

Nordic wood preservation classes and product requirements for preservative-treated wood

Part 1: Pine and other permeable softwoods

NWPC Document No 1:2013

Nordic Wood Preservation Council 2012

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Approved by the Nordic Wood Preservation Council on 26 September 2012

Valid from 1 January 2013

3rd revision

The original language of this document is Swedish.

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1 Background

Since 1976 the Nordic countries have had an official standard for classification of preservative-treated wood. The standard was denoted INSTA 140 in 1989 with national designations SFS 3974 (Finland), DS 2122/INSTA 140 (Denmark), IST/INSTA 140 (Iceland), NS-INSTA 140 (Norway) and SS 05 61 10 (Sweden). This standard classified preservative-treated wood into four wood preservation classes: M, A, AB and B for end-uses in sea-water (M), in ground contact (A), above ground (AB) and for external joinery (B).

In connection with the implementation of the European standards for preservative-treated wood (EN 351) and wood preservatives (EN 599), INSTA 140 was withdrawn in 1997. Thus the Nordic wood preservation classes could no longer be defined in an official standard.

However, the Nordic wood preserving industry wished to maintain the well-established wood preservation classes. Therefore the Nordic Wood Preservation Council (NWPC) decided to prepare this Document which defines the Nordic wood preservation classes with means of the present European standards in the field, and it will in fact be the Nordic application document of EN 351.

The first issue of NWPC Document No 1, Part 1, came into force in 1998. In connection with a revision of EN 351 in 2007 and a modified penetration requirement for preservative-treated poles in 2012 NWPC Document No 1, Part 1 has been revised.

2 Scope

This Document defines four wood preservation classes, M, A, AB and B, and corresponding product requirements for preservative-treated pine (*Pinus* spp) and other permeable softwoods according to EN 350-2. Permeable softwoods are those whose sapwood is classified in treatability class 1.

This Document is applicable to preservative-treated glulam if the glulam product satisfies the requirements of penetration and retention of wood preservative.

These wood preservation classes refer only to the protection against biological deterioration. Any other requirements on the treated wood, such as wood quality grading, machining before treatment and moisture content on delivery must be specified separately.

3 References

For undated references, the latest edition of the referenced document applies.

EN 335-1	Durability of wood and wood-based products. Definition of use classes Part 1. General
EN 350-2	Durability of wood and wood-based products – Natural durability of solid wood. Guide to natural durability and treatability of selected wood species of importance in Europe

EN 351	Durability of wood and wood-based products. Preservative-treated solid wood Part 1. Classification of preservative penetration and retention Part 2. Guidance on sampling for the analysis of preservative-treated wood
EN 599-1	Durability of wood and wood-based products – Efficacy of preventive wood preservatives as determined by biological tests. Specification according to use class
ISO 2859-1	Sampling procedures for inspection by attributes. Sampling schemes indexed by acceptable quality level (AQL) for lot-by-lot inspection.
NTR Document No 2	Conditions for approval of wood preservatives for industrial wood preservation in the Nordic countries Part 1: Pine and other permeable softwoods
NWPC Document No 3	Nordic requirements for quality control of preservative-treated wood Part 1: Pine and other permeable softwoods

4 Wood preservation classes

Preservative-treated wood according to this Document is classified into the following four wood preservation classes: M, A, AB and B.

The classification is based on EN 351-1 and is related to the use classes defined in EN 335-1.

Production of preservative-treated wood according to this Document requires, in addition to requirements specified in sections 5-7, that the production plant is approved and affiliated to quality control according to NWPC Document No 3, Part 1.

How the NWPC wood preservation classes are related to EN 351-1 and EN 335-1 is shown in Annex 1, and examples of service conditions and commodities suitable for the wood preservation classes are shown in Annex 2.

5 Product requirements

5.1 Wood to be treated

The wood must not have any visible attack of wood destroying fungi or other micro-organisms which leads to softening of the wood or reduction of its strength and/or mass, and shall in principle be free from bark and inner bark.

Drying and conditioning of the wood before treatment shall be carried out in such a way that the penetration requirements can be fulfilled and that the properties of the treated wood are not adversely affected with respect to intended end-use.

All machining shall as far as possible be carried out before treatment.

For treatment according to class B, water-stored timber shall not be used, and all machining shall be carried out before treatment.

Stored, de-barked, green poles shall be marked with week and year when the first pole is put in place for drying. De-barked round-wood shall not be kept in stock uncovered during two successive summer periods. The second summer period starts on 1 July.

5.2 Wood preservatives

Wood preservatives shall be approved by the NWPC according to NWPC Document No 2.

Note 1 National restrictions, e.g. a maximum retention level set for a wood preservative by a national environmental authority, may restrict the use of NWPC approved wood preservatives fully or partially.

Note 2 A list of approved wood preservatives can be obtained from the NWPC Secretariat. It is also available on the NWPC website www.ntr-nwpc.com.

5.3 Wood preservation classes and treatment requirements

The wood preservative penetration and retention requirements for each wood preservation class are shown in the scheme below.

Wood preservation class	Treatment requirements	
	Penetration class according to EN 351-1	Retention of wood preservative
M, A and AB	NP 5 Full sapwood penetration	According to NWPC approval for the preservative
B	NP 3 Minimum 6 mm lateral penetration into the sapwood	

For the penetration a maximum tolerance of 10 % is accepted, which means that a maximum 10 % of the number of units in a batch may deviate from the penetration requirement, i.e. an accepted quality level AQL=10 according to EN 351-2 and ISO 2859-1.

For poles a maximum tolerance of 6,5 % is accepted, which means that a maximum 6,5 % of the number of units in a batch may deviate from the requirement, i.e. an accepted quality level AQL=6,5 according to EN 351-2 and ISO 2859-1.

The retention for a batch shall on average be at least as specified in the NWPC approval certificate for the wood preservative used.

If sampling from poles treated with water-borne wood preservatives is carried out by borings and the average sapwood depth is >30 mm, a tolerance of -5 % is allowed for wood preservation class A.

5.4 Machining after treatment

If cutting, drilling of holes and other minor machining cannot be avoided for the wood preservation classes M, A and AB before delivery from the treatment site, the machined surfaces must be treated with a suitable preservative. If other wood working, such as rip sawing and planing is carried out and if the wood is profiled after treatment, the classification will be lost.

If class B-treated wood is machined before delivery the classification will be lost.

6 Marking

Producers of preservative-treated wood affiliated to a quality control according to this Document, have the right and obligation to mark their products with the NWPC quality marks, see below.

Wood preservation class	NWPC quality mark
M	
A	
AB	
B	

Design and proportions shall comply with the images above and the size shall be adapted to the product to be branded.

Note National requirements may exist, and marking requirements are presented in NWPC Document No 3, Part 1.

7 Delivery

On delivery the treated wood according to this Document must comply with the following requirements:

- For wood treated with water-borne wood preservatives, the manufacturer's recommendations concerning after-treatment, e.g. fixation, must be applied before delivery
- Most of highly volatile, organic solvents should have evaporated
- Wood treated with creosote should have a dry surface and be non-tacky

The preservative-treated wood shall also comply with any customer, delivery (e.g. use of stickers, moisture content) or national requirements concerning environment and occupational safety.

Annex 1 (informative)

NWPC wood preservation classes in relation to EN 351-1 and EN 335-1

Penetration class according to EN 351-1		Use classes UC1-UC5 according to EN 335-1 and their relation to the wood preservation classes M, A, AB, B, GRAN and GW				
Class	Penetration requirement	UC 1	UC 2	UC 3	UC 4	UC 5
NP 1	None			GRAN** GW**		
NP 2	Min 3 mm lateral into sapwood					
NP 3	Min 6 mm lateral into sapwood			B		
NP 4*	Min 25 mm					
NP 5	Full sapwood			AB	A	M
NP 6	Full sapwood + 6 mm into heartwood					

* Applies to round-wood of resistant species only, i.e. treatability classified 3-4 according to EN 350-2.

** See NWPC Document No 1, Part 2, applicable to preservative-treated spruce.

Annex 2 (informative)

Example of end-uses for preservative-treated wood

Use class according to EN 335	Service conditions	Example	Recommended wood preservation class
1	Interior timbers in dry conditions.	Furniture, interior cladding	¹⁾
2	Wood above ground and under cover and fully protected from the weather but where high environmental humidity can lead to occasional but not persistent wetting.	Roof trusses, exterior timbers under cover	¹⁾
3	Wood above ground and either continually exposed to the weather or subject to frequent wetting; where there is relatively easy to replace damaged components and where the consequences of failure will be moderate.	3.1 External joinery, such as windows, doors etc 3.2 External cladding, garden timbers	B AB
4	Wood in contact with the ground or fresh water or severely exposed to the weather; or if a wood component is inaccessible or where the consequences of failure will be particularly serious.	Transmission poles, railway sleepers, fence posts, bridges	A
5	Wood constructions in sea water ²⁾ and constructions subject to extreme conditions or where there are special durability and strengths requirements.	Wharf timbers, jetties, piles	M
¹⁾ Preservative-treated wood normally not necessary to use in these use classes ²⁾ Salinity > 0,6%			