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# Living WITH WOOD

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## I INTRODUCTION

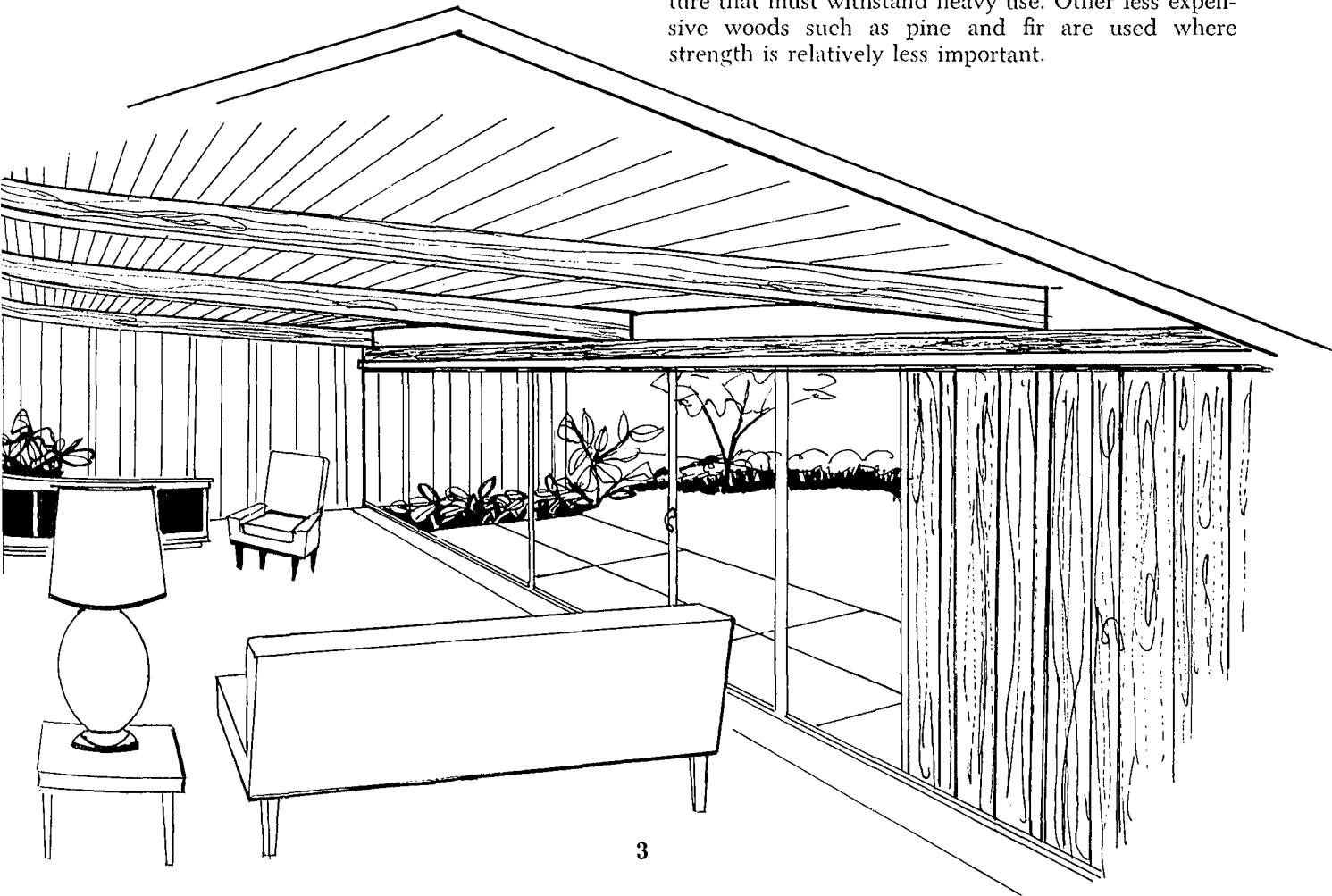
Since the first settlers cleared the land and built log cabins, American families have been surrounded by woods. Wood is an important part of the roof over our heads, the walls around us, the floors under our feet, and the furniture that provides for our comfort. Wood will continue to be used for home interiors because of its warmth, comfort, and beauty. A knowledge of woods, their characteristics and limitations, and an ability to recognize them can be both profitable and satisfying.

## II CHARACTERISTICS OF WOOD

### A. Hardwoods—Softwoods

Woods are divided into two general classes, softwoods and hardwoods. Softwoods come from conifers, the cone-bearing trees, such as pine, fir, cedar, spruce, and hemlock. The hardwoods are deciduous; some hardwood trees shed their leaves annually. Among the hardwoods are ash, oak, elm, beech, maple, cherry, hickory, and walnut. The terms hard and softwoods can be misleading, as some "hardwoods" are actually softer than some "softwoods."

Oak is one of the most durable woods used in homes for finish work, trim, and furniture. Oak's durability makes it highly desirable for flooring and furniture that must withstand heavy use. Other less expensive woods such as pine and fir are used where strength is relatively less important.



## B. Wood Colors and Porosity

Woods may be identified by observing three characteristics—color, porosity, and density (degree of hardness). Woods having open pores or coarse grain, such as chestnut, oak, ash, mahogany, and walnut appear to have fine thumbnail dents running with the lengthwise grain. Of the open-grained woods, walnut has the finest grain; oak has the coarsest.

Among the close- or fine-grained woods are cherry, maple, birch, beech, redwood, gum, poplar, pine, fir, and sycamore. The close-grained woods need only be smoothed by sanding before protective coatings are applied. Before finishing, the pores of coarse woods can be closed by application of a paste/wood filler made of ground quartz, linseed oil or varnish, and paint drier. When the open-grained appearance is desired, no filler is applied.

Redwood and some mahoganies are reddish-orange. Beech, birch, and maple are all light yellow. Red oak has a decidedly pink or reddish cast. Some woods vary in color in a single plank. As the tree ages, color deepens at the heart in cherry, walnut, and redwood, while the outer wood remains considerably lighter. Birch may have streaks of dark brown. Eastern cedar is sometimes streaked with white. Although color variation is an inherent characteristic of wood, some people prefer evenly colored wood for furniture.

## C. Reaction to Moisture

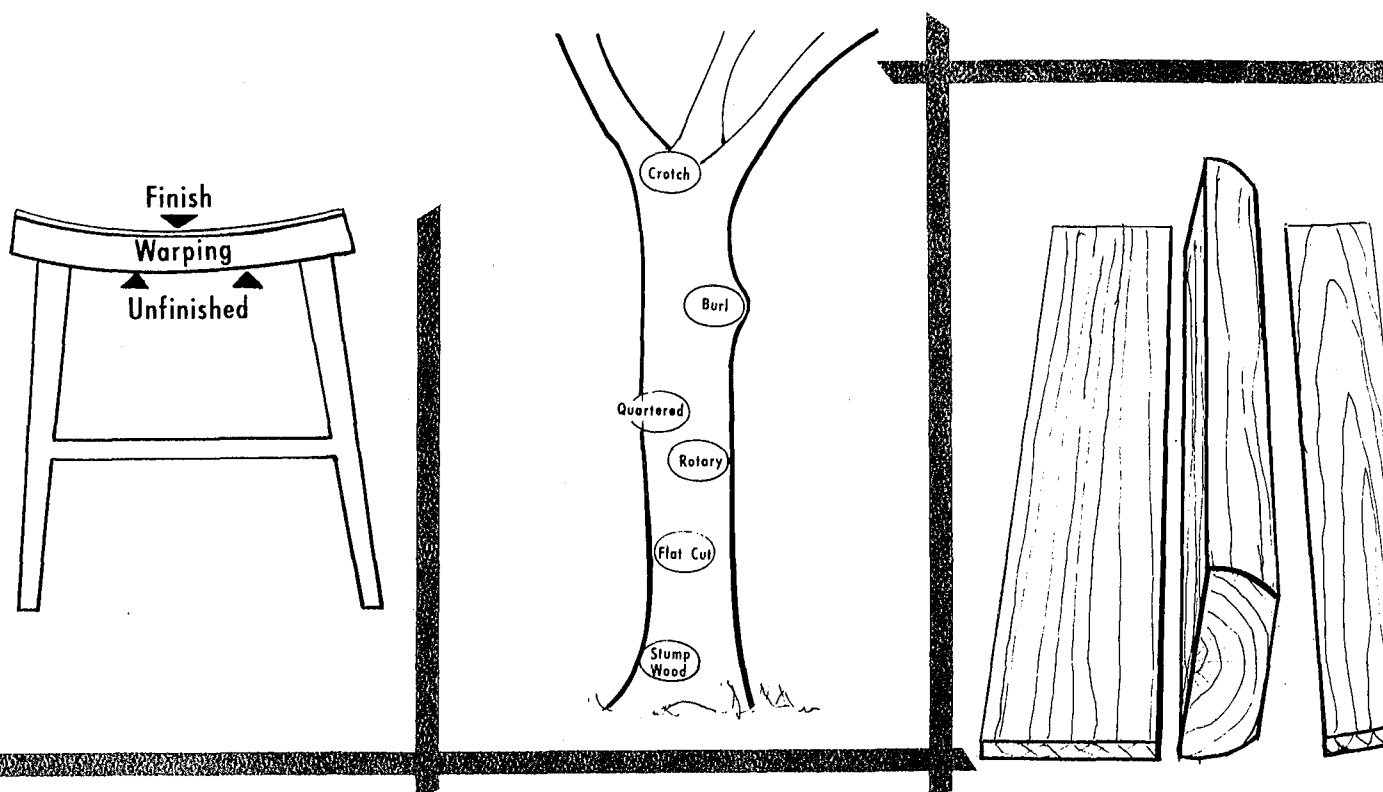
Woods respond to variations in weather, expanding with moisture and contracting with dryness. In heated buildings, woods may have as low as 5 to 6 percent

moisture. In summer when humidity is high, moisture content in woods may increase to 10 to 12 percent. Though protective coatings of paint, varnish, or enamel retard the moisture absorption rate of woods, finishes do not reduce the amount absorbed over a long period of time. Warping occurs when finishes are applied only to one side of a wood surface because the unfinished side absorbs moisture more readily. One very common reaction of wood to moisture occurs when doors and drawers are swollen with moisture. They tend to stick and are difficult to close.

## D. Patterns and Figures in Wood

Wood from the same tree varies considerably in pattern depending on its location in the tree and the way it is cut. Design develops as the tree grows. Crotch wood, taken from the fork, has a pattern of figures and circles. Burls—gnarled, wart-like growths on the trunk—yield bizarre patterns. Maple sometimes has bird's-eye spots and markings resembling bird's eyes. Butt figure, an elusive pattern of light and dark, is found in the base of walnut trees just above ground.

Some woods have distinct annual growth rings that yield a variety of designs when cut by different methods. Rotary slicing results in thin rolls of wood obtained by mounting the log lengthwise in a mill lathe and turning it against the blade. In quarter slicing a log is cut into pie-shaped wedges, then cut across the growth rings. In plain or flat slicing, lengthwise cuts are made through the log, from one side to the other.



### III FURNITURE WOODS

#### A. Kinds

Maple, walnut, cherry, mahogany, pecan, teak, and rosewood are the most prized woods for furniture. Oak and pine are commonly used but are less luxurious. Historically, certain woods have held first place, only to be replaced by others as fashions and tastes change. Walnut is widely used in contemporary furniture. Craftsmen from Scandinavia use teak extensively. Rosewood, popular during the Victorian era, is now used in modern styles. Maple and birch, often used in French provincial styles, are usually finished a light tan and called fruitwood. Oak has recently been enjoying a return to popularity. Mahogany has been very popular since its use by the famous furniture maker, Chippendale. Bleached mahogany was the most popular wood used for modern furniture about 15 years ago. Maple is now used extensively in early American style furniture. Cherry woods are used in medium- and high-priced furniture.

#### B. Solid Versus Veneer

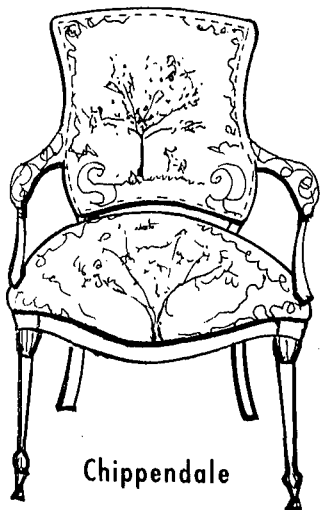
Though many people today prefer solid wood furniture, most furniture is veneered. The development of better glues has eliminated the possibility of veneers peeling in humid weather. Veneered furniture has tops, fronts, end panels, and headboards made from particle board and lumber core. Veneered furniture usually has a five-ply construction of a center core, with cross-band and face veneer on top, and

cross-band and horizontal veneer on the bottom. These plies and core, glued with moisture-resisting glues, are bonded by heat and pressure. Cross-banding controls moisture-caused expansion of veneers. Manufacturers prefer veneer to solid wood because veneer defies warping in any direction. There is little or no difference in the overall production and marketing costs of solids and veneers, and both types occupy the same price brackets. Veneers have the advantage of more grain interest in matched face veneers cut from various scarce or exotic woods. Veneer's greatest contribution to us is to make the rarest woods cheap enough for anybody.

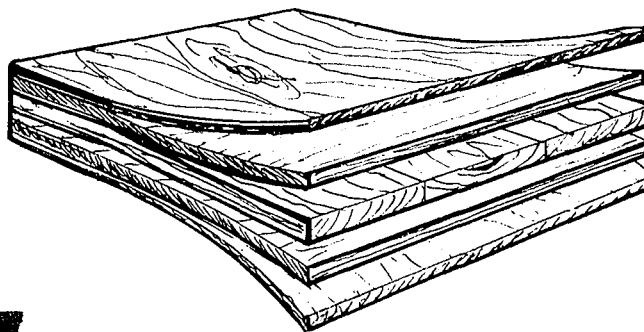
Solid wood furniture is made of one piece of wood without plies of veneer. Solid wood can be carved with ease and, when worn down by use, can be planed, sanded, and refinished without peeling. If worn or damaged, solid wood does not change in appearance, grain, or figure.

### IV WOODS FOR FLOORS

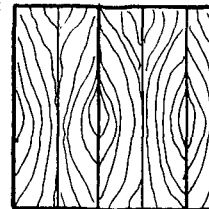
Oak and maple are the most common hardwoods used for flooring. Douglas fir, western larch, and southern pine are softwoods often used for flooring. Most lumberyards stock at least one softwood and two hardwoods. Tongue and groove and end-matched hardwood flooring is commonly furnished. Square-edged and square-end strip flooring is also available, as well as parquetry flooring suitable for laying on a mastic base on an ordinary subfloor.



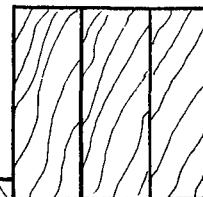
Chippendale



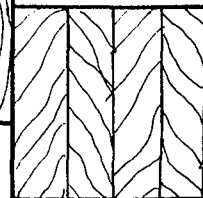
#### Matching Veneers



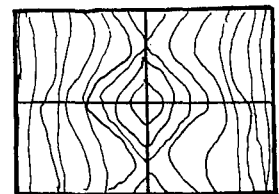
Book



Slip



Herringbone



Four-way

Vertical grain (quarter-sawed) flooring shrinks and swells less than flat grain (plain-sawed) flooring, wears evenly, is more uniform in texture, and remains closed at the joints. The silver or flaked grain of quarter-sawed flooring is usually preferred to the figure of plain-sawed material. You should carefully consider the advantages and disadvantages of various types of wood when you want special decorating effects. Beech, birch, mahogany, and walnut may be used as floorings to attain unusual decorating effects. Today many floorings are prefinished.

### B. Flooring Grades

**Oak flooring**, quarter-sawed, has three grades—clear, sap clear, and select. Plain-sawed flooring has four grades: clear, select, number 1 common, and number 2 common.

**Softwood flooring** is usually available in B and better grade, C select, or D select.

**Maple flooring** is sold under first, second, and third grades.

Grade specifications for flooring are useful guides when selecting various types of wood because these specifications state allowable imperfections in color and grain and indicate service expected.

### C. Plywood Flooring

Plywood and other wood products such as fiber-board and pressed board are often used for floors under wall-to-wall carpet. These materials are also used as an underlayment for smooth surface, resilient flooring materials in new homes and over old uneven floors.

## V PANELING

Homeowners often choose natural wood paneling for walls. Wood paneling gives ordinary rooms an air of warmth, and natural wood is easy to maintain.

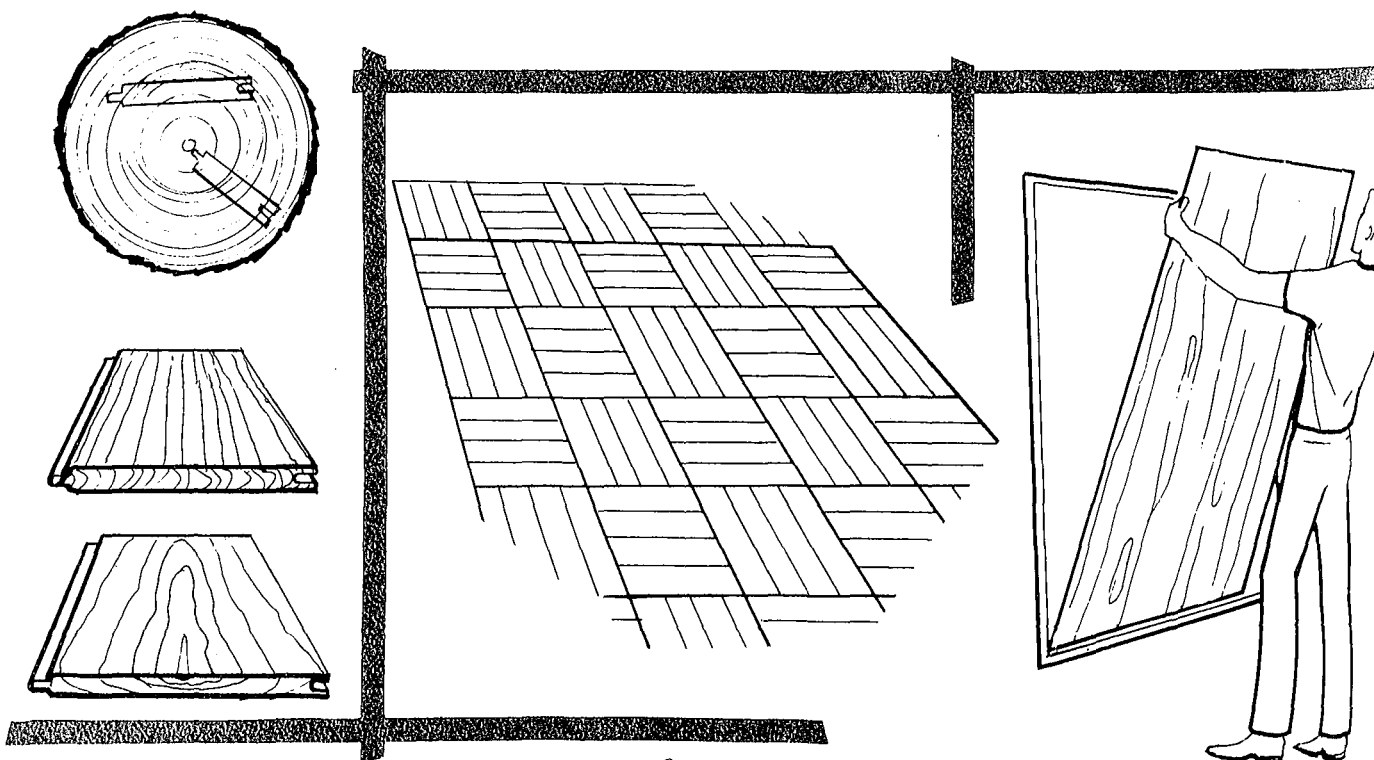
Plywood paneling, available in 4- by 8-foot and 2- by 8-foot sheets and other sizes on order, can be installed by homeowners for from \$100 to \$175 a room. Cost of plywood paneling varies from 20 to 60 cents per square foot. Regularity in plywood veneer paneling cannot be matched in solid paneling. Flawless, solid boards in amounts and lengths needed for paneling an entire room are difficult to find, and it is even more difficult to match large quantities of wood in color and figure. Panel boards need not be flawless. Knotty pine, pecky fir, streaks in birch, and wormy chestnut all have surface interest.

Plywood paneling comes unfinished or finished, and most dealers stock a variety so you can choose from birch, mahogany, walnut, oak, or cherry. Unusual and exotic woods can be custom ordered from all over the world—teak from Burma and Thailand, korina and mahogany from Africa, and Brazilian mahogany and rosewood from South America.

Some cloth-backed veneers can be used around curves or wrapped around pillars.

## VI FACT CHARTS

The charts on the following pages list alphabetically the most commonly used woods, with their origin, common uses, color, grain, density, and other distinguishing characteristics.



## A. FACTS ABOUT NATIVE WOODS USED IN HOMES

Type	Origin	Uses	Color, grain, density	Other characteristics
Ash (white)	United States	Upholstered furniture frames, interior trim.	Hard; prominent, coarse grain; light brown.	Strong, straight grain; stiff, shock resistant; moderate weight; retains shape, wears well; easily worked.
Beech	Eastern United States	Flooring, chairs, drawer interiors.	Hard; fine-grained; color varies from pale brown to deep reddish-brown.	Heavy, strong; has uniform texture; resists abrasion and shock; medium luster.
Birch (yellow, sweet)	Eastern United States, Northeastern United States, and Lake States	Cabinet wood, flooring, plywood paneling, exposed parts and frames of furniture.	Hard; fine grain; light tan to reddish-brown.	Yellow is most abundant and important commercially; has white sapwood and reddish-brown heartwood; heavy, stiff, strong; good shock resistance, uniform texture; takes natural finish well; satiny in appearance.
Butternut	Eastern United States, Deep South	Paneling, carving, decorative veneers.	Pale brown; soft; open grain.	Relatively scarce; available in plywood only; low strength; related to walnut botanically and sometimes called white walnut.
Cedar (Alaska, western red, white)	Pacific coast, Northwest, Lake States, and Northeastern United States	Paneling, furniture; red cedar used for chests and closet lining.	Fine grain; soft; Alaskan: bright, light yellow; red: reddish-brown with white sapwood; white; light with light brown heartwood.	Brittle, lightweight; easily worked; weak, low shrinkage; high resistance to decay; strong, aromatic.
Cherry (black, wild)	Eastern and Northern United States	Paneling, furniture.	Moderately hard; light to dark reddish-brown; fine-grained; darkens with age.	Strong, stiff, heavy; high resistance to shock and denting; not easily worked; high luster.
Chestnut	Southern Appalachians	Veneer panels, furniture, picture frames.	Has large distinct pores; hard; light brown.	Weak, moderately lightweight; scarce; blight is exterminating this wood. Some like the wormy appearance of this wood.
Cypress	Southeastern United States	Paneling, doors, sash, siding.	Color varies from yellowish-brown to almost black; hard, fine-grained.	Moderately light and strong; heartwood highly decay resistant; pecky cypress pock-marked by fungus decay.
Elm (rock)	North Central United States	Plywood paneling, curved frames, upholstered furniture frames, exposed parts of low-priced furniture.	Hard; open grain; light brown.	Heavy, strong, great shock resistance; pliable. nail and screw holding ability; wavy surface finishes well.
Fir (white)	Idaho, California	Small home construction.	Soft, close, straight-grained; white with reddish tinge.	Low strength; nonresinous; easily worked; low decay resistance.
Fir (Douglas)	West Coast—Washington, Oregon, California	Flooring, doors, plywood, low-priced interior and exterior trim.	Light tan; moderately hard; close-grained.	Most plentiful wood in the United States; used mostly for building and structural purposes; strong, moderately heavy.

Type	Origin	Uses	Color, grain, density	Other characteristics
Gum (red, sap)	South	Plywood, interior trim, furniture lets, posts, stretchers, frames, supports—frequently used in combination with other woods.	Heartwood (red gum) is light to deep reddish-brown; sapwood (saggum) nearly white; moderately hard, fine-grained.	Moderately heavy; strong, uniform texture; takes finish well; frequently finished in imitation of other woods; in 1928 it was the most-used furniture wood in this country.
Maple (sugar, black)	United States, Great Lakes, Northeast, Appalachians	Interior trim, furniture, floors in homes, dance halls, bowling alleys.	One of America's hardest woods; heartwood, reddish-brown; sapwood, white; usually fine, straight-grained; sometimes curly, wavy, or bird's eye grain occurs.	Heavy, strong, stiff; good shock resistance; great resistance to abrasive wear, one of the most substantial cabinet woods; curly maple prized for fiddle backs.
Oak (red, white)	Eastern United States, Mainly Mississippi Valley and South	Flooring, interior trim, furniture, plywood for cabinet work, paneling.	Hard, pronounced open grain; rich golden color to light reddish-brown.	Moderately heavy, stiff, strong, resilient, tough; comparatively easy to work with tools; takes many finishes.
Pine (white, ponderosa)	United States	Solid construction in inexpensive furniture, sash, frames, and knotty paneling.	Soft; pale yellow to white in color; straight, fine-grained; darkens with age.	Uniform texture and straight grain; lightweight, low strength, easily worked; has moderately small shrinkage, polishes well; warps or swells little.
Poplar (yellow)	Eastern United States	Interior trim, siding, furniture, panels, plywood cores.	Sapwood, white; hardwood, yellowish-brown tinged with green; soft; straight, fine grain.	Lightweight, moderately weak, does not split readily when nailed; easily worked, easy to glue; stays in place well, holds paint and enamel well; finishes smoothly.
Redwood	West Coast	Sash, doors, frames, siding, interior and exterior finish, paneling.	Heartwood, cherry to dark brown; sapwood, almost white; close, straight grain.	Moderately lightweight, moderately strong; great resistance to decay; low shrinkage; easy to work, stays in place well; holds paint well.
Sycamore	Eastern half of United States	Interior trim, fancy paneling, furniture.	Light to reddish-brown; hard, close interlocked grain.	Moderately heavy, strong; rays are conspicuous when quarter-sawed; seasoning without warping difficult.
Walnut (black)	Central United States	Furniture, paneling, cabinet work, interior.	Light to dark chocolate-brown; hard; moderately prominent, straight grain; sapwood is nearly white.	Strong; resists shock and denting, easily worked; takes stain and finishes exceedingly well; heavy, stiff; is stable in use; one of most beautiful native woods; finishes with luminous under-glow.



## B. FACTS ABOUT IMPORTED WOODS USED IN HOMES

Type	Origin	Uses	Color, grain, density	Other characteristics
Ebony (Macassar)	East Indies, India, Ceylon	Veneer paneling, furniture, inlays, overlays, piano keys —is one of the oldest cabi- net woods.	Black background streaked with gray, brown, orange, and yellow.	Extremely hard tropical wood; has heavy oil content that makes finishing difficult, prevents perfect bluing, causes checks to appear in veneer; logs are very defective, slicing shatters fibers, must be sawed.
Mahogany (Africa-Khaya)	West Coast of Africa	Furniture—solid and veneer —paneling, decorative in- lays.	Light pink through bright red to reddish-brown; me- dium hard, straight, open grain, ribbon striped be- cause bulk of logs are quarter-sawed; has beautiful crotch figure.	Mellow richness increases with age; strong, durable, unusual beauty, does not warp easily; easy to work, takes stain well; trees grow 100'- 150' tall and 8'-10' in diameter and yield lumber of unusual lengths and widths.
Mahogany (true-Honduras)	North and South America, West Indies, Mexico, Central America (finest true mahogany grows in San Domingo, Cuba, Philippine Islands, Mexico, and Guatemala)	Furniture, paneling, grand pianos.	Slightly coarse, small pores, straight grain, beautifully figured, some hard, some soft.	Great differences in quality and general char- acteristics, some heavy, some moderately light; has sheen and depth, enhanced by time.
Mahogany (Philippine)		Paneling, furniture, interior doors and trim.	Medium dark reddish-brown and light yellowish-red; open pores, moderately soft.	Prone to fade under bright light; not a true mahogany; less prized and cheaper than others.
Primavera (white mahogany)		Veneer, furniture.	Resembles mahogany in grain; creamy yellow color, hard.	Like mahogany in weight.
Rosewood (Brazil-East India)	Brazil, Bombay	Veneers, cabinet woods, fur- niture, pianos, decorative veneers used in borders, in- lays, overlays, and parque- try.	Hard, straight-grained; varies in color from brown- ish yellow to reddish-purple with black growth lines; highly porous.	Heavy, tropical wood; richly streaked and grained, extensively used during Victorian era. Smooth satiny sheen, strong, stiff, freshly cut wood gives off strong rose scent; usually quarter-sawed to show prominent lines.
Satinwood	Ceylon, Puerto Rico	Veneer work in furniture, popular in French furniture, Sheraton used it in furniture.	Yellowish; close, fine grain; hard, dense; looks like molten gold.	Durable, usually cut on the quarter to bring out the "ribbon" stripe, expensive; smooth, even surface is satiny and lustrous, possessing great "fire"; called the king of the cabinet woods, is translucent, enhanced by age; some logs have "beeswing" mottle; very oily and sandings from it are as poisonous as poison ivy.
Teak wood	Burma, India, Java, Malay Peninsula	Scandinavian craftsmen use it for furniture, paneling, in- terior trim; sailors like it for boat decks.	Straw yellow to tobacco brown, hard, striped or mottled pattern.	Moderately heavy; easily worked, shrinks, swells, and warps little; resistant to termites; contains resin or oil which retards decay; logs must dry 3 years before they will float; most are crooked and irregular; strong, tough, silky appearance; large, splashy block mottle or fiddle back figure; rich, mellow; 100% non- skid surface.
Zebrawood	West Africa	Favored wood for inlays, veneers, bandings, furniture.	Hard, creamy ground with distinct stripings of dark reddish-brown; open grain.	Pock and cross breaks appear in logs causing great waste; prominent stripes are used to produce geometric patterns.

## C. WOODS FOR INTERIOR PANELING

Type	Sizes available	Characteristics	Cost/square foot	Care.
Solid wood	1", ½", ¾" thick, 3" to 12" wide, 8' lengths	Softwoods and hardwoods, unfinished or pre-finished; variety of patterns and woods; not for use exposed to water or heavy moisture.	22 cents to \$1.75, ½" to ¾" panels of unfinished softwood; up to \$1.75 for pre-finished hardwood.	Warm water, mild soap or detergent; dry.
Plywood veneers	¼" thick is standard; ⅝" thick, 4' x 8', 4' x 7', 2½' x 8', and can order 9' and 10'	Mostly prefinished face veneer, available in many woods, textured surfaces, dimensionally stable, permanent glue bond; some have new durable plastic finish; some have lacquer finish; not for use in shower stall.	From 24 to 80 cents; some patterns and exotic panels from 70 cents to \$1.75. Most luxurious cost up to \$3.00.	Wipe with damp cloth. May use wax.
Wood-grained hardboard	¼" thick, 4' x 7', 4' x 8', 9', 10', 12' lengths cost more.	Photo-processed wood-grained finish on core of wood fibers reconstituted under heat and pressure; dense; rugged; coated with synthetic lacquer; high resistance to scuffs, scratches, household stains; comes in walnut, cherry, teak, elm, oak, pecan; not for use in bathrooms.	From 22 to 33 cents.	Wipe with damp cloth.
Plastic surfaced wood-grained hardboard	¼" thick, 16" x 8', 4' x 8' ungrooved	Modified melamine-resin finish baked on hardboard panel; tough surface resistance to stains and wear; popular wood-grained patterns; not for use in shower stalls; resistant to boiling water and alcohol.	From 35 to 55 cents.	Difficult to soil; wipe with damp cloth.
Gypsum board	⅝" standard thickness; ½" available; popular size 4' x 8', some are 6', 7', 9', and 10' feet in length.	Wood-grain printed paper applied to face of gypsum board and coated with synthetic lacquer or vinyl; solid face or grooved; available in popular species imitations; for installation where moisture is not a problem.	Solid faced panels, 10 to 17 cents; grooved, 12 to 20 cents; vinyl coated, 17 to 23 cents.	Wipe with damp cloth.
Plastic laminate	1/16" gage; 1/36" for walls 4' x 8', 4' x 10'.	Tough; withstands 275° heat; resistant to ordinary solvents, alcohol, boiling water; good for walls in heavy traffic areas; satisfactory for shower areas; popular woods and patterns available.	1/16" material \$1.60 to \$1.70; 1/36" 55 to 65 cents. New solid panels run from 60 cents to \$1.25 depending on thickness and quality.	Needs little if any care.

You are surrounded by wood in many shapes and forms. Because wood resists aging, it has served many generations as furniture, paneling, flooring, and shelter.

The purpose of this bulletin is to stimulate your interest in wood and to help you see and enjoy the beauty of it.

