THE CHARACTERISTICS OF WOOD

Wood is the life blood of the cabinet industry. Without a steady supply of wood, we would not be able to produce the products that we do in a sustainable manner.

Trees are harvested into logs from forests around the world, stored for drying, then further processed into dimensional lumber or sliced or peeled into veneers for panels. The resulting waste from these processes is utilized in the manufacture of other wood products such as plywood and particle board. There are two types of wood: softwood, which is from coniferous trees such as spruce and pine, and there is hardwood, which is from deciduous trees such as oak and maple. Almost all of our wood is hardwood and we receive is as solid lumber, veneer skins and composite panels such as particle board, MDF and veneer core plywood, ready for further processing into cabinets and millwork.

Wood is a natural product, and each species has certain unique characteristics such as color and grain, and these characteristics vary even further within the species and can even have variances within the same tree! The natural grain and color of wood has been, and continues to be naturally beautiful and pleasing to look at for most people.

If you do not like variations in color or inconsistencies in grain DO NOT CHOOSE NATURAL WOOD. You will be better off with a printed man-made product such as melamine, laminate or thermofoil. Advances in manufacturing and digital imaging allow these types of products to replicate wood so well, that sometimes it is hard to tell it's not wood.

We try our best to have the finished product as consistent as possible in color and grain, while still preserving the natural look of wood. As you look through this document you should be able to make a more informed decision on the end product you are looking for.

The final look of your project is determined by the species of wood you choose. All species have different colors and grain, and they all take stain and finishes differently. There are hundreds of tree species, but we will only cover the most commonly used in our industry, which are all native to North America.

RED OAK

Northern Red Oak is grown in the eastern and central United States and southeast and south-central Canada. This wood is a pale reddish brown, with darker sapwood and is heavy, hard and coarse grained.

WHITE OAK

White Oak is grown in the north eastern and north central United States and southeast and south-central Canada. This wood is a light brown, with paler sapwood and is heavy, hard and more straight grained.

YELLOW BIRCH

Yellow Birch is grown in the north eastern United States and southeast and south-central Canada, with the largest population in Canada's Boreal forest in Ontario and Quebec. This wood is a reddish brown to a creamy white, with darker sapwood and is heavy, hard and closed grained.

MAPLE

Maple is grown in the eastern and central United States and southeast and south-central Canada. This wood is a darker reddish brown, with white to creamy white sapwood, and is heavy, hard and closed wavy grained. Mineral streaks are very common.

CHERRY

American Cherry is grown in the eastern and central United States. This wood is a reddish brown, with darker sapwood and is heavy, hard and closed grained. Mineral streaks are very common. Cherry is sensitive to light and will darken quickly over time.

WALNUT

Walnut is grown in the eastern United States. Heartwood can range from a lighter pale brown to a dark chocolate brown with darker brown streaks. Color can sometimes have a grey, purple, or reddish cast. Grain is usually straight, but can be irregular and closed with a medium hardness.

Solid wood is commonly used in the cabinet industry for mouldings, trims, cabinet doors and some counters, but not for casework. Wood, being a natural product, tends to move when exposed to humidity and heat, and in Manitoba, temperature and humidity swings can be vast throughout the seasons. For these reasons, the use of solid wood is restricted to necessary applications which reduce the likelihood of expansion and contraction due to environmental changes.

To create solid wood panels, boards are ripped to a width of typically no more than 2 ¼", growth rings are set opposed and then glued together to form a panel. This process balances the stresses in the wood created by humidity level fluctuation and helps to keep the panels from warping. Sealing a solid wood panel on all surfaces also helps to reduce the impact of humidity to prevent splitting and warping. Solid butcher block table tops that are not completely sealed will likely crack and that's considered normal.

GLUING BOARDS TOGETHER

The advantage to using solid wood is the grain is all the way through the board, making it a good choice for mouldings and trims that may be prone to cupping with humid levels. Refer to our moulding pages for available profiles in solid wood. We stock Red Oak and Maple S4S (surfaced 4 sides) in 1 ½", 3 ½" and 5 ½" widths for custom millwork fabrication.

Solid wood is measured and sold in board feet. A board foot is one square foot of lumber by 1" thick. After kiln drying to 6% to 8% moisture content, the rough thickness is between 7/8" and 15/16" thick. Lumber is also graded according to its usability within the board, not color. The following are the grades available:

Firsts and Seconds (FAS) - The best and most expensive grade. Boards 6" and wider, 8' and longer. Yields 83-1/3 percent of clear face cuttings with minimum sizes of 4" x 5', or 3" x 7'. Board is graded from the poorer face. Suitable for fine furniture, cabinetry and applications where clear, wide boards are needed.

FAS One Face (F1F) - The same as FAS except the board is graded from the better face.

Selects (SEL) - Face side is FAS, back side is No. 1 Common. Boards are 4" and wider, 6' and longer. Yields 83-1/3 percent clear face cuttings with minimum sizes of 4" x 5', or 3" x 7'. A cost-effective substitute for FAS when only one good face is required or smaller cuttings are acceptable.

No. 1 Common - A typical thrift or "shop" grade. Boards are 3" and wider, 4' and longer. Yields 66-2/3 percent clear face cuttings with minimum sizes of 4" x 2', or 3" x 3'. Provides good value, especially if relatively small pieces can be used. This is the industry grade for solid cabinet door manufacturing.

No. 2A & 2B Common - Boards are 3" and wider, 4' and longer. Yields 50 percent clear face cuttings 3" and wider by 2' and longer. Suitable for some paneling and flooring applications.

No. 3A Common - Boards are 3" and wider, 4' and longer. Yields 33-1/3 percent clear face cuttings 3" and wider by 2' and longer. Economical choice for rough utility applications: crates, palettes, fencing, etc.

No. 3B Common - Boards are 3" and wider, 4' and longer. Yields 25 percent clear face cuttings 1-1/2" and wider by 2' and longer. Applications same as No. 3A Common.

Source: National Hardwood Lumber Association

For natural wood products, veneer is the preferred choice because of its stability, visual consistency and value. Veneers typically have a thickness of .5mm and are pressed onto a substrate (particle board, MDF or plywood) on both sides for balancing, and are readily available in 4 x 8 sheet sizes, but can be special ordered up to 5 x 10.

When choosing veneer the following must be specified:

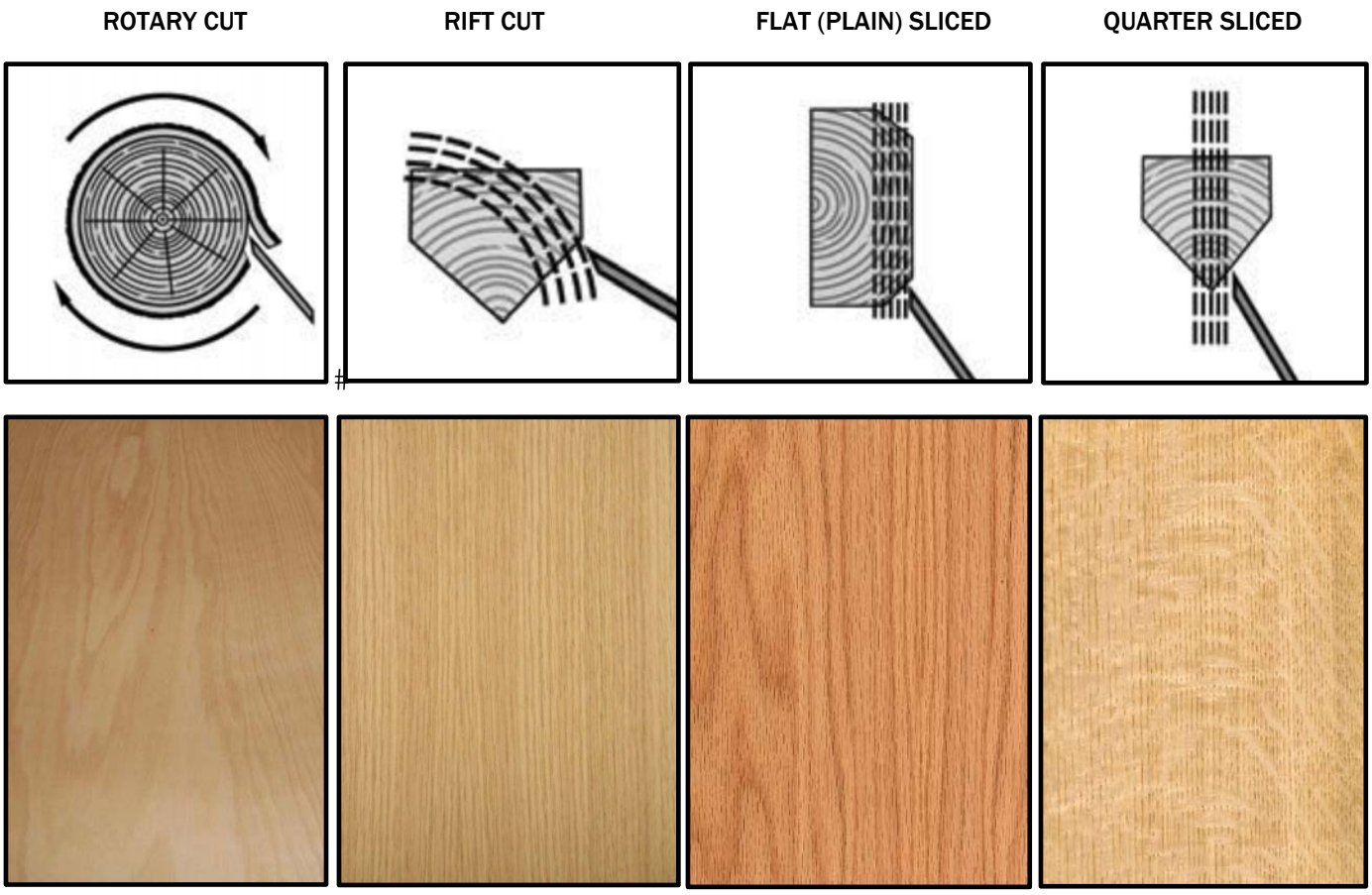
- Species
- Type of cut or slice
- Veneer flitch matching
- Core type

SPECIES

Wood types are referred to as species. There are hundreds of species of veneer available throughout the world and they all have their own color and grain characteristics. When selecting rare or uncommon species, it is important to check availability as the more exotic the veneers are, the more restrictions there may be in type of cut and match.

CUTS AND SLICES

Veneer is cut or sliced depending on method, and is determined by how the log approaches the knife during processing. For slicing, the log moves up and down against the knife similar to the slicing side of a cheese grater, and for rotary cutting, the log spins toward the knife in a circular motion kind of like a potato peeler. The most common cuts are Rotary Cut, Rift Cut, Flat Sliced and Quarter Sliced.



VENEER MATCHING

Once the veneer is cut, it is laid up on a panel face in different types of “matching” configurations. The appearance of the panel can be formal to casual, simple to busy based on the matching choice. Matching selections may be more obvious in some species than in others depending on the natural grain characteristic of that wood species. These are the most common for millwork:

Whole Piece Face – Only available in a rotary cut, the peeled veneer has no seams.

Book Matching - Every other “leaf” or component of veneer from a given log is turned over to produce a mirror image at the splice joint, much like turning the pages of a book, to produce a very aesthetically appealing look across the face. This is most commonly used for plain sliced veneers.

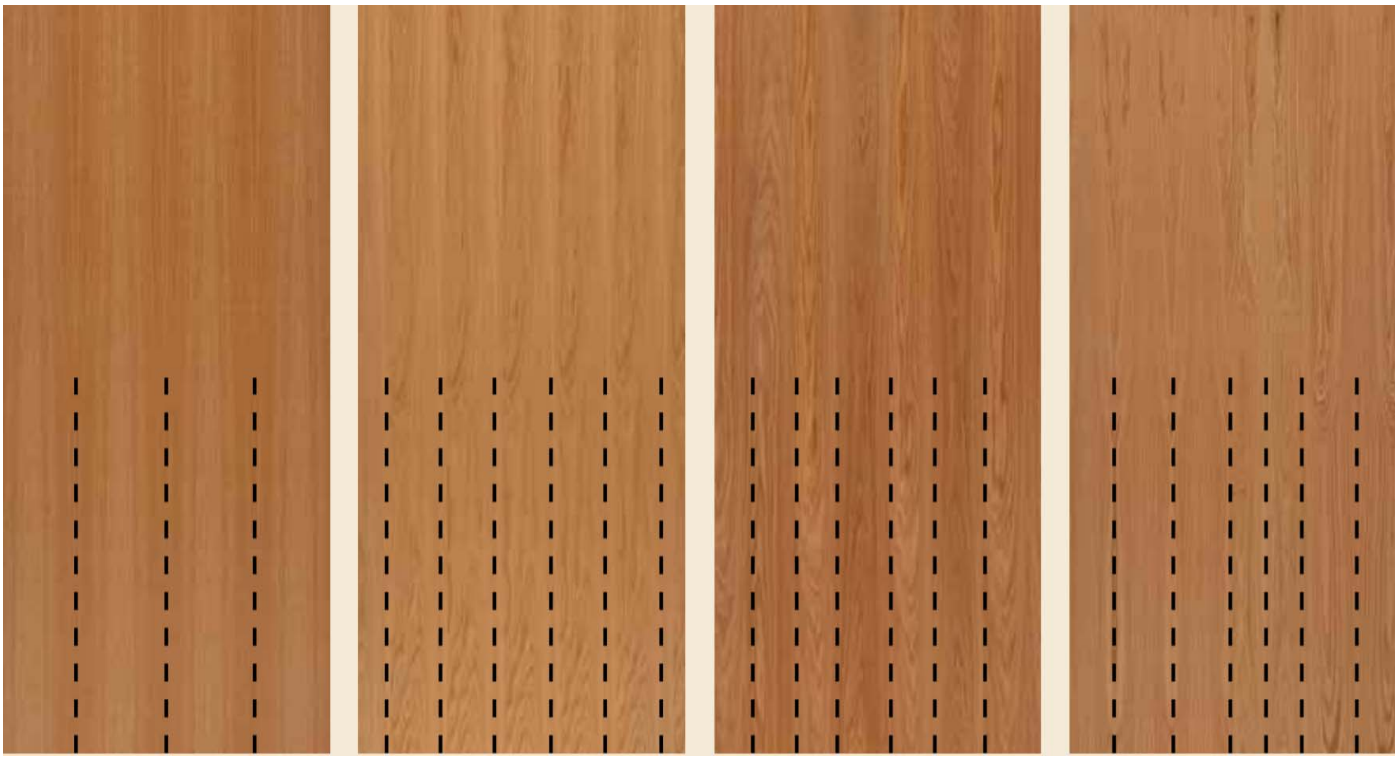
Slip Matching - All components from a given log are spliced together in their respective order without turning over any component, thereby producing a somewhat staggered image across the face. This allows for the panel face to be applied with the tight side of the veneer facing outward in order to minimize the potential for a barber pole effect occasionally observed with book matched veneer. Commonly used for quarter sliced and rift cut veneers.

Plank Matching - Components from various logs of the same species are arranged in a deliberate mismatched manner to achieve a natural lumber effect as often used to produce a rustic effect. Usually Flat cut veneers are wild.

Random Matching - Components are arranged in the order they come from a given stack of veneer that may have come from a number of logs with no consideration given to matching for color or grain. This process is often used to produce backs from remnant material with various cuts of veneers.

PLAIN SLICED RED OAK MATCHING PATTERNS

BOOK MATCHED | SLIP MATCH | PLANK MATCH | RANDOM MATCH



Source: Columbia Forest Products

Composite wood refers to any wood product that is made from multiple materials to make a single panel. Generically speaking we technically refer to this as plywood, which includes cores (substrates) made from primarily Particle Board, MDF, and veneer, with faces made from melamine, laminate or wood veneer. When describing composites, it is best to describe the core and the face (e.g. Maple Veneer on MDF). Composites are available in a variety of sheet sizes from 4 x 8 to 5 x 12 and in thicknesses from 1/8" to 1 1/4".

Particle Board (PC or PB) – Particle board is a common core used in the industry, in which coarse wood chips pressed into a panel with resin at high heat and pressure. It has the most stable core to prevent warping, a smooth surface, excellent dowel capture and good screw holding power. Most particle board is moisture resistant, but will expand when exposed to excessive moisture. Vertical structural strength is excellent and horizontal shelf strength is good for most applications.

Medium Density Fibreboard (MDF) – MDF is finely ground wood fibres pressed into a panel with resin at high heat and pressure, and is commonly used for millwork to accept a painted finish. It has a fairly stable core to prevent warping, very hard smooth surface, and the core is easily machinable, but has poor dowel capture and poor screw holding power. Because of its fine particles, moisture resistance is considered poor unless moisture resistant MDF is specified. Horizontal shelf strength is better than particle board for most applications. MDF can also be ordered fire rated for commercial applications.

Veneer (VC) – Veneer core is most commonly referred to as "plywood" in the marketplace. It has several layers of veneer laid up in perpendicular directions in an odd number of layers and is commonly used as a core for laminate or veneer for casework. Plywood tends to warp easier than MDF or particle board making it less stable, and it has a softer surface making it a core for laminate and veneer only, not melamine. It has good dowel capture and excellent screw holding power, and moisture resistance is high, making it a good choice for counters, cabinets and shelving. Horizontal strength is high when laminate is applied to both sides. Because of its poor stability plywood must be anchored, which is why it is not widely used for cabinet doors.

PARTICLE BOARD MDF VENEER

PANEL FACES

Melamine (MEL) – Melamine is the generic term for melamine coated paper (MCP). Industry assumes that MCP is on both sides of particle board and considers this composite simply "Melamine". It is a decorative paper pressed onto melamine resin and particle board or MDF with plates that have impressions in them to transfer a texture to the surface.

Laminate (P-LAM) – Plastic Laminate, some times referred to as HPL (High Pressure Laminate) is a decorative paper pressed onto phenolic sheets under extreme heat and pressure. Laminate is available in sheet sizes from 4 x 8 to 5 x 12 and is most commonly available in .039" (1 mm) which allows it to be post formed for counters. Laminate is commonly applied to core panels in a cold press using a PVA adhesive, but when impractical to use a press, contact cement adhesive is used. Laminate is the preferred choice for institutional millwork for its impact resistance, but the surface scratch resistance is comparable to melamine.

Veneer (VEN) – Veneer is the term we use when a decorative wood veneer face is applied to a core such as particle board, and is the most common wood product for cabinet making. Where the skin only is required, the veneer is commonly applied to a fleece back, paper back, or a phenolic back.

All industries are becoming more diligent in the protection of the environment and the woodworking industry is no exception. The impacts of our industry include deforestation, wood waste from the manufacturing process, and known carcinogens in composite materials.

DEFORESTATION

Wood is probably one of the most environmentally friendliest building products if it's harvested responsibly. Hardwood forests will grow back to their original state in a very short time after being harvested by the logging industry. Canada and the United States have very strict regulations to prevent deforestation by logging companies.

The Forest Stewardship Council (FSC) was created to prevent deforestation. The main purpose of the council is to ensure re-forestation practices are followed to allow our timberlands to thrive in natural and social habitats. This is done through a chain of custody (CoC) process that ensures through each step of the process the wood is tracked. This gives the end user the confidence that the trees that have been harvested to make their purchased products have a responsible history.

For LEED® projects that require FSC certified materials, the millworker must also be FSC certified with a CoC number to qualify for credit. For customers who want proof of FSC certification for their own peace of mind, most millwork companies can provide proof via the distributor certification for the product purchased for manufacturing, but this does not qualify for the LEED credit.

We are confident that the domestic forest products that we use on a regular basis are harvested responsibly, however when we receive requests for imported wood from other countries whose regulations are not as strict, we insist on FSC certified material from our sources.

WOOD WASTE

During the manufacturing process the industry has a large amount of waste in the form of sawdust and panel offcuts. Our dust is extracted from machinery by vacuum with a large dust collection system, and the panel offcuts are ground into smaller chips and mixed with the sawdust. This dust can be recycled back into particle board in areas where there is a facility, used as boiler fuel or in our case used as ground cover for landfill sites.

CARCINOGENS

Even though carcinogens are not normally seen as a traditional environmental focal point, we consider it a part of the indoor environment at home, in the workplace and at our manufacturing plant. The main carcinogen in our industry is formaldehyde which can be found in the resins for manufacturing particle board, MDF and some plywood.

Formaldehyde occurs naturally in wood and many other natural products, if formaldehyde emissions are below 1.0 ppm then there is no affect on human health. The adding of urea to formaldehyde can increase emissions to a level that is considered a carcinogen, and over recent years manufacturers have been modifying resins to bring down formaldehyde emissions, and as a result, are set into 3 main standards: NAF, NAUF and ULEF.

No added Formaldehyde (NAF) – Alternative additives are used in the resins, PureBond® hardwood plywood is a good example.

No added Urea Formaldehyde (NAUF) – Phenolic Formaldehyde is used in place of Urea Formaldehyde which stops off gassing of the Formaldehyde as the panel is machined

Ultra Low Emitting Formaldehyde (ULEF)– The resins are modified to reduce emissions to less than .5 ppm

CARB II (California Air Resource Board) is a set of emission standards and is considered a world recognized standard for composite wood acceptable emissions.

NAF, NAUF and ULEF count towards LEED® points for Low emitting materials.