



WITH HEAT – NATURALLY | WWW.LUNAWOOD.FI

LUNAWOOD® – HIGHEST QUALITY, TOTALLY NATURAL AND CHEMICAL FREE THERMOWOOD



FINLAND. NATURE. LUNAWOOD®.

Finland: land of a thousand lakes and forests. For countless years the northern climate has created highly durable, natural wood. At Lunawood we enhance this natural ageing process by producing thermowood to the highest standards.

Lunawood® – highest quality, totally natural and chemical free.

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OY LUNAWOOD LTD

Oy Lunawood Ltd, established in 2002 is an innovative pioneer in thermal modification of wood and it has grown to be the Global market leader of thermowood. The company status is based on the quality of its product and its production capacity.

Since its inception Oy Lunawood Ltd has grown rapidly to employ in excess of 50 people at two production plants in Finland. Located at Iisalmi and Joensuu the annual production capacity has risen to 35,000 m³.

The company is proud of its high quality products matched only by its personal and expert service. As the leading producer of thermally modified wood its reputation is built upon innovation, reliability and cooperation. Oy Lunawood Ltd maintains a fully inclusive operating procedure with customers and partners alike enabling the sharing of knowledge, the dissemination of product news and a robust communication network.

LUNAWOOD® THERMOWOOD

The thermal modification process of Lunawood® utilises only high temperatures (between 160 and 215°C) and steam. Therefore the end-product is completely natural and chemical free. It can safely be burned or recycled after its long service life (Nordic Ecolabel).

Lunawood® respects the natural properties of wood. This is achieved by the developed patented process of a more gradual thermal modification which reduces the stresses caused by high temperatures on the chemical and physical elements of the product.



Lunawood uses only the best Finnish raw material from PEFC-certified local forests. We choose carefully only the most suitable logs in close co-operation with our suppliers. The raw material Oy Lunawood Ltd uses is mainly Scandinavian pine and spruce. In order to include knotless products to our product range, we also heat treat birch and non-native tree species such as radiata pine and ash.

The result of thermal modification: durable and stable wood

- Due to the breakdown of the hemicellulose (sugar chains) the wood no longer contains sufficient nutritional substance to support decay-causing fungi (KOMO).
- After processing, the moisture content of the wood is reduced into 4-6 %. The wood does not readily reabsorb water and therefore the dimensional stability and insulation properties are greatly improved (+25%).
- Resin is removed or dried; there is no risk of seepage.
- Harmful emissions, such as formaldehydes, are eliminated which makes Lunawood® pure and safe for indoor and outdoor use.
- Bacteria are killed resulting in a sterile material.



LUNAWOOD®: TWO HEAT TREATMENT CLASSES

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

LunaThermo-S

LunaThermo-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 ($180^{\circ}\text{C} \pm 3$). LunaThermo-S products are suitable mainly for indoor applications, but can also be used in protected outdoor areas as well.

DURABILITY CLASSIFICATION OF DIFFERENT WOOD SPECIES

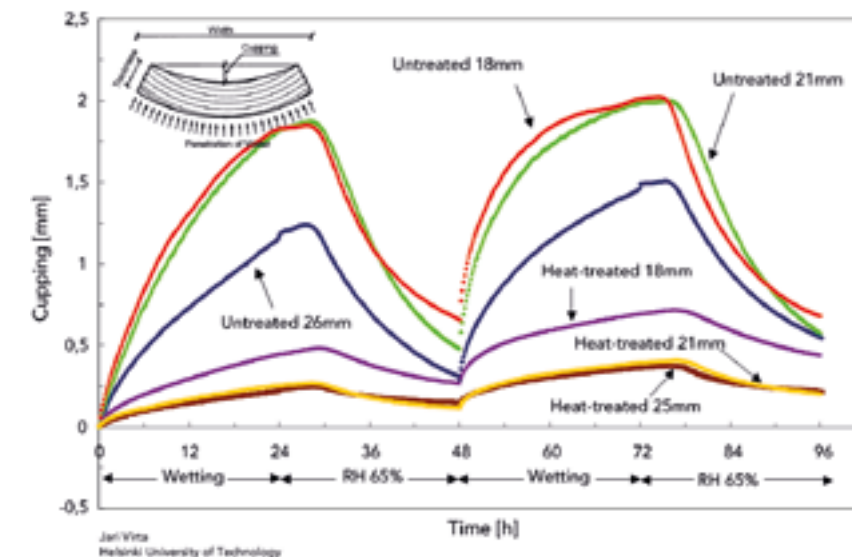
	1 (highest)	2	3	4	5 (weakest)
WOOD SPECIE	Iroko	Iroko			pine spruce
		WRC	WRC		
			Larch	Larch	
		Luna-Thermo-D			
			LunaThermo-S		
		European Oak			
	CCA impegated		Douglas Fir	Douglas Fir	
	C impegated				

Timber of durability class 1 or 2 is considered to be suitable for exterior applications without the need for further treatment.

LunaThermo-D

LunaThermo-D, where D stands for durability, has a darker brown tone. Its durability and stability are improved significantly. LunaThermo-D is thermally modified using higher temperatures ($212^{\circ}\text{C} \pm 3$) and products are suitable for both outdoor and indoor use.

STABILITY DIAGRAM OF EXTERIOR CLADDING BOARDS



Cupping of exterior cladding boards: Comparison between LunaThermo-D and untreated wood in different thicknesses.

LUNAWOOD® DECKING APPLICATIONS

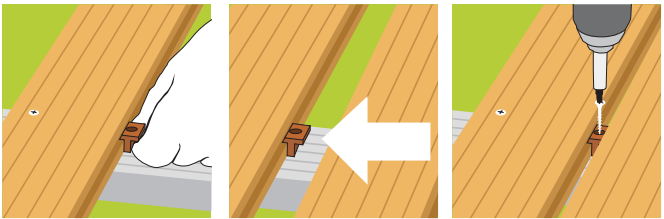
Due to improved insulation properties Lunawood® is an excellent decking material, which balances the changes of heat and cold and makes it pleasant to walk on. Lunawood® decking is resin-free, light-weight, easy to work and fix. It is an elegant, durable and chemical-free solution for terraces, patios and balconies.



Decking Boards

Product	Sizes	Thermo-S/ Thermo-D	lm/m²
LunaDeck 1	26x68	LunaThermo-D	13,7*
LunaDeck 2	26x92	LunaThermo-D	10,31*
	26x117	LunaThermo-D	8,2*
	26x140	LunaThermo-D	6,9*
LunaDeck 2 Profix	26x92	LunaThermo-D	10,31*
	26x117	LunaThermo-D	8,2*
	26x140	LunaThermo-D	6,9*
SHP	26x92	LunaThermo-D	10,31*
	26x117	LunaThermo-D	8,2*
	26x140	LunaThermo-D	6,9*
AntiSlip	26x117	LunaThermo-D	8,2*
	26x140	LunaThermo-D	6,9*
AntiSlip Profix	26x117	LunaThermo-D	8,2*

Installation of Lunawood Profix T-clip



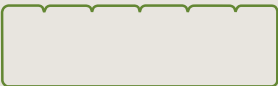
“BRE is able to conclude that the expected service life for the Luna Thermo-D used in the UK for exterior cladding will be 30 years, when following manufacturer’s guidance and best practice construction principles.”

bre

«BRE [the trading name of Building Research Establishment Limited] is a British independent and impartial, research-based consultancy, testing and training organisation, offering expertise in every aspect of the built environment and associated industries.»



LunaDeck 1 profile



LunaDeck 2 profile



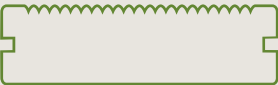
LunaDeck2 Profix profile



SHP profile



AntiSlip profile



AntiSlip Profix profile



Uncoated

Painted

Semi-Transparent

LUNAWOOD® EXTERIOR CLADDINGS

Dimensionally stable and durable Lunawood® is an outstanding choice for exterior claddings and facades. Lunawood® 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.



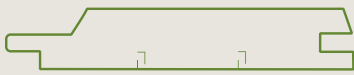
“BRE is able to conclude that the expected service life for the Luna Thermo-D used in the UK for exterior cladding will be 30 years, when following manufacturer’s guidance and best practice construction principles.”

Exterior Cladding Boards

Product	Sizes	Thermo-S/ Thermo-D	lm/m²
UTV	19x92	LunaThermo-D	11,9
	19x117	LunaThermo-D	9,35
	19x140	LunaThermo-D	7,58
UTS	19x117	LunaThermo-D	9,35
UYK	19x140	LunaThermo-D	7,58
UYL	25x140	LunaThermo-D	7,58

Solar Shade Laths

Product	Sizes	Thermo-S/ Thermo-D	lm/m²
SHP	42x42	LunaThermo-D	16,13*
HALF PARALLEL- OGRAM	42x42/28	LunaThermo-D	16,13**
PARALLEL- OGRAM	26x68	LunaThermo-D	11,36**



UTV profile



UTS profile



UYK profile



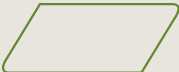
UYL profile



SHP profile



HALF PARALLELOGRAM SSS profile



PARALLELOGRAM SSS profile





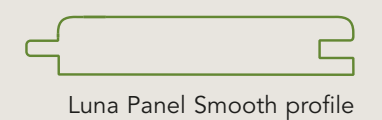
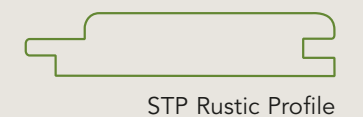
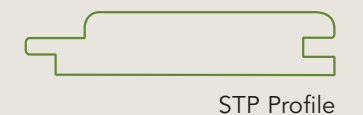
LUNAWOOD® INTERIOR PRODUCTS

INTERIOR DECORATION – The appearance of Lunawood® is soft and warm with a rich shade of brown. It is highly suitable for interior panelling and flooring, creating a cosy 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.

SAUNA & BATHROOM – Lower thermal conductivity and improved stability of thermally modified wood makes Lunawood® 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. Lunawood® produces sauna & bathroom products both in dark and light brown tones.

Interior Panels & Flooring Boards

	Product	Sizes	Thermo-S/ Thermo-D	lm/m²
Panels	STP	15x92	LunaThermo-D LunaThermo-S	11,9
	STP Rustic	15x92	LunaThermo-D LunaThermo-S	11,9
	LunaPanel Velvet	15x92	LunaThermo-S LunaThermo-D	11,7
	LunaPanel Smooth	15x92	LunaThermo-S LunaThermo-D	11,7
Flooring boards	HLL 2/4 TG	26x92/117 (Rw) 25x90 (Birch)	LunaThermo-S LunaThermo-D	11,8/9,0 12,0
	RollFloor®	580x760	LunaThermo-D	





OTHER LUNAWOOD® PRODUCTS AND INDUSTRIAL END USE

Lunawood® thermowood is an excellent material for use in a wide range of garden and landscaping products like fences, pergolas, terrace pillars and posts or even garden buildings such as gazebos. Lunawood has also taken part in developing a new product line, LunaGarden®, which includes modern garden furniture and structures.

Lunalog, a recent innovation developed for the housing industry, was launched in 2009. This glue laminated beam with its low thermal conductivity and environmentally friendly values is an outstanding building material for the log housing industry.

All the improved properties in Lunawood® create many opportunities for its use in industrial applications. In addition to garden design and log housing it is an excellent raw material for joinery products such as doors and windows.

Laminated posts

Product	Sizes	Thermo-S/ Thermo-D	lm/m²
SHP	90x90 120x120 140x140 170x170	LunaThermo-D	





GOOD TO KNOW

The following chapter will present some useful advice and recommendations on the use of Lunawood®. We hope that this information helps you to enjoy all the many benefits of using Lunawood® thermowood.

Durability

LunaThermo-D belonging to durability class 2 has a projected service life of 30+ years when durability against 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.

Equilibrium moisture content

After the thermal process the equilibrium moisture content of Lunawood® is 5 % (+/- 1%). In outdoor use (+20 Celsius, RH 65 %) the equi-

librium moisture content of Lunawood® thermo D pine stabilizes at 6,5 % (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 should be stainless-steel and suitable for fastening wood.

When using nails, they should not be closer than 2 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 groove so that the screw or thin nail is driven in at an angle of less than 40.

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.

Fire Behavior

The fire class of Lunawood is the same as normal wood D-s1-d0. In cases where improved fire class is required Lunawood® can be treated with the same fire protecting products as

normal wood. Follow the manufacturer's instructions.

Gluing

Gluing of Lunawood® 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.

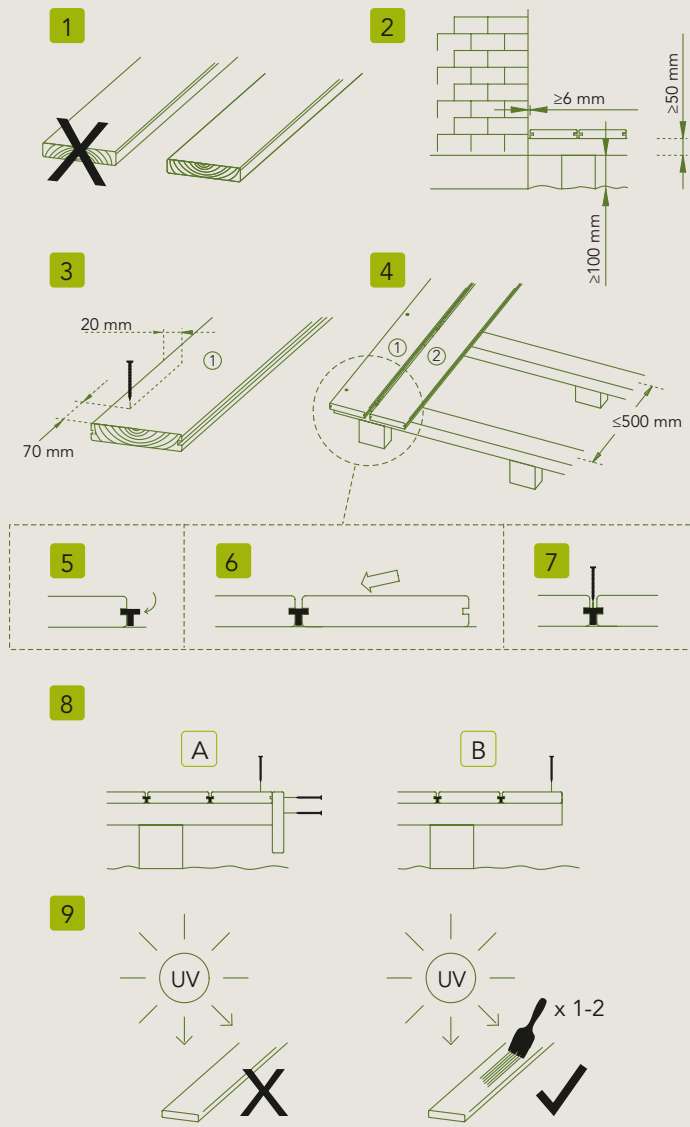
Installation

OF DECKINGS

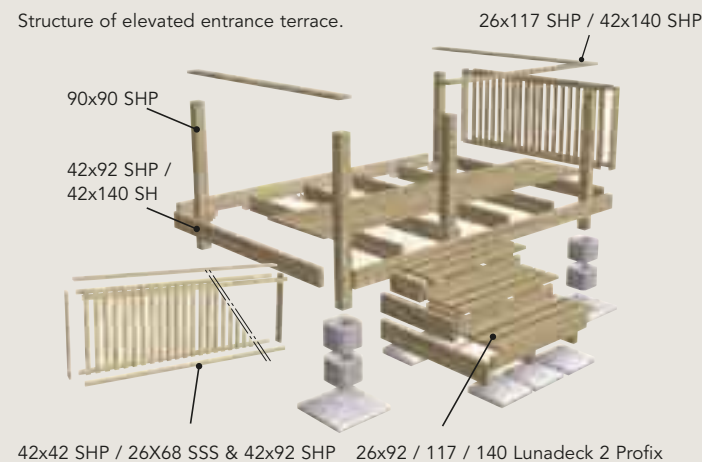
When building a deck it is always recommended to keep the deck off the ground to improve the air circulation below. The gap between the boards should be at least 4 mm to improve

Installation of Lunawood® decking

Guide 1.



Structure of elevated entrance terrace.



air ventilation and promote evaporation of rain water. Any gap next to an adjoining wall should be at least 5cm and the gap between two board ends should be 1-2 mm to allow for any movement.

OF CLADDINGS

In claddings, ventilation should be provided behind the boards (22–25 mm). Please also note that there should be at least 30 cm between the ground and lower edge of the cladding.

Milling

If Lunawood® is intended to be milled, the blades should be in good and sharp condition to ensure good end results. The light, fine-grained saw dust is readily extracted with no adhesion to the cutter blades.

Planing

Lunawood® can be planed with a normal planer or planing machine. Planing Lunawood® gives its surface a superior quality. The planing machine should be adjusted for hard wood species. 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 Lunawood® at all because the quality of the surface is so good after being planed and milled. However if Lunawood® is sanded the resin free material keeps your sand paper in good shape for a longer period of time.

Sawing

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

Surface Treatment

OUTDOORS

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 treat-

ment can be applied either before or immediately after mounting using only a thin layer. 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 Lunawood® thermowood the maintenance interval in painting can be greatly extended, possibly three times longer than usual. 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 LUNAWOOD® WITHOUT SURFACE TREATMENT

We recommend using some form of surface treatment to protect Lunawood® from air born impurities. However unfinished thermowood may be used. The brown colour of the surface will simply fade and turn to grey over time due to the influence of UV.

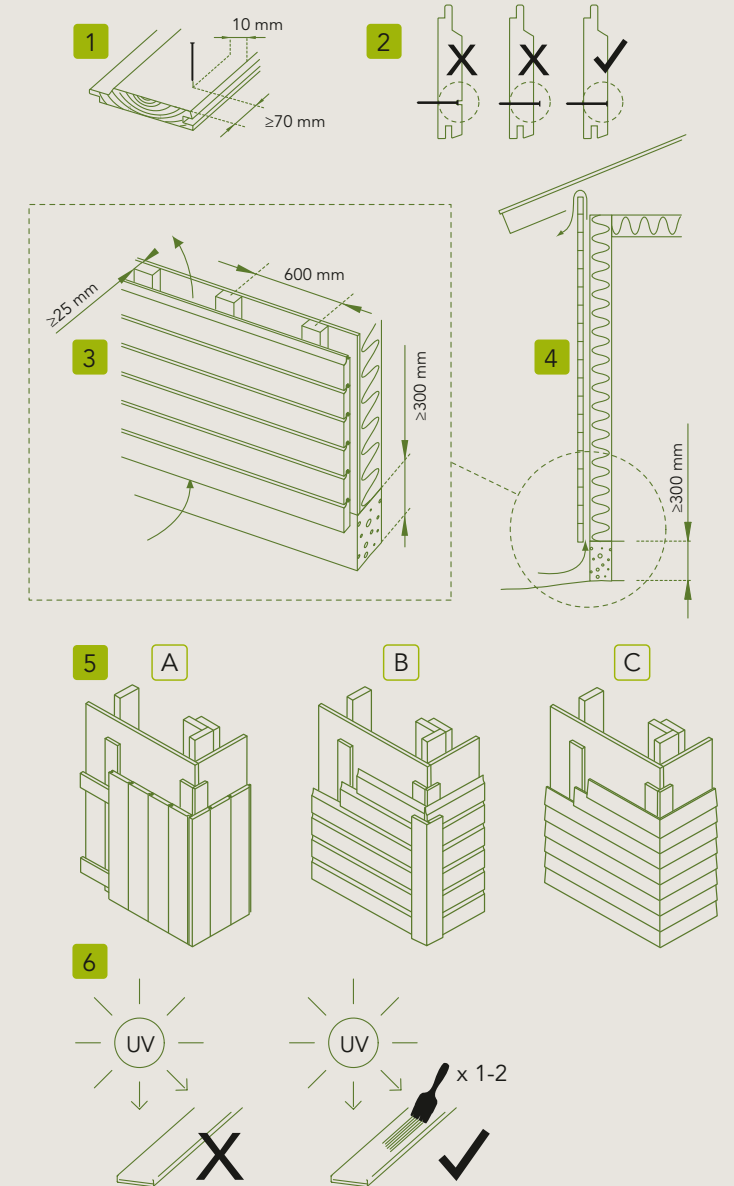
The weathered appearance of the wood is elegant and the beneficial properties remain intact. The surface of the wood merely creates a protective layer for itself. The original brown colour can be restored, using an effective washing solution after which a surface treatment can be applied.

Bending Strength

Bending strength properties are somewhat reduced with heat treatment class LunaThermo-D. Before further official studies are concluded it is recommended that Lunawood® is not used in load bearing structures without additional support; or that strength calculations are carried out on a case-by-case basis.

Installation of Lunawood® cladding

Guide 2.





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