



# Savia<sup>®</sup>

## SAVIA THERMOPINE INFO



### Density

Thermopine has between 5% and 15% less density than the wood had before the heat treatment process. This reduction is mainly due to the variation in the composition of the wood structure, caused by the effect of temperature and the reduction in the moisture content.



### Moisture content balance

The physical and chemical modifications carried out during the manufacture of ThermoPine result in a 50% decrease in the moisture content balance of the wood. This characteristic results in an improvement, both in terms of the dimensional stability and durability of ThermoPine.



### Mechanical properties

Heat treatment causes a modification in the mechanical properties of the wood, particularly in terms of strength and rigidity. In this sense, ThermoPine reduces its strength and slightly increases its rigidity, resulting in a lower degree of deformation compared to untreated natural wood.



### Durability

The heat treatment causes a modification in the structure of the wood, producing new molecules such as furfural, which interacts with the wood's own lignin and means that the fungi enzymes do not recognise it and therefore do not degrade it. In addition, because the hemicellulose chains are destroyed, the fungi have less nutrients for their development, making ThermoPine a product that is suitable for outdoor use.



### Dimensional stability

Less moisture exchange, due to lower moisture content balance level, and reduced radial and tangential shrinkage coefficients make ThermoPine a wood that has a dimensional stability that is up to 75% better than untreated wood. This allows it to perform better outdoors, minimizing movement of the parts during their service life.

Physical Mechanical		Standards
Density	530 +/- 50 kg/m³	Standard UNE-EN 408:2011+A1:2012; UNE-56531
Moisture	4,5 - 7%	Norma UNE-EN 408:2011+A1:2012; UNE-EN 13183-1:2002
Tangential shrinkage coefficient	4,65%	UNE-EN 56533:1977
Radial shrinkage coefficient	1,91%	UNE-EN 56533:1977
Impact resistance (Charpy)	31,74 KJ/m²	UNE-EN ISO 179-1:2024; UNE-CEN/TS 15679:2009
Indentation resistance (Brinell)	2,11 kp/mm²	UNE-EN 1534:2021
Thermal conductivity (λ) in (W/m.k)	0,10 - 0,13	EN 14915:2013+A2:2021
Durability xylophagous fungi	2 - durable	UNE-EN 350:2017
Durability xylophagous beetles	D - durable	UNE-EN 350:2017
Fire Reaction class	D-s2, d0	EN 14915: 2013+A2:2021
Use	3.2	UNE-EN 335:2013



OUTDOOR USE WITHOUT DIRECT CONTACT TO THE GROUND. WE RECOMMEND AVOIDING PERMANENT ACCUMULATIONS OF WATER.

		Premium Quality	Knotty Quality
Sawing marks		✗	✗
Bark		✗	✗
Buds		✗	✗
Cracks		✗	✗
Core		✗	✓ less than 20 cm visible side, unlimited invisible side
Resin pouch		✓ up to 4 lower pouches at 6X1 cm or 3X2 cm	✓ up to 4 lower pouches at 6X1 cm or 3X2 cm
Knots		✓ up to 4 groups of knots that are 5 cm max. in diameter	✓ unlimited, including knot cracks
Holes		✗	✓ -in machining if they do not affect functionality -No through-hole with diameter of less than 10 mm
Rot		✗	✗
Fungi		✗	✗
Warping		✓ Less than 30 mm	✓ Less than 30 mm
Edge curvature		✓ Less than 20 mm	✓ Less than 20 mm
Side curvature		✓ Less than 30 mm	✓ Less than 30 mm

\*Slight defects on the hidden side are acceptable, as long as they do not affect functionality

\*\*\*We guarantee the quality of ThermoPine in 90% of the volume supplied.

\*\*\* Due to the heat treatment process carried out for the manufacture of ThermoPine, knots may have small cracks that will be repaired with putty.

## Equilibrium Moisture Content

Prior to installation, Thermopine profiles must be conditioned to the hygroscopic equilibrium humidity of the area. We recommend leaving the profiles at the installation site for 24 – 48 hours.

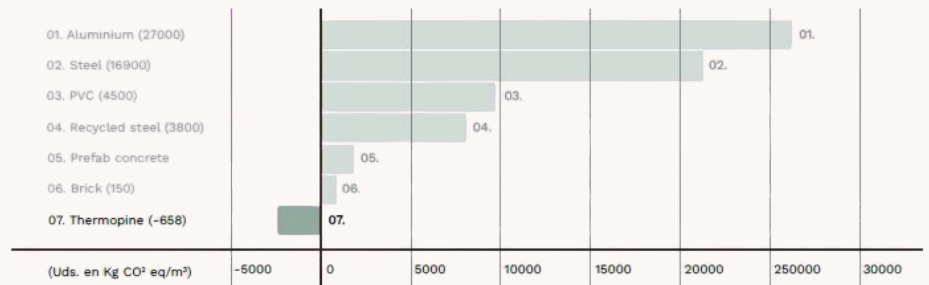
Although the equilibrium humidity of Thermopine may vary slightly between different times of the year, take into account the humidity values of the area for an outdoor installation protected from rain.



## Batten

The batten is fixed to the supporting wall and allows the Thermopine cladding to be separated from it. This creates a ventilated chamber that optimizes the performance and durability of Thermopine when used outdoors. This chamber must be at least 30 mm deep and it must allow air to enter and exit through the air gap at the bottom and the top ends respectively.

The batten must be fastened to the supporting wall with a fastening element that is suitable for the wall. These fastening elements must be at least 80 mm in length with a maximum separation of 500 mm.



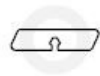
## Fastening



THREADED LAG SCREWS FOR FASTENING



CLIP TYPE CLAMP



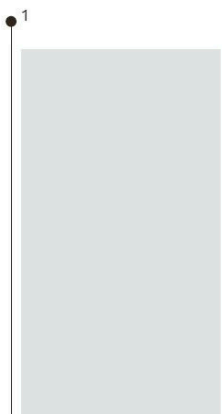
COMBI CLIP	Size (MM)	Pack/slates
Fixed length, premium quality	85X20	5



## 6 Thermopine processing

### Machining

There are no difficulties whatsoever with machining Thermopine. Particular attention should be paid to the sharpening of the tool, in order to reduce the risk of the wood splintering and obtain an optimum finish quality.



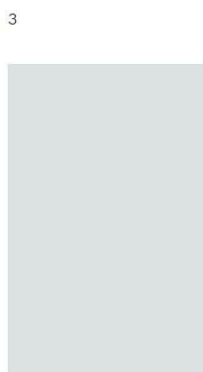
### Gluing

Gluing Thermopine is satisfactory, but there are some considerations to be taken into account. Due to the thermal modification process, the wood's capacity to absorb water is reduced, and therefore, when using PVAc (Polyvinyl Acetate) adhesives, the water content of the adhesive itself should be minimal. On the other hand, when using PU (polyurethane) type adhesives, where water is required for curing, the majority of the moisture will need to be provided by the environment. We recommend the use of PU type adhesives for outdoor Thermopine applications.



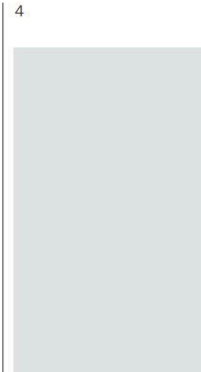
### Planing

Thermopine can be planed in the same way as untreated wood. Special care must be taken to sharpen the tools in order to achieve good quality planing. If this process is to be performed on a planing machine, you need to adjust the feed rate and treat Thermopine as a hardwood.



### Sanding

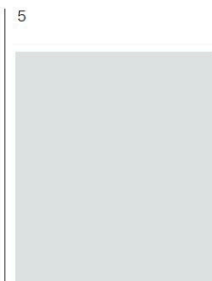
After the planing process, the surface of Thermopine is of high quality and does not require sanding. However, there are no difficulties with sanding Thermopine. The use of a mask is highly recommended due to the fact that fine dust is generated.



### Fastening

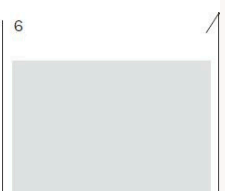
In order to properly fasten Thermopine, it is important to remember that the cohesion between the wood fibres is slightly reduced during the heat treatment. To avoid possible cracking, self-tapping lag screws should be used. If not, the wood should be pre-drilled before inserting the lag screw.

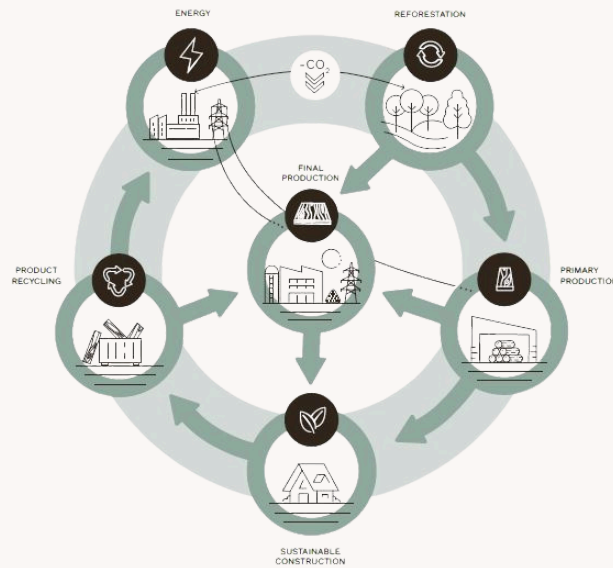
For outdoor applications, or in environments with high humidity conditions, the lag screws must be stainless steel.



### Varnishing

Due to the structure that Thermopine takes on, once the surface of the product has been planed it will be very good quality and sanding is not necessary. Even so, Thermopine sands easily, with the advantage that the sandpaper does not get clogged, due to the effect of the resin. In order to protect Thermopine from the weather and maintain its original colour, we recommend applying a water-based, pigmented, porous protective product that allows the wood to exchange moisture with the environment and protects it from ultraviolet rays.





Thermopine life cycle: sustainable circular economy



### Uniformity of colour

ThermoPine's thermal modification treatment gives it a high degree of uniformity in terms of the colour of the wood. It takes on a dark brown colour across the whole section of the product, allowing it to be cut and planed without altering the colour. To maintain the original appearance of ThermoPine, it is necessary to apply a pigmented UV protection product. Otherwise, none of the properties will be altered, but its colour will change to a soft silver grey.



### Without chemicals

In the manufacture of ThermoPine, we only use heat and steam, completely dispensing with additives and chemicals. This makes the product totally natural and environmentally friendly, while maintaining an optimum level of performance.



### Thermal insulation

Due to the removal of some of the constituent parts of the wood during the thermal modification process, especially the hemicellulose, ThermoPine has reduced thermal conductivity. This results in a considerable improvement in thermal insulation; up to 25%.



### Without resin

Due to the high temperatures reached during the manufacture of ThermoPine, resin encapsulated in wood vanishes. This means that it does not exude resins during its service life, which improves the aesthetic, visual and functional quality of the ThermoPine.

## How durable is ThermoPine?

Various tests and trials have shown that ThermoPine's resistance to decay is far superior to that of untreated softwoods, and equal to that of many tropical hardwoods. In addition, the good dimensional stability demonstrated by ThermoPine also helps to increase its durability by preventing excessive movement of the wood that can lead to cracking or breakage. On the other hand, there are other factors in addition to resistance to decay, such as general product wear, which are also related to product maintenance. With proper installation and appropriate maintenance, the useful life of ThermoPine can exceed 25 years.

## Why is ThermoPine so durable, given that the resin and other extracts have evaporated?

The durability of ThermoPine is achieved due to the fact that, during the heat treatment process, changes in the structure of the wood occur and the hemicellulose (polysaccharide) degrades, resulting in a significant reduction in the nutrients that are essential for the development of fungi and insects.

## Are chemicals used during the ThermoPine manufacturing process?

We only use temperature and steam in the manufacture of ThermoPine. ThermoPine is a product that is 100% natural, sustainable and recyclable.

## Can ThermoPine be used in contact with the ground?

Although ThermoPine is highly durable, the moisture produced by the ground and supplied to the wood causes some of its properties to be altered, and so it is not advisable to commission it in permanent contact with the ground.

## Can ThermoPine be installed outdoors without any surface treatment?

ThermoPine can be installed outdoors without any type of treatment, although this will cause cracks and greying of the product, accelerating its wear due to the photo-degrading action of the sun, as is the case with other woods. If you wish to preserve the original colour of ThermoPine, it is necessary to carry out maintenance cycles as indicated in this document.

