NORDIC PINE AND SPRUCE THERMOWOOD®

FAÇADE | INTERIOR | INDUSTRY | DECKING
The timber used to produce ThermoWood is grown in our own Finnish forests which are fully certified under the Finnish Forestry Certification System and Pan European Forestry Certification. As such you can be sure ThermoWood is sourced from well managed and sustainable forests. The heat treatment process requires no chemical additives. The improved performance is achieved simply by the controlled application of heat and steam.

**The Result of Thermal Modification:**
**Durable and Stable Wood**

**Improved Durability Against Decay**
Due to the breakdown of the hemicellulose (sugar chains) the wood no longer contains sufficient nutritional substance to support decay-causing fungi (KOMO).

**Improved Dimensional Stability**
The equilibrium moisture content of wood reduces as a result of thermal modification and ThermoWood becomes hydrophobic meaning that it does not absorb water easily. This improves its dimensional stability and thermal insulation properties.

**Improved Insulation Properties**

**Resin Free**
Harmful emissions, such as formaldehydes, are eliminated which makes ThermoWood pure and safe for indoor and outdoor use.
THERMOWOOD®

TWO HEAT TREATMENT CLASSES

ThermoWood produces two standard thermal modification classes, ThermoWood-S and ThermoWood-D. The difference between the classes centres on differing heat treatment temperatures.

THERMOWOOD-S

ThermoWood-S, where S stands for stability, has an attractive shade of light brown and the stability is greatly improved. It is heat treated with milder temperatures (190°C). ThermoWood-S products are suitable mainly for indoor applications, but can also be used in protected outdoor areas as well.

THERMOWOOD-D

ThermoWood-D, where D stands for durability, has a darker brown colour tone. Its durability and stability are improved significantly. ThermoWood-D is thermally modified using higher temperatures (212°C) and products are suitable for both outdoor and indoor use.

DURABILITY CLASS 2, SUITABLE FOR EXTERIOR USE (EN 350-1)

Cupping of exterior cladding boards: Comparison between ThermoWood-D and untreated Scandinavian pine and spruce in different thicknesses. Source: Jari Virta, Helsinki University of Technology
ThermoWood is an outstanding deck material due to its stability and durability. Improved insulation properties make ThermoWood an excellent decking material, which balances the changes of heat and cold and makes it pleasant to walk on even barefoot.

ThermoWood decking is resin-free, light-weight and easy to work. It is an ecological, durable and chemical-free solution for creating the finishing touch to your home surrounding. In short, ThermoWood decking is ecological luxury – beautiful, pure and safe.

BRE (the trading name of Building Research Establishment Limited) is a British independent and impartial, research based consultancy, testing and training organization, offering expertise in every aspect of the built environment and associated industries. BRE is able to conclude that the expected service life for Thermo-D Scandinavian pine used in the UK for exterior cladding and decking will be 30 years, when following manufacturer’s guidance and best practice construction principles.
Some best practice construction principles building Thermowood decks, that enable water shedding and drying and avoid water trapping are:

• Minimum thickness of the boards used for decking is 26mm. The heart side of the board should be machined and laid uppermost.

• The under structure or sub frame should be made from suitable material with the necessary durability and design so as not to adversely affect the performance of the deck board.

• Thermowood should not be in direct contact with the ground or in permanently wetted situation. The construction should not create conditions that can later be considered as direct contact with ground.

• The air should be able to circulate between decking board and ground. Humid air should not be trapped beneath the deck and the space beneath the deck area should not be concealed with structures or boards.

• Sub structure of the terrace should be designed so that water dry readily and will not be trapped beneath the deck, nor between the deck board and joists, hand rails or other structures. The contact surface between joists and deck boards should be as minimal as possible.

• The construction of the deck should be designed to have a degree of drop in minimum level of 0,7cm per 100cm to allow the water dry. If the terrace is next to a building the drop should be designed so that water runs away from the building and decking boards should be laid in the same direction.

• Avoid water entrapment under planters, sand pits, paddling pools or similar objects. These items should be moved or rotated regularly to avoid permanently wetting an area of the deck.

• Ensure regular brushing and cleaning of the deck to remove dirt from between the boards and from the top of the surface. Obstacles such as leaves, needles and other outdoor materials will restrict water shedding and allow water trapping.

• Fixing material should be with Stainless Steel screws through pre-drilled holes.

• There should be a minimum 6mm gap between decking boards width 92 mm-140mm and minimum 8mm for widths 160 – 210mm to allow for water drainage. Same minimum gap should be left between the boards and wall if the deck is built next to a building or wall structure.

• It is highly recommended that Thermowood is coated every 1-3 years with a suitable deck oil or proprietary brand of deck sealer. This will maintain the appearance of the deck for longer. It is typical for all timber products that over time cracks and shakes appears on top of the board. Coating and maintaining wooden product regularly will reduce this phenomenon and helps one to avoid cracks and shakes over the service life.
Dimensionally stable and durable ThermoWood is an outstanding choice for exterior claddings and facades. ThermoWood allows Scandinavian softwood to be successfully used in hot and humid weather conditions. In addition all our cladding products have the European conformity mark, the CE mark.

30 YEAR EXPECTED SERVICE LIFE

Uncoated ThermoWood-D exterior cladding can provide a 30-year desired service life. This fact is based on a number of conditions including: the quality of the workmanship at the time of installation and the exposure of cladding to the weather including location, elevation and design. If coated, over the life of the product, ThermoWood-D will have a 60-year desired service life, providing the coating is maintained in-line with the coating manufacturer recommendations over the service life of the product.

VISUAL QUALITY

Due to the high temperature of ThermoWood treatment process, resins are removed from the wood. This ensures a high visual quality for both uncoated and coated ThermoWood-D claddings. The colour of ThermoWood-D is affected by the treatment temperature and time. The higher the temperature the darker the appearance. As with all softwoods, variances occur and are due to varying densities. When ThermoWood-D is exposed to UV light, it will lose its colour and turn beautiful silver grey unless protected by a pigmented surface protection.

REMEMBER TO
- SECURE AIR VENTILATION
- USE ONLY STAINLESS STEEL SCREWS AND NAILS
**THERMOWOOD®**

**INTERIOR PRODUCTS**

**INTERIOR DECORATION**

The appearance of ThermoWood is soft and warm with a rich shade of brown. It is highly suitable for interior panelling and flooring, creating a cozy atmosphere in any home. The boards are easy to cut, shape and install. In addition to its attractive appearance the thermal modification of wood eliminates the risk of harmful emissions, such as formaldehydes; this makes the wood pure, safe and hygienic for indoor use even for those consumers prone to wood related reactions. Also resin is removed in the process.

**SAUNA & BATHROOM**

Lower thermal conductivity and improved stability of thermally modified wood makes ThermoWood an outstanding product in hot and humid environments. Further, it is a hygienic material without resin, which broadens the variety of end uses and applications. ThermoWood sauna & bathroom products are produced both in dark and light brown tones.
OTHER PRODUCTS AND INDUSTRIAL END USE

ThermoWood is an excellent material for use in a wide range of garden and landscaping products like fences, pergolas, posts or garden buildings such as gazebos and greenhouses.

All the improved properties in ThermoWood create many opportunities for its use in industrial applications.

It is an excellent raw material for joinery products such as doors, windows, and garden furniture.

In addition to planed profiles, thermally modified sawn timber dimensions in several sizes are usually available.

Our product range also includes glue laminated sound knotted wide sections.

ThermoWood does not include any chemicals so it can be used in kitchenware and worktops.

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<thead>
<tr>
<th>THERMOWOOD MOST USUAL STANDARD DIMENSIONS</th>
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<tbody>
<tr>
<td><strong>PINE</strong></td>
</tr>
<tr>
<td>19X100</td>
</tr>
<tr>
<td>25X100/125/150</td>
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<tr>
<td>32X75/100/125/150</td>
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<tr>
<td>38X125/150</td>
</tr>
<tr>
<td>50/100/125/150/200</td>
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| **NORWAY SPRUCE**                        |
| 22X150                                   | THERMO-D |
| 25X150                                   | THERMO-D |
| 50X150                                   | THERMO-D |

| **ASH**                                  |
| 26X125/150                               | THERMO-D |

Other dimensions available, please contact your local ThermoWood representative for more details.
GOOD TO KNOW ABOUT THERMOWOOD®

The following chapter will present some useful advice and recommendations on the use of ThermoWood. The purpose of this information is to help you to enjoy all the many benefits of using ThermoWood.

DURABILITY
ThermoWood-D belonging to durability class 2 has a projected service life of 30+ years when resistance to decay is considered (BRE). This applies to exterior cladding and decking applications. However the decking material is subject to surface wear and loading which decreases the reasonable expected service life to 15–20 years. ThermoWood is not recommended for use in direct contact with ground.

EQUILIBRIUM MOISTURE CONTENT
After the thermal process the equilibrium moisture content of ThermoWood is 5 % (+/- 2%). In outdoor use (+20 Celsius, RH 85 %) the equilibrium moisture content of ThermoWood thermoD pine stabilizes at 10 % (EN 13183).

FASTENING
BY HAND
Thermal processing makes wood slightly more susceptible to splitting. For this reason we recommend using self-tapping screws with a coarse thread or pre-drilled holes before fixing. The screws and nails should be stainless-steel and suitable for fastening wood. When using nails, they should not be closer than 7 cm from the end of the board or use pre-drilled nail holes. When using a conventional hammer, it is advisable to use a nail punch for the last 2–3 mm.

Tongue and grooved boards should be fastened using pre-drilled holes from over the top of the tongue so that the screw or thin nail is driven in at an angle of less than 40 degrees. In the installation the heart side should always be the weather exposed face.

BY PNEUMATIC NAILING MACHINE
Good results can be achieved by using a small pneumatic nailing machine. However the pressure must be adjusted so that the nails are not driven too deeply into the wood.

GLUING
Gluing of ThermoWood is possible. However the gluing and compression time may be 4–6 times longer compared to untreated wood. Always follow the glue manufacturers’ guidelines.

PLANING
ThermoWood can be planed with a normal planer or planing machine. Planing ThermoWood gives its surface a superior quality. The planing machine should be adjusted for hardwood species and the planing speed is less than with untreated similar wood. The raw material after thermal processing may be convex and therefore the feed rollers should be adjusted accordingly to prevent the boards from splitting.

SANDING
Sanding may not be needed with ThermoWood at all because the quality of the surface is so good after being planed and milled. However if ThermoWood is sanded the resin free material keeps your sand paper in good shape for a longer period of time.

SAWING
Sawing ThermoWood is just as easy as sawing ordinary wood. However the blade should be a sharp, fine-toothed saw and the wood should be fed slowly.

SURFACE TREATMENT
OUTDOORS
ThermoWood should be surface treated before installation or immediately after installation if the beautiful brown colour is to be retained. The surface colour can be retained by treating the boards with tinted/pigmented wood oil, wax, wood-protecting stain, varnish or paint, which contains a UV filter. The surface treatment can be applied either before or immediately after installation using only a thin coat. Any excess should be wiped off. However one should always follow the manufacturer’s recommended guidelines.
The surface treatment should be renewed as necessary. The need for re-treating varies depending on the climate, amount of usage and the degree of exposure to UV light. With painted untreated wood the typical interval between maintenance is approximately 5 years. With ThermoWood the maintenance interval in painting can be greatly extended, possibly three times longer than usual, depending on the amount of UV and geographical location. By using a more stable material considerable costs can be saved in cladding and decking, taking into consideration the entire lifespan of the product.

INDOORS
Normal paints, wood oils, waxes and varnishes can be used indoors. For saunas, paraffin oil can be used in addition to a surface treatment agent to emphasize the colour of ThermoWood and protect it from impurities.

THE USE OF THERMOWOOD® WITHOUT SURFACE TREATMENT
ThermoWood is recommended to use surface treatment always when the end use application is exposed to weather. With all wood materials it is typical that along time fine cracks and splinters appear to the surface. Though ThermoWood has lower potential for these defects, they still exist and coating protects the wood from them.

If unfinished ThermoWood is used or it has been coated with non-pigmented wood oil the brown colour of the surface will fade and turn to grey over time due the influence of UV. The weathered grey appearance of the ThermoWood is elegant and the beneficial properties in durability against decay remain intact. However especially horizontally planed surfaces such as terraces, which are exposed to surface wear and downright rain and sun, require protective coating to ensure long service life considering the mechanical properties. In other words surface treatment with e.g. wood oil is the best way to protect wooden deck. Further coating protects ThermoWood from air born impurities allowing easier cleaning.

If the colour of ThermoWood has started to fade, the original brown colour can be restored using an effective washing solution designed for wood and/or sanding. After restoring the colour a surface treatment can be applied with e.g. brown pigmented wood oil.

STRENGTH
Strength properties are somewhat reduced with heat treatment class ThermoWood-D. Therefore it is not recommended to use ThermoWood in load bearing structures without additional support; or that strength calculations are carried out on a case-by-case basis.
» Weather endurance
» Dimensional stability
» All climates
» Non toxic
» Resin free
» Thermal insulation

More information
www.thermowood.fi
ThermoWood® Handbook Surface coating handbook
ThermoWood® Planing handbook