



***Betula* spp.** **American Birch**

Family: Betulaceae

Birch (*Betula* spp.) is composed of 30 to 50 species growing in Asia [12], North America [4] and Europe [4]. All species look alike microscopically. The word *betula* is the classical Latin name of birch. The important species are yellow birch (*Betula alleghaniensis*), sweet birch (*B. lenta*), and paper birch (*B. papyrifera*). Other birches of some commercial importance are river birch (*B. nigra*), gray birch (*B. populifolia*), and western paper birch (*B. papyrifera* var. *commutata*).

*Betula alleghaniensis**—black birch, Canadian silky wood, gray birch, hard birch, Quebec birch, silver birch, swamp birch, white birch, witch hazel, **yellow birch**

*Betula lenta**—black birch, black cherry birch, cherry birch, mahogany, mahogany birch, mountain birch, mountain mahogany, red birch, river birch, spice birch, yellow birch, **sweet birch**

Betula nana—**swamp birch**

*Betula nigra**—black birch, red birch, **river birch**, water birch

Betula occidentalis—black birch, canyon birch, cherry birch, mountain birch, red birch, red canyon birch, spring birch, swamp birch, sweet birch, **water birch**, western birch, western paper birch, western red birch

*Betula papyrifera**—black birch, canoe birch, gray birch, large white birch, northwestern paper birch, **paper birch**, red birch, silver birch, western birch, western paper birch, white birch

Betula papyrifera var. *papyrifera*—paper birch (typical)

Betula papyrifera var. *commutata*—western paper birch

Betula papyrifera var. *cordifolia*—mountain paper birch

Betula papyrifera var. *kenaica*—Kenai birch

Betula papyrifera var. *neoalaskana*—Alaska paper birch

Betula papyrifera var. *subcordata*—northwestern paper birch

Betula pendula—**silver birch**, white birch

*Betula populifolia**—blue birch, blueleaf birch, broom birch, fire birch, **gray birch**, oldfield birch, pin birch, poplar-leaved birch, poverty birch, small white birch, white birch, wire birch

Betula pumila—**dwarf birch**

Betula uber—Ashe's birch, Virginia birch, **Virginia roundleaf birch**

(* = commercial species)

Distribution

North America: Yellow birch, sweet birch, and paper birch grow principally in the Northeastern and Lake States. Yellow and sweet birch also grow along the Appalachian Mountains to northern Georgia. Paper birch is also found throughout Canada and Alaska. Yellow, sweet, and paper birch are the source of most birch lumber and veneer.

The Tree

Birches can reach a height of 70 ft, with a diameter of more than 2 ft.

The Wood

General

The wood varies slightly among species. The wood of yellow birch and sweet birch is heavy, hard and strong, while that of paper birch is lighter, and less hard, strong and stiff. All birches have a fine, uniform texture. Paper birch is easy to work with hand tools; sweet birch and yellow birch are difficult to work with hand tools and difficult to glue, but easily machined. Yellow birch has white sapwood and light reddish-brown heartwood. Sweet birch has light-colored sapwood and dark brown heartwood tinged with red.

Mechanical Properties (2-inch standard)

	Specific gravity	MOE 10 ⁶ lbf/in ²	MOR 10 ³ lbf/in ²	Compression		WML ^a in-lbf/in ³	Hardness lbf	Shear 10 ³ lbf/in ²
				Parallel 10 ³ lbf/in ²	Perpendicular 10 ³ lbf/in ²			
<i>B. alleghaniensis</i> (yellow birch)^b								
Green	0.55	1.50	8.30	3.38	0.43	16.1	780	1.11
Dry	0.62	2.01	16.6	8.17	0.97	20.8	1,260	1.88
<i>B. lenta</i> (sweet birch)^b								
Green	0.60	1.65	9.4	3.74	0.47	15.7	970	1.24
Dry	0.65	2.17	16.9	8.54	1.08	18.0	1,470	2.24
<i>B. papyrifera</i> (paper birch)^b								
Green	0.48	1.17	6.4	2.36	0.27	16.2	560	0.84
Dry	0.55	1.59	12.3	5.69	0.60	16.0	910	1.21
<i>B. papyrifera</i> var. <i>neolaskana</i> (Alaska paper birch)^c								
Green	0.49	1.35	7.1	3.03	0.43	11.6	560	0.92
Dry	0.55	1.9	13.6	7.45	0.82	13.9	830	1.40
<i>B. populifolia</i> (gray birch)^c								
Green	0.45	–	–	–	–	–	–	–
Dry	0.51	1.15	9.8	4.87	0.92	10.8	760	1.34

^aWML = Work to maximum load.

^bReference (98).

^cReference (59).

Drying and Shrinkage

Type of shrinkage	Percentage of shrinkage (green to final moisture content)		
	0% MC	6% MC	20% MC
<i>B. alleghaniensis</i> (yellow birch)			
Tangential	9.5	7.4	3.1
Radial	7.3	5.8	2.4
Volumetric	16.8	13.4	5.6
<i>B. lenta</i> (sweet birch)			
Tangential	9.0	–	–
Radial	6.5	–	–
Volumetric	15.6	–	–
<i>B. nigra</i> (river birch)			
Tangential	9.2	–	–
Radial	4.7	–	–
Volumetric	13.5	–	–

<i>B. papyrifera</i> (paper birch)			
Tangential	8.6	6.9	2.9
Radial	6.3	5.0	2.1
Volumetric	16.2	13.0	5.4
<i>B. papyrifera</i> var. <i>neolaskana</i> (Alaska paper birch)			
Tangential	9.9	–	–
Radial	6.5	–	–
Volumetric	16.7	–	–
<i>B. populifolia</i> (gray birch)			
Tangential	–	–	–
Radial	5.2	–	–
Volumetric	14.7	–	–

^aBirch shrinks considerably during drying. References: 0% MC (98), 6% and 20% MC (90).

Kiln Drying Schedules^a

Condition	Stock				
	4/4, 5/4, 6/4	8/4	10/4	12/4	16/4
<i>B. lenta</i> , <i>B. nigra</i> , <i>B. populifolia</i> , <i>B. papyrifera</i>					
Standard	T10-C4	T8-D3	–	–	–
1-in. squares	T10-C6	–	–	–	–
Whiter 1-in.squares	T5-C6	–	–	–	–
2-in. squares	T8-C4	–	–	–	–
Whiter 2-in. squares	T5-C4	–	–	–	–
<i>B. alleghaniensis</i>					
Standard	T10-C4	T8-D3	–	–	–
1-in. squares	T10-C6	–	–	–	–
Whiter 1-in.squares	T5-C6	–	–	–	–
2-in. squares	T8-C4	–	–	–	–
Whiter 2-in. squares	T5-C4	–	–	–	–

^aReferences (6, 86).

Working Properties: Working properties may vary with species. In general, birches split during nailing; if successfully nailed, they have good nail-holding properties.

Durability: Rated as slightly or nonresistant to heartwood decay.

Preservation: No information available at this time.

Uses: Yellow and sweet birch lumber and veneer are used principally in the manufacture of furniture, boxes, baskets, crates, wooden ware, cooperage, interior finish, and doors. Birch veneer goes into plywood used for flush doors, furniture, paneling, radio and television cabinets, aircraft, and other specialty uses. Paper birch is used for turned products, including spools, bobbins, small handles, and toys. Also used for pulp wood, fuel wood, turnery, distillation products, toothpicks, ice cream sticks and tongue depressors.

Toxicity: Birches can cause dermatitis (40, 64, 105).

Additional Reading and References Cited (in parentheses)

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