

Nordic requirements for quality control of preservative-treated wood

Part 2: Spruce (*Picea* spp)

NWPC Document No 3:2011

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Part 2: Spruce (*Picea* spp)

1 Background

With this Document the NWPC is introducing third party quality control for preservative-treated spruce according to NWPC Document No 1, Part 2.

2 Scope

This Document contains requirements for quality control of preservative-treated wood of spruce (*Picea* spp) produced to comply with the requirements for the wood preservation classes GRAN and GW according to definitions in NWPC Document No 1, Part 2.

Quality control bodies approved by the NWPC to carry out quality control of preservative-treated wood may apply deviations from the requirements in this Document. The deviations must be clearly justified, limited in time and they have to be approved by the NWPC Technical Committee, following prompt preparation.

This Document is not intended for investigation of preservative-treated spruce in use.

Note. Updated lists of producers of treated wood, affiliated to quality control according to this Document as well as of those quality control bodies that are approved by the NWPC can be acquired from the NWPC Secretariat, see www.ntr-nwpc.com.

3 References

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

NWPC Document No 1	Nordic wood preservation classes and product requirements for preservative-treated wood. Part 2: Spruce (<i>Picea</i> spp)
NWPC Document No 2	Conditions for approval of wood preservatives for industrial wood preservation in the Nordic Countries. Part 1: Pine and other permeable softwoods
EN 212	Wood preservatives. General guidance on sampling and preparation for analysis of wood preservatives and treated timber
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

ISO 2859-1 Sampling procedures for inspection by attributes
Sampling schemes indexed by acceptable quality level (AQL)
for lot-by-lot inspection

4 **Definitions**

Charge	All the wood treated together in a single operation
Batch	Clearly identifiable collection of units of preservative-treated wood manufactured to conform to the same defined penetration and retention requirements, e.g. cladding boards and window components
Sampling unit	One unit (for example a cladding board) of preservative-treated wood taken from a batch of preservative-treated wood
Composite sample	Collection of all test samples derived from the sampling units taken from the batch in accordance with the chosen sampling plan for the determination of retention
Sampling	All samples taken from a batch at the same time for the analysis of penetration and retention

See also definitions in EN 335, EN 350-2 and EN 351.

5 **Requirements for affiliation to quality control**

5.1 **General**

Producers of preservative-treated wood who wish to treat preservative-treated wood according to the requirements in NWPC Document No 1, Part 2, can, for each of their production sites, seek affiliation to quality control according to this Document.

The requirements for affiliation to the quality control are stated in clauses 5.2 to 5.7.

5.2 **Equipment**

The treatment plant shall be designed and equipped in such a way that the requirements for the requested wood preservation class according to NWPC Document No 1, Part 2, can be fulfilled.

The plant shall always be equipped with:

- instrument that can continuously monitor the process; process times, pressure and vacuum.
- instrument to measure the moisture content in the timber before treatment. If this is an electrical device, the electrodes shall be insulated.
- Device to measure the uptake of wood preservative/treating solution for each charge.

If the process requires heat, the plant shall be equipped with an instrument for registration of the temperature of the preservative/treating solution.

Note For example, heat is required with water-borne systems during the winter.

If the preservative is delivered as a concentrate, paste or powder that shall be diluted, the plant shall have equipment to measure the concentration of the treating solution.

5.3 Instructions

There shall be written instructions for:

- the plant's operation and maintenance
- the factory production control
- preparation of treating solution (if dilution is required)
- fixation of the wood preservative (for water-borne wood preservatives)

5.4 Factory production control

Continuous factory production control shall be carried out according to clause 7.2 under the leadership of the plant operator in charge.

5.5 Description of the production

Attached to the application for quality control the producer shall prepare a description of the production with at least the following contents:

- Contact details of the producer/production site (address, phone no, e-mail etc)
- Plant operator in charge and deputy
- Production statistics (with respect to preservative-treated wood and preservatives used)
- Commodities and wood preservation classes to be comprised in the quality control
- Production equipment, treatment processes used, type of process control
- Equipment for factory production control
- Instructions, see clause 5.3.

5.6 Initial inspection

Before the plant can be affiliated to the quality control, the production equipment, equipment and routines for factory production control shall be examined and approved by the quality control body. Additionally, a sampling carried out during the initial inspection shall be approved.

5.7 Affiliation to the quality control

When the initial inspection has been approved, the producer can be affiliated to the quality control. This is confirmed by an agreement between the producer and quality control body.

5.8 The producers' rights and obligations

When the requirements in this Document are satisfied, the producer has the right to produce classified, preservative-treated wood according to NWPC Document No 1, Part 2, as well as right and obligation to brand the treated wood with the NWPC quality marks, see clause 8.

Treated wood produced according to other specifications shall be clearly branded with divergent marks. The producer alone is responsible for the preservative-treated wood produced.

Any changes in connection with the production or plant operator in charge shall be reported in writing to the quality control body without delay.

The costs in connection with approval, initial as well as annual inspections, analyses and license fees shall be paid by the producer according to rules of the quality control body. For producers not belonging to the NWPC member countries, an annual fee as well as a royalty related to the production of wood treated

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according to NWPC Document No 1, Part 2, will be invoiced by the NWPC Secretariat. These fees are decided at the NWPC annual meeting.

6 Withdrawal from the quality control scheme

The producer can withdraw from the quality control scheme with one month's written notice. However, the producer is obliged to fulfil his economical obligations with respect to the quality control scheme for the present fiscal year.

7 Production control of preservative-treated wood

7.1 General

Production control of preservative-treated wood consists of factory production control according to 7.2 and third party control according to 7.3.

7.2 Factory production control

7.2.1 Aim and scope

The aim of the factory production control is to steer and ensure the quality of the production with respect to those product requirements defined for each wood preservation class in NWPC Document No 1, Part 2.

The most important parts of the factory production control are:

- Checking that the wood to be treated conforms with the requirements in NWPC Document No 1, Part 2
- Checking the concentration of the treating solution (when applicable) before treatment
- Selection of a suitable process as well as monitoring the process
- Checking the result of the treatment, i.e. the retention of the preservative shall comply with the requirements in NWPC Document No 1, Part 2.
- Checking that the delivery requirements are fulfilled
- Recording the treatment
- Application of routines for handling any deviation observed at the factory production or third party control.

Instructions for the factory production control shall be prepared, see clause 5.3.

Note 1 For preservation classes GRAN and GW the penetration is not checked as there is no requirement on preservative penetration.

Note 2 The instructions can be prepared in collaboration with the quality control body and/or customer.

The routines for the factory production control shall be adapted to the production at the production site.

Note 3 By this is understood, e.g. the need for checking the moisture content before treatment will vary with the type of production. If the wood is supplied from the producer's own sawmill and planing mill, the need for checking is probably less than if there are many suppliers of the wood raw material or if the production is mainly based on service treatments.

7.2.2 Treatment records

The production shall be recorded continuously with a minimum of information accordingly:

- date and charge number
- wood species, commodity and quantity
- wood preservation class or other treatment specification
- highest and lowest moisture content measured before treatment, see Note 3 above
- wood preservative used, concentration (if diluted) of treating solution and temperature if heating is part of the process
- preservation process (times, pressure and vacuum)
- uptake of treating solution/preservative for each charge (litre/m³ total volume of wood)
- re-treatment, if applicable, and result of penetration analysis

Note Treatment records can be kept electronically or as printouts from computers etc.

It shall be clearly stated in the records who was responsible for the treatment and the records shall be filed for at least five years.

7.2.3 Sub-standard treatment

If sub-standard retention is found either at the factory production control or the third party inspection, the batch must either be re-treated to comply with the requirements in NWPC Document No 1, Part 2, or be delivered to customer, but clearly marked that the batch does not comply with these requirements.

7.3 Third party control

Third party control shall be conducted by a control body approved by the NWPC. The aim of the third party control is to ensure that the factory production control is carried out and to check that the quality of the treated wood complies with the requirements in NWPC Document No 1, Part 2.

The third party control shall be carried out through at least two unannounced visits during one calendar year as decided and carried out by the control body.

For production sites with an annual production of NTR branded wood of maximum 7 000 m³ only *one* inspection per year is normally carried out. The second inspection can be replaced by a procedure where the sampling is carried by the production site and the samples are sent to the control body for analysis and evaluation. However, this requires that the production site during two consecutive years with four inspection visits have had approved results for all wood preservation classes applicable for the site. If the production site at any inspection does not comply with the requirements in NWPC Document No 1, Part 2, two inspection visits will again be carried out during the next two years.

The same applies with respect to major deviations from the nominal wood preservative composition, marking of the treated wood, the factory production control and any particular national requirements.

During the inspection visit the inspector shall:

- check that factory production control and treatment records are carried out continuously according to given instructions
- check the plant's equipment for factory production control, mainly equipment for measuring the concentration of the treating solution (if applicable) and the wood moisture content
- take a sample of the wood preservative for chemical and/or physical analysis
- take random samples from the treated wood for analysis of the preservative retention
- check that updated instructions required according to this Document are available
- check that requirements for delivery and marking are fulfilled

- check that any particular national requirements are fulfilled.

The inspector cannot ask for information regarding conditions that are not specified in this or other NWPC documents.

After the inspection visit a report with the results of the analyses carried out as well as any observations of importance will be sent to the producer.

8 Marking

Producers affiliated to third party quality control have the right and obligation to brand the products with the NWPC quality marks.



Wood preservation class	NWPC quality marks	Colour codes
GRAN		Orange
GW		Brun

Figure 8.1 NWPC quality marks and related colour codes for preservative-treated spruce.

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

The quality marks may also be used on invoices, letterheads, promotion leaflets etc.

Delivery documentation (e.g. delivery note) shall always contain information on wood preservative used and wood preservation class. If pre-printed on invoices, delivery notes etc that the wood delivered is treated according to the requirements in NWPC Document No 1, Part 2, it must be clearly stated if the wood is treated according to another specification to avoid misunderstanding.

Bundle marking shall at least contain the following information, see Figure 8.2:

- Treatment according to NWPC Document No 1, Part 2, and EN 351-1
- Name of wood preservative used
- Wood preservation class and penetration class according to EN 351-1: NP 1 for classes GRAN and GW
- Wood preservative retention in the analytical zone (refer to NWPC list of approved wood preservatives)
- Charge number and year
- Name of the producer

Note National requirements on additional information on the bundle marking and requirements for individual marking may apply.


Preswood Ltd	
	
Wood preservative	Pressure Z with a minimum retention of 9,0 kg/m ³ in the analytical zone (outer 3 mm)
Charge no:	125/09
Penetration class:	NP 1 (EN 351-1)
This timber is treated according to NWPC Document No 1, Part 2, and EN 351-1 and quality supervised in accordance with NWPC Document No 3, Part 2.	

Figure 8.2 Example of bundle marking.

Colour code may be used to brand each piece of the treated wood as an alternative to using the quality mark, see Figure 8.1.

Producers treating wood according to NWPC Document No 1, Part 2, and certified for CE-marking may also use the CE-mark to mark each piece or for bundle marking.

9 Guidelines for sanctions

9.1 General

Before any sanctions are carried out, it shall be considered whether there are extenuating or aggravation circumstances.

9.2 Sanctions if the retention is not approved

If the retention is not approved at third party control for one or more classes, the following procedure shall be carried out:

1. The control body informs the producer in the inspection report that the samples have sub-standard retention. Normally the producer shall within two weeks after receiving the report send at least 13 cross-clauses of the non-conforming commodity(-ies) or class/-es for analysis.

Note In order to find the reasons for non-conforming retention, a sample of the treating solution can also be taken and analyzed.

2. If the retention is still not conforming to the requirements after analysis of the samples sent by the producer, an extra inspection is normally carried out within one month.

3. If the retention at this extra inspection does not comply with the requirement the right to mark is normally withdrawn for the commodity or class.

4. If more than two months have passed since withdrawal of the right to mark for a commodity or class, or more than four months have passed since the control body reported inadequate retention at an ordinary

inspection, and no action has been carried out, the right to mark will be withdrawn for all commodities and classes and the producer will be suspended from the third party control.

9.3 Sanctions if the formulation of the wood preservative does not comply with the nominal formulation

If the formulation of the wood preservative does not comply with the nominal specification or tolerances allowed for chemical composition and/or physical properties, see NWPC Document No 1, Part 2, and clause 10.5.

- a new sample shall be taken and analyzed within two months after receipt of the report from the quality inspection
- if this sample is still not approved, a new sample shall be taken within one month
- if the formulation still does not comply with the tolerances, the right to mark will be withdrawn for the wood preservation class two months after the producer has been informed.

9.4 Sanctions following other remarks

- If marking according to this Document is missing or incorrect
- If the requirements regarding the factory production control are not met
- If any particular national requirements are not met, then

1. a remark thereof will be noted in the inspection report.

2. the remark will be followed up at the next ordinary inspection. If no action has been taken by the producer, the producer shall notify the control body in writing within 14 days after receipt of the inspection report of any action to be taken to meet the requirements again.

3. if the remark still exists after the extra inspection, another extra inspection is carried out within two (2) months to follow up the action plan.

4. if no correction measures have been taken until the extra inspection, the right to mark is withdrawn for the commodity or class.

9.5 Continuous violation of the requirements

If at an ordinary inspection the producer has neglected to carry out the action with respect to remarks from previous inspections, the right to mark is withdrawn immediately and the producer is suspended from the third party control.

9.6 Withdrawal of the right to mark the treated wood

When the right to mark is withdrawn, the producer must not brand the timber with the NWPC quality marks. The right to mark can be withdrawn for a commodity (window components, cladding), a single wood preservation class (GRAN, GW) or all classes for which the producer is approved. The latter means that the producer is suspended from the third party control.

Withdrawal of the right to mark is reported to the producer and made public on the NWPC website www.ntr-nwpc.com.

9.7 Requirements to regain the right to mark the treated wood

To regain the right to mark the treated wood the producer must inform the control body in writing what action has been carried out to correct the circumstances that caused the withdrawal of the right to mark. The

control body will then carry out at least one inspection to check that the production complies with the quality requirements. If the production is approved, the producer will regain the right to mark.

9.8 Suspension from the quality control scheme

Suspension from the quality control will take place, in addition to what is said in clauses 9.2, 9.5 and 9.6 if:

- the marking is mis-used
- if the control body is prevented by the producer to carry out inspections
- there are circumstances that can have the effect that authorities or the public lose their confidence in the control scheme and /or the control body
- the producer does not settle his account with the control body.

At suspension, approval certificate and affiliation agreement are immediately withdrawn.

Suspension is reported to the producer and made public on the NWPC website www.ntr-nwpc.com.

Annex 1 (normative)

10 Third party control of the classes GRAN and GW. Sampling, measuring and calculation of the wood preservative retention

10.1 General

Sampling and analysis of wood treated with water-borne and organic solvent borne wood preservatives are based on guidelines in EN 351-2.

Samples of treated wood and wood preservative/treating solution shall be adequately marked to secure traceability during further processing.

10.2 Selection of batch

For the selection of batch, the following shall be considered:

- The batch shall be selected from wood treated since the latest inspection.
- If sampling is to be carried out from the same commodity manufactured at different plants at the same site, the batch should be selected in such a way that commodities from the different plants are represented in the batch.

10.3 Sampling for determination of retention

10.3.1 General

Samples shall be taken at random from the selected batch after appropriate conditioning.

The number of samples is determined according to the number of sampling units of the batch, see Table 10.1.

Table 10.1 Number of samples to be taken from batches of different sizes

Batch size	Number of samples to be taken from the batch
5* - 150	5
151 - 500	8
501 - 3200	13
3201 - 35000	20
35001 - 500000	32
> 500.000	50

* If the batch consists of less than 5 units, every piece of timber shall be subject to sampling.

Note The same sampling frequency may be used for the factory production control of batches.

Test samples shall be taken from clear, straight-grained wood, away from splits, checks and other defects and at least 100 mm away from knots in a longitudinal direction. For assessment of retention, test samples shall be taken midway between ends or at least 500 mm from the end grain.

Test samples shall be taken as cross-sections, see clause 10.3.2.

10.3.2 Cross-sections

Cross-sections shall be at least 70 mm long.

10.4 Determination of preservative retention

The retention shall be determined for samples from a batch by quantitative chemical analysis according to well-recognized methods or methods recommended by the wood preservative manufacturer.

Blooming on the surface of treated wood shall be removed before analysis.

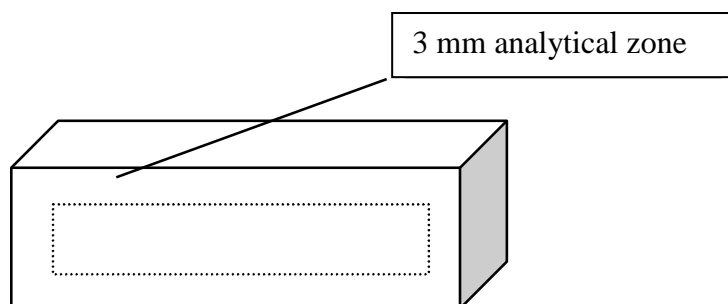


Figure 10.1 Sampling for analysis of preservative retention.

From the cross-sections, slices of a suitable thickness, depending on the method of retention analysis, are cut. The outer 3 mm from all surfaces, as far as possible, are removed, see Figure 10.1, and collected in a composite sample.

For determination of the retention, at least analytical data for one active ingredient will be used. The selection of active ingredient must be carried out with respect to which of the active ingredients that can be analyzed with the highest accuracy and precision.

If the density of the wood cannot be determined by accepted methods, a dry density of 430 kg/m^3 shall be used for spruce (*Picea abies*).

The retention is considered to be approved if the retention of the composite sample determined by analysis (kg/m^3 sapwood) is at least the retention approved by the NWPC for the wood preservation class in question.

10.5 Sampling and analysis of wood preservative and treating solution

Wood preservatives used at each production site shall be analyzed by the control body annually with respect to the compliance with specifications and tolerances of active ingredients and, if applicable, physical properties.

Sampling from wood preservative and treating solution shall be carried out according to EN 212.


The active ingredients of water-borne and organic solvent type wood preservatives shall be analyzed with respect to well-recognized, quantitative chemical methods of analysis or methods recommended by the wood preservative manufacturer. The result of the analysis shall be in accordance with the composition stated in the NWPC approval certificate and with tolerances according to Table 10.2.

Table 10.2 Tolerances for active ingredients in wood preservatives.

Nominal percentage of active ingredients	Tolerance as percentage of nominal formulation
active ingredient \leq 2,5 % m/m	\pm 15,0 %
2,5 % < active ingredient \leq 10,0 % m/m	\pm 10,0 %
10,0 % < active ingredient \leq 25,0 % m/m	\pm 6,0 %
25,0 % < active ingredient \leq 50,0 % m/m	\pm 5,0 %
50,0 % < active ingredient \leq 100,0 % m/m	\pm 2,5 %

Annex 2 (informative)

Example of bundle marking

<p>(Tillverkare)</p> <p>Träskyddsbehandlat virke enligt SS-EN 351-1 och NTR Dokument nr 1, del 2 Produktionen är kvalitetskontrollerad och certifierad av SP Sveriges Tekniska Forskningsinstitut.</p>  <p>Användningsområde: Panel utomhus</p>	<p>Dimension/Kund</p> <p>Tillverkningsdatum/Körning nr</p> <p>Beräknat fixeringsdatum</p>
	<p>Träskyddsmedel Virket är behandlat med Wolmanit CX-8 (Kemikalieinspektionens reg.nr. 4122), som innehåller koppar, koppar-HDO och bor som verksamma beståndsdelar.</p> <p>Inträngningsklass Virket uppfyller inträngningsklass NP1 enligt SS-EN 351-1.</p> <p>Uptagning av träskyddsmedel Virket innehåller minst 10,0 kg träskyddsmedel/m³ i den yttre 3 mm zonen.</p> <p>Användningsområde Panel utomhus.</p> <p>Skyddsåtgärder Bearbetning av det behandlade virket bör undvikas. Är detta inte möjligt och om bearbetning görs inomhus, behövs normalt andningskydd (halvmask med partikelfilter P2), eftersom trädamn kan vara farligt vid inandning.</p> <p>Avfallshantering Utrangerat virke och virkesavfall skall omhändertas enligt kommunens anvisningar.</p>

Example of bundle marking (orange colour recommended) for wood preservation class GRAN.