

Sitka Spruce

*The largest of
all the spruces*



Responsible timber harvesting

All forest products companies harvesting Sitka spruce in coastal British Columbia recognize that the forest is a precious resource that must be carefully managed and continually renewed. Intensive silvicultural and forest protection operations help renew the Sitka spruce resource. Every company has ISO certification and many are working towards certification under other forest management certification programs.

Sitka spruce (*Picea sitchensis*) is the largest and most imposing of the three commercially important spruces growing in British Columbia where it is confined to the coastal forest region. A moisture-loving tree, it is most abundant in the northern portion of its range, especially on the rain-swept Queen Charlotte Islands. Sitka spruce grows in pure stands or mixed with Douglas fir, Western red cedar and native hardwoods. Rivaling the Douglas fir in size, Sitka spruce is best known for its tall stem which produces considerable amounts of clear, defect-free wood, making it an important source of high grade Clear and Factory timber in large dimensions.

The wood's appearance and properties

Like the tree from which it comes, Sitka spruce is an impressive wood, with the highest strength to weight ratio of any wood species in the world. Sitka spruce also has great resilience and elasticity, properties that make it able to withstand suddenly applied loads.

The wood is attractive in appearance because the narrow sapwood blends gradually into the heartwood with no abrupt transition. The color ranges from a creamy white to a near white with a light pinkish tinge. It is odorless and tasteless.

Sitka spruce is well known as a lumber for remanufacturing purposes due to its excellent working properties. It seasons readily



and, once dry, is stable with no tendency to warp or twist. It machines well to fine tolerances and holds fasteners securely because of the wood's long fibers, straight grain and soft texture.

Sitka spruce also planes easily to a smooth finish and pleasant surface sheen without splitting.

The wood accepts and holds paint and stain finishes very well, requiring fewer coats than many other woods because of its light, uniform color. It is equally amenable to gluing.

A comprehensive tabulation of Sitka spruce's physical properties and working characteristics and comparisons with other British Columbia coastal softwoods is shown on page 3.



Available in Clear, Factory, Construction and custom grades

Sitka spruce's suitability for widespread use in the construction and secondary remanufacturing industries derives from both its desirable physical properties and the wide range of grades in which it is available. All Sitka spruce lumber is manufactured, graded and sorted in compliance with the provisions of the relevant domestic or foreign grading rule. Sitka spruce is available in the following Canadian grade classifications:

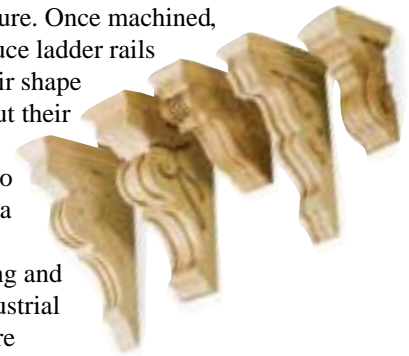
Clear (Knot free)	No. 2 Clear and Better
	No. 3 Clear
	No. 4 Clear
Factory (Remanufactured for Clear recovery)	Factory Flicht
	Shop Flicht
	No. 1 Shop and Better
Construction	No. 2 Shop
	Moulding Stock A & B
	Light Framing
	Structural Light Framing
	Structural Joists and Planks
	Merchantable

A full description of the above grades and the range of available sizes can be found in the Coast Forest publication *Wood Species and Products from the Coast Region of British Columbia* and on website www.coastforest.org.

The sought-after spruce

Sitka spruce gained early fame as an aircraft and boat building material because of its high strength to weight ratio and shock-absorbing qualities. Although no longer used in aircraft manufacture, except for the construction of lightweight gliding planes, Sitka spruce is still a sought-after boat building material for masts, spars and structural framing. It is widely used in racing craft, from shells to offshore yachts, because it offers great strength without adding undue weight. It is ideally suited for oars and paddles and is considered a preferred choice for racing oars.

Its strength, light weight and exceptional resilience make Sitka spruce one of the world's top ranking woods for ladder manufacture. Once machined, Sitka spruce ladder rails retain their shape throughout their service life. It also excels as a wood for scaffolding and other industrial uses where strength, light weight and resilience are important.



Its good working properties make Sitka spruce a highly regarded species for specialized joinery work such as interior finishing and sliding screens. Because it finishes well and glues easily, Sitka spruce can take on a wide variety of woodworking assignments. It is also valued for the manufacture of sounding boards for fine musical instruments because of its long wood fibers, great resonance, dimensional stability and good gluing properties.

Sitka spruce has a fine reputation as a construction wood in residential house framing and is also used for many decorative purposes.

Because it weathers well and evenly and does not sliver or splinter easily, Sitka spruce is often used for outdoor stadium seats.

Comparative Physical Properties of Coast Species

		High Range ♦	Low Range ○	Hem-Fir		Douglas Fir <i>Pseudotsuga menziesii</i>	Sitka Spruce <i>Picea sitchensis</i>	Western Red Cedar <i>Thuja plicata</i>	Yellow Cedar <i>Chamaecyparis nootkatensis</i>	
				Amabilis Fir <i>Abies Amabilis</i>	Pacific Coast Hemlock <i>Tsuga heterophylla</i>					
Physical Properties	Density (12%-kg/m ³)			445	480	545	430	385	480	
	Specific Gravity (12% m.c.)			0.39	0.43	0.49	0.39	0.34	0.43	
	Bending Strength (MOR) (MPa)			68.9	81.1	88.6	69.5	53.8	79.7	
	Stiffness (MOE) (x10 ³ MPa)			11.4	12.3	13.5	11.2	8.3	11.0	
	Compression parallel to grain (MPa)			40.8	46.7	50.1	37.8	33.9	45.9	
	Compression perpendicular to grain (MPa)			3.6	4.5	6.0	4.1	3.4	4.7	
	Shear (MPa)			7.5	6.5	9.5	9.2	5.6	9.2	
	Cleavage (N/mm)			36.8	37.5	38.9	38.0	25.4	45.4	
	Dimensional stability (Shrinkage % green to O.D.)	Tangential			9.2	7.8	7.4	7.8	4.5	6.0
		Radial			4.4	4.2	4.8	4.6	2.1	3.7
Hardness (N)			1820	2740	2990	2200	1470	2510		
Durability	Natural durability (approx. life in contact with ground)	>10 yrs	≤ 10 yrs	○	○	♦	○	♦	♦	
	Treatability (preservatives or fire)	permeable – moderately resistant	resistant – extremely resistant	♦	♦	○	○	○	○	
Drying	Drying rate	rapid-moderate	fairly slow-very slow	♦	♦	♦	♦	○	○	
	Tendency to check during drying	absent or easily controllable	controllable with some care	♦	♦	♦	♦	♦	♦	
	Tendency to distortion during drying	absent-slight	moderate	♦	○	♦	♦	♦	♦	
Workability	Machining (planing/turning/moulding/mortising/boring, etc.)	good-excellent	fair	♦	♦	♦	♦	♦	♦	
	Blunting	very little/slight-little/slight	moderate	♦	♦	○	♦	♦	♦	
	Nailing/resistance to splitting	well-excellent	poor-satisfactory	♦	♦	♦	♦	♦	♦	
	Screw/nail holding	good-excellent	satisfactory	♦	♦	♦	♦	○	♦	
	Gluing	w/out difficulty exceptional	difficult satisfactory	♦	♦	♦	♦	♦	♦	
Finishing	Natural colour - whitsh ¹ , creamy wht ² , lt. buff ³ , pale/lt. yellw ⁴ , yellwsh ⁵ , yellwsh-brn ⁶ , pnksh ⁷ , redsh wht ⁸ , salmon ⁹ , pnkshyellow ¹⁰ , red ¹¹ , cherry rd ¹² , dp rd ¹³ , mahogany ¹⁴ , pnk-brn ¹⁵ , orng ¹⁶ , dk chocolate brn ¹⁷ , lt. brn ¹⁸ , pale rdsh brn ¹⁹ , orng-wht ²⁰			1, 3, 6	1, 6	4, 8, 11, 13	2, 4, 7, 10, 16	9, 17, 15	1, 5	
	Paint finishing	good-excellent	poor-satisfactory	♦	♦	○	○?	♦	♦	
	Stain finishing	good-excellent	poor-satisfactory	♦	♦	○	♦	♦	♦	
	Tendency to resin exudation	Absent or infrequent after drying	Acceptability depends on finish to be used and visual standards required	♦	♦	○	♦	♦	♦	
Misc. Properties	Tendency to corrode ferrous metals	Likely	Unlikely	○	○	○	○	♦	♦	
	Becomes stained in contact with ferrous metals	Likely	Unlikely	○	○	○	○	♦	♦	

Commercial enquiries and requests for information

Quality assured Sitka spruce is available in domestic and export markets. The Coast Forest Products Association (Coast Forest) is committed to prompt customer referral. Upon receipt, bona fide commercial enquiries and requests for other information are immediately forwarded to manufacturing members who will then respond with relevant product literature and/or information regarding pricing, terms, documentation and shipping. Enquiries may be sent to Coast Forest by mail, fax, telephone, e-mail, or by referring to the website.

Product literature

The Coast Forest Products Association (Coast Forest) publishes a library of descriptive, application, and technical literature about Sitka spruce and other coastal wood products, single copies of which are available free of charge from the office listed below.



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