

**Testing of CC, CCA, CCB and CCP
Wood Preservatives according to
EN 113/EN 84**

NWPC-INFORMATION No. 25/90



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Background

In the revised Nordic standard for preservative-treated wood, INSTA 140 (1989), the number of preservation classes were increased from three to four. The additional class is called AB. Class AB treated timber is intended for sawn timber preferably treated with water-borne preservatives for out of ground contact use. The existing class B is intended for joinery, treated with organic solvent preservatives. Earlier, class A (timber for ground contact) was also used for out of ground contact commodities.

The new class AB is in accordance with the philosophy "use only as much preservative as is needed to protect the timber in the environment it is to be used".

The Nordic Wood Preservation Council (NWPC) is the institution granting approvals for wood preservatives to be used in accordance to the standard INSTA 140: "Wood preservation - Quality requirements for preservative treated wood". The test requirement for water-borne preservatives for approval to class AB is EN 113 after leaching according to EN 84 – and a field test out of ground contact (prEN 330) when approved by CEN.

At the time when class AB was introduced in 1989 adequate test reports were not available for all the various types of water-borne wood preservatives. NWPC then decided to carry out the tests on its own account and commissioned The Technical Research Center of Finland (VTT) to carry out the tests.

VTT delivered the results to NWPC in the reports No. PUU 09 - 13/90 15th January 1990.

This NWPC-Information is a summary of VTT's reports.

Preservatives tested.

The following commercial formulations were used as representatives for the wood preservative types:

The CC formulation was:

<i>CuO</i>	25,5 %
<i>CrO₃</i>	66,2 %
<i>H₂SO₄</i>	8,3 %

The CCA formulations were of both oxide type B and oxide type C (after AWPA):

CCA type B	CCA type C
<i>CuO</i> 14,8 %	<i>CuO</i> 14,2 %
<i>CrO₃</i> 26,6 %	<i>CrO₃</i> 37,6 %
<i>As₂O₃</i> 34,0%	<i>As₂O₃</i> 24,6%
<i>H₂O</i> 24,6 %	<i>H₂O</i> 24,6 %A

The CCB-oxid formulation was:

<i>CuO</i>	11,5 %
<i>CrO₃</i>	26,8 %
<i>H₃BO₃</i>	24,0 %
<i>H₂O</i>	37,7%

The CCP-oxid formulation was:

<i>CuO</i>	14,8 %
<i>CrO₃</i>	26,6 %
<i>H₃PO₄</i>	21,0 %
<i>H₂O</i>	37,6 %

Test method

The test standard used was EN 113 with and without leaching (EN 84). There were minor modifications regarding the test fungi and the number of dilutions tested.

Solutions

The solutions of the different preservatives were used in 3 dilutions depending on the retention of the preservative in class A. The dilutions were as follows:

CC	: 0,5 %,	0,75 %	and	1,0 %
CCA type B	: 0,9 %,	1,3 %	and	1,7 %.
CCA type C	: 0,7 %,	1,0 %	and	1,3 %.
CCB	: 1,5 %,	2,25 %	and	3,0 %
CCP	: 1,3 %,	1,9 %	and	2,6 %

Wood species

The wood species used in the test was European redwood (*Pinus sylvestris*).

Fungi and time of exposure

The fungi used were *Coniophora puteana* BAM Ebw 15, *Poria placenta* FPRL 280 and *Gloeophyllum trabeum* BAM Ewb 109. Time of exposure was 16 weeks, whereafter the loss of mass was determined.

Results

According to the test the toxic values were as follows:

Preservative		Toxic value	
		without leaching kg/m ³	with leaching kg/m ³
CC	<i>Coniophora puteana</i>	> 6,9	5,0 - 6,9
	<i>Poria placenta</i>	> 7,0	> 6,9
	<i>Gloeophyllum trabeum</i>	< 3,4	< 3,4

Preservative	Fungi	Toxic values	
		without leaching kg/m ³	with leaching kg/m ³
CCA type B	<i>Coniophora puteana</i>	< 6,1	< 6,1
	<i>Poria placenta</i>	< 6,1	< 6,1
	<i>Gloeophyllum trabeum</i>	< 6,1	< 6,1
CCA type C	<i>Coniophora puteana</i>	< 4,8	< 4,8
	<i>Poria placenta</i>	< 4,8	< 4,8
	<i>Gloeophyllum trabeum</i>	< 4,8	< 4,8
CCB	<i>Coniophora puteana</i>	< 10,5	10,5 - 15,4
	<i>Poria placenta</i>	< 10,5	15,5 - 20,8
	<i>Gloeophyllum trabeum</i>	< 10,5	< 10,5
CCP	<i>Coniophora puteana</i>	> 19,5	> 19,5
	<i>Poria placenta</i>	> 19,5	> 19,5
	<i>Gloeophyllum trabeum</i>	< 9,8	< 9,8

NWPC's requirement for class AB retention

The Council decided that where the results from an EN 113 test with leaching (EN 84) led to a higher retention than required for the preservative in class A, the retention in class AB will be the same as class A. If NWPC later gets an application for a specific formulation in class AB with results from an EN 113-test with EN 84-test or an out of ground contact field test (prEN 330) leading to a lower retention than approved on the basis of this work, a new retention can be approved for class AB for this specific preservative.

Based upon the results mentioned above, NWPC decided in the meeting on 8th February 1990 that the retention requirements for the different types of preservatives should be:

Type of preservative	Class AB kg/m ³
CCA	about 50 % of class A
CCB	75 % of class A
CCP	the same as class A
CC	

For specific informations regarding approved retentions in the various classes refer to NWPC's publication: "Wood preservatives Approved by the Nordic Wood Preservation Council".

References

In this document reference is made to:

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- EN 113 Determination of toxic values of wood preservatives against wood destroying Basidiomycetes cultured on an agar medium.
- EN 84 Wood preservatives. Accelerated ageing of treated wood prior to biological testing. Leaching procedure.
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