

# WESTERN RED CEDAR QUICK FACTS

## WESTERN RED CEDAR

Western Red Cedar (*Thuja plicata*) is one of North America's great renewable resources. Slow growing and naturally durable, Western Red Cedar has one of the longest life spans of any North American softwood. It produces lengths of timber with true, straight grain. It is free from pitch and its heartwood has natural decay resistance. Its low density gives it an insulation value superior to most other species. Light weight, easy to work, easy to finish, possessing outstanding dimensional stability, Western Red Cedar is a preferred wood for nearly all purposes where attractive appearance or resistance to weather is important.

## FEATURES OF WESTERN RED CEDAR

Acoustic properties:	Cedar tends to dampen sound transmission
Density (oven dry):	21 lb/ft <sup>3</sup>
Specific gravity (oven dry):	0.32
Durability:	Durable species
Fasteners:	Corrosion resistant only (aluminum, hot-dipped galvanized, stainless steel)
Finishing:	Exterior paints, stains & bleaching products and interior varnishes, oils and waxes all work well.
Flame spread rating:	45 (Class II)
Smoke developed classification:	125
k value (12% mc):	0.74 BTU in./ft <sup>2</sup> h <sup>o</sup> F
R value:	1.35/in. of thickness
Stability:	Cedar is the most stable softwood species
Workability:	Easy to cut, saw, nail and glue.

## PHYSICAL PROPERTIES

### DENSITY

One of the lightest commercial softwoods, Western Red Cedar at oven-dry conditions is approximately 21 pounds per cubic foot with a relative density (specific gravity) of 0.32. Cedar's low density enhances its insulation value and makes it an easy wood to transport and handle.

### DIMENSIONAL STABILITY

Like all woods, Western Red Cedar is hygroscopic and will absorb or discharge moisture to attain equilibrium with the surrounding atmosphere. However, it has a very low shrinkage factor and is superior to all other coniferous woods in its resistance to warping, twisting and checking. Shrinkage in both the radial and tangential directions is given in Table 1.

### DECAY RESISTANCE

One of Western Red Cedar's most valuable characteristics is its well-known high resistance to decay. It is one of the most durable coniferous species and can be counted on to give long and trouble free service under most conditions. Cedar's decay resistance comes from the presence of naturally occurring fungicidal compounds in the wood called thujaplicins. Another extractive present in the wood, thujic acid, helps make the wood resistant to insect attack. Properly finished and maintained, cedar will deliver decades of trouble-free service. If exposed for prolonged periods to conditions where decay could be a factor, such as where the wood is in contact with the ground, cedar should be treated with suitable wood preservatives.

### THERMAL CONDUCTIVITY

Wood is an excellent thermal insulator. This is an important characteristic since good thermal insulators help keep buildings cool in the summer and reduce heating costs in winter.

The conduction of heat in wood is directly related to its density. Woods with low density have the highest thermal insulating value because such woods contain a high proportion of cell cavities. In dry wood, these cavities are filled with air which is one of the best known thermal insulators.

With its low density and high proportion of air spaces, Western Red Cedar is the best thermal insulator among the commonly available softwood species and is far superior to brick, concrete and steel. It has a coefficient of thermal conductivity (k value) at 12% mc of 0.74 BTU in./ft<sup>2</sup> h °F.

## ACOUSTICAL PROPERTIES

An important acoustical property of wood is its ability to damp vibrations. Wood has a cellular network of minute interlocking pores which converts sound energy into heat by frictional and viscoelastic resistance.

Because of the high internal friction created by the cellular pore network, wood has more sound damping capacity than most structural materials. Floor, ceiling and wall assemblies of wood can provide effective economical sound insulation and absorption when properly utilized. Western Red Cedar is particularly effective in this regard and can be used to help reduce noise or to confine it to certain areas.

## FASTENING

Western Red Cedar has good fastening properties but its natural preservatives have a corrosive effect on some unprotected metals in close contact, causing a black stain on the wood. Fasteners should be corrosion resistant such as aluminum, hot-dipped galvanized or stainless steel.

Nails and screws used to fasten Western Red Cedar should be about one-third longer than those used to fasten hardwood species.

**TABLE 2 SIZES OF ROUGH WESTERN RED CEDAR**

Thickness (in.)	Width (in.)
1	2
1 3/4	4
2	6
3	8
4	10
6	12
10	14
12	
14	

**TABLE 1 SHRINKAGE OF WESTERN RED CEDAR**

Direction of Shrinkage	Shrinkage in Percentage					
	From green (25% or greater moisture content) to			From kiln dried (15% average moisture content) to		
	15%	12%	6%	15%	12%	6%
Radial	0.96	1.2	1.8	0	0.3	1.0
Tangential	2.0	2.6	3.8	0	0.7	2.1

## NOTES TO TABLE

1. Radial shrinkage applies to the width of vertical grain lumber; tangential to the width of flat grain lumber.
2. Shrinkage does not begin until the fiber saturation point is reached.
3. 15% is the average equilibrium moisture content of wood during the summer in the Pacific Northwest.
4. 12% is the average equilibrium moisture content in most areas of the U.S.
5. 6% is the average equilibrium moisture content for interiors of heated buildings.



COURTESY OF SUPERKÜL / PHOTO BY SHAI GIL FOTOGRAFHY

**TABLE 3 WESTERN RED CEDAR PRODUCTS**

Product	Thickness in. (nominal)	Width in. (nominal)	Grade	Grading Rule Paragraph		
				NLGA	WWPA	WCLIB
<b>Bevel Siding (1)</b> Clear	1/2, 3/4	4, 6, 8, 10	Clear V.G. Heart	201a	21.11	106-aa
			A	201b	21.12	106-a
			Rustic	201d	N/A	N/A
			B	201c	21.13	106-b
			C	201e	21.14	106-c
Proprietary	N/A	N/A	N/A			
Knotty	5/8, 11/16, 3/4, 7/8	6, 8, 10, 12	Select Knotty	205a	N/A	111-e
			Quality Knotty	205b	N/A	111-f
			Proprietary	N/A	N/A	N/A
Knotty-Rabbetted	3/4, 5/4	6, 8, 10	Select Knotty	205a	N/A	111-e
			Quality Knotty	205b	N/A	111-f
Knotty-Wavy Edged	7/8	10, 12	Select Knotty	205a	N/A	111-e
			Quality Knotty	205b	N/A	111-f
<b>Pattern Siding (1)</b> Clear	1	4, 6, 8	Clear Heart	200a	20.11	102-b
			A	200b	20.12	102-c
			B	200c	20.13	102-d
Knotty	1	4, 6, 8	Select Knotty	204a	N/A	111-e
			Quality Knotty	204b	N/A	111-f
			Standard and Better	114a, b, c	N/A	118-a, b, c
			Proprietary	N/A	N/A	N/A
<b>Clear Finish</b>	1, 5/4, 2	2, 3, 4, 6, 8, 10, 12	Clear Heart	200a	20.11	102-b
			A	200b	20.12	102-c
			B	200c	20.13	102-d
<b>Boards</b>	1	2, 3, 4, 6, 8, 10, 12	Select Knotty	204a	N/A	111-e
			Quality Knotty	204b	N/A	111-f
			Standard and Better	114a, b, c	30.50 (118a, b, c)	118-a, b, c
<b>Fence Boards</b>	1	6, 8, 10	Select Knotty	210a	N/A	117-a
			Quality Knotty	210b	N/A	117-b
			Rustic	N/A	N/A	117-c
<b>Roof Decking</b>	2, 3, 4	6, 8	Select	127b	55.11	127-b
			Commercial	127c	55.12	127-c
<b>Outdoor Decking</b> Architect Clear	5/4, 2	4, 6, 8, 10, 12	Architect Clear	N/A	N/A	N/A
			Custom Clear			
Architect Knotty	5/4, 2	4, 6, 8, 10, 12	Architect Knotty Custom Knotty	N/A	N/A	N/A
<b>Paneling (2)</b> Clear	1	4, 6, 8	Clear Heart	200a	20.11	102-b
			A	200b	20.12	102-c
			B	200c	20.13	102-d
Knotty	1	4, 6, 8	Select Knotty	204a	N/A	111-e
			Quality Knotty	204b	N/A	111-f
<b>Joists and Planks (3)</b>	2, 3, 4	2, 3, 4	Appearance	N/A	N/A	N/A
	2, 3, 4	6, 8, 10, 12	Standard and Better	122b, c	40.11, 12	122-b, c
			Appearance	N/A	N/A	N/A
			No. 2 and Better	124-a, b, c	62.10, 11, 12	123-a, b, c
<b>Timbers (3)</b>	5, 6, 8, 10, 12	5, 6, 8, 10, 12 and wider	Appearance	N/A	N/A	N/A
			Standard and Better	131a, b, c	80.10, 11, 12	131-a, b, c
<b>Beams &amp; Stringers (3)</b>	5, 6, 8, 10, 12	5, 6, 8, 10, 12	No.2 and better Width more than 2" greater than thickness	130a, b, cc	70.10, 11, 12	130-a, b, cc

**NOTES  
TO TABLE**

1. Siding is available kiln-dried or air-dried with smooth or saw-textured surface. Factory primed siding is also available.
2. Paneling is available kiln-dried with smooth or saw-texture surface.
3. Grade descriptions are given in NLGA, WWPA and WCLIB grading rules. Grade descriptions of proprietary products are available from the manufacturer.

**TABLE 4 SIZES OF DRESSED WESTERN RED CEDAR LUMBER**

Item	Thickness (in.)			Width (in.)		
	Nominal	Actual		Nominal	Actual	
		Dry	Green		Dry	Green
Boards	1	1 1/16	3/4	2	1 1/2	1 9/16
	1 1/4	1	1 1/32	3	2 1/2	2 9/16
				4	3 1/2	3 9/16
				6	5 1/2	5 9/16
				8	7 1/4	7 3/8
				10	9 1/4	9 3/8
			12	11 1/4	11 3/8	
Joists and Planks	2	1 1/2	1 9/16	2	1 1/2	1 9/16
	3	2 1/2	2 9/16	3	2 1/2	2 9/16
	4	3 1/2	3 9/16	4	3 1/2	3 9/16
				6	5 1/2	5 9/16
				8	7 1/4	7 3/8
				10	9 1/4	9 3/8
			12	11 1/4	11 3/8	
Timbers	5		4 1/2	5		4 1/2
	6		5 1/2	6		5 1/2
	8		7 1/2	8		7 1/2

*\*Larger timbers are available by special order.*

*Confirm availability before specifying.*

**REFERENCE LITERATURE**

The Western Red Cedar Lumber Association publishes reference material about the specification and use of members' products. The following publications are available from our website in either PDF format for instant download or you can order a hardcopy and request it to be mailed to you.

*HOW TO INSTALL WESTERN RED CEDAR SIDING*

*DESIGNER HANDBOOK*

*HOW TO FINISH WESTERN RED CEDAR*

*HOW TO SPECIFY WESTERN RED CEDAR*

For technical information, please visit our website: [www.realcedar.com](http://www.realcedar.com) or call Toll Free **866-778-9096**

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