



## Pinus echinata Mill.

### Family: Pinaceae

### Shortleaf Pine

The genus *Pinus* is composed of about 100 species native to temperate and tropical regions of the world. Wood of pine can be separated microscopically into the white, red and yellow pine groups. The word *pinus* is the classical Latin name. The word *echinata* means spiny or prickly, referring to the cones. Shortleaf pine is one of the southern pines.

**Other Common Names:** Amerikaanse shortleaf, Arkansas pine, Arkansas shortleaf pine, Arkansas soft pine, bull pine, Carolina pine, forest pine, igel kiefer, North Carolina pine, North Carolina yellow pine, oldfield pine, pin a feuilles courtes, pin dortleaf, pin doux, pin shortleaf, pino pece americano, pino tea americano, pitch pine, poor pine, rosemary, Rosemary pine, rosemary shortleaf, shortleaf yellow pine, shortleaf pine, shortleaved pine, shortschat pine, shortstraw pine, slash pine, soderns gul-tall, spruce pine, sydstaternas gul-tall, Virginia yellow pine, yellow pine, yellow shortleaf pine, yellow yellow pine.

**Distribution:** Shortleaf pine is native to extreme southeastern New York and New Jersey west to Pennsylvania, southern Ohio, eastern Kentucky, southern Illinois and southern Missouri south to eastern Oklahoma and eastern Texas east to northern Florida and Georgia.

**The Tree:** Shortleaf pine trees normally reach heights of 100 feet, with diameters of 3 feet. Exceptional trees may grow to 130 feet tall, with a diameter of 4 feet.

**General Wood Characteristics:** The sapwood of shortleaf pine is a yellowish white, while the heartwood is a reddish brown. The sapwood is usually wide in second growth stands. Heartwood begins to form when the tree is about 20 years old. In old, slow-growth trees, sapwood may be only 1 to 2 inches in width. The wood of shortleaf pine is very heavy and strong, very stiff, hard and moderately high in shock resistance. It also has a straight grain, medium texture and is difficult to work with hand tools. It ranks high in nail holding capacity, but there may be difficulty in gluing. All the southern pines have moderately large shrinkage but are stable when properly seasoned. The heartwood is rated as moderate to low in resistance to decay. The sapwood is more easily impregnated with preservatives.

#### Mechanical Properties (2-inch standard)

	Specific gravity	MOE x10 <sup>6</sup> lbf/in <sup>2</sup>	MOR lbf/in <sup>2</sup>	Compression		WML <sup>a</sup> in-lbf/in <sup>3</sup>	Hardness lbf	Shear lbf/in <sup>2</sup>
				Parallel lbf/in <sup>2</sup>	Perpendicular lbf/in <sup>2</sup>			
Green	0.47	1.39	7400	3530	350	8.2	440	910
Dry	0.54	1.75	13100	7270	820	11.0	690	1390

<sup>a</sup>WML = Work to maximum load.  
Reference (56).

#### Drying and Shrinkage

Type of shrinkage	Percentage of shrinkage (green to final moisture content)		
	0% MC	6% MC	20% MC
Tangential	7.7	6.2	2.6
Radial	4.6	3.5	1.5
Volumetric	12.3	9.8	4.1
References: (185, 56, 192).			

### Kiln Drying Schedules<sup>a</sup>

#### Conventional temperature/moisture content-controlled schedules<sup>a</sup>

Condition	4/4, 5/4 stock	6/4 stock	8/4 stock	10/4 stock	12/4 stock	British schedule 4/4 stock
Standard	T13-C6	T12-C5	T12-C5	T10- C4	T10- C4	L
Highest Quality	279	279	279	T10- C4	T10- C4	NA

<sup>a</sup>Reference (28, 185).

#### Conventional temperature/time-controlled schedules<sup>a</sup>

Condition	Lower grades			Upper grades			
	4/4, 5/4 stock	6/4 stock	8/4 stock	4/4, 5/4 stock	6/4 stock	8/4 stock	12/4, 16/4 stock
Standard	291	NA	282	281	NA	282	284

<sup>a</sup>References (28, 185).

#### High temperature<sup>a</sup>

Condition	4/4, 5/4 stock	6/4 stock	8/4 stock	Other products
Standard	401/402	NA	NA	403

<sup>a</sup>References (28, 184).

**Working Properties:** Shortleaf pine is difficult to work with hand tools. It ranks high in nail holding capacity, but there may be difficulty in gluing.

**Durability:** The heartwood is rated as moderate to low in resistance to decay.

**Preservation:** The sapwood is more easily impregnated with preservatives.

**Uses:** The denser and higher strength southern pine is used extensively in construction of factories, warehouses, bridges, trestles, and docks in the form of stringers, and for roof trusses, beams, posts, joists, and piles. Lumber of lower density and strength finds many uses for building material, such as interior finish, sheathing, subflooring, and joists and for boxes, pallets, and crates. Southern pine is also used also for tight and slack cooperage. When used for railroad cross ties, piles, poles and mine timbers, it is usually treated with preservatives. The manufacture of structural grade plywood from southern pine has become a major wood-using industry.

**Toxicity:** In general, working with pine wood may cause dermatitis, allergic bronchial asthma or rhinitis in some individuals (5,9&14).

#### Additional Reading and References Cited (in parentheses)

1. Boone, R. S.; Kozlik, C. J.; Bois, P. J., and Wengert, E. M. Dry kiln schedules for commercial woods - temperate and tropical. Madison, WI: USDA Forest Service, FPL-GTR-57; 1988.
2. Dallimore, W.; Jackson, A. B., and Harrison, S. G. A handbook of Coniferae and Ginkgoaceae. London, UK: Edward Arnold Ltd.; 1966.
3. Elias, T. S. The complete trees of North America, field guide and natural history. New York, NY: van Nostrand Reinhold Co.; 1980.
4. Gaby, L. I. The southern pines, an American wood. Washington, DC, USA: USDA Forest Service, FS-256; 1985.
5. Hausen, B. M. Woods injurious to human health. A manual. New York, NY: Walter de Gruyter; 1981.
6. Henderson, F. Y. A handbook of softwoods. London: HMSO; 1977.
7. Lawson, E. R. *Pinus echinata* Mill. Shortleaf Pine. in: Burns, R. M. and Honkala, B. H., tech. coords. Silvics of North America. Volume 1, Conifers. Washington, DC: USDA Forest Service; 1990; pp. 316-326.
8. Little, jr. E. L. Checklist of United States trees (native and naturalized). Washington, DC: USGPO, USDA Forest Service, Ag. Handbook No. 541; 1979.
9. Mitchell, J. and Rook, A. Botanical dermatology: plants and plant products injurious to the skin. Vancouver, BC: Greenglass Ltd.; 1979.
10. Simpson, W. T. Dry kiln operator's manual. Madison, WI: USDA Forest Service, FPL Ag. Handbook No. 188; 1991.
11. Sternitzke, H. S. and Nelson, T. C. The southern pines of the United States. Economic Botany. 1970; 24(2):142-150.
12. Summitt, R. and Sliker, A. CRC handbook of materials science. Vol. 4. Boca Raton, FL: CRC Press, Inc.; 1980.
13. USDA. Wood handbook: wood as an engineering material. Madison, WI: USDA Forest Service, FPL Ag. Handbook No. 72; 1974.
14. Woods, B. and Calnan, C. D. Toxic woods. British Journal of Dermatology. 1976; 95(13):1-97.