



**Abies concolor**  
**Family: Pinaceae**

**White Fir**

The genus *Abies* (True Firs) is composed of about 40 species native to North America [9], Central America [7], Africa [2], Europe [1] and Eurasia [25]. There are two varieties of white fir, the typical white fir (*Abies concolor* var. *concolor*) and California white fir (*Abies concolor* var. *lowiana* [Gord.] Lemm). *Abies* is the classical Latin name of silver fir (*Abies alba* Mill.) of Europe. The word *concolor* means of uniform color, referring to the needles, which are pale blue green on both surfaces.

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**Distribution**

White fir is native to the mountains from central Colorado west to southeast Idaho and southwest Oregon, south to southern California and east to southern Arizona and southern New Mexico. It also grows in northwest Mexico.

**The Tree**

White fir trees reach heights of 180 feet, with diameters of 6 feet on the west coast (California & Oregon), while in Arizona and New Mexico it reaches heights of 134 feet, with a diameter of 4 feet . A record specimen from the Sierra Nevada was measured at 192 feet tall, with a diameter of almost 9 feet.

**The Wood**

**General**

Both sapwood and heartwood is nearly white to a reddish brown. It has a medium to coarse texture and no characteristic odor or taste. It normally is straight grained, easy to work and stays in place when properly dried. It is moderate to moderately low in strength, stiffness, ability to resist shock and in nail withdrawal resistance. It is easily dried, but is susceptible to wetwood bacterial attack, which requires special handling during drying. It paints and glues well.

**Mechanical Properties (5 cm standard)**

	Specific Gravity	MOE GPa	MOR MPa	Compression		WML <sup>a</sup> KJ/m <sup>3</sup>	Hardness N	Shear MPa
				Parallel MPa	Perpendicular MPa			
Green	0.37	8.00	40.7	20.2	1.93	38.61	1510	5.24
Dry	0.40	10.3	67.6	40.0	3.65	49.6	2130	7.58

<sup>a</sup>WML = Work to maximum load.  
 Reference (59).

## Drying and Shrinkage

Type of shrinkage	Percentage of shrinkage (green to final moisture content)		
	0% MC	6% MC	20% MC
Tangential	7.0	5.7	2.4
Radial	3.3	2.6	1.1
Volumetric	9.8	7.8	3.3
References: 0% MC (98), 6% and 20% MC (90).			

## 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
Lower grades	T9-D6	NA	T9-D5	NA	NA	NA
Upper grades	T12-E5	T11-D5	T10-E4	T8-A4	T8-A4	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	291	291	294	294	294	288

<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	400	400	400	4- by 6-in. decking (405) Studs (406)

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

**Working Properties:** White fir is easy to work and stays in place when properly dried. It paints and glues well and is moderate to moderately low in nail holding ability.

**Durability:** Rated as slightly resistant or nonresistant to heartwood decay (11).

**Preservation:** It is considered difficult to penetrate with preservatives (6).

**Uses:** The tree is a favorite Christmas tree. The wood is used for solid construction (framing, sheathing, subflooring, concrete forms, decking, planking, beams, posts, siding and paneling), plywood, pulp, millwork, prefabricated buildings, structural members, crating, shook, furniture parts, mobile homes, fruit and vegetable containers.

**Toxicity:** May cause dermatitis or eczema (2,7&12).

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

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