

SUBALPINE FIR

Botanical Name:
Abies lasiocarpa (Hook.) Nutt.

Subalpine fir grows throughout most of the British Columbia Interior from mid- to high elevations. It is a medium-sized tree, on average 20 to 35 metres in height and 30 cm in diameter. Subalpine fir is occasionally found in pure stands, but usually is mixed with other species, principally Engelmann spruce and white spruce.

Common Uses

Subalpine fir, lodgepole pine, and interior spruce are marketed together as a species group (spruce-pine-fir, or SPF). Kiln dried SPF lumber is used as a structural framing material in all types of residential, commercial, industrial and agricultural building applications. Kiln dried SPF lumber is also used extensively in the manufacture of prefabricated housing, trusses and other structural components.

This wood is also used for plywood veneers, planing-mill products, crates and boxes, sashes, doors, frames, food containers, pulpwood and general millwork. Subalpine fir is used with spruce and lodgepole pine for producing 100% bleached Kraft pulp and chemi-thermo-mechanical pulp (CTMP).



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Subalpine fir lumber is dried according to end-use and customer specifications. Kiln drying inhibits natural staining of the wood, improves its strength and stiffness, enhances its appearance, and increases its resistance to decay and attack by insects.

PHYSICAL PROPERTIES		
DENSITY (kg/m ³)	Green	331
	Air Dry	351
SPECIFIC GRAVITY (12% M.C.)	Standard	0.33
HARDNESS (N)	Side	1557
	End	n/a
MOE (Mpa)	Green	8690
	Air Dry	10300
MOR (Mpa)	Green	35.6
	Air Dry	55.2
COMPRESSION PARALLEL (Mpa)	Air Dry	35.4
COMPRESSION PERPENDICULAR (Mpa)	Air Dry	3.61
SHEAR (Mpa)	Air Dry	6.74
CLEAVAGE (N/mm Width)	Air Dry	n/a
SHRINKAGE OD = oven dry air = air dry 12%	Radial (OD)	2.6%
	Tangential (OD)	7.4%
	Volumetric (OD)	9.4%
	Volumetric (air)	n/a
	Tang / Rad ratio	2.8

VISUAL PROPERTIES	
COLOUR	
Heartwood	Nearly white to pale reddish-brown.
Sapwood	Nearly white.
Heartwood / Sapwood Contrast	The sapwood is not clearly differentiated from the heartwood.
Latewood / Earlywood Contrast	The annual growth rings often show somewhat prominent brown latewood bands.
GRAIN	
The wood is generally straight-grained with medium to coarse, but even texture.	
FIGURE	
Plainsawn lumber or rotary-cut veneer: Conspicuous growth ring. Quartersawn lumber or quarter-sliced veneer: Distinct, inconspicuous growth ring stripe.	
KNOTS	
Abundant and small.	



WORKING PROPERTIES		
PROCESS	PERFORMANCE	COMMENTS
MACHINING		
Planing	Good planing quality	Recommended planer settings: 20° hook angle and 20 kmpi (knife marks per inch). Due to the usually wide bands of soft earlywood there is a definite tendency for these to become compressed during planing, later lifting to give a ridged surface.
Turning	Medium to low surface quality	Common defects: torn out grain.
Sawing	Easy to work with tools	Due to the usually wide bands of soft earlywood there is a definite tendency for these to tear in sawing.
Boring	Medium	Medium boring quality with both brad and single twist bits. Due to the usually wide bands of soft earlywood there is a definite tendency for these to tear in boring operations.
Mortising	Good to moderate	Good mortising quality when using a hollow chisel mortise. Due to the usually wide bands of soft earlywood there is a definite tendency for these to tear in mortising. Common mortising defects: splintering on the out-going side of the mortise and crushed grain inside the mortise.
Shaping	Good shaping quality	Common shaping defects in the order of frequency: Splintering at the corner, rough end-grain, fuzzy grain, raised grain, and torn grain. Recommended: The use of a counter piece for end-grain shaping.
Veneering	N/A	
Sanding	Good	
FASTENING		
Screwing	Moderate	Average screw retention: 313 lb.
Nail Retention	Moderate	
Lateral Nail Holding	Moderate	About 40% reduction to Douglas-fir.
Gluing	Easy	Bonds very easily with adhesives of a wide range of properties and under a wide range of bonding conditions.
FINISHING		
Staining	Easy	Smooth finish with little texture. Dark stain produces prominent wild grain. Recommended: light-coloured stains with low penetration power will produce a more even colour.
Painting	Average to good paint holding ability	
Lacquering	Good	Performed well in the tape test (i.e. small flakes of the coating were detached at intersections of cuts) and in the pull-off test (i.e. average strength of 29 kg/cm ²).
Waxing	Good	Best results are obtained when using light-coloured waxes (e.g. Mellow Pine).
DRYING		
Ease of Drying	Easy to moderately easy	Few defects expected except in the most extreme cases.
HEARTWOOD DURABILITY		
Natural Decay Resistance	Slightly durable	Not appropriate for prolonged outdoor exposure.
Treatability	Impermeable	Can be improved by incising.



Commercial Availability

Subalpine fir is produced predominantly as SPF in structural grades according to National Lumber Grades Authority (NLGA) rules for dimension lumber. Select Structural, #2 and better, and stud grades are the most common grades produced. Specialty in-house grades, lamstock and export grades are also available. Subalpine fir is the most treatable of the SPF mix.

Appearance grades can also be produced according to NLGA rules.

** Marketed as structural lumber in the SPF (spruce-pine-fir) species mix. SPF includes lodgepole pine, white spruce, Engelmann spruce, red spruce, black spruce, jack pine, balsam fir and subalpine fir.*