



***Tsuga heterophylla* (Raf.) Sarg.**

Family: Pinaceae

Western Hemlock

The genus *Tsuga* contains about 14 species native to North America [4] and southern and eastern Asia [10]. The word *tsuga* is the Japanese name for the native hemlocks of Japan. The word *heterophylla* means ‘with other (different or various) leaves’.

Other Common Names: Alpine hemlock, alpine spruce, berg-hemlock, black hemlock, mountain hemlock, Olympic fir, Pacific Coast hemlock, Patton's hemlock, Patton's spruce, Prince Albert's fir, tsuga de California, tsuga de Californie, tsuga de l'ouest, tsuga de Patton, tsuga di California, vastamerikansk berg-hemlock, weeping spruce, westamerikanische hemlocktanne, western hemlock, western hemlock spruce, Williamson's spruce.

Distribution: Western hemlock is native to the Pacific Coast region from southern Alaska (Kenai Peninsula) southeast through southeastern Alaska and western British Columbia to western Washington, western Oregon and northwestern California. Also in the Rocky Mountain region from southeastern British Columbia south to northeastern Washington, northern Idaho and northwestern Montana.

The Tree: Western hemlock trees reach height of 200 feet, with diameters of 3 feet. An exceptional specimen was recorded at 259 feet tall, with a diameter of 108 inches.

General Wood Characteristics: The heartwood and sapwood of western hemlock are almost white with a purplish tinge. The sapwood, which is sometimes lighter in color, is generally not more than 1 inch thick. The wood often contains small, sound, black knots that are usually tight and stay in place. Dark streaks are often found in the lumber; these are caused by hemlock bark maggots and generally do not reduce strength. Western hemlock is moderately light in weight and moderate in strength. It is moderate in its hardness, stiffness, and shock resistance. It has moderately large shrinkage, about the same as Douglas-fir. Green hemlock lumber contains considerably more water than Douglas-fir, and requires longer kiln drying time. Trees may contain wetwood and/or have ring shake. The wood is intermediate in nail holding ability and has a tendency to split when nailed. It is satisfactory with respect to being glued and in taking stains, polish, varnish and paint.

Mechanical Properties (2-inch standard)

	Specific gravity	MOE x10 ⁶ lbf/in ²	MOR lbf/in ²	Compression		WML ^a in-lbf/in ³	Hardness lbf	Shear lbf/in ²
				Parallel lbf/in ²	Perpendicular lbf/in ²			
Green	0.42	1.31	6600	3360	280	6.9	410	860
Dry	0.44	1.63	11300	7200	550	8.3	540	1290

^aWML = Work to maximum load.
Reference (56).

Drying and Shrinkage

Type of shrinkage	Percentage of shrinkage (green to final moisture content)		
	0% MC	6% MC	20% MC
Tangential	7.8	6.3	2.6
Radial	4.2	3.4	1.4
Volumetric	12.4	9.5	4.0
References: (56, 192).			

Kiln Drying Schedules^a

Conventional temperature/moisture content-controlled schedules^a

Condition	4/4, 5/4 stock	6/4 stock	8/4 stock	10/4 stock	12/4 stock	British schedule 4/4 stock
Lower grades	T11-E5	NA	T11-E5	NA	NA	NA
Upper grades	T12-C5	T11-C5	T11-C4	T8-A3	T8-A3	K

^aReference (28, 185).

Conventional temperature/time-controlled schedules^a

Condition	Lower grades			Upper grades			
	4/4, 5/4 stock	6/4 stock	8/4 stock	4/4, 5/4 stock	6/4 stock	8/4 stock	12/4, 16/4 stock
Standard	291	291	291	294	294	294	288

^aReferences (28, 185).

High temperature^a

Condition	4/4, 5/4 stock	6/4 stock	8/4 stock	Other products
Standard	400	400	400/ 415	NA

^aReferences (28, 184).

Working Properties: The wood is intermediate in nail holding ability and has a tendency to split when nailed. It is satisfactory with respect to being glued and in taking stains, polish, varnish and paint.

Durability: Hemlocks are rated as being slightly or nonresistant to heartwood decay.

Preservation: Western hemlock is resistant to preservative treatment (6).

Uses: Roof decking, laminating stock, moldings, architectural trim, general construction, newsprint and plywood.

Toxicity: May cause dermatitis (5,10&16).

Additional Reading and References Cited (in parentheses)

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Abbreviations