



Picea mariana (Mill.) B.S.P.

Family: Pinaceae

Black 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 *mariana* means “of Maryland”, in the broad sense for North America, as this species is not native to Maryland.

Other Common Names: Amerikaanse zwarte spar, amerikansk svart-gran, black spruce, blue spruce, bog spruce, Canadian spruce, double spruce, eastern spruce, Eastern Canadian spruce, epicea noir d'Amerique, epinette batarde, epinette jaune, epinette noire, he balsam, he-balsam, juniper, muckeag spruce, New Brunswick spruce, picea negra americana, picea nera americana, Quebec spruce, sapin noir, sapinette noire, sapinette noire 'Amerique, schwarz-fichte, schwarzfichte, shortleaf black spruce, spruce pine, spruces d'america, St. John's spruce, swamp black spruce, swamp spruce, transcontinental spruce, water spruce, western spruce, yew pine.

Distribution: Black spruce has a widespread distribution across northern North America near the northern limit of trees, from Newfoundland, Labrador and northern Quebec, west to the Hudson Bay, northwest Mackinaw and central, western and southern Alaska, south to central British Columbia, and east to southern Manitoba, central Minnesota, Wisconsin, southeastern Michigan southern Ontario, New York, central and northeastern Pennsylvania, northern New Jersey, Rhode Island and Massachusetts.

The Tree: Black spruce trees reach heights of over 50 feet, with diameters of 1 foot. Exceptional trees grow to 90 feet with a diameter of almost 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	0.38	9.51	42.1	19.6	1.65	51.0	1640	5.10
Dry	0.43	11.0	74.5	41.1	3.79	72.4	2310	8.48

^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	6.8	5.4	2.3
Radial	4.1	3.3	1.4
Volumetric	11.3	9.0	3.8
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
Standard	T11-B4	NA	T10-B3	T5-A2	T5-A2	K

^aReference (28, 74, 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	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 (5,9&15).

Additional Reading & References Cited (in parentheses):

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