

What kind of wood for

	Heat-treated wood / ThermoWood®	Kestopuu®	OrganoWood®
How are they treated?	"Heat-treated wood is made by heating the wood to a temperature above 160 °C. The manufacturing process is based on the use of steam and high temperature. No chemicals are added to the wood during the process. The manufacturing process can be divided into three separate stages: 1. raising the temperature, 2. actual heat treatment and 3. lowering the temperature and evening out the moisture content. The moisture content of the wood is evened out according to use, usually to over 4% moisture.	"Pressure-impregnated timber is pine that has been treated with preservative in an industrial plant to prevent rot and blue discolouration. In pressure-impregnated timber, the preservative is introduced into the wood at high pressure using water in an impregnation cylinder. The preservative is forced into the surface cells of the wood which are susceptible to rot. In Finland, timber is preserved according to strict quality requirements and standards. Modern, copper-based preservatives are safe and effective. The production of impregnated timber is subject to strict quality control. Kestopuu is manufactured in Finland and the raw material used is Finnish pine harvested in certified forests."	OrganoWood technology is based on changing wood to give it effective protection against rot, burning, water and dampness. The fibres are changed at the molecular level using non-poisonous mineral-based substance. Development of the patented OrganoWood technology is based on the natural fossilisation process, which can be speeded up using environmentally friendly OrganoClick technology to alter bio-fibres. The method uses a natural vegetable substance as an organic catalyst to bind the minerals to the wood fibres. Consequently, wood that is treated using OrganoWood technology becomes 10% fossil and 90% wood.
How does treatment affect properties?	During heat-treatment, the rot and weather resistance of the wood and its thermal insulation properties improve while moisture movement is reduced. At high temperatures, the resin is removed from the wood. Heat-treatment has little effect on the hardness of the wood. Changes in density and the wood species used are of more importance than hardness. Heat-treatment slightly reduces the bending strength and splitting strength of the wood. At high temperatures, the wood turns brown throughout.	Pressure impregnation is an effective way to improve the rot-resistance of timber in damp, outdoor conditions. In outdoor use, treated timber lasts 3-5 times longer than untreated. Pressure impregnation has no significant impact on the strength characteristics of timber. Treated timber is a little more difficult to ignite than untreated and burns slowly. The copper in the preservative gives the wood a greenish tinge. Impregnated wood is also available in brown and with a pre-finished surface treatment in e.g. grey. The weight of the timber increases significantly in the impregnation process. When it dries out, it returns to almost its original weight.	The wood acquires extremely good rot and fire protection, and turns grey beautifully. The wood also becomes more wear-resistant and less liable to splinter than untreated wood. The fossilisation that occurs on the surface of the fibres causes them to become encapsulated, so that rot-causing fungi cannot penetrate the fibres and affect them. Thus, the fungi are not killed, as happens if traditional wood preservatives containing biocides are used. Instead, the fungi are kept out by a physical barrier. Because fossil material does not burn, the treatment also gives effective fire protection.
How are they classed and what are the differences?	"Generally, in ThermoWood product classifications, hardwood and softwood are classed separately on the basis of the temperature used. Treatment temperatures are specified to optimise the requirements of the finished product. Product classes are Thermo-S and Thermo-D. Thermo-S (Stability) -class heat treatment improves dimensional stability and gives the brown colour. Thermo-D (Durability) -class heat treatment significantly improves anti-rot properties and gives a darker brown colour than Thermo-S class. In addition to the general product classification, products supplied to industrial customers for further processing can be heat-treated, by agreement, to optimise the properties precisely to take into account the demands of the end product.	In Finland, preserved timber is either AB class or A class. The preservative content in A class Kestopuu is higher. It is suitable for use in conjunction with earth, water or concrete and in structures that are difficult to repair subsequently. AB class Kestopuu is used above ground, e.g. for decking and fencing.	Different manufacturers make terrace floorboards of different widths, lengths, thicknesses and profiles. 

the garden?

Wood is a popular material for terraces, jetties and other outdoor structures. In recent years, a host of new wood-based materials have emerged alongside traditional wood materials. We have collated for this article basic information on various alternatives. Further information is available direct from the manufacturers.

	Wood composites		Siberian larch
How are they treated?	Composites and their 'recipes' are of many types and many qualities. The raw materials used for composite terraces are fibres (e.g. wood, rice and bamboo) and polymers (e.g. polyethylene, polypropylene, pvc). Additives such as colours, UV protection and binders, improve the properties of the product. Composite terrace floorboards are manufactured by extrusion.		Siberian larch is a durable material for building, both indoors and outdoors. Larch is an ecological alternative; it resists rot, wear and tear without special treatment.
	UPM ProFi Deck	LunaComp Deck	Its fine grain and beautiful reddish-brown colour are well-suited to buildings which call for timber that is wear-resistant but individual. Characteristic of larch is its well-developed heartwood and sapwood. The red-brown heartwood can be clearly distinguished from the light-brownish sapwood.
How does treatment affect properties?	The main materials used for UPM ProFi Deck terrace floorboards are cellulose-based fibres and polymers which do not contain lignin and are produced as by-products in the manufacture and treatment of PSA laminate. During the terrace floorboard manufacturing process, cellulose fibres are encapsulated in high-quality polypropylene so that the terrace has a high degree of stain resistance. The high-friction finish of UPM ProFi Deck comes straight from the manufacture so that the surface of the product is not damaged by the use of a wire brush.	LunaComp Deck is made of modern innovative wood-plastic composite. Main raw materials are the sawdust which is a by-product of the manufacture of Lunawood heat-treated timber i.e. heat-treated wood fibre and high quality plastic polymers. Heat-treated timber is a characteristically weather and rot-resistant material based on the physical and chemical changes in wood caused by the heat-treatment process. Additional rot-preserved are not required.	
	The proportion of fibre to plastic, the quality and the method of manufacture all affect the terrace floorboards' colour permanence, shock resistance and ease of maintenance. UPM ProFi Deck is optimised to provide good stain-resistance with a sealed surface, the correct fibre and polymer consistency improves shock resistance, the correct proportion of expensive polymer to cheap fibre reduces water absorption, non-lignin fibre, high-quality colour pigment and UV protection keep colours bright and the surface texture provides grip when wet. Lignin is a naturally occurring molecule in wood which causes it to turn grey under the effect of sunlight.	LunaComp Deck is extremely dense. In a solid cubic metre, there is twice as much wood fibre as in Finnish pine, so it is heavier than wood. LunaComp Deck does not absorb water in the same way as wood, so it does not swell, split, or change its shape as wood does. Composites do not have a grain direction as wood does, so wood composites are stiffer than wood. Correspondingly, composites do not splinter like wood. The hardness of LunaComp Deck is many times greater than even the hardest species of wood. Thus it is resistant to wear and tear even in the most demanding situations, such as stairs.	Because of its structure, Siberian larch is resistant to changes in weather, even when untreated. The number and quality of the naturally occurring compounds in larch make it naturally rot-resistant.
How are they classed and what are the differences?	"There is no actual classification for plastic-wood composites. They can be divided e.g. according to type of plastic used into polyolefin-based (PP and PE) and PVC-based composites. On the basis of the profile used, they can be divided into hollow and solid boards. In Europe, the EN 15534 standard for wood-plastic composite products is currently in preparation and some sections have already been approved. It is not, however, harmonised, so it is not binding on all manufacturers. The Standard guarantees certain properties for the products, including shock resistance and friction. UPM ProFi Deck carries the CE marking.		Siberian larch is divided into the same quality classes as other conifers. General classification is AB (st) and C (vi).
			

	Heat-treated wood / ThermoWood ®	Kestopuu ®	OrganoWood ®
Standard dimensions	Heat-treated wood products are available in standard dimensions and profiles for the most common cladding panels for indoor and outdoor use. Manufacturers have their own profiles for terrace floorboards and louver battens. Thicker/wider boards can be made by gluing thinner/narrower boards together.  ThermoWood	A large selection of Kestopuu products are available, in all common timber sizes.  Kestopuu	Normal dimensions are: 28x95, 28x120, 34x145, 45x95, 45x145 OrganoWood is also available in other sizes to order.  OrganoWood
Where are they used?	Common uses for heat-treated wood internally are sauna interiors, wall and ceiling panels, floorboards and furniture. Common uses for heat-treated wood externally are cladding, louver screens, terraces, fences and joinery products such as windows, doors, bath tubs etc.	Common uses for Kestopuu include terraces, patios, pergolas, jetties, sandpits, steps, playground furniture, cladding, fence-posts, columns, handrails, embankments, bridges, etc.	Uses for OrganoWood include timber canopies, terraces, jetties, sand-pits and bridges. Other uses where good fire and rot-resistance is an advantage include attics, basements and cladding panels.
Surface treatment	Heat treated wood is brown in colour. In order to preserve its original colour and to prevent surface cracks, a UV-protection surface treatment is recommended. Oil-based surface treatments work as on untreated wood. Absorption is slower with water-based treatments, so products with a long drying time are recommended. The surface treatment should be spread in a thin layer, if necessary several times. Remember to read the instructions for using the surface treatment.	Impregnated timber is structurally durable with no surface treatment, but it does have an impact on appearance. Surface treatment with various products and there is no difference between adhesion. Water-based and solvent-based treatments work equally well on preserved timber. Before surface treatment, impregnated wood should be dry and the temperature should be at least 5 °C. Impregnated timber that has been stored outdoors must be allowed to dry for at least a month. For example, timber structures built in spring can be painted in late summer, and those built in autumn can be painted the following summer.	OrganoWood is maintenance-free. If given a single application of OrganoWood dirt and water protection, the surface will reject water for many years.
Fixings	Self-tapping screws are recommended for fixing. Pre-drilling reduces the risk of splitting near the ends of the boards. When screw fixing, wide-threaded screws suitable for wood fixing are recommended. When nailing with a hammer, nails should not be used closer than 30 mm. to the ends of the boards, or pre-drilled holes should be used. To ensure long-term durability and to prevent discolouration, stainless steel or acid-resistant fastenings are recommended in damp conditions.	For the sake of load-bearing and safety considerations, stainless steel fastenings should be used in larger constructions. In other structures, such as decking, hot-dipped galvanised fastenings may be used. The same material should be used for all fastenings in one structure.	OrganoWood may be fixed with any fastenings, but we recommend high-quality, long-lasting fastenings made of e.g. stainless steel, because OrganoWood itself is an extremely long-lasting material.

Wood composites		Siberian larch
Standard dimensions	The manufacturers have several different board profiles with various dimensions.	Koskisen Ltd offers Siberian larch in the following sizes: sawn: 32x100/125/150, 50x100/150/200 planed all round: 28x95, 28x120, 28x145, 45x95, 45x145, 45x195
	UPM ProFi Deck UPM ProFi Deck width is 150 mm, height 28 mm and standard length 4 m. Other composite terrace floorboards include: UPM ProFi Veranda: width 140 mm, height 25 mm and standard length 4 m. UPM ProFi Lifecycle: width 137 mm, height 25 mm and standard length 4 m. Special lengths up to 9 m. available to order.	
Where are they used?	LunaComp Deck	Standard dimensions of LunaComp Deck terrace floorboards are 26x140 mm. and length 4 metres. Any dimensions can be supplied on request.
	Common uses for UPM ProFi Deck include public and private terraces, patios, jetties and walkways. Because of their durability and ease of maintenance, composite products are particularly suitable for very demanding public use.	
Surface treatment	LunaComp Deck boards are mainly used for terraces and jetties. Because of its wear-resistance and ease of maintenance, the product is well-suited to public projects. Swimming-pool areas in spas and hotels are also places where the boards can be used to good effect. Globally, products manufactured from wood-plastic composite are used in garden construction and for external cladding. In practice, the product is well suited to any outdoor use whatever.	Popular uses for Siberian larch include cladding boards, garden furniture and garden structures. It is an environmentally friendly alternative for all wooden garden constructions. Uses include terraces, pergolas and canopies, fences, paths, steps, garden furniture, jetties, park benches, children's playgrounds and construction of planting areas.
	The advantages of wood-plastic composites over wood are durability and ease of maintenance. They do not need to be sanded, oiled or treated in any other way. A regular washing is sufficient. They do not splinter and are not slippery when wet.  UPM ProFi Deck	
Fixings	 LunaComp Deck	 Siberian larch
	LunaComp Deck does not need any additional protective treatment, just cleaning and washing are sufficient. Bushing with water is enough, though if necessary, terrace-washing liquid may be used.	
Fixings	Siberian larch may be given surface treatments like any other conifer.	Siberian larch may be given surface treatments like any other conifer. Fixing should be by normal non-rusting fastenings; pre-drilling is recommended.
	The advantages of wood-plastic composites over wood are durability and ease of maintenance. They do not need to be sanded, oiled or treated in any other way. A regular washing is sufficient. They do not splinter and are not slippery when wet. A composite terrace is precise, straight and therefore easy to install. The UPM ProFi Deck system includes secret fastenings, step treads and edge profiles, plus numerous tools to make installation easier.	

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	Heat-treated wood / ThermoWood ®	Kestopuu ®	OrganoWood ®
Movement	The dimensional stability of heat-treated wood is considerably improved because of the reduced moisture content. In heat-treated wood, both radial and tangential swelling as moisture content increases may be 40-50% less than in untreated wood. Because the moisture movement of heat-treated wood is reduced, change of shape in finished products with changes in weather conditions are also reduced.	The moisture content of freshly impregnated timber should be taken into account in construction. Timber shrinks 1-2% longitudinally when dry. After this stage, the dimensional stability of impregnated timber does not differ from that of untreated timber in normal conditions.	OrganoWood is always dried after treatment, so there are no warping problems.
Long-term durability	According to standardisation tests carried out in laboratory conditions (EN 113, ENV 807) heat-treatment improves the biological durability of wood considerably. Without any additional chemical protection, ThermoWood can be used in standard EN 335-1 classes 1-3 conditions. On the basis of field tests, ThermoWood is not recommended for use in continuously wet ground where high structural strength is required.	Pressure impregnation improves the rot-resistance of wood substantially. Outdoors, Kestopuu lasts 3-5 times longer than untreated timber, normally about 20-25 years. Field tests have been carried out on impregnated timber over decades to ascertain its long-term durability.	On the basis of current tests, OrganoWood is extremely durable. It is also guaranteed for 10 years against rot.
Protection against weather	The UV radiation in sunlight causes heat-treated wood to turn grey like other wood products. With time, sunlight and changes in moisture content and temperature may cause micro-splits in the surface of unpainted heat-treated wood. Weather resistance can be improved by painting and regular maintenance.  ThermoWood	Kestopuu turns grey like any other timber under the effects of UV radiation. Over many years, the surface of unpainted and poorly maintained timber will darken and become friable.  Kestopuu	The product keeps its natural colour, but ages naturally. When wood ages, it turns grey and then keeps its silver-grey colour. There are several external reasons for this. Sunlight destroys the lignin and hemicellulose in the surface of the wood causing loss of colour. Other factors, such as dirt, epiphyte and dead wood particles cause the wood to turn grey. The combination of loss of colour and turning grey produces the silver-grey colour.
Recycling / reuse	The ThermoWood heat-treatment process uses only high temperatures and steam. Chemicals are not used. Emissions given off by products during use are extremely small. At the end of its life cycle, ThermoWood can be disposed of like normal wood. Burning is the most usual way of using waste wood from construction and demolition.	In Finland, a recycling system has been set up for impregnated timber by the product manufacturers, which is free of charge to consumers. There are recycling collection points in timber yards and refuse stations. In the recycling process, the fixings are removed and sent to metal recycling. The timber is then used for heat and electricity generation.	In practice, OrganoWood is non-combustible, but it can be destroyed in an incineration plant where it chars slowly like other combustible material. Because the product is 100% non-poisonous, it can also be buried or used for landfill in small quantities. Because of its rot-resistance, the product cannot be composted.
	www.thermowood.fi	www.kestopuu.fi	www.organowood.com

	UPM ProFi Deck	LunaComp Deck	Siberian larch
Movement	All composites expand and contract with changes in temperature. Thermal expansion has to be taken into account in installation. The rule of thumb for UPM ProFi products is that approx. 6 mm gaps should be left at both ends. A 6 mm. gap over 4 m. is sufficient for a maximum rise in temperature of 20 degrees, e.g. the transition from winter to summer.	The movement of the LunaComp Deck is only 1 mm per linear metre when change of the temperature is between +/- 30 degrees.	Siberian larch tends to move like any other untreated conifer.
Long-term durability	The advantage of a composite terrace is its durability. The material withstands shocks and scratches, year after year, it does not splinter and demands no more maintenance than a regular wash. UPM ProFi Deck products carry a 10-year guarantee which covers the durability of the structure according to product and use. However, the anticipated useful life of the product is considerably longer.	Independent of markets, LunaComp Deck has a 10-year rot-free guarantee. However, the product's life expectancy is 25-30 years.	Because of its resistance to rot, Siberian larch resists changes in the weather.
Protection against weather	"All composites expand and contract with changes in temperature. See above. UPM ProFi material does not contain lignin, a molecule which occurs naturally in wood, so it does not turn grey, but colours remain bright. However, as with all materials, the colour of a composite will eventually dull slightly. UPM ProFi Deck products are designed to withstand Finnish conditions. Their shock resistance also remains good in cold conditions.	When building a composite terrace, it is important to leave sufficiently large thermal-expansion joints. Temperature changes do not cause the product to change shape. UV radiation may cause the product to lose its colour slightly during the first year, but after that, the colour remains unchanged. Water and ice do not cause changes in the product, but ice should not be removed from the surface with a metal object. Air and air pollution gradually cause acidification and dirt to stick on even surfaces, but this can be washed off.	Untreated, Siberian larch turns grey under the influence of UV radiation.
Recycling / reuse	The main materials used to make UPM ProFi are the paper and plastic left over from the manufacture of PVA laminate. Because there are no other significant uses for these surplus materials, the manufacture of UPM ProFi reduces the quantity of landfill and combustion waste. UPM ProFi products can be recycled and ground up as raw material for new UPM ProFi products. No waste is produced in the manufacturing process, as anything left over can be used again as raw material for new UPM ProFi products. UPM ProFi products do not contain dangerous chemicals, so that after their long life, they can be destroyed with normal domestic or combustion waste, or even be burned on a garden bonfire.	LunaComp construction waste can be burned. Combustion does not give rise to poisonous pollutants and all that is left is very fine dust. LunaComp burns at a higher thermal value than wood, which should be taken into account when burning. The product can also be recycled as energy waste with other domestic refuse.	Siberian larch can be disposed of like any other normal untreated timber.
	www.upmprofi.fi	www.lunacomp.fi	www.koskisen.fi