technology transfer *fact sheet*

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The genus *Abies* (True Firs) is composed of about 40 species native to North America [9], Central America [7], Africa [2], Europe [1] and Eurasia [25]. *Abies* is the classical Latin name of silver fir (*Abies alba* Mill.) of Europe. The word *balsamea* is the ancient word for the balsam tree, referring to the resinous pockets or blisters in the bark.

Other Common Names: Abete balsamico, abeto balsamico, abeto oloroso, balm-of-gilead, balm-of-gilead fir, balsam, balsam fir, balsam-gran, balsam-tanne, balsem-den, balsemzilver-den, beaumier de Gilead, blister fir, blister pine, blisters cho-koh-tung, bracted balsam fir, Canadian balsam, Canadian fir, eastern fir, fir pine, firs d'america, fir-tree, Gilead fir, sapin, sapin baumier, sapin beaumier, sapin blanc, sapin rouge, silver fir, silver pine, single pine, single spruce, var.

Distribution: From Newfoundland and Labrador west to northeast Alberta, south and east to southern Manitoba, Minnesota, northeast Iowa, central Wisconsin, central Michigan, southern Ontario, New York, central Pennsylvania, Connecticut and Maine.

The Tree: Balsam fir normally reaches heights of 60 feet with diameters of1.5 feet. Trees growing in optimal conditions can reach heights of 90 feet with diameters of 2.5 feet. It grows from sea level to about 6,000 feet.

General Wood Characteristics: The wood is white to pale brown. It is without distinctive odor or taste. It is light weight and soft, has good splitting resistance, is low in shock resistance. Mechanically, it ranks better than white spruce (*Picea glauca*), and is equal to or less than properties of red (*Picea rubens*) and black spruce (*Picea mariana*). It has low nail holding capacity.

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	0.33	1.25	5500	2630	190	4.7	290	660
Dry	0.41	1.45	9200	5280	400	5.1	400	940

[a]WML = Work to maximum load.
Reference (56).

Drying and Shrinkage

	Percentage of shrinkage (green to final moisture content)		
Type of shrinkage	0% MC	6% MC	20% MC
Tangential	6.9	5.5	2.3
Radial	2.9	2.3	1.0
Volumetric	11.2	9.0	3.7

References: (178, 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	T12-E5	NA	T10-E4	T8-A4	T8-A4	L

[a]Reference (28, 185).

Conventional temperature/time-controlled schedules[a]

	Lower grades			Upper grades			
Condition	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

[a]References (28, 185).

High temperature[a]

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

[a]References (28, 185).

Working Properties: Balsam fir works easily with both hand tools and machine operations. It finishes well, provided one uses sharp cutting edges. It takes nails, paint, varnish and polish well. It has good splitting resistance.

Durability: It is rated as slightly resistant to nonresistant to heartwood decay (15). It is susceptible to attack by ambrosia beetles (pinhole borers), longhorn beetles, Buprestid beetles and *Sirex* wood wasps (5).

Preservation: Reported as resistant to preservative treatments (5).

Uses: The tree is a favorite Christmas tree, while the wood is used for pulpwood, lumber, light frame construction, paneling and crates. The oleoresin (balsam) is used in microscopy, medicinal compounds and spirit varnishes.

Toxicity: Working with the wood may cause eczema or dermatitis (4,9&16).

Additional Reading and References Cited (in parentheses)

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