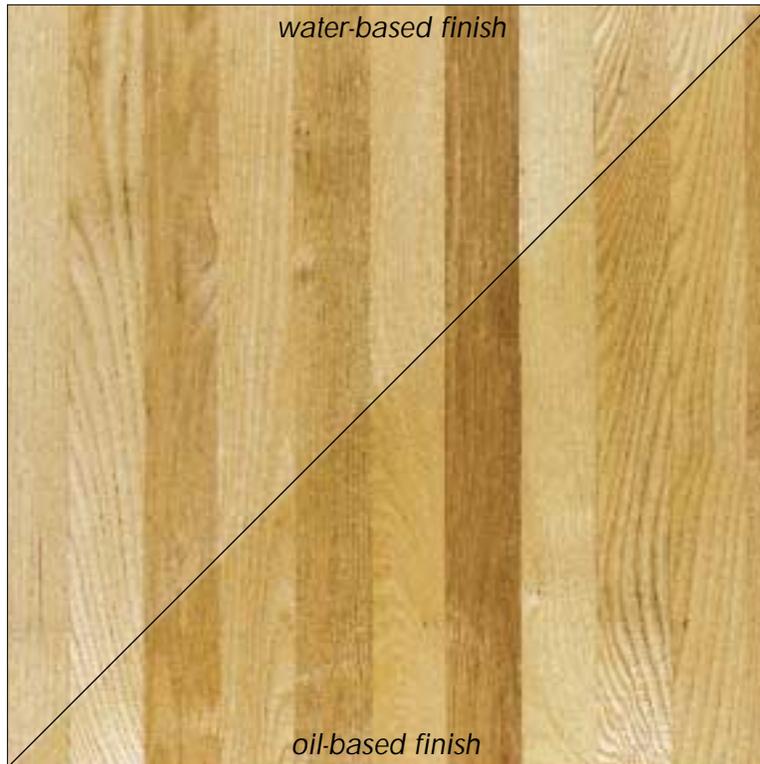


ASH, WHITE

Fraxinus americana



Appearance

COLOR: Heartwood is light tan to dark brown; sapwood is creamy white. Similar in appearance to white oak, but frequently more yellow.

GRAIN: Bold, straight, moderately open grain with occasional wavy figuring. Can have strong contrast in grain in plainsawn boards.

VARIATIONS WITHIN SPECIES AND GRADES:

Sometimes confused with hickory; the zone of large pores is more distinctive in ash, similar to that of red oak.

Properties

HARDNESS/JANKA: 1320 (2% harder than Northern red oak).

DIMENSIONAL STABILITY: Above average (7.8; 9% more stable than Northern red oak).

Workability

SAWING/MACHINING: Good machining qualities.

NAILING: No known problems.

SANDING: Sands satisfactorily if the correct sanding sequence is followed.

Suggested Sequence

First Cut: 50 at a 7 to 15 degree angle to the grain

Second Cut: 60 or 80 straight with the grain

Third Cut: 80 or 100

Hard Plate: 100

Screen: 80 or 100

FINISHING: May be difficult to stain.

Origin

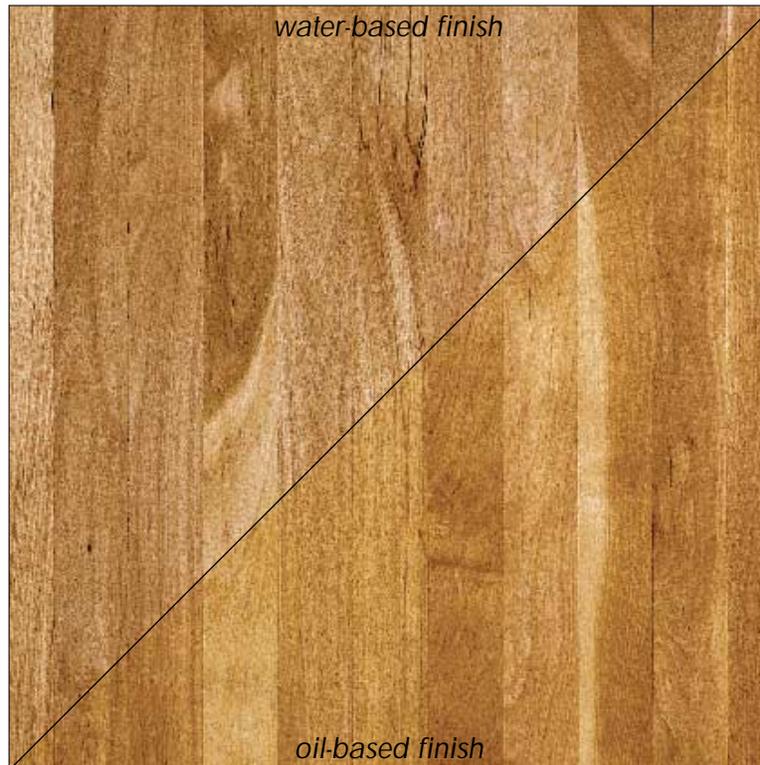
North America.

Availability

Readily available.

BEECH

Fagus grandifolia



Appearance

COLOR: Heartwood is mostly reddish brown; sapwood is generally pale white.

GRAIN: Mostly closed, straight grain; fine, uniform texture. Coarser than European beech.

VARIATIONS WITHIN SPECIES AND GRADES: Only one species is native to the United States. Moderate to high color variation between boards.

Properties

HARDNESS (JANKA): 1300 (1% harder than Northern red oak).

DIMENSIONAL STABILITY: Below average (11.9; 38% less stable than Northern red oak).

Workability

SAWING/MACHINING: Difficult to work with hand tools, but good machining qualities.

NAILING: Has a tendency to split the tongues.

SANDING: Sands satisfactorily if correct sanding sequence is followed.

Suggested Sequence

First Cut: 50 or 60 at a 7 to 15 degree angle to the grain

Second Cut: 60 or 80 straight with the grain

Third Cut: 80 or 100

Hard Plate: Not recommended

First Screen: 80 or 100

Second Screen: 120 or 150

FINISHING: May be difficult to stain.

Origin

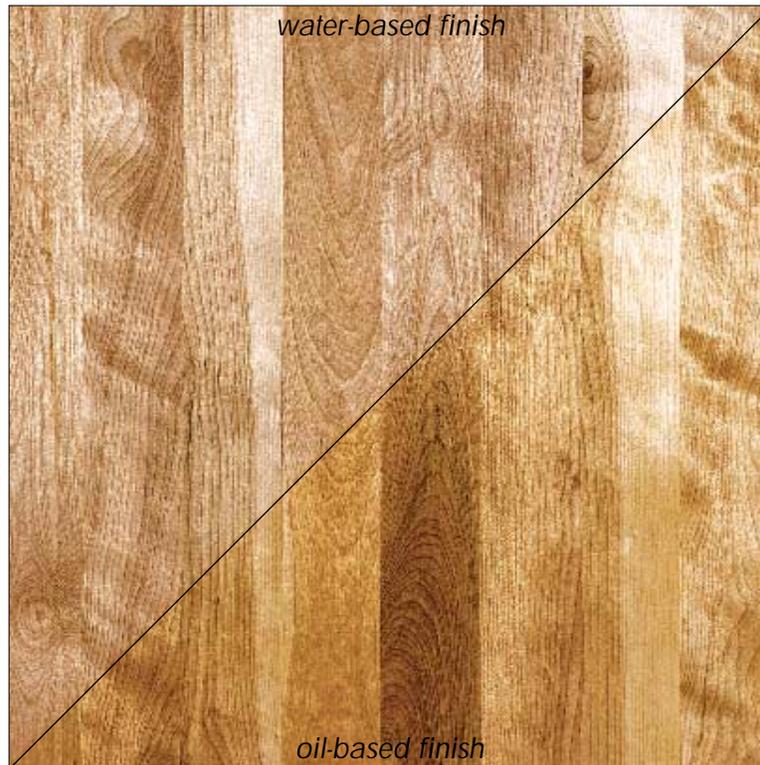
North America.

Availability

Moderately available.

BIRCH

Betula spp.



Appearance

COLOR: In yellow birch (*B. alleghaniensis*), sapwood is creamy yellow or pale white; heartwood is light reddish brown tinged with red. In sweet birch (*B. lenta*), sapwood is light colored and heartwood is dark brown tinged with red.

GRAIN: Medium figuring, straight, closed grain, even texture. Occasional curly grain or wavy figure in some boards.

VARIATIONS WITHIN SPECIES AND GRADES: Yellow birch, sweet birch, paper birch. Paper birch (*B. papyrifera*) is softer and lower in weight and strength than yellow or sweet birch. However, yellow birch is most commonly used for flooring. Boards can vary greatly in grain and color.

Properties

SIDE HARDNESS/JANKA: Yellow: 1260 (2% softer than Northern red oak).

DIMENSIONAL STABILITY: Average (Yellow: 9.5; 10% less stable than Northern red oak).

Workability:

SAWING/MACHINING: Difficult to work with hand tools, but good machining qualities.

NAILING: No known problems.

SANDING: Sands satisfactorily if the correct sanding sequence is followed.

Suggested Sequence

First Cut: 50 at a 7 to 15 degree angle to the grain

Second Cut: 80 straight with the grain

Third Cut: 120

Hard Plate: 100 or 120

First Screen: 100

Second Screen: 100

FINISHING: May be difficult to stain.

Origin

North America.

Availability

Moderately available.

CHERRY, BLACK

Prunus serotina



Appearance

COLOR: Heartwood is light to dark reddish brown, lustrous; sapwood is light brown to pale with a light pinkish tone. Some flooring manufacturers steam lumber to bleed the darker heartwood color into the sapwood, resulting in a more uniform color. Color darkens significantly with age.

GRAIN: Fine, frequently wavy, uniform texture. Distinctive flake pattern on true quartersawn surfaces. Texture is satiny, with some gum pockets.

VARIATIONS WITHIN SPECIES AND GRADES: Significant color variation between boards.

Properties

HARDNESS (JANKA): 950 (26% softer than Northern red oak).

DIMENSIONAL STABILITY: Above average (7.1; 17% more stable than Northern red oak).

Workability

SAWING/MACHINING: Good machining qualities.

NAILING: No known problems.

SANDING: Sands satisfactorily if the correct sanding

sequence is followed.

Suggested Sequence

First Cut: 60 at a 7-15 degree angle with the grain

Second Cut: 80 straight with the grain

Third Cut: 100

Hard Plate: Not recommended

Screen: 80 or 100

FINISHING: No known problems.

Origin

North America.

Availability

Readily available.

DOUGLAS FIR

Pseudotsuga menziesii



Appearance

COLOR: Heartwood is yellowish tan to light brown. Sapwood is tan to white. Heartwood may be confused with that of Southern yellow pine. Radical color change upon exposure to sunlight.

GRAIN: Normally straight, with occasional wavy or spiral texture. Nearly all fir flooring is vertical-grain or riftsawn clear-grade material.

VARIATIONS WITHIN SPECIES AND GRADES: Wood varies greatly in weight and strength. Young trees of moderate to rapid growth have reddish heartwood and are called red fir. The narrow-ringed wood of old trees may be yellowish-brown and is known as yellow fir.

Properties

HARDNESS (JANKA): 660 (49% softer than Northern red oak).

DIMENSIONAL STABILITY: Above average (7.3; 15% more stable than Northern red oak).

Workability

SAWING/MACHINING: Harder to work with hand tools than the soft pines.

NAILING: No known problems.

SANDING: Sands satisfactorily if the correct sanding sequence is followed.

Suggested Sequence

First Cut: 60 at a 7-15 degree angle with the grain

Second Cut: 80 straight with the grain

Third Cut: 100 or 120

Hard Plate: Not recommended

Screen: 100 or 120

FINISHING: Some boards develop a slight pinkish to bright salmon color when finished with some products. Because of tendency toward color change, care must be taken to avoid oversanding when refinishing an existing floor. May be difficult to stain.

COMMENTS: Sometimes milled as vertical end-grain block, which is significantly harder than plainsawn.

Origin

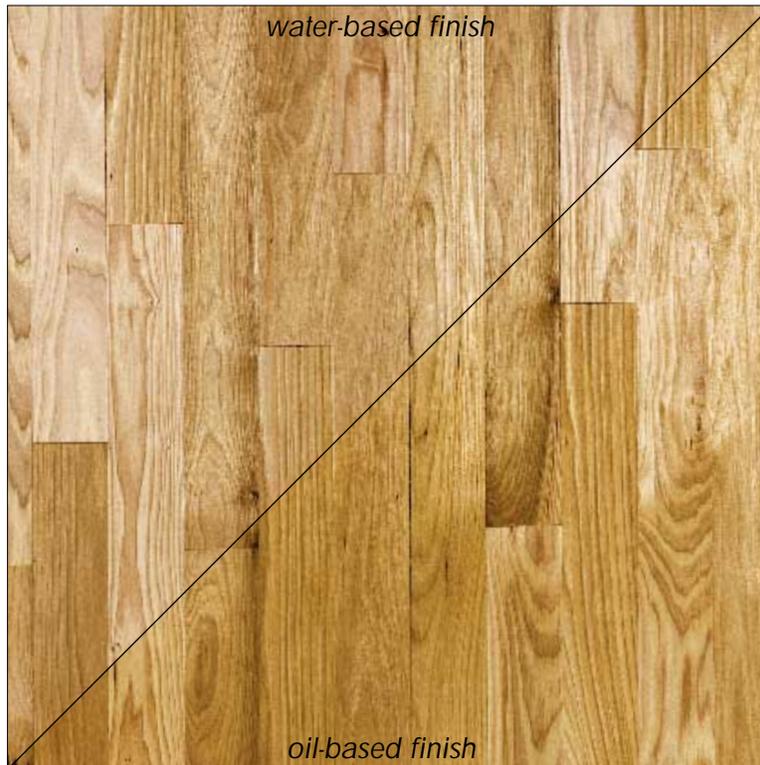
North America.

Availability

Readily available.

HICKORY/PECAN

Carya spp.



Appearance

COLOR: Pecan heartwood is reddish brown with dark brown stripes; sapwood is white or creamy white with pinkish tones. Hickory heartwood is tan or reddish; sapwood is white to cream, with fine brown lines.

GRAIN: Pecan is open, occasionally wavy or irregular. Hickory is closed, with moderate definition; somewhat rough-textured.

VARIATIONS WITHIN SPECIES AND GRADES: In both hickory and pecan, there are often pronounced differentiations in color between spring wood and summer wood. In pecan, sapwood is usually graded higher than darker heartwood. Pecan and hickory are traditionally mixed by flooring mills.

Properties

HARDNESS (JANKA): 1820 (41% harder than Northern red oak). Pecan is slightly softer than true hickories.

DIMENSIONAL STABILITY: Average (8.9; 3% less stable than Northern red oak).

Workability

SAWING/MACHINING: Hickory's density makes it difficult to machine and work with hand tools.

NAILING: Has a tendency to split the tongues.

SANDING: Difficult to sand because of density, and because light color makes sander marks show more than on darker woods.

Suggested Sequence

First Cut: 40 or 50 at a 7-15 degree angle with the grain

Second Cut: 50 or 60 straight with the grain

Third Cut: 80 or 100

Hard Plate: 100

Screen: 80 or 100

FINISHING: May be difficult to stain.

Origin

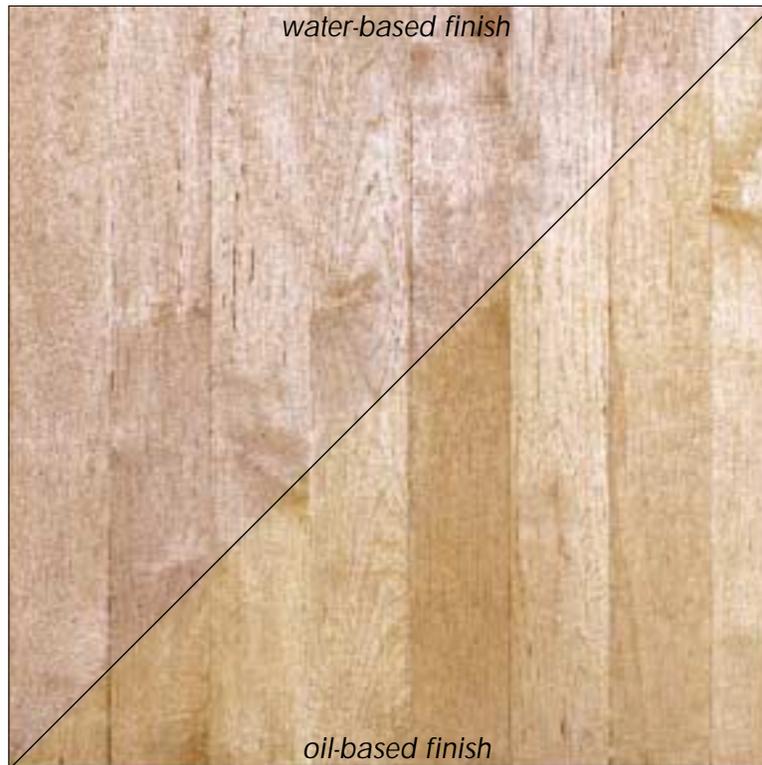
North America.

Availability

Readily available.

MAPLE, SUGAR/HARD

Acer saccharum



Appearance

COLOR: Heartwood is creamy white to light reddish brown; sapwood is pale to creamy white.

GRAIN: Closed, subdued grain, with medium figuring and uniform texture. Occasionally shows quilted, fiddleback, curly or bird's-eye figuring. Figured boards often culled during grading and sold at a premium.

VARIATIONS WITHIN SPECIES AND GRADES: Black maple (*B. nigrum*) is also hard; other species are classified as soft.

Properties

HARDNESS (JANKA): 1450 (12% harder than Northern red oak).

DIMENSIONAL STABILITY: Average (9.9; 15% less stable than red oak).

Workability

SAWING/MACHINING: Density makes machining difficult.

NAILING: No known problems.

SANDING: Extra care must be taken during sanding and finishing, as sanding marks and finish lines

are more obvious due to maple's density and light color. The species also burnishes, dulling fine paper and screens and making it difficult to cut out previous scratches.

Suggested Sequence

First Cut: 50 at a 7 to 15 degree angle to the grain

Second Cut: 80 straight with the grain

Third Cut: 120

Hard Plate: 100 or 120

First Screen: 100

Second Screen: 100

FINISHING: Takes neutral finish well. May be difficult to stain.

Origin

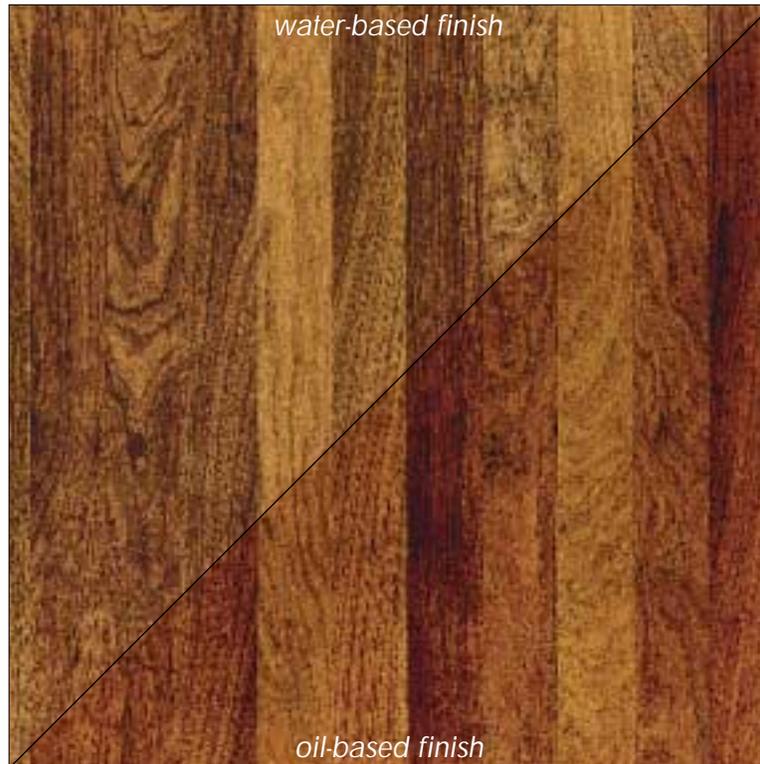
North America.

Availability

Easily available. Figured grains have limited availability.

MESQUITE

Prosopis glandulosa



Appearance

COLOR: Light brown to dark reddish brown.

GRAIN: High in character, with ingrown bark and mineral streaks. Most commonly used in flooring as end-grain block, which has small irregular cracks radiating across the grain.

VARIATIONS WITHIN SPECIES AND GRADES: One grade; moderate color variations.

Properties

HARDNESS (JANKA): 2345 (82% harder than Northern red oak).

DIMENSIONAL STABILITY: Excellent (3.2; 63% more stable than Northern red oak).

Workability

SAWING/MACHINING: Very good machining qualities.

NAILING: Splits tongues easily.

SANDING: Plainsawn can be sanded to a smooth surface. End-grain requires a coarser abrasive to flatten; it is recommended that it be flattened by sanding at a 45-degree angle to the grain.

Suggested Sequence

First Cut: 40 or 50 at a 7-15 degree angle with the grain

Second Cut: 60 or 80 straight with the grain

Third Cut: 80 or 100

Hard Plate: 100

First Screen: 80 or 100

Second Screen: 120

FINISHING: No known problems.

COMMENTS: End-grain block usage results in a hard, high-wear surface. Produces only shorter-length boards.

Origin

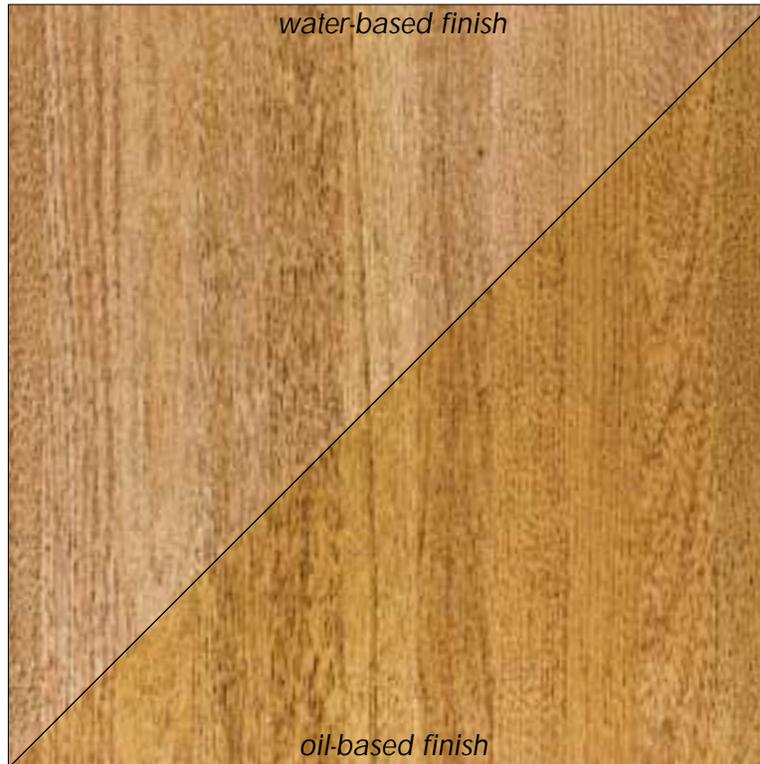
North America.

Availability

Limited availability.

OAK, RED

Quercus spp.



Appearance

COLOR: Heartwood and sapwood are similar, with sapwood lighter in color; most pieces have a reddish tone. Slightly redder than white oak.

GRAIN: Open, slightly coarser (more porous) than white oak. Plainsawn boards have a plumed or flared grain appearance; riftsawn has a tighter grain pattern, low figuring; quartersawn has a flake pattern, sometimes called tiger rays or butterflies.

VARIATIONS WITHIN SPECIES AND GRADES: More than 200 subspecies in North America; great variation in color and grain, depending on the origin of the wood and differences in growing seasons. Northern, Southern and Appalachian red oak all can be divided into upland and lowland species. Because they grow more slowly, upland species have a more uniform grain pattern than lowland species, with more growth rings per inch.

Properties

HARDNESS (JANKA): Northern: 1290 (benchmark). Southern: below average (1060; 18% softer than Northern red oak).

DIMENSIONAL STABILITY: Northern: average (8.6). Southern: below average (11.3; 31% less stable than

Northern red oak).

Workability

SAWING/MACHINING: Above average in all machining operations.

NAILING: No known problems.

SANDING: Sands satisfactorily if the correct sanding sequence is followed.

Suggested Sequence

First Cut: 50 at a 7-15 degree angle with the grain

Second Cut: 80 straight with the grain

Third Cut: 100

Hard Plate: 100

Screen: 100 or 120

FINISHING: Stains well and demonstrates strong stain contrast. Red oak generally works better than white oak for bleached floors because it is more porous, and because tannins in white oak can discolor the floor.

Origin

North America.

Availability

Easily available.

OAK, WHITE

Quercus spp.



Appearance

COLOR: Heartwood is light brown; some boards may have a pinkish tint or a slight grayish cast. Sapwood is white to cream.

GRAIN: Open, with longer rays than red oak. Occasional crotches, swirls and burls. Plainsawn boards have a plumed or flared grain appearance; riftsawn has a tighter grain pattern, low figuring; quarter-sawn has a flake pattern, sometimes called tiger rays or butterflies.

VARIATIONS WITHIN SPECIES AND GRADES: Considerable variation among boards in color and grain texture, but variations not as pronounced as in red oak.

Properties

HARDNESS (JANKA): 1210 (6% softer than Northern red oak).

DIMENSIONAL STABILITY: Average (10.5; 22% less stable than red oak).

Workability

SAWING/MACHINING: Excellent machining qualities.

NAILING: No known problems.

SANDING: Sands satisfactorily if the correct sanding sequence is followed.

Suggested Sequence

First Cut: 50 or 60 at a 7-15 degree angle with the grain

Second Cut: 60 or 80 straight with the grain

Third Cut: 80 or 100

Hard Plate: 100

Screen: 80 or 100

FINISHING: During the finishing process, tannins at the surface can react with some liquids to turn the wood green or brown. This effect tends to be more pronounced with products that have a high water content, such as wood bleach and water-based finishes. Stains very well and accepts stain evenly.

Origin

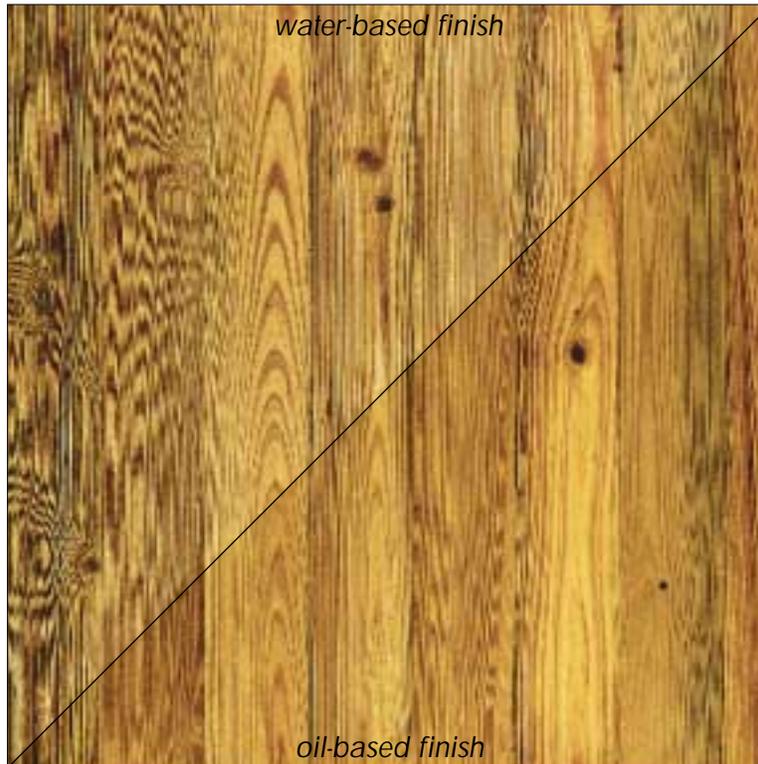
North America.

Availability

Easily available.

PINE, ANTIQUE HEART

Pinus spp.



Appearance

COLOR: Heartwood is yellow after cutting and turns deep pinkish tan to warm reddish brown within weeks due to high resin content. Sapwood remains yellow, with occasional blue-black sap stain.

GRAIN: Dense, with high figuring. Plainsawn is swirled; rift- or quartersawn is primarily pinstriped. Curly or burl grain is rare.

VARIATIONS WITHIN SPECIES AND GRADES: Moderate color variation.

Properties

HARDNESS (JANKA): 1225 (5% softer than Northern red oak).

DIMENSIONAL STABILITY: Values can vary greatly due to the variety of species and ages used.

Workability

SAWING/MACHINING: Good machining and hand-tooling qualities.

NAILING: No known problems.

SANDING: Tendency to clog paper due to high resin content. Abrasives will need to be changed fre-

quently during sanding. Beginning with a coarse grade is recommended.

Suggested Sequence

First Cut: 40 at a 7-15 degree angle with the grain

Second Cut: 50 straight with the grain

Third Cut: 80

Hard Plate: Not recommended

Screen: 80

FINISHING: May be difficult to stain. To reduce the wood's tendency to repel finish coats, surface resins may be removed with a 100 percent pure (not recycled) solvent that is compatible with the finish to be used (do not use water).

Origin

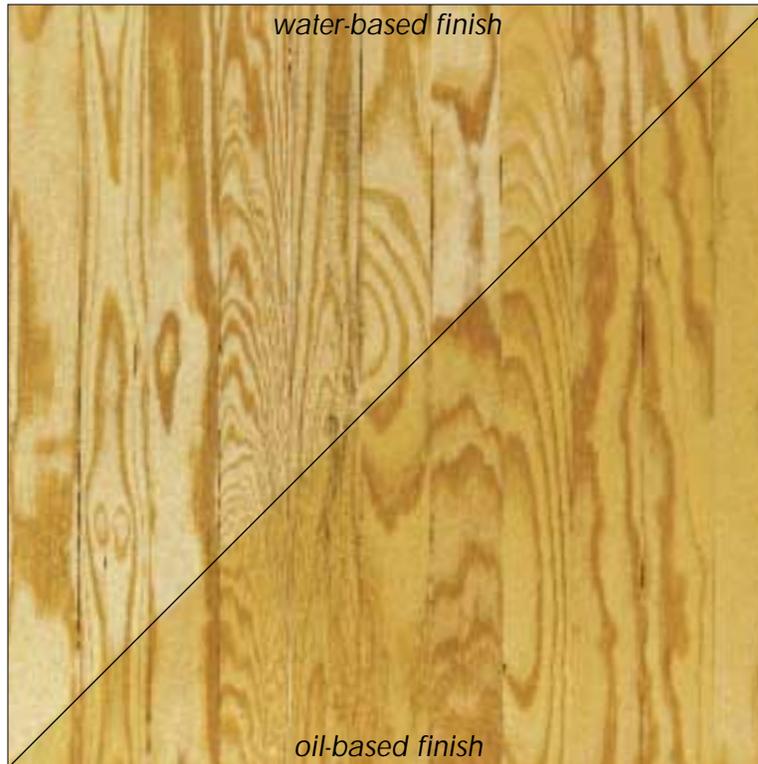
North America. Often recovered from structural timbers in pre-1900 warehouses and factories, or as sunken logs from river bottoms.

Availability

Limited.

PINE, SOUTHERN YELLOW

Pinus spp.



Appearance

COLOR: Heartwood varies from light yellow/orange to reddish brown or yellowish brown; sapwood is light tan to yellowish white.

GRAIN: Closed, with high figuring; patterns range from clear to knotty.

VARIATIONS WITHIN SPECIES AND GRADES: Longleaf pine (*P. palustris*), shortleaf pine (*P. echinata*), loblolly pine (*P. taeda*), slash pine (*P. elliottii*). All have many of the same characteristics as Douglas fir. Old-growth lumber in these varieties has substantially higher density and is more stable than second-growth material.

Properties

HARDNESS (JANKA): Loblolly and shortleaf 690, (47% softer than Northern red oak); longleaf 870 (33% softer than Northern red oak).

DIMENSIONAL STABILITY: Above average (7.5; 13% more stable than Northern red oak).

Workability

SAWING/MACHINING: Good machining qualities.

NAILING: No known problems.

SANDING: Resin in wood tends to clog abrasives; frequent sandpaper changes are required.

Suggested Sequence

First Cut: 50 at a 7-15 degree angle with the grain

Second Cut: 60 or 80 straight with the grain

Third Cut: 80 or 100

Hard Plate: Not recommended

Screen: 80 or 100

FINISHING: May be difficult to stain. To reduce the wood's tendency to repel finish coats, surface resins may be removed with a 100 percent pure (not recycled) solvent that is compatible with the finish to be used (do not use water).

COMMENTS: Generally manufactured for flooring with no end-match; sometimes flooring is "distressed" to create an antique look.

Origin

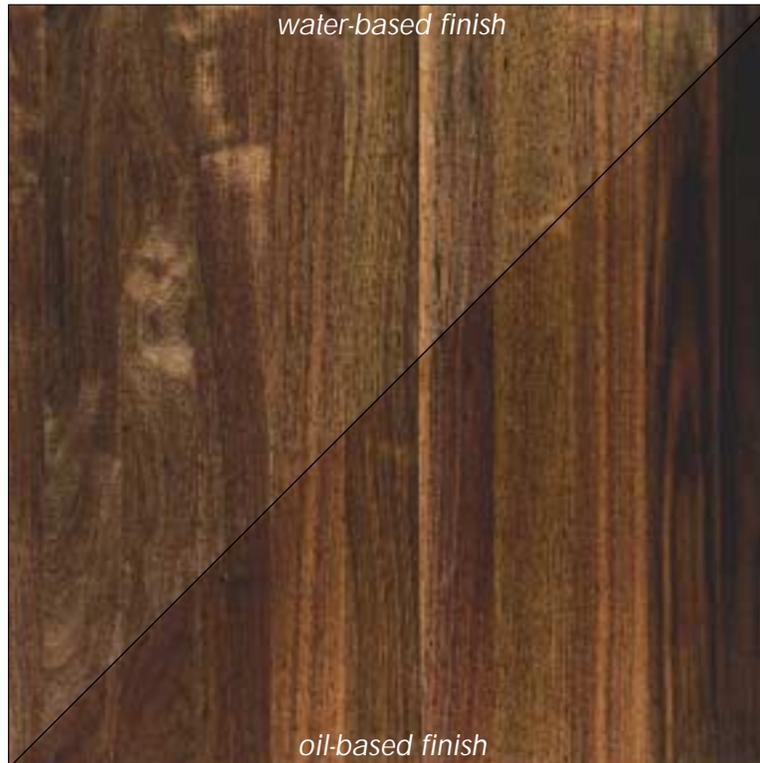
North America.

Availability

Easily available.

WALNUT, AMERICAN BLACK

Juglans nigra



Appearance

COLOR: Heartwood ranges from a deep, rich dark brown to a purplish black. Sapwood is nearly white to tan. Difference between heartwood and sapwood color is great; some flooring manufacturers steam lumber to bleed the darker heartwood color into the sapwood, resulting in a more uniform color.

GRAIN: Mostly straight and open, but some boards have burl or curly grain. Arrangement of pores is similar to hickories and persimmon, but pores are smaller in size.

VARIATIONS WITHIN SPECIES AND GRADES: Great variety of color and figure within species, as well as variation in color among boards, especially in lower grades and from material that isn't steamed prior to kiln-drying.

Properties

HARDNESS (JANKA): 1010 (22% softer than Northern red oak).

DIMENSIONAL STABILITY: Average (7.8; 9% more stable than Northern red oak).

Workability

SAWING/MACHINING: Excellent machining qualities.

NAILING: No known problems.

SANDING: Sands satisfactorily.

Suggested Sequence

First Cut: 60 at a 7-15 degree angle with the grain

Second Cut: 80 straight with the grain

Third Cut: 100

Hard Plate: Not recommended

First Screen: 80 or 100

Second Screen: 100 or 120

FINISHING: No known finishing problems.

COMMENTS: Frequently used as a highlight material for borders or other inlay techniques.

Origin

North America.

Availability

Moderately available.