



Picea rubens Sarg.
Family: Pinaceae
Red 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 *rubens* means reddish, referring to the reddish brown cones.

Other Common Names: Abetina rossa, Adirondack spruce, black spruce, blue spruce, Canadese rode spar, Canadian red spruce, Canadian spruce, double spruce, eastern spruce, epicea rouge du Canada, he balsam, he-balsam, Hudson-fichte, kanadensisk rod-gran, North American red spruce, picea roja de Canada, picea rossa del Canada, red spruce, rot-fichte, sapinette rouge du Canada, spruce pine, spruces d'america, West Virginia spruce, yellow spruce.

Distribution: Red spruce is native to Cape Breton Islands, Nova Scotia and New Brunswick, west to Maine, southern Quebec and southeastern Ontario and south to central New York, northeastern Pennsylvania, northern New Jersey and Massachusetts. It also grows in the Appalachian Mountains of extreme western Maryland, eastern West Virginia, northern and western Virginia, western North Carolina and eastern Tennessee.

The Tree: Red spruce can reach heights of 110 feet, with diameters of 4.5 feet. At the northern limit of its range, red spruce reaches heights of only 80 feet and diameters of 2 feet.

General Wood Characteristics: The wood dries easily and is stable after drying, is moderately light in weight and easily worked, has moderate shrinkage, and is moderately strong, stiff, tough, and hard. It is not very resistant to bending or end-wise compression. It is straight, even grained, medium to fine textured, soft and produces a lustrous finish. It is without characteristic odor or taste. The wood is a pale yellowish white, and there is little difference between the heartwood and sapwood. It has exceptional resonance qualities, in the form of thin boards. It has moderately high shrinkage, but is easily air or kiln dried. It is easily worked, glues well, is average in paint holding ability, but rates low in nail holding capacity. It also rates low in decay resistance and is difficult to penetrate with preservatives.

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	0.37	9.17	41.4	18.7	1.79	47.6	1560	5.17
Dry	0.41	11.1	74.5	38.2	3.79	57.9	2180	8.89

^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	6.2	2.6
Radial	3.8	3.0	1.3
Volumetric	11.8	9.4	3.9
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-B4	NA	T10-B3	T5-A2	T5-A2	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	291	291	NA

^aReferences (28, 185).

High temperature^a

Condition	4/4, 5/4 stock	6/4 stock	8/4 stock	Other products
Standard	410	NA	411	NA

^aReferences (28, 185).

Working Properties: It is easily worked, glues well, is average in paint holding ability, but rates low in nail holding capacity.

Durability: It also rates low in decay resistance.

Preservation: It is difficult to penetrate with preservatives.

Uses: The largest use of black spruce is for pulpwood. It is also used for framing material, general millwork, boxes and crates, and piano sounding boards.

Toxicity: Working with fresh spruce wood may cause dermatitis, or other contact sensitivity (6,9&15).

Additional Reading and References Cited (in parentheses)

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