

# Western Red Cedar

*A giant  
among giants*

In Canada, Western red cedar (*Thuja plicata*) is confined to British Columbia where it is one of the largest trees in the Pacific region. It is found on the coast as far north as Alaska and in the valleys of the interior wet belt. Cedar grows singly or in scattered patches, never in pure stands of any extent. It comprises about 20% of mature coastal forests.

A slow-growing, naturally durable tree, it has the longest life span of any tree in the British Columbia coastal forest, where the best specimens are found. Mature trees are massive in size, with a flared base and a thick weathered bark, reddish brown in color and characteristically stringy and fibrous. An aura of myth and legend has always surrounded the Western red cedar, once called the giant arborvitae – tree of life – dating from the days that the first peoples of the west coast used it in their everyday lives for clothing, baskets, houses and boats. Fragrantly aromatic when freshly cut, Western red cedar is known and respected as one of Canada's most beautiful and durable wood species, and one of its most commercially valuable.



## *Responsible timber harvesting*

All forest products companies harvesting Western red cedar 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 Western red cedar resource. Every company has ISO certification and many are working towards certification under other forest management certification programs.

# The wood's appearance and properties

Western red cedar's slow growth and its naturally occurring fungicidal compounds in the wood called thujuplicins produce the wood's fine grain, decay resistance and rich coloring that is its trademark.

Another extractive present in the wood, thujic acid, helps make the species resistant to insect attack. The narrow sapwood is a light straw color and the heartwood is a blend of warm earth tones, from pale yellow through reddish pink to chocolate brown.

Light in weight, and with a soft texture, Western red cedar is an extremely dimensionally stable wood that seasons



easily and quickly with low shrinkage factor. Its low density and particular air-filled cellular structure make it the best thermal insulator among commonly available softwoods, far superior to brick, steel and concrete.

Western red cedar machines easily with either hand or power tools and planes to a smooth finish that is rich and lustrous.

Freedom from pitch and resin gives Western red cedar excellent finishing properties. Because of its dimensional stability, it is an ideal base for a variety of finishes, either full bodied paints or stains, or semi-transparent products that reveal the wood's warm color and texture. It has good gluing qualities and nailing properties.

A comprehensive tabulation of Western red cedar's physical properties and working characteristics and comparisons with other British Columbia softwoods is shown on page 3.



# Widely available in Clear, Factory, proprietary and custom grades

The density, strength and stiffness of Western red cedar is not as high as other coastal softwoods and so it is not commonly used for structural applications other than in larger sizes for applications such as exposed posts and beams where dimensional stability and appearance are important considerations. The knotty portions of the log are usually manufactured into specialty siding and decking products rather than into structural grades. Western red cedar is readily available in the following Canadian grade classifications. Descriptions of proprietary grades of siding and decking and other specialty products can be found in literature published by the Western Red Cedar Lumber Association and on website [www.wrcla.org](http://www.wrcla.org).

**Clear** No. 2 Clear and Better  
(Knot free) No. 3 Clear  
No. 4 Clear

**Factory** Factory Flitch  
(Remanufactured for Clear recovery) Shop Flitch  
No. 1 Shop and Better  
No. 2 Shop  
Moulding Stock A & B

**Construction** Light Framing  
Structural Light Framing  
Structural Joists and Planks  
Merchantable

A full description of the above grades and the wide 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 websites [www.wrcla.org](http://www.wrcla.org) and [www.coastforest.org](http://www.coastforest.org).

# Many uses indoors and outdoors

Beauty and durability, the hallmarks of Western red cedar, have made it one of the world's most widely specified woods for many aspects of residential design. Cedar tends to be used for applications where dimensional stability, natural durability and fine appearance is required. Architects and designers, who appreciate visual continuity of materials, specify Western red cedar for outdoor landscape elements such as decks, planters, fences, screens, garden furniture and sheds, as well as for exterior siding, roof tiles, interior wall and ceiling panelling, doors and windows, and a variety of joinery items.

Western red cedar is well suited for decks and fencing. Lightweight and stable, it is easy to work with and weathers the elements naturally. Its excellent insulating qualities are an added advantage to its use as an exterior siding, an application where it is both practical and visually pleasing.



Its well known ability to receive paint and stain finishes allows a range of effects to be achieved with Western red cedar, the preferred species for siding, house trim and fascias. The wood is equally appropriate for residential, commercial and institutional construction.

As an interior panelling, Western red cedar offers tonal and textural qualities which add a natural character to any area.

Doors and windows are major end uses of Western red cedar, utilizing the wood's weather resistance, stability, longevity and excellent working properties.

# 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 <sup>3</sup> ) <sup>①</sup>			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 <sup>3</sup> 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 <sup>②</sup> (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) <sup>③</sup>	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 <sup>1</sup> , creamy wht <sup>2</sup> , lt. buff <sup>3</sup> , pale/lt. yellw <sup>4</sup> , yellowsh <sup>5</sup> , yellwsh-brn <sup>6</sup> , pnksh <sup>7</sup> , redsh wht <sup>8</sup> , salmon <sup>9</sup> , pnkshyellow <sup>10</sup> , red <sup>11</sup> , cherry rd <sup>12</sup> , dp rd <sup>13</sup> , mahogany <sup>14</sup> , pnk-brn <sup>15</sup> , orng <sup>16</sup> , dk chocolate brn <sup>17</sup> , lt. brn <sup>18</sup> , pale rdsh brn <sup>19</sup> , orng-wht <sup>20</sup>			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	○	○	○	○	♦	♦	

① Cedar's low density and high proportion of air-filled cell cavities give it a coefficient of thermal conductivity (k value) at 12% moisture content of 0.74 BTU in./ft<sup>2</sup> h°F and an R value of 1.35/in. of thickness making it an excellent thermal insulator.

② Cedar has significantly less size change under varying moisture conditions, which makes it an ideal wood for paint finishes.

③ Untreated cedar has a flame spread rating of 69 (Class 11) and a smoke developed classification of 98.

# Commercial enquiries and requests for information

Quality assured Western red cedar is widely 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 Coast Forest members and the Western Red Cedar Lumber Association (WRCLA), who will then respond with relevant product literature and/or information regarding pricing, terms, documentation and shipping. Enquiries may be sent to Coast Forest or WRCLA by mail, fax, telephone, e-mail, or by referring to either website.

## Product literature

The Coast Forest Products Association (Coast Forest) and the Western Red Cedar Lumber Association (WRCLA) publish a library of descriptive, application, and technical literature about Western red cedar products, single copies of which are available free of charge from the offices listed below:



### Coast Forest Products Association

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