

KARAVA
TUNTEE PUUN




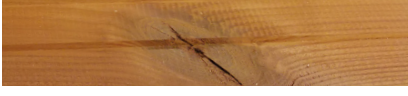






A man with light brown hair, wearing a dark work jacket and large red earmuffs, is working in a wood mill. He is holding a large, light-colored piece of wood. The background shows a large window with multiple panes, a red fire extinguisher, and various industrial equipment. The scene is brightly lit, likely from the window.

ThermoWood®
Grading Guide

Karava ThermoWood Grading Guide

Knots and quality defects		Better face	Back side
HIT&MISS		not allowed	max 50 % of the width of the board
FEED-ROLLER MARKS		not allowed	unlimited
WANE		not allowed	max 1/3 of the width and 20 % of the thickness of the board
MECHANICAL DEFECTS		not allowed	unlimited
SURFACE CHECKS		max 100 mm long	unlimited
SHAKES		not allowed	not allowed
END SPLITS		max length = width of the board	unlimited
RING SHAKE		not allowed	not allowed
SOUND KNOTS		visual grading, not measured, has to maintain integrity of the board	unlimited
KNOT HOLE		not allowed	unlimited

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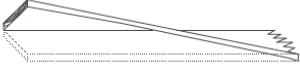

Knots and quality defects		Better face	Back side
BARK KNOTS		sound, up to Ø 30 mm, bark not over half of the diameter	unlimited
DEAD KNOTS		up to Ø 15 mm	unlimited
BLACK KNOTS		Ø up to 20 % of the width of the board	unlimited
KNOT SHAKE		up to 1 mm wide and 50 mm long	unlimited
PIN KNOTS		allowed	unlimited
SPIKE KNOTS		Ø up to 1/2 of the width of the board	unlimited
EDGE & ARRIS KNOTS		allowed	unlimited
KNOT CLUSTER		visual grading, not measured, has to maintain integrity	unlimited
PARTIALLY INTERGROWN KNOTS		bark up to 1/2 of the diameter	unlimited
RESIN POCKET		allowed up to 300 mm ²	unlimited

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Knots and quality defects		Better face	Back side
SCAR		allowed up to 300 mm ²	unlimited
PITH		max 20 % of the length of the board	unlimited
SLOPE OF GRAIN		allowed	unlimited
BARK		not allowed	not allowed
ROT		not allowed	not allowed
MOULD		not allowed	not allowed
INSECT HOLES		not allowed	unlimited

Grading book / A-grade / up to 5 % of the volume can be of lower grade

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Knots and quality defects		Better face	Back side
BOW		allowed up to 2 mm per linear meter	
SPRING		allowed up to 7.5 mm per linear meter	
TWIST		allowed up to 5 % per linear meter, has to be reversible during installation	
CUP		up to 1 % of the width of the board	
TOLERANCES:		thickness: +/-0.5 mm; width: +/-0.5/-1.0 mm	

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Karava saunas and wood products

Store and Showroom:
 Vesalantie 21
 33960 Pirkkala
 Finland
 Mon-Fri, 8 am to 4 pm

Contact information:
 +358 207 345 370
 myynti@karava.fi
 www.karava.fi

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ThermoWood properties

Pine and spruce

Property	Measurement unit	Reference	Thermo-S	Thermo-D
Weight loss in the process	%	0	2	7
Density (abs. Dry / fresh volume)	kg/m ³	350 - 400	340 - 390	325 - 370
Actual density (65% RH)	kg/m ³	420 - 480	410 - 470	370 - 420
Equilibrium humidity (RH = 65%)	%	12	7	5
Maximum swelling (volume)	%	12	6	5
Swelling at 6% humidity (volume)	%	2,4	2,4	2,4
Thermal conductivity (RH 65%)	W/m/K	0,13 - 0,14	0,11 - 0,12	0,10 - 0,11
Color (L-value)	-	80 - 86	58 ± 4	45 ± 4
pH-value	-	4,5 - 5	around 4	around 4
Biological resistance EN113	rot resistance class	3 - 4	-	pine = 1, spruce = 2
Flexural strength (large specimens)	N/mm ²	57 - 74	45 - 65	32 - 47
MOE	N/mm ²	8100 - 13700	8700 - 11200	8100 - 10100
Impact strength	J/mm ²	65 - 70	50 - 55	40 - 50
Brinell-hardness	-	1,3 - 1,8	1,1 - 1,6	1,1 - 1,6
Screw pull-out strength	N/mm ²	18 - 22	16 - 20	13 - 19
Wear resistance: Taber (RH 65%)	mm/100 rounds	0,03 - 0,05	0,07 - 0,15	0,10 - 0,20

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