



Picea engelmannii

Parry ex. Engelm.

Family: Pinaceae

Engelmann Spruce

The genus *Picea* is composed of about 30 species native to North America [12] and Eurasia [20]. The word *picea* comes from the ancient Latin name (*pix, picis* = pitch) of a pitchy pine, probably Scotch pine (*Pinus sylvestris* L.). The word *engelmannii* is named for George Engelmann (1809-1884), German born physician and botanist of St. Louis, an authority on conifers who first recognized this species as undescribed.

Other Common Names: Arizona spruce, balsam, Columbian spruce, Engelmann elm, Engelmann spar, Engelmann spruce, Engelmann-fichte, Engelmanns-gran, epicea d'Engelmann, epinette d'Engelmann, mountain spruce, picea de Englemann, picea di Engelmann, pino real, real pino, Rocky Mountain spruce, silver spruce, spruces d'america, western white spruce, white pine, white spruce.

Distribution: Engelmann spruce is native to the Rocky Mountain region from southwestern Alberta and central British Columbia, south in the high mountains from Washington to northern California, east to eastern Nevada, southeastern Arizona and southern New Mexico and north to Wyoming and central Montana. About two thirds of the lumber is produced in the southern Rocky Mountain States. Most of the remainder comes from the northern Rocky Mountain States and Oregon.

The Tree: Engelmann spruce trees reach heights of 130 feet, with diameters of 3 feet. Larger trees may exceed 130 feet in height and 3.5 feet in diameter.

General Wood Characteristics: The heartwood of Engelmann spruce is nearly white with a slight tinge of red. The sapwood varies from 3/4 inch to 2 inches in width and is often difficult to distinguish from heartwood. The wood has medium to fine texture and is without characteristic taste or odor. It is generally straight grained. Engelmann spruce rated as light in weight. It is low in strength as a beam or post. It is limber, soft, low in shock resistance, and has moderately small shrinkage. The lumber typically contains numerous small knots.

Mechanical Properties (2-inch standard)

	Specific gravity	MOE GPa	MOR MPa	Compression		WML ^a KJ/m ³	Hardness N	Shear MPa
				Parallel MPa	Perpendicular MPa			
Green	0.33	7.10	32.4	15.0	1.38	35.2	1160	4.41
Dry	0.35	8.96	64.1	30.9	2.83	44.1	1730	8.27

^aWML = Work to maximum load.
Reference (59).

Drying and Shrinkage

Type of shrinkage	Percentage of shrinkage (green to final moisture content)		
	0% MC	6% MC	20% MC

Tangential	7.1	5.3	2.2
Radial	3.8	2.7	1.1
Volumetric	11.0	8.3	3.5
References: 0% (56) 6% and 20% MC (90).			

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	T7-B6	T5-B5	T5-B5	NA	NA	NA
Upper grades	T9-E5	NA	T7-E4	T7-A4	T7-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	291	289	289	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	4- by 6-in. decking (405) Studs (406)

^aReferences (28, 184).

Working Properties: Engelmann spruce is easily worked (14).

Durability: Spruces are rated as slightly or nonresistant to heartwood decay (14).

Preservation: Engelmann spruce is rated as resistant to preservative treatment (7).

Uses: Engelmann spruce is used principally for lumber and for mine timbers, railroad crossties, and poles. It is used also in building construction in the form of dimension lumber, flooring, sheathing, and studding. It has excellent properties for pulp and paper making.

Toxicity: Working with fresh spruce wood may cause dermatitis, or other contact sensitivity (6,11 & 16).

Additional Reading and References Cited (in parentheses)

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