

TECHNICAL SPECIFICATIONS FOR SPRUCE (PINUS ABIES)



Tree Size:

Tree height is 0-10 m

Tree height is 10-20 m

Tree height is 20-30 m

Strength Properties:

Density (dry weight) = 23-30 lbs/cu. ft. 31-37 lbs/cu. ft. Low

Hardness (side grain) = Very Soft

Shrinkage, Radial = Very Small

Shearing strength (parallel to grain) = very low

Shrinkage, Tangential = Small - Medium

Max. crushing strength = Low

Toughness-Hammer drop (Impact Strength) = very low

Toughness (total work) = Very Low - Small

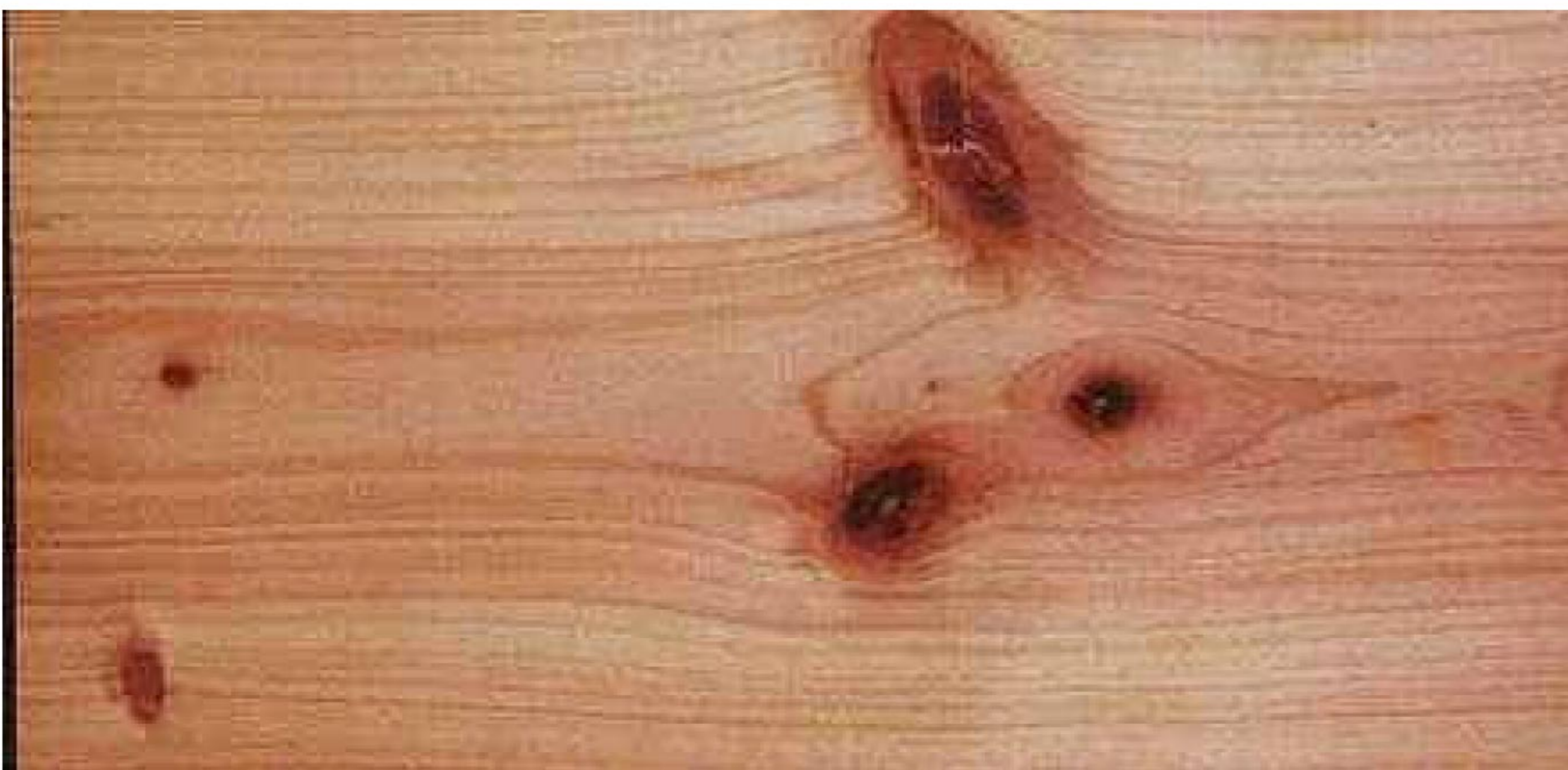
Mor / Bending strength = Very Low

Modulus of Elasticity (stiffness) = Very Low - Moderate

Max. crushing strength = Very Low – Low

Strength properties are reported to vary widely and are dependent upon origin, but the timber is comparable to Redwood (Sequoia) in most respects. It has medium bending strength in the air-dry condition (about 12 percent moisture content). It is closer in strength to Mahogany than either Teak or White oak. It is weak in compression parallel to grain (maximum crushing strength). The wood is soft, and surfaces may dent easily. It also does not wear well, and mars easily. Wood is low in weight, and has average, or medium, density. Wood produced by Spruce trees from central and eastern Europe possesses exceptional resonance qualities and is used for sound boards of pianos and bellies of violins and guitars.

Images:



NUMERIC DATA

Item	Green	Dry	Unit
Bending Strength	372	641	kg/cm ²
Density		448	kg/m ³
Hardness		171	kg
Impact Strength	48	43	cm
Maximum Crushing Strength	197	362	kg/cm ²
Shearing Strength		80	kg/cm ²
Stiffness	78	98	1000 kg/cm ²
Toughness		149	cm-kg
Work to Maximum Load	0.42	0.63	cm-kg/cm ³
Specific Gravity	0.31	0.43	
Weight	400	400	kg/m ³
Radial Shrinkage	2		%