

Boatbuilding Softwoods – Technical Comparisons

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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 , org ¹⁶ , dk chocolate brn ¹⁷ , lt. brn ¹⁸ , pale rdsh brn ¹⁹ , org-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	○	○	○	○	♦	♦	