skillbuilder

Choosing Lumber

"A Board in the Hand is Worth Two in the Bush..."

Whether you use hand or power tools, traditional or modern joinery techniques, there is one thing all woodworkers have in common: wood - the material we work with.

There are three very important elements that must come together in making a project that will not only be pleasing to the eye, but will stand the test of time: good design, careful workmanship and meticulous selection of materials. You can continue to refine your design on paper, but at some point you will have to make that transition from a two dimensional drawing to selecting the lumber to use for each part. This can be one of the most difficult phases of any project and one that has the greatest effect on the final appearance of your finished piece.

Some Woods Have Style

Certain species of wood have traditionally been associated with different styles of furniture. The wood of choice for the Arts & Crafts movement was quarter sawn white oak, valued for its appearance, durability and dimensional stability. An Arts & Crafts style piece executed in maple might be a well-made example of a classic style, but the choice of wood would be visually at odds with the design. Pine and other softwoods impart a more relaxed, country influence, while traditional hardwoods, such as cherry and walnut, are more likely to be associated with fine furniture.

All Woods Have Character

All trees share common growth characteristics (annual growth rings, branches, sap, etc.), but these individual characteristics vary widely from one species to another. Different species have marked variations in the characteristics of their wood. For example, ash wood is pale with wide, open grain, while cherry wood is reddish brown with fine, closed grain. It is these variations that give each species its unique characteristics, making them suitable for one job and unsuitable for another. Wood falls into one of two categories, either softwood or hardwood, though it could be argued that the categories might better be labelled "Wood I can afford" and "Wood I can only dream about". Generally, coniferous trees fall into the softwood category, and deciduous into the hardwood.

A Hunting We Will Go

Once the choice of species has been made, the hunt for the perfect boards begins. However, before heading off to the lumber dealer, it is best to do a little preparation. After years of board stalking, I've come up with a kit that I always take with me to the lumberyard. Now, returning to the lumberyard to pick up those 'one or two' extra boards, has become a thing of the past.

A key part of my kit is the shopping list. After I have worked out the design of a project, I create an inventory of the parts, using Cutlist Plus software. The rest of the kit consists of: a pencil, some white chalk, a pad of graph paper on a clipboard, a calculator, and a moisture meter. I also have a small digital recorder I take along with me, which I use to record special notes or reminders.

At the lumberyard, with the list in hand, I begin to select boards for the project. Rough lumber is sold and measured in ¼" increments; when a board is referred to as 4/4, it means it is four quarters of an inch thick, or one inch. The most common sizes you are likely to encounter at the lumber yard are 4/4 (1"), 6/4 (1½"), 8/4 (2") and 12/4 (3"). Generally, larger dimension lumber is priced per board foot. Price is also dependant upon the wood quality. Boards without blemishes, and of even colour, command higher prices. On most projects it isn't necessary to purchase the best grade material for the entire project. Purchasing a lower grade will allow you to bring home more lumber, and give you the freedom to lay out parts based on appearance rather than waste.

The sequence in which boards are cut from a log will determine how stable the boards will be once they dry. As a board loses moisture it will shrink in three dimensions. The change in length is so small as to be considered insignificant and the change in radial movement is always less than the tangential movement. This is most significant as the wood dries between the time it's cut (i.e. green wood), and the point where it is kiln dried or air dried and ready for use. Wood that shrinks excessively, or that has been dried improperly, will often develop checks at the ends. When shopping for lumber, carefully inspect the ends for any checking, or for excessively long checks. It is best to allow for some scrap at the end of each board, just in case. As you trim the end, hit the off-cut across the edge of your bench, and if it breaks in two, you'll have to cut off a little more.

Wood Moves

Even after you've applied your chosen finish, wood will continue to move. As the wood absorbs and loses moisture from one season to the next, components can twist and bind. For example, a tall cabinet door with glass panels that I built several years ago tends to curve from top to bottom every time the moisture content in the air goes up. The rails and stiles on the door are quite narrow, so I should have chosen straighter-grained stock when originally selecting my lumber.

For furniture making, the best, most stable stock has the annual growth rings intersecting each face at approximately the same angle, roughly 45º. Wood cut this way is referred to as quarter sawn. Milling quarter sawn lumber is a labour intensive process, which is why it costs more than plain-sawn lumber. The appearance of the grain will tend to be similar on all four sides. This makes quarter sawn lumber a great choice for table legs, rails and stiles of frame and panel doors, or for any part where two adjacent sides are visible.

Buy Now

It's good practice to purchase all of your lumber for a project at the same time. By doing this, you can acclimatize all the lumber to the same relative humidity level. More importantly, the wood will likely be of a more consistent appearance. Some woods, cherry in particular, can have extreme changes in colour and figure from one tree to the next. Trying to find a few more boards with the same appearance can be an exercise in frustration. The shopping list ensures that you will purchase enough stock for your project the first time.

While flipping through the boards, keep an eye open for signs that a number of boards may have come from the same tree. Looking at the ends and the growth rings will tell you where in the log the board was sawn. In some cases, knots may go through more than one board, and often the outer boards have a live edge. By comparing these features, the colouring, grain and other distinguishing marks, it is often possible to identify several boards cut from the same log.

It's generally more difficult to find long boards. Stock under four or five feet long can often be cut from longer boards, but as the parts become longer, the rough stock will have to be either very clear and straight, or have extra thickness to allow you to remove any bow along its length. In making parts for the room divider (featured in this issue), four stiles had to be set aside: three because they kept bowing no matter how often they were jointed flat, and one because it was under the minimum thickness by the time it was flat.

Lumber kit

As you pull lumber from the stack, check off the parts on your list, and with the chalk, note the part number directly onto the board. A cha mark on the board is more reliable than your memory of which board is for which part of your project.

Wider Is Sometimes Better

Not all species are available in quarter sawn form from all dealers, but it can be possible to cut parts from wider boards to accomplish the same end. At the lumber yard I will often look for wider planks for this very reason. When a wide board is cut from the log it will have some vertical grain on the outer edges and some face grain in the center of the board. By purchasing enough stock and carefully laying out the parts it would be possible to use quarter sawn material for all visible parts. Decisions like this must often be made at the lumberyard based on the stock on hand. It is a way to stretch your material budget a little further, by buying a lower grade and resawing it for appearance back in the shop.

When looking at the rough lumber and mentally laying out the parts, keep in mind that knots indicate a change in grain direction. When a piece like this is milled, the part will always tend to bow to some degree, and that is what happened to the three stiles for the room divider mentioned earlier.

When you've selected your lumber, restack the pile neatly. Before heading off, calculate the number of board feet you have pulled just to be sure you have enough. It's advisable to allow for errors, waste and slight changes in plan when purchasing your material. Depending on the material and the complexity of the project I'll typically allow from 10 to 40% extra.

Moisture meters available at:
Electrophysics **www.electrophysics.on.ca**

Meter the Moisture

Lumber for your projects can come from many sources, but before you can use it to build anything, it must be dry. Lumber that is kiln dried will have a moisture content right out of the kiln of 7 or 8%. However, by the time the lumber is delivered to your local dealer and arrives at your shop, the moisture content may have changed dramatically. Storage conditions between the kiln and your shop are clearly out of your control, so it is always a good idea after purchasing lumber to acclimatize it in your shop for several weeks. To avoid using lumber that is still in the process of adjusting to its new environment it is best to use a moisture meter to verify the moisture content of the wood. Most dealers don't mind customers checking the moisture content at the yard as long as they are using a pinless meter. The meter in my lumber kit uses electromagnetic waves to calculate the moisture content of a given piece of wood. Its use couldn't be simpler or quicker – simply turn it on, enter the species, and place the meter on the wood to be measured. The result is displayed right on the screen instantly without the need for conversion tables and other calculations. Typically, I check a couple of areas on each board as I select them just to confirm they are all in the same moisture range. Back at the shop I once more check each piece of wood and note it in chalk on the board. Every few days I'll recheck the boards, and when the readings have stabilized, I can be reasonably certain there won't be any surprises when I start the milling process.