

Spruce-Pine-Fir [SPF]

Engelmann Spruce {*Picea glauca*}
Lodgepole Pine {*Pinus contorta*}
Subalpine Fir {*Abies lasiocarpa* Fir}

The three softwoods comprising the principal species in the Spruce-Pine-Fir (SPF) species group share many common characteristics and properties as well as the same native habitat in the montane, boreal and subalpine forest regions of British Columbia and Alberta. White Spruce, Lodgepole Pine and Subalpine Fir are all trees of medium size, averaging 30 metres in height and up to 80 centimetres in diameter. They are hardy trees, relatively slow growing and yield high grade timber with small sound, tight knots. Well suited to the cold winters and hot summers that characterize the continental climate of their northern forest area, trees of the Spruce-Pine-Fir group are the most abundant softwoods in Canada and the most commercially important. Forest reserves are estimated at more than 500 million cubic metres and reforestation already in place assures excellent continuity of supply over the long term.

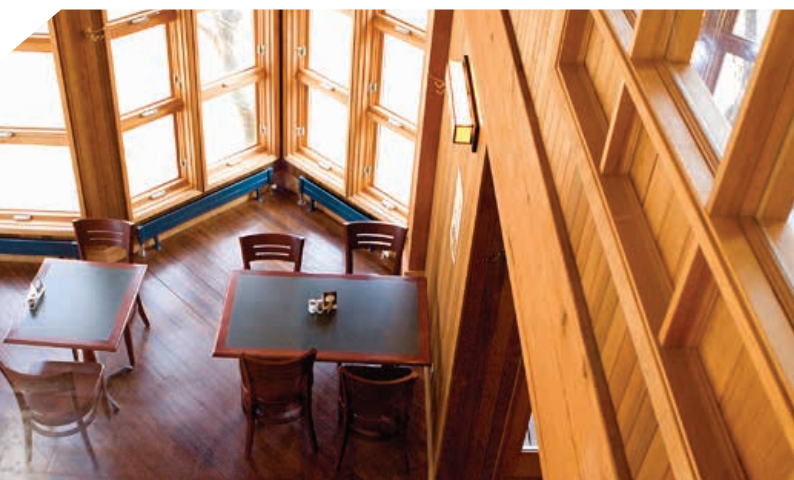
COMMON USES

SPF's strength, light weight, ease of handling and good working properties have made it a popular wood for framing applications in all types of construction. Strong, stiff and stable, SPF is well known and highly regarded not only in North America, but also in Europe and Japan. Readily available in a wide range of sizes and lengths, including finger jointed lengths up to 12 metres, it is an extremely versatile lumber for residential, commercial, industrial and agricultural buildings. SPF is a particular favourite with house builders, who appreciate its high structural performance as well as its fine appearance.

The prefabrication industry is also a major user of SPF because of the wood's strength, dimensional stability and superior gluing properties. Manufacturers of modular houses, trusses, and other structural components regularly specify kiln-dried SPF as a wood they can rely on for consistent quality and ready availability in precise dimensions.

APPEARANCE & PROPERTIES

In contrast with other commercial softwoods, SPF is a distinctly white wood, with very little colour variation between springwood and summerwood. The wood has a bright clean appearance, ranging in colour from white to pale yellow, with a fine straight grain and smooth texture. SPF has a high strength to weight ratio and is well known for its outstanding working properties. It takes and holds nails exceptionally well and is easily worked with hand power tools. It has good gluing, painting and staining properties. Lumber of this species group is seasoned uniformly in dry kilns to a moisture content of 19 percent or less. Kiln drying inhibits natural staining of the wood, improves its strength and stiffness, enhances its appearance, and also increases its resistance to decay and attack by insects. The drying process also improves the wood's dimensional stability, finishing qualities and thermal resistance while at the same time reducing shrinkage, warping and checking in storage.



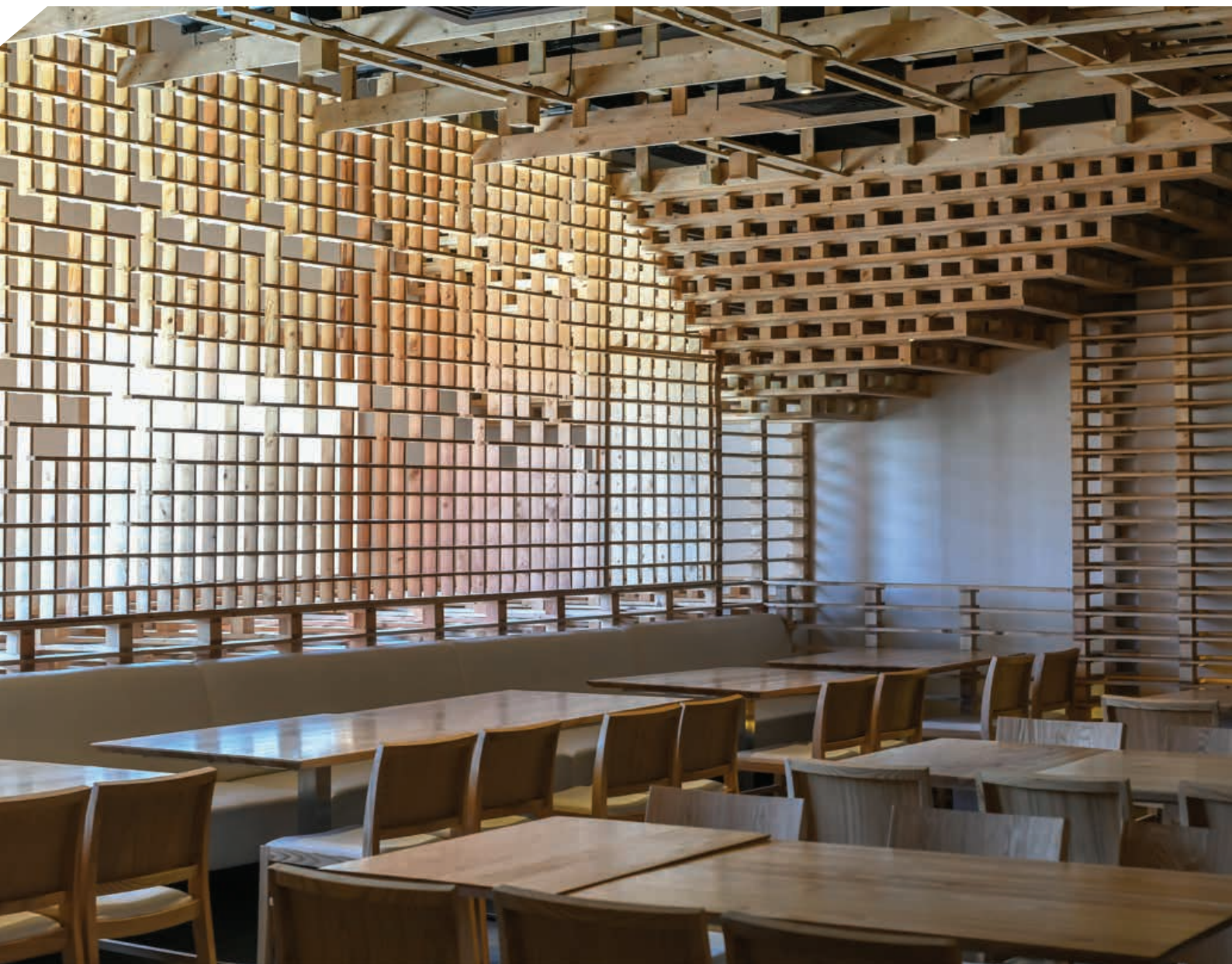
PHYSICAL PROPERTIES SPRUCE, PINE & FIR				
		SPRUCE	PINE	FIR
STIFFNESS/ MOE (MPa)	Air Dry	10000	10900	10200
STRENGTH/MOR (MPa)	Air Dry	63	76	56
DENSITY (kg/m ³)	Air Dry	380	430	351
COMPRESSION PARALLEL (MPa)	Air Dry	36.9	43.2	35.4
SHEAR (MPa)	Air Dry	6.79	8.54	6.74
SHRINKAGE (air dried 1:2")	Tangential / Radial ratio	2.2	1.4	2.8

WORKING PROPERTIES WHITE SPRUCE/ENGELMANN SPRUCE			
	PROCESS	PERFORMANCE	COMMENTS
MACHINING	Planing	Excellent	Good planing quality. Recommended planer settings: 12 degree or 20 degree hook angle and 20 KMPI (knife marks per inch).
	Shaping	Good	Good shaping quality.
	Sanding	Very Good	
FASTENING	Screwing	Good	Very good resistance to splitting.
	Nail Retention	Good	Very good resistance to splitting.
	Gluing	Average	
FINISHING	Staining	Good	Good staining properties. A smooth finish is achieved. A natural finish (clear coat) or a light stain looks the best.
	Painting	Average	
DRYING	Ease of Drying	Good	Spruce dries faster than pine and is not adversely affected by severe high-temperature schedules.
DURABILITY	Natural Decay Resistance	Poor	Not appropriate for prolonged outdoor exposure.
	Treatability	Good	Can be improved by incising.



WORKING PROPERTIES LODGEPOLE PINE

	PROCESS	PERFORMANCE	COMMENTS
MACHINING	Planing	Excellent	Recommended planer settings: 20 degree hook angle and 8, 12, or 16 KMPI.
	Shaping	Good	
	Sanding	Good	
FASTENING	Screwing	Average	
	Nail Retention	Average	
	Gluing	Easy	
FINISHING	Staining	Easy	Surface is smooth with only two topcoats. Recommended: light and natural stains.
	Painting	Good	
DRYING	Ease of Drying	Good	Few defects expected except in the most extreme cases.
DURABILITY	Natural Decay Resistance	Poor	Not appropriate for prolonged outdoor exposure.
	Treatability	Good	Can be improved by incising.



WORKING PROPERTIES SUBALPINE FIR

	PROCESS	PERFORMANCE	COMMENTS
MACHINING	Planing	Good	Recommended planer settings: 20 degree hook angle and 20 KMPI.
		Medium to low	
	Sawing	Good	
	Shaping	Good	
	Sanding	Good	
FASTENING	Screwing	Average	
	Nail Retention	Average	
	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 can highlight prominent wild grain. Recommended: light-coloured stains with low penetration power will produce a more even colour.
	Painting	Average to Good	
DRYING	Ease of Drying	Good	Few defects expected except in the most extreme cases.
DURABILITY	Natural Decay Resistance	Fair	Not appropriate for prolonged outdoor exposure.
	Treatability	Poor	Can be improved by incising.



FOR MORE INFORMATION ON THE AVAILABILITY OF SPF, PLEASE CONTACT INFO@CANADIANWOOD.COM.VN



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Data for this factsheet has been compiled by FPInnovations from internal and external scientific sources. FPInnovations is a not-for-profit technical research institute serving the Canadian forest sector.