

Nordic requirements for quality control of industrially Protected wood

Part 3: Heartwood of Scots pine and other durable woods

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Part 3: Heartwood of Scots pine and other durable woods

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1 Background

The Nordic industrial wood protection industry has requested to extend the NWPC classification of the well-known and established classes for preservative-treated pine and other permeable wood species, M, A, AB and B to also comprise preservative-treated heartwood of Scots pine and other durable woods. The Nordic Wood Preservation Council (NWPC) has, decided to prepare the present document that sets the requirements for the quality control.

2 Scope

This Document contains requirements for quality control of industrially treated heartwood produced to comply with the requirements for the wood preservation classes HC and HW according to definitions in NWPC Document No 1, Part 3.

Quality control bodies approved by the NWPC to carry out quality control of industrially protected 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 TEG, following prompt preparation.

This Document is not intended for investigation of treated wood 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.

- 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 Quality control bodies

4.1 Approval

The NWPC Board approves quality control bodies to carry out quality control of preservative-treated wood according to NTR Document 3 part 1.

Application for approval shall be sent to NTR/NWPC Secretariat. The quality control body will receive a Letter of confirmation when approved.

4.2 Requirements on quality control bodies

Quality control bodies shall have sufficient expertise and logistics in handling third party control related to the wood preserving industry.

Quality control bodies doing inspections of preservative-treated wood shall be accredited according to EN ISO IEC 17020. Laboratories performing analyses do not need to be accredited for the specific analyses but shall have an accreditation, i.e. have a quality system in place according to EN ISO IEC 17025.

4.3 Termination

Termination by the NWPC can be made at the latest by November for the following year. Termination by the quality control body can be made without previous notice to the NWPC.

5 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. |
| Sampling unit | One unit (for example a window) of preservative-treated wood taken from a batch of 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 retention |

6 Requirements for affiliation to quality control

6.1 General

Producers of industrially protected wood who wish to produce according to the requirements in NWPC Document No 1, Part 3, 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 6.2 to 6.7.

6.2 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 1, can be fulfilled.

The plant shall always be equipped with:

- instruments that can continuously monitor the process.
- instrument to measure the moisture content in the timber before treatment. If this is an electrical device, the electrodes shall be insulated and at least 30 mm long.
- Device/method 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.

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.

6.3 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)

6.4 Factory production control

Continuous factory production control shall be carried out according to clause 8.2 under the leadership of the plant operator in charge.

6.5 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 6.3.

6.6 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.

6.7 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.

6.8 The producers' rights and obligations

When the requirements in this Document are satisfied, the producer has the right to produce classified, industrially protected wood according to NWPC Document No 1, Part 3, as well as right and obligation to brand the treated wood with the NWPC quality marks, see clause 9.

The right to brand the treated wood with the NTR quality mark is communicated in a certificate comprising wood protection class and the preservative. The certificate is valid for 5 years but will be invalid when subject to changes regarding the protection class or wood preservative.

The producer alone is responsible for the 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 the application process, initial inspection, approval and issuing of certificate as well as annual inspections inclusive of analyses and reporting shall be paid by the producer according to the regulations of the quality control body.

For producers not belonging to the NWPC member countries, the NWPC Secretariat will invoice an annual fee as well as a royalty related to the production of wood treated according to NWPC Document No 1, Part 3. These fees are subject to decision at the NWPC annual meeting

7 Withdrawal from the quality control scheme

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

8 Production control of preservative-treated wood

8.1 General

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

8.2 Factory production control

8.2.1 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 3.

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 3
- 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. penetration and retention of the preservative shall comply with the requirements in NWPC Document No 1, Part 3
- Checking that the delivery requirements are fulfilled
- Recording the treatment
- Application 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 6.3.

Note 1 The instructions can be prepared in collaboration with the quality control body and/or customers.

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

Note 2 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.

8.2.2 Treatment records

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

- wood species and quantity
- wood preservation class or other treatment specification
- highest and lowest moisture content measured before treatment, see Note 2 above
- wood preservative used, concentration (if diluted) of treating solution and temperature if heating is part of the process
- treatment process (dipping, spraying etc.)
- uptake of treating solution/preservative for each charge (g/m²)
- result of factory production control with respect to penetration (number of samples/number approved)
- re-treatment, if applicable

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.

8.2.3 Sub-standard treatment

If sub-standard penetration and retention are 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 1, or be delivered to customer, but clearly marked that the batch does not comply with these requirements.

8.3 Third party control

A control body approved by the NWPC, cf. clause 4, shall conduct third party control. 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 1.

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.

The second inspection can be replaced by a procedure, in which the sampling is carried out by the treater 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 3, two inspection visits will again be carried out during the following 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 is prepared, and any observations of importance will be sent to the producer.

9 Marking

Producers affiliated to third party quality control have the right and obligation to brand the products with the NWPC quality marks, c.f. NTR Document 1 part 3 and Table 9.1.

| Wood protection class | Nordic quality marking | Colour code |
|-----------------------|---|-------------|
| NTR HW |  | Brown |
| NTR HC |  | Orange |

Table 9.1 NWPC quality marks and related colour codes for preservative-treated wood

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 3, 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 9.1:

- Treatment according to NWPC Document No 1, Part 3, and EN 351-1
- Name of wood preservative used
- Wood preservation class and penetration class according to EN 351-1: NP 1 for classes HC and HW
- Wood preservative retention (refer to NWPC list of approved wood preservatives)
- Charge number and year
- Name of the producer

Windowwood Ltd



This timber is treated according to NWPC Document No 1, Part 3, and EN 351-1 and quality supervised in accordance with NWPC Document No 3, Part 3

Wood preservative: Biocidal product containing X, Y and Z with a minimum retention of X g a.s/m² sapwood

| | |
|--------------------|-----------------|
| Charge no: | 125/09 |
| Penetration class: | NP 1 (EN 351-1) |
| | |

Figure 9.1 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 3, and certified for CE-marking may also use the CE-mark to mark each piece, or for bundle marking.

10 Guidelines for sanctions

10.1 General

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

10.2 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 or 20 borings 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 for analysis.

2. If the retention is still not conforming with 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.
5. The NWPC Technical Group must be informed if the control body observes consistent problems to comply with the retention requirement.

10.3 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 3.

- the manufacturer of the preservative must be informed.
- a new sample shall be taken and analysed within two months after receipt of the report from the quality inspection

- 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.

10.4 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

A remark thereof will be noted in the inspection report.

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.

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.

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

10.5 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.

10.6 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 or cladding) 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.

10.7 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.

10.8 Suspension from the quality control scheme

Suspension from the quality control will take place, in addition to what is said in clauses 10.2, 10.3, 10.6 and 10.7, if:

- the marking is misused
- 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, the 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)

11 Third party control of the class HW and HC. Sampling, measuring and calculation of the wood preservative retention

11.1 General

Sampling and analysis of wood treated with water-borne wood preservative 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.

11.2 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.

11.3 Sampling for determination of retention

11.3.1 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 11.1. These tables are based on the sampling procedure in EN 351-2 (ISO 2859-1) with AQL = 10 % and AQL = 6,5 % respectively at inspection level S3.

Table 11.1 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 – 3 200 | 13 |
| 3 201 – 35 000 | 20 |
| 35 001 – 500 000 | 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.

Sampling units consisting of sapwood alone may be taken for the control. If in doubt, the boundary between heartwood and sapwood may be established with a heartwood reagent.

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 as appropriate, see clauses 11.3.2.

If penetration and retention can be determined from a single test sample, only one test sample per

sampling unit is necessary. Otherwise, two or possibly more test samples shall be taken adjacent to each other.

11.3.2 Cross-sections

Cross-sections shall be at least 70 mm long. From these, clauses with a thickness of 5 mm are cut for analysis.

11.4 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.

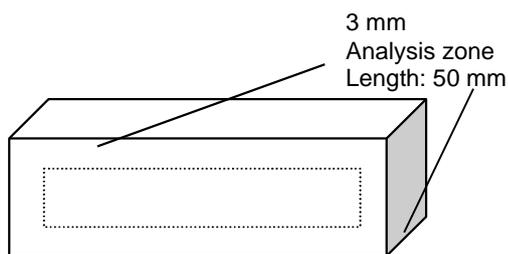


Figure 11.1 Sampling for analysis of preservative retention.

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 11.1, 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 analysed with the highest accuracy and precision. If the density of the wood cannot be determined by accepted methods the density according to EN 350-2, expressed as dry density, shall be used.

The retention is considered to be approved if the retention of the composite sample determined by analysis (g/m^2) is at least the retention approved by the NWPC for the wood preservation class in question.

11.5 Sampling and analysis of wood preservative and treating solution

Wood preservatives used at each production site shall be analysed 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 analysed 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 11.2.

Table 11.2 Tolerances for active ingredients in wood preservatives.

| Nominal content of modifying agent | | | | Tolerance, percentage of nominal content | |
|------------------------------------|---------------------|---|-------------|--|--------|
| 0 % | < active ingredient | ≤ | 1,0 % m/m | ± | 20,0 % |
| 1,0 % | < 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 % |