











PINE
THERMO-D DATA SHEET

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Mechanical Properties, Strength values		Pine, Kiln-dried	Pine, Thermowood
Modules of elasticity (MOE), flatwise (MPa-N/mm ²) DIN EN 408, TS 2478		8529	7411
Modules of rupture (MOR), flatwise (MPa) DIN EN 408, TS 2474		76	31-42
Impact bending strength (IBS), flatwise (MPa) TS 2477		0,43	0,16
Compressive strength (CS), (MPa) TS 2595		42	44
Dimensional Stability 65%Rh 20°C <i>(Increased Stability)</i> <i>(Minimized deformations)</i> <i>(Minimized Expansion and Shrinkage)</i>		Pine, Kiln-dried	Pine, Thermowood
Maximum swelling ratio, tangential (SW-T) (%) DIN 52184, TS 4083, 4084		8,6	3,22
Maximum swelling ratio, radial (SW-R) (%) TS 4083, 4084		4,42	1,5
Maximum swelling ratio, longitudinal (SW-L) (%) TS 4083, 4084		0,18	0,07
Maximum shrinkage ratio, tangential (Sh-T) (%) TS 4083, 4084		7,26	3,62
Maximum shrinkage ratio, radial (Sh-R) (%) TS 4083, 4084		4	1,79
Maximum shrinkage ratio, longitudinal (Sh-L) (%) TS 4083, 4084		0,16	0,08

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Physical Properties, Moisture content		Pine, Kiln-dried	Pine, Thermowood
Equilibrium moisture content at 20/65 (%) EN 13183-1		11,6 (9-12)	4 (4-6)
Raw density at 20/65 (kg/m ³) DIN 52182		434-470	362-404
Biological durability against wood-decaying basidiomycetes <i>(Increased durability to decay) (Resins and sugars removed) (Low moisture content prevents decay and fungi growth)</i>		Pine, Kiln-dried	Pine, Thermowood
Preliminary durability classification Median mass loss (< 5 %) CEN/TS 15083-1		-	Class 2
Surface burning characteristics of buildings material- Fire resistance. <i>(Improved fire-resistance)</i>		Pine, Kiln-dried	Pine, Thermowood
Fire Resistance (UNCOATED) EN 13823	Class	-	D
	Smoke Production	-	S2
	Flaming droplets/particles	-	d0
Fire Resistance (COATED by using fire retardancy liquids) (immersed/impregnated wood) EN 13823	Class	-	A2/B
	Smoke Production	-	S1
	Flaming droplets/particles	-	d0
Nail and screw holding strength <i>(screw withdrawal strength)</i>		Pine, Kiln-dried	Pine, Thermowood
<p>a. Stainless steel or galvanised screws and plastic clips are recommended. Hidden and face fixing systems EN 1383, NEN 6562</p> <p>b. Steel material standard 10088-3</p>		-	Class A2
Surface contaminations from fixation elements		-	Not delicate
Glueing		Pine, Kiln-dried	Pine, Thermowood
Fingerjoints Laminations Panel production		-	MUF, Polyuretane
Brinell Hardness		Pine, Kiln-dried	Pine, Thermowood
		-	15 N/mm ²

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Emissions		Pine, Kiln-dried	Pine, Thermowood
The emissions are not harmful in fresh air.		-	OK
The smell of thermowood products may disappear within a few days but with the surface treatment or rain it may raise up again. 100 % natural, environmentally friendly and recyclable products.		-	Short Time
Thermal conductivity, Insulation <i>(Decreased Thermal Conductivity)</i>		Pine, Kiln-dried	Pine, Thermowood
Heat conductivity W/mK TS EN 12667		1,2	0,099
Colour		Pine, Kiln-dried	Pine, Thermowood
Colour of the wood changes (Pine colour is dark brown)		-	OK
Oil and water based coatings		-	OK
Environment <i>(100 % naturel) (recycleable) (from renewable forests)</i>		Pine, Kiln-dried	Pine, Thermowood
PEFC certified		-	OK
100 % naturel		OK	OK
100 % recyclable and biodegradable		OK	OK
Low processing energy demand		OK	OK
Sustainable development and a low carbon future		OK	OK
Wood industries on fast grown plantation wood		OK	OK
From sustainably managed forests		OK	OK
Healthy and safety		Pine, Kiln-dried	Pine, Thermowood
Definitely naturel and harmless. Free of chemicals.		OK	OK
Completely healthy.		OK	OK
Improving the stability and durability of wood without using any persistent toxic chemicals		OK	OK
Freeze-heat shock treatments		Pine, Kiln-dried	Pine, Thermowood
1 Cycle: Freezing stage: 3 days -40°C as frozen wood and then Heating stage: 30 min 200°C in furnace as thermal shock effects. R&D test specs and ASTM-D 143-94 standards.		-	OK-5 cycle <i>(surfacequality) (no cracks) (no color change).</i>