WESTERN RED CEDAR
Technical Properties

Relative Density and Weight of the Wood
The wood of Western Red Cedar is light. The wood weighs 370 to 385 kg/m3 when air dry (12% moisture content), 330 to 340 kg/m3 when oven-dry, and 432 to 533 kg/m3 when green.

Dimensional Stability
Western Red Cedar wood has excellent dimensional stability because of its low wood density and low shrinkage factor. A major contributor to its dimensional stability is the fact that its moisture content at the fibre saturation point is 18 to 23%, compared to 25 to 30% in most Canadian softwoods. As a result, Western Red Cedar shrinks and swells minimally, displaying small movements with changes in humidity.

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 the 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. per square ft.h degrees F. The R value (the reciprocal of k) for Western Red Cedar is 1.35” of thickness.

Accoustic Properties
An important accoustical 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.

Flame Spread
Flame spreading ratings describe the surface burning characteristics of interior finishes. They are used to regulate the use of interior finish materials to reduce the probability of rapid fire spread. Materials are burned in a test furnace for a relative assessment of flammability. The lower the flame spread rating, the more the material resists the spread of fire. Western Red Cedar has a Spread of Flame Index rating of 10.

Smoke Development
Smoke developed classifications reflect the amount of smoke released by burning material. They are used in conjunction with flame spread ratings to regulate the use of interior finish materials where the potential to generate smoke or control smoke movement is of major fire safety importance. Western Red Cedar has a Smoke Development Index rating of 4.

Resistance to Decay
Western red cedar heartwood is renowned for its high decay-resistance. This natural durability is attributed to the presence of extractives, mainly the thujaplicins, and to a lesser extent, the water-soluble phenolics which are toxic to a number of woodrotting fungi.

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 silicon bronze 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.

Because it is free of pitch and resin, Western Red Cedar has excellent gluing properties, comparable to those, for example, of old growth Redwood and American Chestnut. It works well with a wide range of adhesives.

Finishing
Although cedar is a naturally durable species, leaving it untreated is not recommended because a finish or protective coating will greatly increase its service life. Cedar is free of pitch and with its high degree of dimensional stability, it is the best of the softwoods for accepting paints, stains, oils and other coatings. For a detailed discussion, see Finishing Western Red Cedar published by the Western Red Cedar Lumber Association.

Workability
With its straight grain and uniform texture, Western Red Cedar is among the easiest and most rewarding woods to work with. It takes a fine finish in all hand and machine operations, takes fasteners without splitting and is easily sawn and nailed. When working with Western Red Cedar, sharp cutters are recommended.

Products, Grades and Sizes
There are few more versatile building materials than Western Red Cedar which is ideal both for indoor and outdoor uses. Western Red Cedar lumber is available in visual stress grades for construction and finishing uses in a range of lengths, widths and thicknesses. It is available in clear or knotty grades with dressed surface, or rough sawn; kiln dried or airdried; flat grain and vertical grain.

Western Red Cedar is used to manufacture a range of specialty products such as siding, paneling or sarking. Detailed product information is available from the Western Red Cedar Export Association.

Cedar produced by the Western Red Cedar Export Association includes specialty end use grades as well as products graded to National Lumber Grading Authority (NLGA) rules. NLGA grades are approved by the American Lumber Standards Board of Review and are accepted under all US building codes.

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 long 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:	330-385kg/m
Specific Gravity (oven dry):	0.35
Durability:	Durable species
Fasteners:	Corrosion resistant only (silicone bronze, stainless steel)
Finishing:	Paints, stains, varnishes, oils and waxes all work well
Flame spread rating:	69 (class II) 10 (AS1530)
Smoke developed classification:	98 4 (AS1530)
k value(12% mc):	0.74 BTU inch/square ft.h degrees F
R value:	1.35 in. of thickness
Stability:	Cedar is the most stable softwood species
Workability:	Easy to cut, saw, nail and glue

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:
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 summer average equilibrium moisture content in dry areas of the Pacific Northwest.
5. 6% is the average equilibrium moisture content for interiors of heated buildings.

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