thus can be stated in the NWPC Certificate of approval and list of approved preservatives.

5.4 Wood preservation class

The application for approval can refer to one or more wood preservation classes.

5.5 Characterization of the preservative

The state of delivery, e.g. paste, granulate, liquid etc and the complete formulation of the preservative shall be given. The active ingredients shall be stated by empirical formula, CAS number if applicable, and percentage m/m. If additives are used these shall be stated by type, e.g. binders of alkyd type, and percentage m/m.

The various components shall be grouped, where applicable, into

- active ingredients
- binders
- solvents
- co-solvents
- pH stabilizers
- anti-foaming agents
- etc

Active ingredients and other components (without mentioning individual substances) will be stated in the certificate of approval. The product's contents of the various components shall be stated with the following tolerances:

Nominal content of active ingredient	Tolerance, percentage of nominal content
active ingredient ≤ 2,5 % m/m	± 15,0 %
2,5 % < active ingredient ≤ 10,0 % m/m	± 10,0 %
10,0 % < active ingredient ≤ 25,0 % m/m	± 6,0 %
25,0 % < active ingredient ≤ 50,0 % m/m	± 5,0 %
50,0 % < active ingredient ≤ 100,0 % m/m	± 2,5 %

For organic solvents the following physical properties shall be stated:

- density (g/cm³ at 20 °C)
- kinematic viscosity (mm²/s at 20 °C)
- flashpoint (°C, minimum)
- water content (% v/v, maximum)
- distillation range (°C); when 90 % has been distilled off

5.6 Biological tests

5.6.1 General

Mandatory tests for each wood preservation class are stated in Annex 3.

Reports from biological testing must contain information and confirmation of the tested product's chemical composition, e.g. by a report from chemical analysis of the active ingredients of the product.

Independent institutes accepted by the NWPC shall carry out tests and chemical analyses.

5.6.2 Wood preservation classes B and AB

Wood preservatives to be used for NWPC wood preservation classes B and AB shall be tested according to EN 599-1, paragraph 6.3, Hazard class 3, Penetrating process.

The minimum biological testing requirements are:

a) Wood preservation class B

Commodities, such as external joinery, intended for use in conjunction with a paint or other coating or with some other form of protective casing applied prior to exposure in use which protects the preservative from depletion:

- wood destroying basidiomycete fungi in accordance with EN 113 after EN 73 and after EN 84 separately, but excluding *Coriolus versicolor*
- field test in accordance with EN 330 (L-joint) at two test sites - at least one of them in the Nordic area. The test shall be carried out until the untreated reference samples of pine sapwood have reached the mean rating 3 (severe decay) in one of the fields, or for at least 5 years. When renewal the requirement of field test results can be replaced by documented experience for at least 10 years in the Nordic countries from use in practice

b) Wood preservation class AB

Commodities other than in (a):

- wood destroying basidiomycete fungi in accordance with EN 113 after EN 73 and after EN 84 separately, but excluding *Coriolus versicolor*
- field test in accordance with ENV 12037 (Lap-joint) at two test sites - at least one of them in the Nordic area. The test shall be carried out until the untreated reference samples of pine sapwood have reached the mean rating 3 (severe decay) in one of the fields or for at least 5 years. When renewal the requirement of field test results can be replaced by documented experience for at least 10 years in the Nordic countries from use in practice.

NOTE: If surface coating before exposure is recommended by the producer, the test samples will be surface coated with the recommended product before field testing.

5.6.3 Wood preservation class A

Wood preservatives to be used for NWPC wood preservation class A shall be tested according to EN 599-1, paragraph 6.4, Hazard class 4, Penetrating process.

The minimum biological testing requirements are:

- wood destroying basidiomycete fungi in accordance with EN 113 after EN 73 and after EN 84 separately and including *Coriolus versicolor*
- soft rot fungi in accordance with EN 807
- field test in accordance with EN 252 after a minimum period of five years at two test sites - at least one of them in the Nordic area. After 30th June 2009, test results from two sites situated in the Nordic area are required.

5.6.4 Wood preservation class M

Wood preservatives to be used for NWPC wood preservation class M shall be tested according to EN 599-1, paragraph 6.5, Hazard class 5.

The minimum biological testing requirements are:

- wood destroying basidiomycete fungi in accordance with EN 113 after EN 73 and after EN 84 separately and including *Coriolus versicolor*
- soft rot fungi in accordance with EN 807
- marine test in accordance with EN 275 after a minimum period of five years at one test site in the Nordic area.

5.7 Methods for chemical analysis and for checking compliance of the treated wood

The applicant shall advise methods for:

- quantitative analysis (% m/m) of all active ingredients in the solution of the preservative and at least for the main active ingredient in the treated wood
- determination of the concentration of preservative in the treating solution if the treating solution is mixed at the treating plant

- determination of the penetration of preservative in the treated wood, visualised by colour pictures
- determination of the degree of fixation if applicable.

There must be at least one official (published) method for each of the four requirements.

5.8 Treatability properties and stability

The application shall contain documented results of the treatability properties and stability in use and storage of the preservative:

- the ability of uptake and penetration into pine sapwood for the wood preservation classes in question shall be demonstrated according to the following procedure:

Classes AB, A and M

20 cladding boards, (thickness 19-25 mm and minimum width 95 mm) and 20 planks (planed, minimum thickness 45 mm and minimum width 95 mm) of pine of Nordic origin shall be treated with the preservative in a pilot or commercial plant according to a typical process to be used in practice. If test samples of less than 1 m length have to be used they must be end-sealed. Minimum 50 % of the cross sections of the test samples must consist of sapwood. After treatment the samples are cut in the middle and the following requirements apply:

- Maximum 5 samples of each type may have untreated sapwood zones.
- All other samples must have full sapwood penetration of all active ingredients. (If the active ingredients are not coloured or can be shown by reagents, the penetration must be documented by chemical analysis)
- The retention, as demonstrated by chemical analysis, shall be at least the one expected to be approved.

Class B

20 profiled components of pine of Nordic origin, minimum 0,75 m long and with a sapwood depth of minimum 6 mm on one side shall be treated with the preservative in a pilot or commercial plant according to a typical process to be used in practice. After treatment the samples are cut in the middle and the following requirements apply:

- Maximum 5 samples may have untreated sapwood in the 6 mm zone.
 - All other samples must have full penetration of all active ingredients in the 6 mm sapwood zone.
 - The retention, as demonstrated by chemical analysis, shall be at least the one expected to be approved.
- the preservative's stability during treatment and in the storage tank. The applicant shall demonstrate that the preservative solution contains the same amount and relative proportions of active ingredients after storage for three months as well as after 10 successive treatments with pine wood samples as in the fresh solution.

If certain additives are recommended, e.g. for certain periods of the year, such as

- agents to prevent mould on the treated wood
- pH stabilisers
- colour stabilisers
- water-repellents

the treatability properties and stability must be demonstrated with relevant amounts of these additives.

5.9 Technical data sheets

The application must contain draft technical data sheets for

- the wood preservative

- additives, if applicable
- the treated wood

See Annex 4 for guidance to prepare technical data sheets.

6 Procedure

6.1 Application

The application form, see Annex 2, properly filled out and relevant annexes, such as test reports, methods of analysis and draft technical data sheets shall be submitted (6 copies) to

The NWPC Secretariat
For address see www.ntr-nwpc.com

The NWPC secretariat will acknowledge the receipt of the application and will simultaneously send an invoice of the application fee.

The application form as well as information about current fees can be obtained from the NWPC Secretariat.

If the documentation from field tests for classes AB and B is based on less than five years testing in one field, see 5.6.2 a) and b), the applicant shall submit the test results from both fields after five years' testing to the NWPC Secretariat for consideration.

6.2 Confidentiality

The NWPC Secretariat and Technical Committee will process all applications with confidentiality.

6.3 Approval

Approval of the preservative or refusal is normally reported to the applicant within three months after receipt of the application and application fee.

NWPC decisions are final. Only the reasons for refusal are explained.

6.4 Certificate of approval

The approval is reported in the form of a certificate, see Annex 1, which is signed by the Chairman of the NWPC Technical Committee and the NWPC Secretary-General. The certificate of approval only refers to protection against the relevant biological agencies and does not consider physical or chemical properties of the preservative. The approval is valid in Denmark, Finland, Iceland, Norway and Sweden.

6.5 List of approved preservatives

The NWPC will issue, normally twice per year, an updated list of approved preservatives. The list will include current retention figures per wood preservation class for each preservative. The list of approved preservatives can be seen at www.ntr-nwpc.com

6.6 Communication

All communication with the NWPC and its Technical Committee has to be through the NWPC Secretariat. The address for NWPC Secretariat see www.ntr-nwpc.com

7 Evaluation

The NWPC Technical Committee will evaluate the complete application and in this process particular attention will be paid to biological reference values (b.r.v.), the critical value (c.v.) as well as other relevant information about the performance of the preservative.

The retention is then determined by multiplying the critical value (c.v.) by an adjustment factor, see EN 351-1, paragraph 5.3.

NOTE: In the evaluation process of a wood preservative for wood preservation class AB data from field tests in ground contact, e.g. in accordance with EN 252, can also be considered.

The retention requirements are expressed with the following precision:

Retention requirements	Precision
$0 < \text{approved retention} \leq 5,0 \text{ kg/m}^3$	0,1 kg/m ³
$5 < \text{approved retention} \leq 10,0 \text{ kg/m}^3$	0,5 kg/m ³
$10 < \text{approved retention} \leq 50,0 \text{ kg/m}^3$	1,0 kg/m ³
$\text{approved retention} > 50 \text{ kg/m}^3$	5,0 kg/m ³

If the formulation of the preservative is changed, EN 599-1, Annex A will be considered to see if the changes will lead to requirements for re-testing of the preservative.

8 Approval

A NWPC-approval is reported in the form of a certificate which normally is valid for 5 years. Only one certificate is issued for each preservative. This is submitted to the applicant. The NWPC Secretariat and members of the NWPC Technical Committee hold confidential copies.

The national Nordic quality control and certification bodies, see NWPC Document No. 1, may request copies of the certificates from the certificate holders.

9 Marking

Wood preservatives approved by the NWPC, and marketed to wood preserving plants affiliated to a national Nordic quality control and certification scheme, see NWPC Document No. 1, shall be marked

- in accordance with EN 599-2, paragraph 6, "Marking", and
- with NWPC approved retention according to the Nordic wood preservation class.

NOTE: The NWPC marking can, for example, be expressed as
"This preservative is approved by the Nordic Wood Preservation Council for use in the Nordic wood preservation class X with a retention of XX kg/m³ sapwood".

10 Control

The compliance of an approved preservative with the nominal formulation will be checked in connection with third party inspections within the framework of the quality control and certification scheme, see NWPC Document No. 3.

11 Renewal

An approval is normally valid for five years. It can be renewed following a written application, payment of a renewal fee and consideration by the NWPC Technical Committee. The NWPC Secretariat will remind certificate holders approximately two months before the expiry date.

Application for renewal shall contain updated field test results.

12 Transition conditions

Approvals, valid in 1997, can be confirmed by a certificate issued according to the conditions in this document following a written application but without any fee.

When an approval expires it can be renewed without presentation of further documentation until 31 December 2004, following a written application and payment of a renewal fee. Preliminary approvals for the wood preservation classes AB and B, valid until 31 December 2004, can be issued based on the mandatory laboratory tests.

These transition conditions are applicable until 31 December 2004. After that date, an approval can be renewed according to paragraph 11 only.

13 Revision and withdrawal

This document can be revised by the NWPC. It can be withdrawn with one year's notice.

Annex 1 (normative):

NWPC Certificate

NORDISKA TRÄSKYDDSRÅDET - NTR
NORDIC WOOD PRESERVATION COUNCIL - NWPC



Certificate No. 500 for approval of wood preservatives

Preservative Preswood S24 **Date** 2 March 1999
Ref. No. T82/99

Requested by Wood Pres A/S
DK-2300 Copenhagen, Denmark

Description of preservative The preservative has the following formulation:

A. Total		B. Active ingredients	
CuO	10,3 %	Cu	8,2 % m/m
CrO₃	26,8 %	Cr	13,9 % m/m
As₂O₅	22,7 %	As	14,8 % m/m
H₂O	40,2 %		
	<hr/>		
	100,00 % m/m		

Conditions of approval The preservative is approved for use in the following Nordic Wood Preservation Class according to NWPC Document No. 1 which is the Nordic application document of EN 351 and EN 599.

Nordic Wood Preservation Class	M	A	AB	B
<i>European Hazard Class</i>	5	4	3	3 (coated)
Retention, kg/m³ sapwood	30,0	12,0	5,0	-

The retention figure refers to the total formulation (A) specified above. This approval is valid for all pine species (*Pinus* spp) and other softwood species which are classified as permeable according to EN 350-2 and which have been approved by the NWPC.

Remarks and reservations This approval only refers to protection against biological agencies and does not consider physical or chemical properties.

This approval only refers to the preservative product and does not include preservative-treated wood. Wood treated according to the classes M, A, AB and B is exclusively supplied by treatment plants affiliated to the Nordic Quality Control Scheme for Preservative-treated Wood according to NWPC Document No. 3.

This certificate must only be reproduced in its complete form.

Validity This approval is valid until **31 December 2004**. However, it can be withdrawn earlier if it is considered necessary following new test results etc. For validity, see the latest issue of the NWPC list of approved preservatives.

Signature NN NX
NWPC Secretary-General Chairman of the NWPC Technical Committee

Annex 2 (normative):

Application for Approval of Wood Preservatives

according to NWPC Document No. 2

1 Applicant

Name: _____

Address: _____

Telephone: _____ Telefax: _____

E-mail: _____ Internet: _____

2 Name of product

3 Wood preservation class

Approval is applied for the following Nordic wood preservation class(es) according to NWPC Document No. 1
Expected retentions are expressed as kg/m³ sapwood.

Wood species		Classes applied for; please tick in appropriate box(es)			
Trade name	Botanical name	M	A	AB	B
European redwood	<i>Pinus sylvestris</i>				

4 Data of the preservative

State when delivered (paste, powder, granulate liquid etc)
and packaging: Appendix No. _____

Chemical composition ¹⁾ incl. possible additives: Appendix No. _____

Physical data ²⁾: Appendix No. _____

Documentation re chemical analysis of active ingredient(s): Appendix No. _____

¹⁾ Complete composition must be presented. For organic solvent preservatives, in addition to the percentage of active ingredients the type and percentage of binding agents and water repellents (e.g. "binder of alkyd type", 2 %), colour additives, driers and other additives (e.g. colour of aniline type, 0,5 %) and solvent must also be stated.

²⁾ For organic solvent wood preservatives in particular, it is important to know certain physical properties. For the solvent, or alternatively for the preservatives, the following must be stated:

- density (20 °C, g/m³)
- flash point (°C, minimum)
- distillation range (°C), alternatively temperature when 90 % of the solvent (preservative) has been distilled off.
- kinematic viscosity, (20 °C, mm²/s)
- water content (% v/v maximum)

5 Biological test results

See also Annex 3

Laboratory tests:

- Basidiomycetes:

EN 73 + EN 113 + or - *Coriolus versicolor*:

Appendix No. _____

EN 84 + EN 113 + or - *Coriolus versicolor*:

Appendix No. _____

- Soft rot: ENV 807, Part 2:

Appendix No. _____

Field-tests above ground:

- EN 330: L-joint:

Appendix No. _____

- ENV 12037: Lap-joint:

Appendix No. _____

Field test in ground contact: EN 252:

Appendix No. _____

Marine test in seawater: EN 275:

Appendix No. _____

Chemical analysis of product tested:

Appendix No. _____

6 Treating properties and stability

According to paragraph 5.8:

Appendix No. _____

7 Methods of analysis and quality control

Method(s) of analysis for determination of all active ingredient(s) of the preservative and at least the main active ingredient in the treated wood:

Appendix No. _____

Method(s) of analysis for determination of the retention of the preservative (active ingredient(s)) in the treated wood:

Appendix No. _____

Method(s) for determination of the concentration of the preservative solution at the treating plant in those instances where the solution is prepared by diluting a concentrate or prepared from a powder etc:

Appendix No. _____

Method(s) for qualitative determination of the penetration of the preservative in the wood (visualized by colour pictures):

Appendix No. _____

8 Other information

Records of the durability of the treated wood under service conditions:

Appendix No. _____

Draft technical data sheet for the preservative:

Appendix No. _____

Draft technical data sheet for the treated wood:

Appendix No. _____

The undersigned understands that:

- the application will be treated confidentially as soon as the application fee, after invoicing, has been paid to the NWPC
- only the efficacy of the preservative against biological degradation is considered by the NWPC
- any approval that may result will be communicated in the form of a certificate with a validity of five years but the approval can be withdrawn immediately if considered necessary on account of new evidence
- copy of the approval will be distributed to the national bodies responsible for the quality control and certification of preservative-treated wood
- the NWPC issues a list of approved preservatives.

Place and date

Signature

Annex 3 (informative): Minimum requirements for fungal tests

Test Methods	NWPC Wood Preservation class			
	B	AB	A	M
Test on European redwood (<i>Pinus sylvestris</i> L) sapwood only				
EN 73 + EN 113 (Not <i>Coriolus versicolor</i>)	+	+		
EN 73 + EN 113 + <i>Coriolus versicolor</i>			+	+
EN 84 + EN 113 (Not <i>Coriolus versicolor</i>)	+	+		
EN 84 + EN 113 + <i>Coriolus versicolor</i>			+	+
EN 330 (the untreated reference samples of pine sapwood shall have reached the mean rating 3 of severe decay)*	+			
ENV 12037 (the untreated reference samples of pine sapwood shall have reached the mean rating 3 of severe decay)*		+		
ENV 807, Part 2			+	+
EN 252 (≥ 5 years)*			+	
EN 275 (≥ 5 years)				+

* At least 2 relevant localities and at least one Nordic site.

Annex 4 (informative): Guidelines for Technical Data Sheets

1 Introduction

A technical data sheet, as complete as possible, for the preservative and the treated wood must be enclosed with the application.

During the impregnation one or more properties of the wood are changed. Primarily the resistance to biological degradation is increased. However, the treatment can cause other important changes. The aim of the data sheet is to supply as much information as possible about the products to ensure that the preservative and treated wood will be correctly used.

This appendix is intended to help the applicant to prepare good technical data sheets. The list below includes properties and facts of importance - in certain instances of decisive importance - for an appropriate use of the preservative and the treated wood. Evidently, information on parts of Section 3 below are required only when relevant to the applications envisaged. Information presented in the data sheets can preferably be used in instructions etc.

Properties not investigated should be marked as "not investigated" or "investigation in hand". If possible, references should be given for all information.

The approval will not include the contents of the technical data sheet. If obviously incorrect or misleading - information is given, the NWPC reserves the right to comment on it. The approval procedure may be delayed until corrections have been done and accepted by the NWPC.

2 Technical data sheet for the preservative

2.1 General description

- Condition on delivery (liquid, powder, paste etc)
- Colour
- Odour
- Type of container.

2.2 Physical and chemical data

- Complete chemical composition and information on suitable methods for analysis of active ingredients.
- Physical data important for the user to know; for water-borne preservatives, this can be, for instance, solubility at different temperatures, pH and corrosivity; for organic solvent preservatives: density, viscosity, flash point, contents of aromatic hydrocarbons and distillation range ought to be mentioned.
- Properties re fixation (water-borne preservatives) and evaporation of solvent (organic solvent preservatives).

2.3 Instructions for the use of the preservative

- Information about which wood preservation classes the preservative is approved for and retention requirements (these data will be obtained from the NWPC when the preservative is approved).
- Recommended impregnation methods.
- Preparation of solution; recommended concentration with regard to the impregnation method and preservation class
- Additives; recommended concentration.

2.4 Environmental and occupational safety

- Toxicity (LD₅₀-value, toxic limit etc)
- Safety regulations
- Disposal of spillage, sludge
- Registration with products control authorities.

3 Technical data sheet for the treated wood

3.1 General

- Colour, colour fastness
- Other information on appearance, e.g. if the wood may become sticky after the impregnation
- Odour.

3.2 Conditioning, fixation of the preservative, solvent evaporation

- Conditioning and fixation properties regarding temperature, atmospheric humidity etc.
- Information about the suitability of kiln drying and recommended procedure (for wood treated with water-borne preservatives).
- Information about the suitability of forced evaporation of solvent and recommended procedure (for wood treated with organic solvent type preservatives).

3.3 Influence of water

- Water repellent properties
- Dimensional stability, split formation, fibre swelling
- Equilibrium moisture content
- Leachability of active ingredients.

3.4 Strength properties

- Impact, bending, compression, cleavage and shearing strength
- Nail and screw-holding properties.

3.5 Electrical properties

- Conductivity.

3.6 Fire-resistant properties

- Inflammability
- Glowing properties.

3.7 Machining properties

- Notify if treated wood has any blunting effect on tools such as saws and planes.

3.8 Compatibility with other materials

- Paints and other products for surface treatment
- Adhesives
- Metals (corrosion)
- Plastics and rubbers
- Stone, bricks, concrete
- Bituminous materials
- Putty and other sealing compounds.

3.9 Treatment after impregnation, maintenance

- Need for surface treatment after impregnation
- Treatment after wood-working
- Recommended ways of maintenance, e.g. for external cladding, garden furniture etc.

Examples of suitable paints, stains etc ought to be mentioned.

3.10 Environmental and occupational safety

- Toxicity to humans and animals
- Phytotoxicity
- Disposal of waste (waste wood, discarded wood).

3.11 Restrictions concerning handling and use, cf. 3.10

- Influence on food, potable water and fodder
- Indoor use.

3.12 Quality control

- Methods for checking penetration and retention of the preservatives in the wood.

3.13 Other