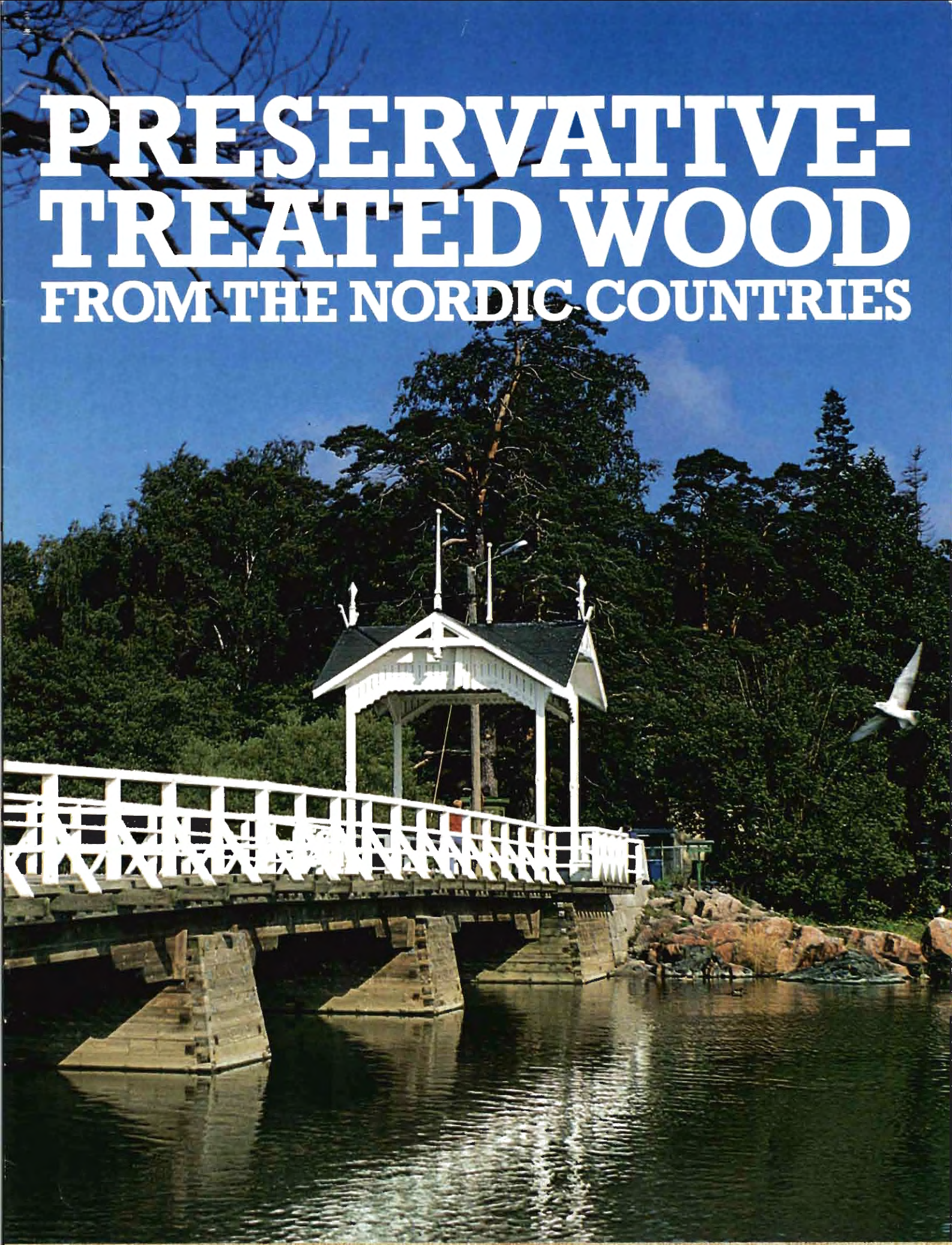
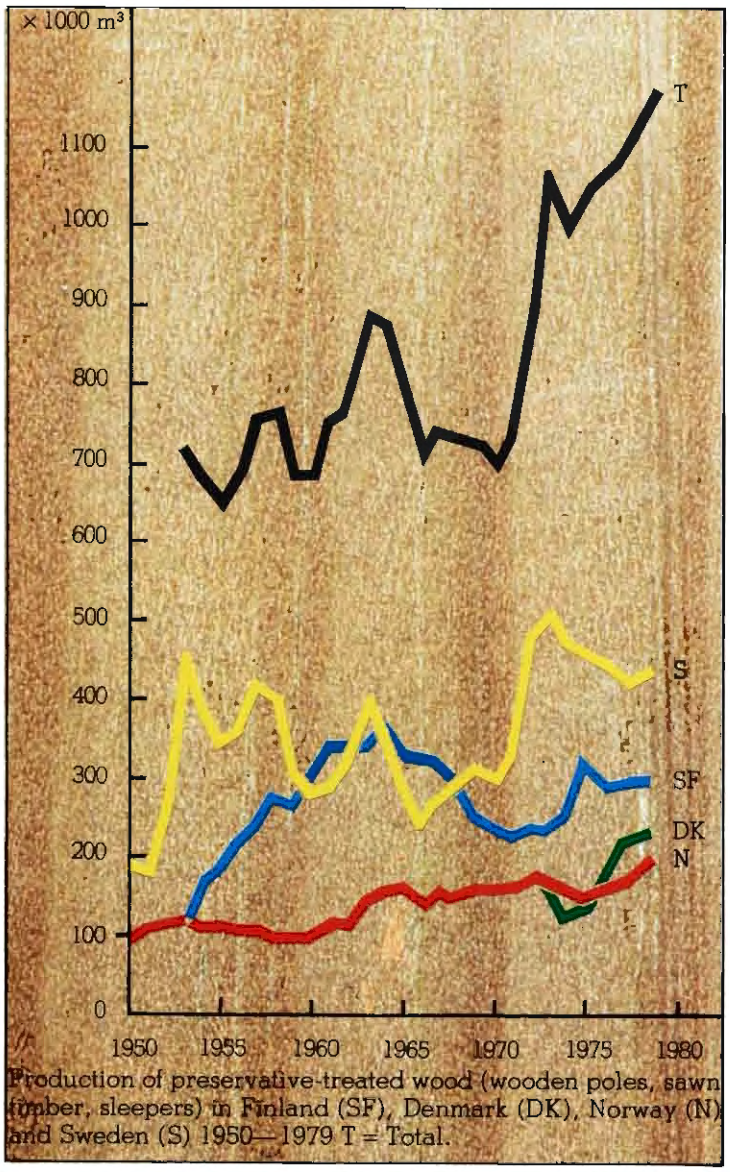
PRESERVATIVE-TREATED WOOD
FROM THE NORDIC COUNTRIES



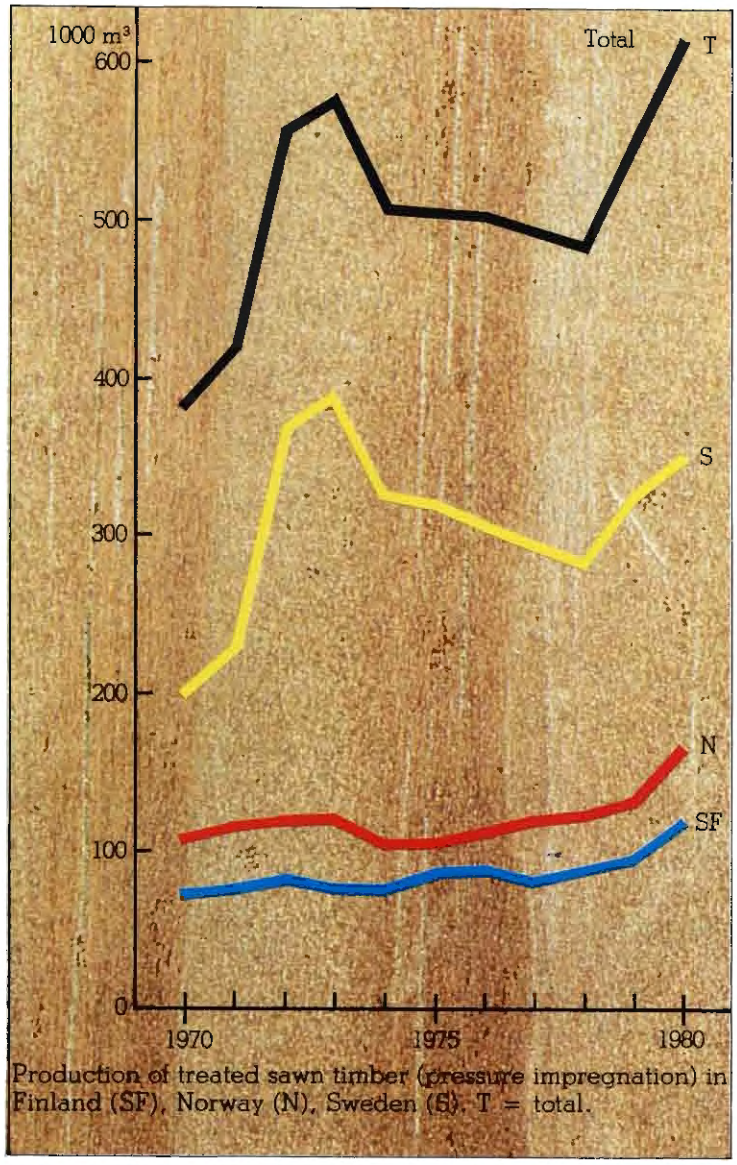
Nordic Wood Preservation Council

WOOD PRESERVATION IN THE NORDIC COUNTRIES

In the Nordic countries there are approximately 500 wood preservation plants. They produce more than 1 million m^3 of treated wood annually, of which 10 to 15% is exported to other markets.
Industrial wood preservation has been of great importance in the Nordic countries since the early years of the 20th century, when mainly railways sleepers and utility poles were treated. Today, sawn timber and joinery products are the main items.



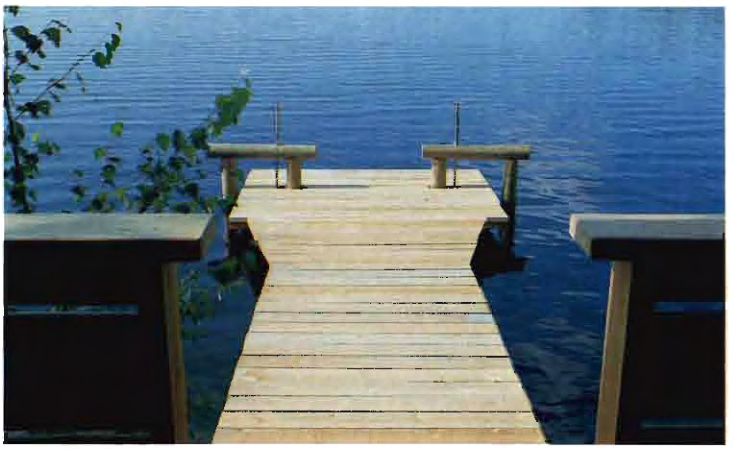
Production of preservative-treated wood (wooden poles, sawn timber, sleepers) in Finland (SF), Denmark (DK), Norway (N) and Sweden (S) 1950—1979 T = Total.



Production of treated sawn timber (pressure impregnation) in Finland (SF), Norway (N), Sweden (S). T = total.

NEW APPLICATIONS OF WOOD

Wood has a long tradition as a building material in the Nordic countries. Correctly used and maintained it has many advantages over other materials. Where it is impossible to guarantee long durability for a wooden construction by a good technical design only, the life of the construction can be significantly increased by a proper wood preservative treatment. In addition, the door is opened to new applications of wood.



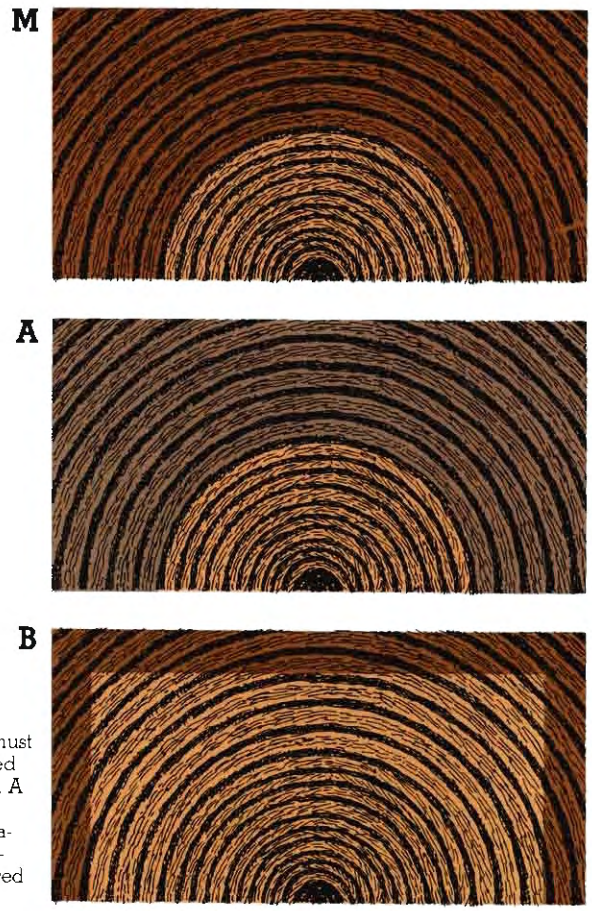
STANDARD FOR TREATED WOOD

The Nordic countries have a common standard for preservative treated wood.

In a common standard for Denmark, Finland, Norway and Sweden (nationally referred to as DS 2122, SFS 3974, NS 3190 and SIS 056110) three different classes, M, A and B, of treated wood are defined. The standard refers to round and sawn timber and joinery products made of Baltic redwood (*Pinus sylvestris* L). For economic and technical reasons this is virtually the only type of wood treated in the Nordic countries.

Wood treated according to *class M* is suitable for marine constructions exposed to attack by marine organisms (e.g. *Teredo* spp) and constructions subject to severe conditions, or where there are special safety requirements, e.g. piers and marinas in sea water, foundation piling and cooling towers.

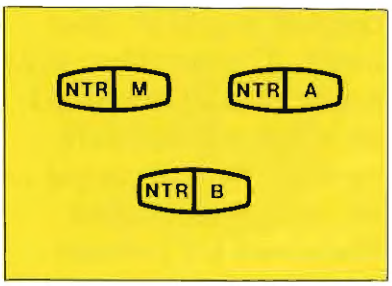
Full penetration into the sapwood and an extra high retention of the preservative are required. The requirements are usually achieved by pressure treatment with creosote or a water-borne preservative of the CCA type.



All sapwood must be impregnated in class M and A and at least 10 mm penetration of the sapwood is required for class B.

Wood treated according to *class A* is well protected everywhere where there is a high risk of decay and/or insect attack. Examples are timbers in ground contact, such as transmission poles, railway sleepers and fence posts; timbers for outdoor use, such as garden furniture and playground equipment; building timbers, such as roof boarding, battens, ground floor joists etc.
Complete penetration into all sapwood is required and the requirements are usually met by pressure impregnation with creosote or various water-borne preservatives.
Impregnated wood *class B* is intended for wood in above-ground constructions where there is a substantial risk of decay, such as window and door parts.
At least 10 mm penetration of the sapwood is required. No cutting or wood working must be carried out after treatment. The requirements are normally achieved by a double vacuum process with an organic solvent preservative.
The need for preservative treatment depends on the end use of the wood, and this is considered in the standard. It therefore gives a good guidance for architects, builders and civil engineers, as well as for the "do-it-yourself" man, to make the correct choice of treated wood.

QUALITY CONTROL



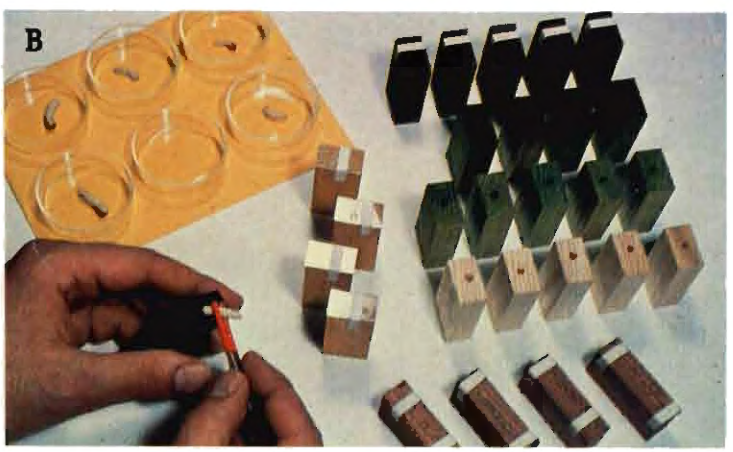
Nordic quality brands for preservative-treated wood.

Producers of impregnated wood, according to the Nordic standard, are affiliated to a quality control scheme operated by national control authorities. Inspection officers regularly visit preservation plants to check that the requirements in the standard and NWPC Document 1.6.1. are met. The preservation plants also carry out their own quality control to ensure achievement of the quality requirements.
Only preservation plants affiliated to the official quality control scheme are allowed to brand their products with registered quality marks. A current list of affiliated preservation plants is enclosed.
More than 50% of the production of preservative-treated wood in the Nordic countries is currently (1981) treated according to the Nordic standard. For export purposes, preservation according to other standards, e.g. American, British, French and German, can also be carried out by the larger plants.

TESTING AND APPROVAL OF WOOD PRESERVATIVES

The wood preserving industry in the Nordic countries uses internationally known preservatives such as creosote, water-borne CCA preservatives and organic solvent organotin compounds.
Before a wood preservative can be used commercially for treatment according to the Nordic standard it must be approved by the Nordic Wood Preservation Council. The requirements are given in NWPC Document 1.2.1.

Only the protection afforded against biological degradation is considered in the approval. Approval regarding environmental and occupational safety is given separately by the national environmental authorities.
Approval for class M requires a marine test according to NWPC Standard 1.4.2.2. in the first place, and for class A a field test in ground contact according to NWPC Standard 1.4.2.1., and a test against the house longhorn beetle (*Hylotrupes bajulus* L) according to EN 47 are required. Approval for class B requires testing against decay fungi according to DIN 52176.
In the approval, the minimum retention, expressed as kg preservative per m^3 sapwood, in each class, is stated.
A list of approved preservatives is enclosed.



PROPERTIES OF TREATED WOOD

During the impregnation one or more properties are changed. Primarily, the resistance to biological degradation is increased, and the durability enhanced by several hundred per cent compared with untreated wood.
However, the treatment can cause other changes. For example, the strength, qluability or water absorption can be altered, which might influence purposes for which the wood can be used.
Extensive studies of the properties of treated wood and its suitability for certain end uses have been, and are, continuously carried out in the Nordic countries.

In the Table a selection of technical properties of preservative-treated wood are summarized. The properties may vary between similar preservatives made by different manufacturers and more detailed information can usually be obtained from the manufacturers' data sheets.

Property of treated timber	Water-borne type preservative	Organic solvent type preservative	Creosote
Colour	Greenish-grey; goes grey with time	Usually unchanged; goes grey with time. Coloured types fade with time	Brown; fades with time
Odour	None	Depends on solvent used; varies from strong to negligible	Strong; diminishes with time
Can it be painted, varnished or glued?	Yes	Usually; take manufacturer's advice	No
Corrosion of metals by treated wood	Usually negligible; wood treated with preservatives containing copper should not be used in contact with aluminium	None	None
Water absorption	Usually unchanged	Depends on the preservative but usually less than for untreated wood; increases with time	Less than for untreated wood; increases slowly with time
Strength	Usually unchanged	Unchanged	Unchanged
Phytotoxicity	None or negligible	None or negligible with the organo-tin preservatives	Freshly treated wood is phytotoxic; the effect decreases on weathering

Footnote: For water-borne preservatives it is presupposed that the wood has been redried after treatment and for organic solvent type preservatives that most of the solvent has evaporated off.

THE NORDIC WOOD PRESERVATION COUNCIL — NWPC

The Nordic Wood Preservation Council is a joint organization of the Danish Wood Council, The Finnish Wood Preservation Association, The Norwegian Institute for Wood Working and Wood Technology and The Swedish Wood Preservation Institute. It was established in 1969 with the purpose of stimulating and co-ordinating the individual countries' contributions in the field of wood preservation.

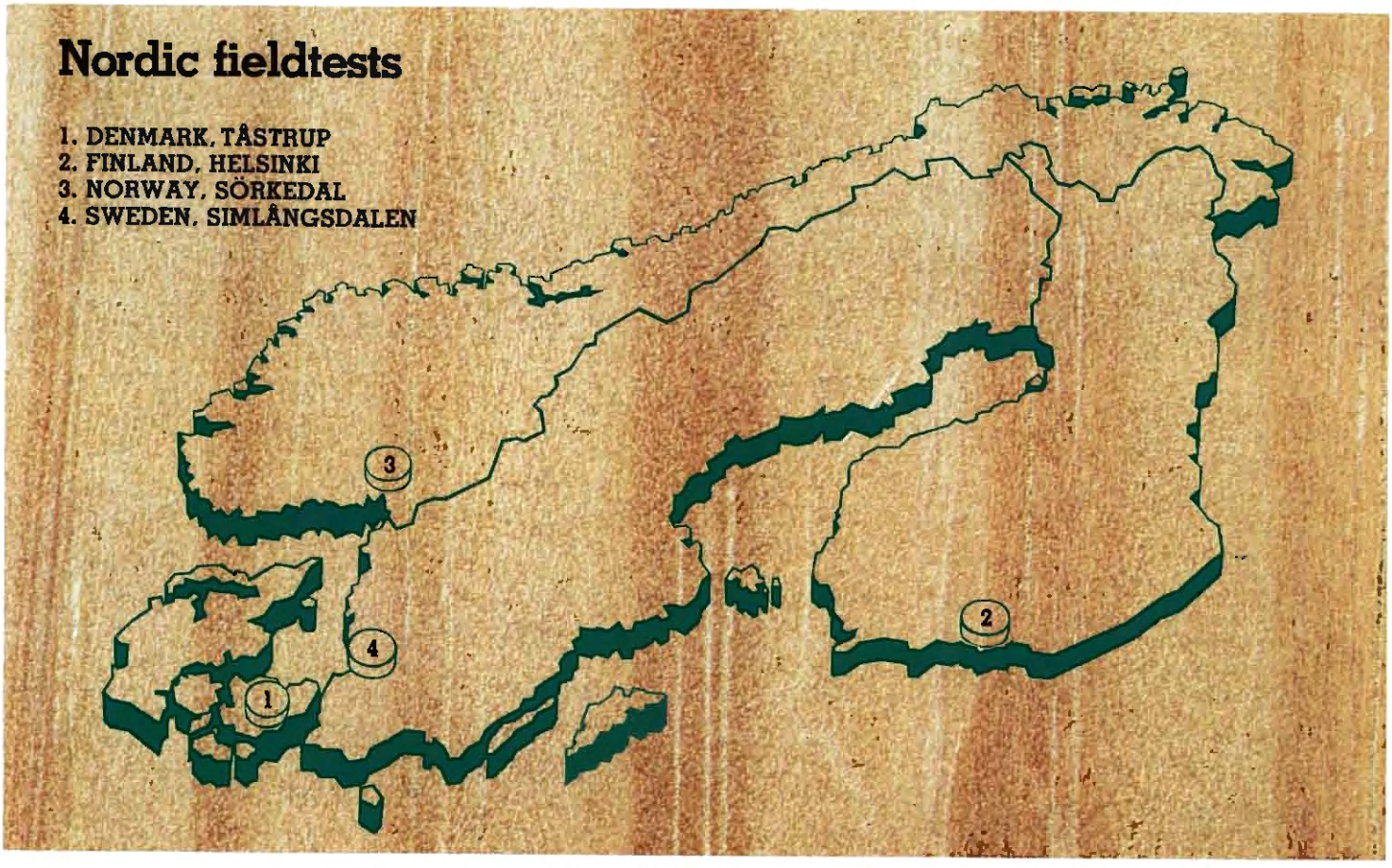
The work has so far focused on:

—the development of testing methods and standards for wood preservatives and treated wood
—co-ordination of wood preservation research
—promotion of information exchange
—testing of wood preservatives

Since 1980, the NWPC has also been the authority responsible for approving wood preservatives for industrial use in the Nordic countries.

The Secretariat, which is held by each member organization in turn, together with a group of four technical experts, is responsible for the current work of the NWPC. The technical experts are chosen from research institutes involved in wood preservation research.

The NWPC is financed by the member organizations and currently (1981) also by the Nordic Council of Ministers.

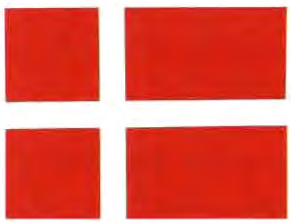


MEMBER ORGANIZATIONS OF THE NORDIC WOOD PRESERVATION COUNCIL

The Swedish Wood
Preservation Institute
Box 5607
S-114 86 Stockholm
Sweden
Tel 08-22 25 40/170
Telex 14375 STURES

The Finnish Wood
Preservation Association
Mannerheimintie 40 D 87
SF-00100 Helsinki 10
Finland
Tel 90-49 27 62

The Norwegian Institute for
Wood Working and
Wood Technology
Box 337
Blindern
N-Oslo 3
Norway
Tel 02-46 98 80
Telex 18171 FORSK N



The Danish Wood Council
c/o Technological Institute
Gregersensvej 3
DK-2630 Tåstrup
Denmark
Tel 02-996611/313
Telex 33416 TI DK

PUBLICATIONS BY NWPC

STANDARDS/ DOCUMENTS

NWPC Document 1.2.1. 1980
Conditions for approval of wood preservatives for use in classes M, A, B and Bx.

NWPC Document 1.6.1. 1980
Regler för kvalitetskontroll av impregnerat trä i klasserna M, A, B och Bx (Regulations for quality control of preservative-treated wood in the classes M, A, B and Bx; English summary)

NWPC Standard 1.4.1.1. 1970
NWPC Standard for testing of wood preservatives. Mycological test. Jordburk method — a soil block test with wood-rotting Basidiomycetes.

NWPC Standard 1.4.1.2. 1970
NWPC Standard for testing of wood preservatives. Mycological test. Mullåde method — a soil block test in unsterile soil.

NWPC Standard 1.4.1.3. 1979
Mycological testing of anti-stain preservatives for freshly sawn timber. The Mini-board method.

NWPC Standard 1.4.2.1. 1971
NWPC Standard for testing of wood preservatives. Mycological test (field test) — a field test with stakes.

NWPC Standard 1.4.2.2. 1973
NWPC Standard for testing of wood preservatives. Marine test — a test against marine wood-boring organisms in sea water.

INFORMATIONS

NWPC Information No. 1. 1972
Klem, G. S. Trebeskyttelse

NWPC Information No. 2. 1972
Nordiska Träskyddsrådet (The Nordic Wood Preservation Council; English Summary)

NWPC Information No. 3. 1972
Klem, G. S. Kvalitetskontroll av trykkimpregnert trevirke.

NWPC Information No. 4. 1972
Träskydd, begrepp och definitioner avseende biologisk förstöring av trävirke

NWPC Information No. 5. 1973
Produktion av tryckimpregnerat virke i Finland, Norge och Sverige 1972

NWPC Information No. 6. 1974
Henningsson, B. NWPC Field test no. 1 with pressure preservatives. Results after 5 years' testing

NWPC Information No. 7. 1977
Glossary of terms relating to timber preservation

NWPC Information No. 8. 1979
Produktion av impregnerat virke i Norden 1978

NWPC Information No. 9. 1979
Borsholt, E. NWPC Field test no. 1 with wood preservatives. Results after 10 years' testing

NWPC Information No. 10. 1979
Jermer, J. Kuusamo, M. Nordiska Träskyddsrådet 10 år. 1969-1979.

NWPC Information No. 11. 1981
Jermer, J. Preservative-treated wood from the Nordic countries.

NTR Information no.11 1981
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The Danish Wood Council
c/o Technological Institute
Gregersensvej 3
DK-2630 Tåstrup
Denmark
Tel 02-996611/313
Telex 33416 TI DK

The Norwegian Institute for
Wood Working and
Wood Technology
Box 337
Blindern
N-Oslo 3
Norway
Tel 02-46 98 80
Telex 18171 FORSK N

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Preservation Association
Mannerheimintie 40 D 87
SF-00100 Helsinki 10
Finland
Tel 90-49 27 62

The Swedish Wood
Preservation Institute
Box 5607
S-114 86 Stockholm
Sweden
Tel 08-22 25 40/170
Telex 14375 STURES

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