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ISSUE #126
JUNE/JULY 2020

CANADIAN Woodworking & HOME IMPROVEMENT

10^{TH ANNUAL}
WORKING IN A
**SMALL
SHOP** ISSUE

SHOP JIGS FEATURE

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Veneer-Cutting Jig p.20

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editor's letter

I'm writing this in mid-April, and the past month has been a crazy ride. By the time you read this, things will have changed again. On the one hand, our lives are dramatically altered, yet as woodworkers we have always been great at isolating ourselves in our workshops and simply building our next project. Life goes on, and we're probably some of the luckier ones. Be honest now – you've wanted to tune up your bandsaw for a year now. You designed a coffee table six months ago, but haven't had the time to make it. And you've been considering a wainscoting project for years. At least we have projects to keep our minds busy.

If you don't know how to tune up your bandsaw, you need a design for that new coffee table you have in mind, or you haven't a clue how to install wainscoting, we can help. Check out our website for lots of tips and free project plans. If you have a specific question, join our woodworking and DIY forum and pose your question there. There's an incredible amount of knowledge shared there every day for free.

A big thank you goes to our sponsors for continuing to support us through these tough times. Without their support we wouldn't be able to provide free online project plans, our woodworking forum and this print issue. I hope these are all things that make you more productive and help you feel more connected right now.

After you've searched our website and forum, and visited a few of our sponsors online, I hope you enjoy reading about the projects and techniques in this issue that will make working in a small shop even more enjoyable and productive.

— Rob Brown

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letters

'Top 10 Underrated Tools' Article

Rob, your 'Top 10 Underrated Tools' article (Apr/May 2020) missed one of my favourites: the awl. A sharp awl is so useful for marking, scribing, starting screws and more.

Ron C.

St. Jacobs, Ontario

Via email

Hi Ron, This article struck a nerve with many of our readers. I've received a number of emails, and a long thread has been developing in our online forum in the 'Magazine and Website' area. It seems we all have a few 'unsung hero' tools in our shops, and feel the need to stand up for them, which is great. A few tools our members have mentioned on the forum are hand screw clamps, bi-focal safety glasses, a laser level and a shop furnace. Hard to argue against any of these items. The fun thing about these Top 10 lists is that we all have a slightly different take on what should be on the list. It's interesting to see what other people's thoughts are.

Thanks for your letter.

Rob Brown

Editor – CW&HI



Helping Kids Learn Woodworking

I'm a subscriber and big fan of Canadian Woodworking. I'm also a cabinet-maker and high school shop teacher in Goderich, Ontario. During the current state of emergency due to the pandemic, schools are not operating as usual. Students and staff are locked out of the buildings for the foreseeable future. I'm currently tasked with trying to find ways to allow my students to continue learning during this time. This is a particularly challenging task for a shop teacher, I'm finding.

Is there a possibility that Canadian Woodworking would be willing to allow my students to access your online subscriber content during this time of isolation? I know it's a lot, but I ask you to please consider.

Thanks,

Nathan C.

Technological Studies Teacher

Goderich District Collegiate Institute

Hi Nathan,

Thanks for your letter. We're had many instructors from across Canada ask us the same question, and we're happy to help out. Woodworking instructors and their students now are eligible for an eight-month print and digital subscription to Canadian Woodworking & Home Improvement magazine at no cost to them.

The education subscription includes full access to our online library of all past issues, and a selection of subscriber-only woodworking videos. Usually, this content is restricted to subscribers who pay the annual subscription fee (that helps fund the creation of our content). King Canada is the sponsor for the education subscriptions. To take advantage of this offer, instructors and students should register at learn.canadianwoodworking.com

Enrolment for the education subscription is subject to Publisher approval. We will arrange the digital access as quickly as possible.

Michael Fox

Publisher, CW&HI

Great Gift!

(From a subscriber at the Toronto Woodworking Show – Feb. 2020)

I'm new to woodworking, and last year received a copy of *CW&HI* as a stocking stuffer from my wife. Since then, your magazine has been very helpful to me as I learn about woodworking. I went through the ads in the back of the magazine so I knew where to get what I needed for my shop. It was from the magazine that I knew about this show – keep up the good work!

Rob R.

Milton, Ontario

Subscription Draw Winners

James W. Kirkfield, ON has won a Multi tool kit from King Canada.



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Thank you.

Michael Fox

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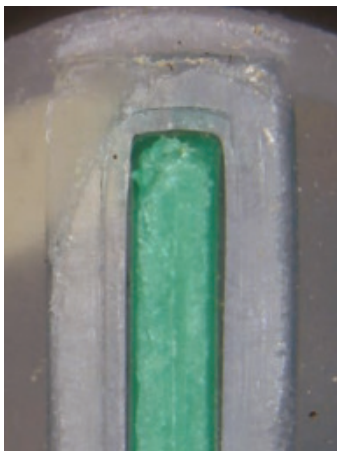
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Tool Reviews

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Micro Mystery

Can you guess this object commonly found in most shops?

Follow us on Instagram and Facebook to see regular close-up photos of common workshop tools and objects. We will post the answer to this one in our Aug/Sept issue.



Best Build

Check out the **Woodworking** section of our forum for our latest "Best Build" thread — a 16' x 28' detached workshop. This month's winner, Stephanie, wins a **Veritas Dual Marking Gauge** from Lee Valley.



To find out more about this project, go to: forum.canadianwoodworking.com or simply go to CanadianWoodworking.com and click **FORUM**.

Free Plan

Rolling Shop Storage

Small shop storage is always to be taken seriously. Flexibility is no different. Combining the two is genius! Build a rolling shop storage cabinet to solve a few small shop challenges at once. View this plan and more at: canadianwoodworking.com/free-plans



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Video Links

www.canadianwoodworking.com/videos

Canadian Quotes — Jason Wheeler

Craig Thibodeau
Spinning
Puzzle Box



Forum Thread

Check out these home improvement threads and many others at forum.canadianwoodworking.com

- **Basement Shop Renovation** — Build Thread — From dust collection and flooring to heating and lighting, join in the discussion about a member's new basement shop space, and how he's setting it up.
- **How comfortable is an overhead propane radiant heater?** — There are pros and cons to every type of small shop heating system. Read about how our members find an overhead radiant heater stacks up.

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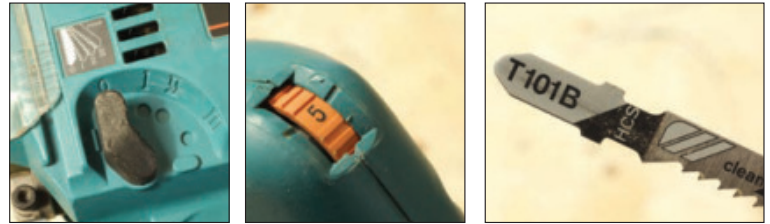
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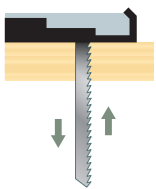
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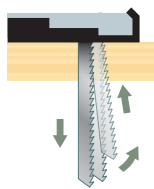
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Often used for making rough cuts in solid wood and sheet goods, a jigsaw is very handy when a perfectly straight cut isn't needed. A jigsaw is sometimes looked on to make fairly accurate cuts, too, but its accuracy depends on the user. Jigsaws are reasonably priced and multi-functional, so they make good tools for a beginner. Jigsaws are also lightweight, so they make great jobsite and home improvement tools. A band saw can cut outside curves, but a jigsaw can cut inside curves as well, as in removing material from the center of a workpiece (think of a cut-out in a countertop for a kitchen sink). Selecting a blade is important. Some blades leave a smoother edge, some excel at cutting tight curves, while others are for cutting non-ferrous metals. There are many other types of blades on the market. Many jigsaws will accept T-shank blades, which make blade changes quick and easy.

Handle Types: Barrel, D-handle

Price: \$50 - \$575

Common Options: Variable speed, orbital cutting action

Weight: 1kg – 4kg

Get the Most Out of Your Jigsaw

Use the Right Blade

Easily swapped in or out, the right blade makes a big difference in the quality of the finished edge you will end up with.

Power Source

Most jigsaws are corded, but battery-powered models excel at jobsite tasks or in busy production shop situations.

Orbital Action

Some jigsaws have settings that cause the blade to travel in a vaguely elliptical path to make faster cuts. Familiarize yourself with the settings you should use when cutting in different situations.

Consider the Attachments

Most jigsaws will do the basics, but if you are going to ask a lot of your jigsaw consider the attachments that come with it, as they will expand the saw's usefulness.

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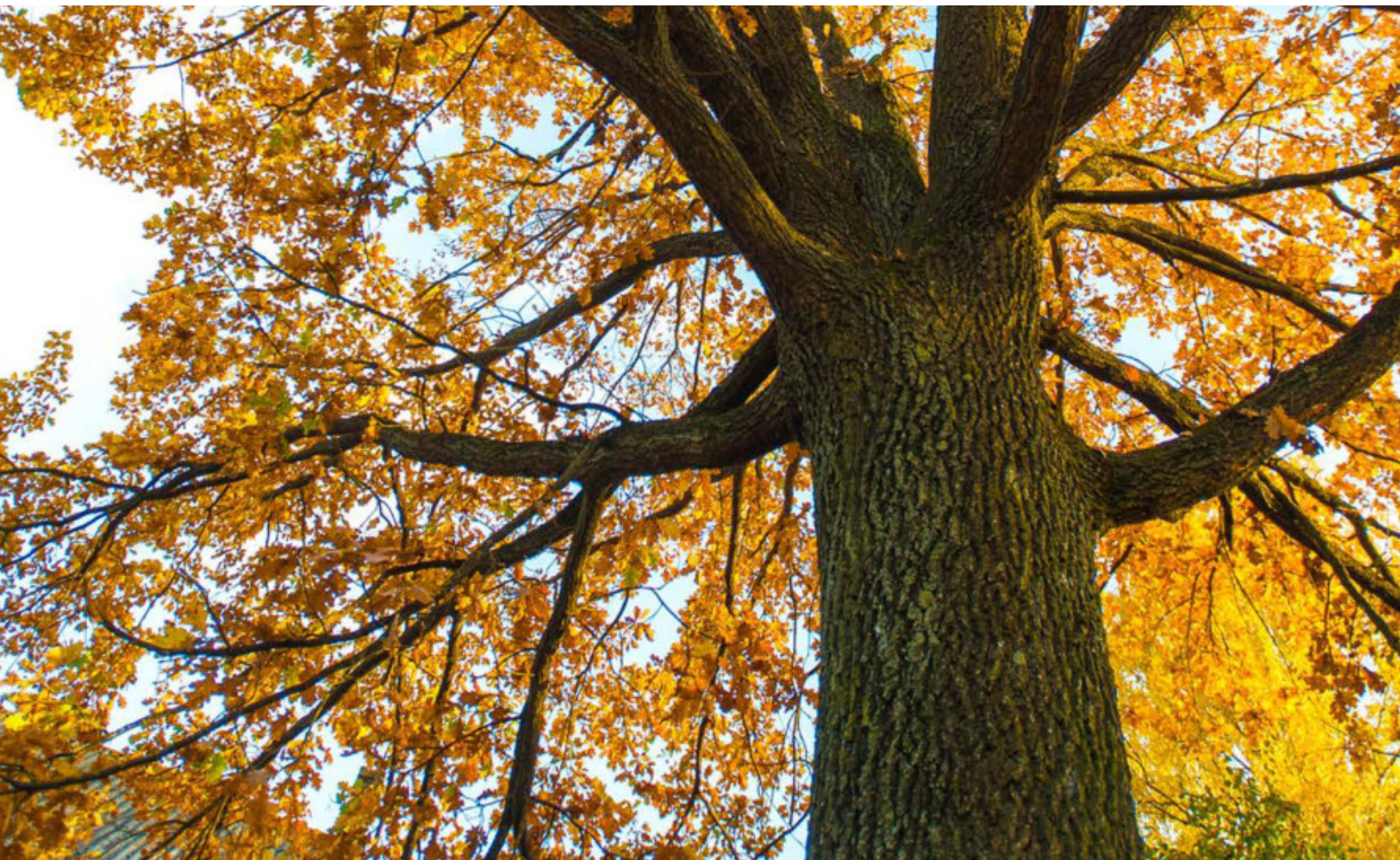
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Wood Science: An Introduction

We all know wood is a beautiful material that can be machined, joined, smoothed and finished, but many woodworkers never think of wood in a more scientific way. Let's take a look at where wood comes from, and why it has certain characteristics.

BY PETER MAC SWEEN

If you have been a woodworker long enough, you've probably come across an uncooperative piece of wood that won't stay flat, pinches on your saw blade or stains unevenly. You may also have had the pleasure of working a beautiful piece of fiddleback maple or walnut burl. These problematic and beautiful

pieces of wood share one simple fact — they both come from trees.

Trees didn't evolve to please or frustrate woodworkers. Their structure serves only the tree itself. The beauty and pleasure we get from working with wood doesn't concern the tree. Put another way, wood is a natural product. That's why it's important for woodworkers to understand how trees grow and how their internal structure determines our working relationship with this beautiful and natural product.

Start in the middle

Most people are familiar with the basics of tree anatomy. All trees have a root system to anchor the tree and absorb nutrients and water from the soil. Above the roots is the trunk of the tree, which in turn supports the crown which contains all of the leaves. We're going to concern ourselves with the mid zone — the trunk — as that's the portion of the tree where lumber comes from.

The best way to examine the trunk is to look at a cross section. What you will see is an easily recognized bark layer on the outer circumference enclosing the trunk. The trunk is made up of wood usually with many growth rings and a center pith representing the early juvenile period of growth. Beneath the bark is a very



Normal Cross Section – With fairly typical growing conditions, trees have a pith close to the center of the tree. The pith is the first layer of material the tree builds as it grows taller. There is also an outer band of lighter-coloured cells, called sapwood, that bring sap up to the crown of the tree. The darker cells towards the center of the tree are called heartwood. The bark of the tree is shown on the outer perimeter.

thin layer of living material called the cambium, and this is where growth takes place.

The tree grows when cells of the cambium divide. Those on the inside produce the area called the sapwood which conducts sap from the roots upward (in the spring). Those cells on the outside of the cambium layer are used to conduct nutrients from the crown downward (in the fall). Eventually, these outer cells form the bark as new growth occurs. Growth in most trees is cyclical. There is a dormant period (winter) followed by a period of growth. This produces the familiar growth rings visible in most species.

Fantastic figure

The bulk of the trunk is made up of wood. If you look closely, you may see individual cells. The cells in the trunk are organized vertically and this produces the major grain direction of the wood. Reading grain for the woodworker is the ability to recognize the direction that these longitudinal cells grow. Knowing how to read the grain will tell you which direction to plane or machine a piece of wood to minimize tear-out. Also, when the direction of growth deviates from the vertical, the wonderful phenomenon known as figure results. Fiddleback, ribbon, mottled and quilt are some of the figures produced by an errant grain direction.

In a perfect world, a tree grows straight up with little deviation from vertical. Straight trees will have a cross section with a perfectly centered pith. Yearly growth rings will show a consistent width no matter which part of the trunk you examine. But trees rarely grow straight. They can tilt, bow and rotate as the trunk reacts to different growing conditions. This will affect the quality of the lumber these trees produce.

Reaction wood

While most trees have a pith located fairly close to the center of the cross section of a tree, that's not always the case. For a number of reasons, some trees have an off-centered pith, as well as uneven



Reaction Wood – A number of unique growing conditions can cause a tree to build more cells (both sapwood and heartwood) on one side of its trunk. This causes the pith to be well off center, and results in what is called 'reaction wood', which reacts differently when machined by a woodworker.

growth rings. The tree is essentially putting more growth on one side to help support the tree as it grows upwards towards the sun's light. This type of growth produces reaction wood.

Reaction wood is typically denser than the wood in the rest of the trunk, even compared to wood in the same growth ring. It is unstable, warps and moves unpredictably. It tends to 'fuzz' when being machined and will also blotch when stained. Woodworkers should examine the end grain of lumber when purchasing. Lumber with an off-center pith and uneven growth rings off to one side are visual clues that reaction wood is present and should be avoided.

It's important for woodworkers to learn how to read the grain. Whether examining a cross section of a log or the end grain of a piece of lumber, the tree will give us important visual clues as to how it grew before it was cut down. Trees will give up their secrets and with that knowledge we can bring out the beauty and potential of any piece of wood.

Next time, we will return to our standard tree cross section and examine the variations that occur in the sapwood and the heartwood. These areas of the tree are important to the woodworker as they also have stories to tell through their colour, figure and workability.

Peter's woodworking journey began with a career in carpentry followed by a decade buying and selling veneer. His spare time is spent abusing his guitars and exploring the great outdoors.

PETER MAC SWEEN
pjmacsween@sympatico.ca



Go Online for More

RELATED ARTICLES: Wood Movement (Apr/May 2009)

Top 10 Jig-Making Parts

When you need to make a jig, the last thing you want to do is head to the local lumberyard, followed by making an online purchase, in order to have the necessary materials on hand. Grab the basics now, so you can get right to work later.

BY ROB BROWN

1 Plywood — When it's strength and durability you're after, standard 1/2" or 3/4" plywood is a good choice. For more extreme situations, or for a jig that will see a lot of use, Baltic birch plywood is extremely strong and durable. Plywood isn't the flattest sheet good, but that's not always critical.

2 MDF — If flatness is your main concern, MDF might be the answer. Like any material, it has its downsides, though. MDF's screw-holding capabilities and overall durability are both on the lower side.

3 Particleboard — Particleboard is generally cost effective, and in most shops it's plentiful. And being fairly flat, fairly strong and fairly decent at holding a screw, it's a good middle ground for most jigs. Melamine surfaces, which are often applied to particleboard, are slipperier than all other sheet goods, which may pose a challenge to keeping the workpiece stationary during a cut.

4 Hold-Downs — Many jigs don't need any form of device to secure the workpiece, but that's not always the case. Having a few different types of hold-down devices to use as needed makes jig use safer and more efficient. You'll also come up with many uses for them when they're not attached to a jig.



5 Push-in Measuring Tape — Some would consider this extravagant (I might agree), but don't we master jig-makers deserve it? I would never add this to most of my jigs, but there are times when accurately and quickly knowing a distance is incredibly handy. Just machine a shallow groove, press in the tape once it's positioned properly and enjoy.

6 T-Track — Many jigs don't need to get this serious, but if yours will get a lot of use or you need the maximum amount of flexibility, you could probably benefit from including T-track. The ability to quickly change the location of hold-downs or stops is a huge plus.

7 T-Bolts — T-Track will quickly become useless without its partner in crime, the T-bolt. A T-bolt head fits into the slot on a T-track, a piece of wood can be drilled to accept the threaded shaft of the T-bolt, and allows you to tighten down a stop or other object, which leads me to...

8 Threaded Knob — In order to quickly and easily apply and remove pressure to a stop, workpiece, etc., a threaded knob is the last piece of the puzzle. The shape of the handle rarely matters, but the size of the thread sure does. When you're purchasing all of these threaded jig parts, ensure they all have the same size of thread on them. I prefer 1/4-20, but a larger option is fine, too.

9 Quarter Sawn Stock for Runners — An item you don't need to purchase specifically, quarter sawn solid wood changes dimension less than flat sawn material. Dense, quarter sawn material is great for making runners so jigs can slide back and forth in grooves on table saws, router tables and the like. If you come across a longer length of material that may be appropriate, just put it aside until you need it.

10 Aftermarket Products — There are many products that make creating jigs easier. In fact, some are downright brilliant, and turn jig-making into an enjoyable process. An online search will likely shine the light on many items you never even knew were available.



ROB BROWN

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Jason Wheeler

...on being creative, LEGO and being in the shop solo.

BY ROB BROWN



Special Dresser – This black walnut dresser was a special project for Wheeler. It was a gift to his partner, who had a childhood dresser with a similar style: three drawers and one cabinet with shelving inside. Wheeler wanted to create an ‘adult’ version for their home. Some of the details include a tapered edge and mitre-fold case construction.

How long have you been building furniture?
Over 10 years.

What sort of furniture do you specialize in?
Mainly customized kitchens and modern furniture, but you name it, I’ll make it!

Tell us a couple interesting things about your personal life.

I love cars, specifically hot rods. I’ll be building my very own hot rod this year.

Do you prefer hand tools or power tools?
Definitely prefer power tools, but I’m a hybrid-style guy.

Solid wood or veneer?
Solid wood.

Figured wood or straight grain?
Figured wood.

Inherited Vintage Stanley Sweetheart or fresh-out-of-the-box Veritas?
Veritas.

Flowing curves or geometric shapes?
Geometric shapes.

Favourite wood?
Walnut.

Least favourite wood?
Pine.



Photos by Natalie Borsella

Jason Wheeler, 39, Wheelers Studio Inc, www.wheelersstudio.com

Location & size of studio – Port Perry, Ontario, Canada, & approximately 3,000 square feet

Education – High school, apprenticeships & small/large shop experience

quotes

My studio is my 'home'. If I didn't have a family, I'd seriously spend every minute there, not because I ever feel like I have to, but because I truly love it. If I have a 'day off', you'll still likely find me there. I'm a very tidy, organized and clean person, so everything in the shop has a specific spot.



Typically, my day starts early. I naturally wake up between 6 a.m. and 7 a.m., and so I'm at the shop by 8 a.m. I'm at my best when I'm at the shop solo. I just go, go go. There are days when I look at the clock, it's 3 p.m. and I realized I haven't eaten lunch. But I love it, it's a rush for me when I'm there.



I've always had a creative headspace. When it comes to my designs, I just get visions and ideas for pieces. I think my being more creative, unique and modern with designs is what people are attracted to.



The design typically comes first for me. Once in a while you would stumble across a beautiful piece of natural wood and a client would want to use that for a table or piece of furniture. But for most of the time, I would say it's typically vision, design, create, finish project.

Social media has been a great platform for me to showcase my work. Because it is visually based, I can share my work — the process along the way, the brands and tools I use — and it allows me to fully display my work to the world.



Introducing kids to woodworking at a younger age would be great. Show them how cool it is to be able to build something. I have a six-year-old son who loves coming to the shop. He loves the tools, watching me work and spending time with me there. What kid wouldn't love to create and build?



It's a really neat part about my job — building a piece that someone has a vision to create, but I get to make that vision the reality.



My son motivates me. I love bringing him into the shop with me on weekends. He typically asks to go, so we'll go up for a couple of hours. Children have that natural curiosity. They have that creative headspace that for most adults dissipates. I'm hoping he follows my footsteps in finding what he loves, and works hard to accomplish his goals in whatever that may be. I just want him to be happy. He has a great imagination and I love watching him build



Built-Ins – A unique built-in unit in a century home was a fun build for Wheeler, but also a huge challenge as there was a 4" slope in the floor where the unit was to be located. Wheeler creates a lot of interior built-in units. (Photo by Stef Brown)

with his LEGO. Who knows, maybe he'll be the next Wheelers Studio Carpenter!



If you're good at what you do, woodworking is a viable career path. Be humble, put your head down, put in the work, continually learn and 100% it is a viable career path. I love what I do every day and I'm able to support myself and my family.



I guess I've stated it a few times already, but I'm grateful I've been able to pursue my passion, and that people support my business as they do. The carpentry and woodworking industry is tough. There is competition from the box stores, and there are many great designers and architects out there, looking for the next best carpenter. I can proudly say, I have skill and I have learned so much along the way to get to where I am today. This craft brings me joy every day. It allows me to exert my creative drive. It allows me to build beautiful pieces for my clients and customers. It allows me to meet amazing people. I hope that the more people learn about custom furniture, they'll realize that it's made with heart and pride. It's more than just wood, it's the love of the craft.

ROB BROWN

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SLIDESHOW: To view a slideshow of Wheeler's work visit the Videos section of our website.



Make a Table Saw Mitre Spline Jig

Accurately and safely machining grooves to a mitred corner will add strength and beauty to a classic joint.

BY ROB BROWN

Tight-fitting mitre joints are a thing of beauty. They're visually clean and tidy as they don't show any end grain. They also show virtually continuous grain running through the joint at 90° as long as the two mating parts were cut from the same board. The downside of a mitre joint is its lack of strength when compared to many other joints that can be used in the same situation. There are many situations where a bomb-proof joint isn't required; a picture or mirror frame, for example. There are, however, many times when a strong joint is a necessity.

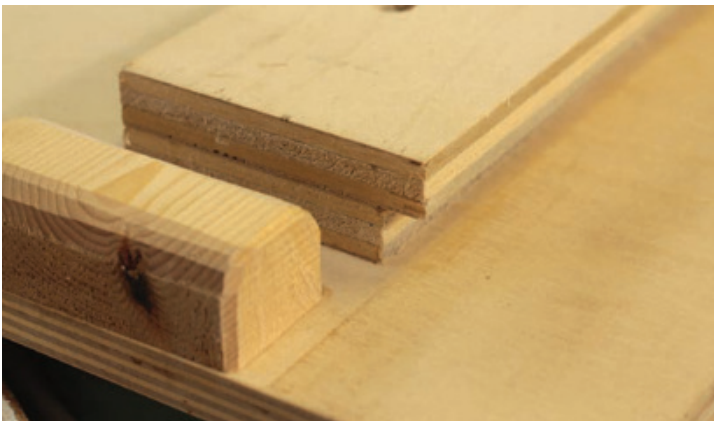
If you really want to use a mitre joint, but need something strong, adding a spline is one fairly easy solution. Briefly, the steps go like this: cut and assemble the mitres, let them dry, run the mitre joints on end over a blade to produce the slots for the splines, machine

and install the splines, trim the splines flush. It's all surprisingly easy, but only if you have a jig to help you cut the slots in each joint. But where would you get such an incredible jig? Good question. I've got just the solution.

Simple and specific

There are only a few main parts that make up this jig, and you very likely have them in your shop already. The parts on my jig are all plywood, but you could easily make everything except the main jig base out of solid wood. In fact, that approach might even make for a stronger, longer-lasting jig. The parts are glued and screwed together.

When it comes to sizing the jig and working to the specific dimensions I talk about in this article, you may have to adjust your jig to suit your table saw's fence. I'm using this jig on a General T-fence system, though your fence may be different. The main



Fence Attachment Assembly – Brown used a simple system of two slightly different sized pieces of plywood that were attached to the rear face of his jig to ensure it travelled along the fence properly.

things you have to consider when making the jig are that its base sits perpendicular to the table, it travels parallel to the blade and it has no movement in its fit to the fence.

Plywood base

Cut the base to size. If you generally make larger pieces of furniture, feel free to make the base larger. If you only build small items, a smaller base like this will work just fine. When unsure, always err on the larger side to ensure adequate workpiece support when needed.

I used 1/2" thick plywood, but there's nothing wrong with using thicker material if you have it on hand. I find at least half the time I'm building jigs I end up using what I have on hand as long as it will get the job done.

Consider your fence

Working with my T-fence was pretty simple. A metal rectangular tube makes up the center section of my fence, and a 1/2" thick piece of Baltic birch plywood is secured directly to both outer faces of the tube. These plywood pieces extend about 1/2" above the upper face of the rectangular tube, and gave me something to hook my jig onto.

I was lucky, as the thickness of the piece of plywood attached to the face of my rip fence was the exact same thickness as a piece I had on hand. Tolerances at this stage have to be pretty exacting if the jig is going to operate smoothly and accurately. I was able to glue the inner and outer fence attachment pieces together with their long edges offset by 1/2". When I temporarily screwed this assembly to the jig base, the gap between the outer fence attachment and the back surface of the jig base accepted the plywood attached to the face of my rip fence.

With the fence attachment assembly complete and sized properly, I placed the long edge of my jig base on the main table surface of my table saw with the back of the base pressed up against the fence. I then set the fence attachment assembly on top of the plywood rip fence face and screwed it in place from the front face of the jig.

Maybe you need to make adjustments

If you don't have a piece of plywood the exact width of your fence's face, you have a few options. One option is to machine a piece of solid wood to the exact thickness and substitute it for the



Snug, But Not Tight – The inner fence attachment piece is the same thickness as the outer face of the rip fence. The outer fence attachment piece extends below the inner piece and helps keep the jig perpendicular to the table saw's surface while in use.



A Good Grasp – The shaped piece of solid wood on the rear face of the jig base acts as a handle during use. It allows the jig to be easily returned to the starting position after a groove has been made in the workpiece.

inner fence attachment piece.

Another option is to make your entire fence attachment assembly out of solid wood. Start with a block about twice as thick as your rip fence's face and machine it to about the same length as your jig base, by about 3" wide. You will then have to machine a rabbet in its edge to accept the top portion of the rip fence's face perfectly. Be careful here, as taking even 1/32" too much material off will leave you with a sloppy fitting jig. Temporarily screwing it to another surface to test the fit will be necessary.

If you're working with a completely different rip fence system, you will have to improvise. Making a cavity that will fit right over the entire overall width of your rip fence might be necessary. If that's the case, just ensure the members that make up the cavity hold the jig base at a right angle to the table when complete, and allow the jig to slide smoothly and properly along the rip fence.

The jig face

Now that the jig is running wonderfully along the rip fence, you need to attach two 2" wide strips to hold the workpiece in place at 45° to the table saw's table during use. I attached them to the jig's face so their intersection would hold the workpiece slightly above the top surface of the table saw.

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Materials List

Part	Qty	T	W	L	Material
Base	1	3/4	12	30	3/4" Plywood
Fence Strips	2	1/2	2	14	Plywood or Solid
Inner Fence Attachment Piece	1	1/2	3	28	1/2" Plywood
Outer Fence Attachment Piece	1	1/2	3-1/2	28	1/2" Plywood
Handle	1	1	1	3	Solid

Attach the first one at 45° to the bottom edge of the jig with a pair of screws, then use a square to ensure the second strip is square to the first strip and will hold the workpiece slightly above the table saw. Be sure to drive the screws high enough so that the blade won't come into contact with them during use.

Using the jig

I usually hold the assembled workpiece (often a door, picture or mirror frame) against the jig base with my left hand, and push the jig and workpiece over the blade with my right hand. To give my right hand a great grip on the jig I added a simple wood block on the back of the base at about the midway point up the jig's short edge. This block comes in handy when I'm pulling the jig back towards me after I remove the freshly machined workpiece from the jig.

I also added a 10" long block of plywood to the back side of the jig base, near its top, so when the jig was lying on

a shelf I could stack other jigs on top of it without having them tip over.

I usually use a flat-top rip blade to create a thin slot, though if I need a wider slot a dado set works just fine. Once you have the workpiece in place, adjust the height of the blade and the location of the rip fence according to the piece you're working on. I generally try to center the blade on the workpiece, and also try to have the ends of the spline finish directly in line with the inner edge of the frame members for aesthetic reasons, but sometimes making it larger, and therefore stronger, is what's required.

With the settings dialed in, press the workpiece against the jig's base and run it over the blade. If your workpiece is smaller, you may want to use a hold-down device to secure it in place during machining the slot. Once the slot has been created, remove the workpiece, return the jig to its starting position and repeat as necessary with the other joints in the workpiece.

Splines

Machine a long length of solid wood to act as splines. One of the edges must be straight and square, as it will sit against the narrow inside edge of the slot. Make sure the fit isn't too tight or it will be very tough to get the spline to seat into the slot completely. Gaps between a spline and the workpiece are unsightly.

Once enough material has been cut to size, I cut the individual splines from the long length, ensuring they will be long enough to extend out both ends of the slot. I often opt for contrasting colours of wood, but the choice is yours. Apply a small amount of glue to both the inner surfaces of the slot and the outer surfaces of the spline before pressing them into place. A few light taps with a hammer may also be needed, but clamping



Align the Ends – Although there are very few hard rules, Brown often lines up the end of the groove with the extension of the inner edge of either the horizontal or vertical members of the frame he's working on. Raising and lowering the blade makes this adjustment.



Cut the Keys – With the slots cut and the solid for the keys dressed to proper thickness, mark and the cut the keys oversized so they can be glued in place.

the workpiece to a work surface first will work best. A pair of cauls to protect the workpiece and a clamp to ensure no gaps enables a good glue-up.

When the splines are dry, I often trim them to rough length on the bandsaw before using a chisel or hand plane to flush them to the workpiece.

Get creative

You can also get fancy and cut and install a thick spline first, then cut a narrower slot directly in the first spline, and install a third type of wood. Even adding two or more splines across the width of a wider workpiece is an option. This approach will add strength and provide a strong visual element. Every situation is a bit different. Consider the strength you need, as well as how powerful a design element you want, then set out to cut and install mitre keys as you see fit.



Get Creative – By installing a wider contrasting key first, then cutting a slot in that key and installing a key made from a third species of wood, you will create a very strong look.



Cauls and a Clamp – Apply glue to both faces of the workpiece, as well as both faces of the key, then slide the key into the slot. A caul on either side of the key and a clamp to add a small amount of pressure are all that's needed.



Finished Mitre Key – Once installed and trimmed flush, the mitre key provides a lot of strength and some nice contrast to the joint. You can also use the same species if you want an even simpler look, but need the strength.

One of these days Rob is going to have to put an addition on his shop to store all his jigs.

ROB BROWN

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Make a Veneer-Cutting Jig

Veneer is a great material to incorporate into a project, but it's not machined in the same way solid wood is. This jig will allow you to trim veneer edges straight so they can be joined and pressed onto a substrate.

BY ROB BROWN

Veneer is incredibly underappreciated by most woodworkers. Both highly figured and incredibly straight-grained options are available, and are generally a lot more cost effective and sustainable than solid wood, as you use much less of them. Veneer, and the substrates it's adhered to, is much less likely to move with seasonal humidity changes, making unique and boundary-pushing designs obtainable. On top of that, the ability to use veneer to cover the faces of flat or curved panels is another huge benefit.

The general public's dislike for veneer mainly stems from the massive amount of poorly designed and constructed furniture available in many stores for low cost. Sadly, veneer gets blamed for this, even though it has little to do with the real problem.

Photos by Rob Brown



Veneer challenges woodworkers

The downside for a woodworker is the fact that some specialized tools are needed to harness the power of veneer and incorporate it into a project. Lumber can be edge-glued to produce wider panels. Veneer can, too, but it's a much different process. It first has to be trimmed straight before it can be joined with other pieces of veneer. At that stage it can be pressed onto a substrate and incorporated into a project. This simple jig will help you with trimming veneer edges straight, so they can be joined to any mating pieces of veneer.

I use a track saw to do the actual veneer trimming, but some sort of shop-made circular saw jig could be used also. The level of accuracy would have to be high, as you want the blade travelling in a straight line at all times, with no side-to-side movement.

A sharp blade is a must, as is a good method to apply downward pressure to the veneer where the cut is being made. This pressure ensures the veneer edge is clean and will mate with another freshly cut edge of veneer.

The base

A large, flat base makes up the vast majority of the jig. I used 3/4" thick MDF, but plywood and particleboard have their own pros and cons. From a full-length sheet, I ripped a strip about 24" wide, then routed a simple 1/4" round over on all the edges and corners to protect against chipping.

The cleats

The only other parts of this jig are the two small wood cleats that align the track. These are glued into a groove towards either end of the base. To the best of my knowledge, all track saw tracks have a slot on their underside. This slot is what the cleat will protrude up into. The cleat needs to be the exact width of the track so there's no movement between the track and the cleat.

Measure the width of your slot. The Dewalt track saw I have has a 1/4" wide groove, so I used a 1/4" bit in my router to make a shallow groove in the base, about 3" long. The exact location isn't important, however, I would recommend doing some math in order to keep the cutting edge of the track at least 6" away from the edge of the base. This is to help support the offcuts during the cut.

I set up my router on a simple jig that would allow me to keep the two cleats equidistant from the long edge of the jig, and routed 1/4" wide grooves towards either end of the base. If you don't have a router bit the exact width as the slot on the underside of your track, make multiple passes with a narrower bit. An exact fit with the slot is the only critical part of this jig build, so take the time to obtain a perfect fit. I then dressed hardwood strips to fit perfectly in the grooves, and glued them in place.

When dry, I eased the edges of the cleats to make the track fit onto the cleats easier. Once the track was positioned, I drew a pair of lines on both ends of the base, at either side of the track, to visually mark the outer edge of the track. This makes it easier to line up the track each time you put the track in place.



Exact Width – If you can, choose a router bit the exact diameter as the slot in the underside of your track to rout the groove in the base. Making multiple passes with a narrower bit is also an option. A proper fit between the track and the cleats is a must.



Super Simple – Brown attached his router to a piece of 1/4" plywood, then screwed a guide to the underside of the plywood. The guide runs along the edge of the jig base while the router bit machines a groove to accept the cleat towards both ends of the base.

Using the jig

Although it's not the end of the world, it's best not to cut completely through the base when trimming veneer to width. No matter how many pieces of veneer you're cutting, adjust the depth of cut to only cut about 1/8" into the base.

Veneer is generally sold with uneven edges that need to be trimmed straight so they can be matched and joined together if you need wider sheets of veneer. I cut the pieces of veneer to rough length so they're easier to handle. With the track off to the side, I place one or more pieces of veneer on the base, align the edge to



Quick Installation – With the cleats in place and the veneer positioned where you want it cut, position the track over both cleats. Notice the two marker lines at the edge of the base. These assist with positioning the track, and are drawn at both ends of the base.

be cut with the kerf cut into the base, add the track on top of the veneer, and place the saw on the track. The weight of the saw is likely enough to apply enough downward pressure to the track to reduce chipping of the veneer during the cut. If you find the veneer is chipping, some downward pressure might be the answer.

Slowly but surely

Veneer is somewhat fragile, and will chip heavily if your blade isn't sharp enough or if you make the cut too quickly. I move the saw very slowly and watch the cutting area very closely to see if there's chipping. Positioning the veneer so the grain runs away from the portion of veneer you want to keep, rather than into the work-piece, will also help reduce chipping. If you follow these basics you'll be surprised how even and clean the edge of the freshly cut piece of veneer is.



How Deep? – Brown aims to cut about 1/8" below the underside of the lower layer of veneer. With multiple layers of veneer, you'll have to take their combined thicknesses into account when setting the depth of cut. Different veneers require different approaches, but Brown finds a shallow cut the best approach for the vast majority of situations.



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Large, Flat Area – Although it doesn't have to be perfect, ensuring the jig is supported properly along its length, and that it's relatively flat, will make it easier and safer to use. Using a table saw and router table for support is Brown's approach, but you'll also notice some solid wood blocks under the rear end of the jig.

If you want to use the offcut to join with other pieces of veneer, and need to have it finished as cleanly as possible, I find it very useful to place the veneer on the base (as usual), then lay a piece of 1/8" or 1/4" thick material on top of the veneer before placing the track on top of the stack of veneers. As long as the 1/8" or 1/4" material overlaps the cut by an inch or so, it will apply downward pressure on the offcut section of veneer, and will go a long way to reduce chipping.

It's also possible to cut across the grain of the veneer at 90°, or even another angle you need to create the veneer match you're after. I've added a few pencil lines on my base to assist with quickly making a 90° cut. Working with veneer gives you the option to create a lot of strong visual patterns, so let your imagination run wild, and use this jig to trim veneer at any angle you'd like.

Tape it together

Once the veneer is trimmed straight, it can be joined together with thin veneer tape. I use pieces of tape about 2" long, staggered every few inches at a right angle to the veneer joint, then come back and apply pieces of tape along the joint, ensuring the entire edge of the veneer is taped. Once joined, I apply the veneer to a substrate, and machine it like any standard sheet good. A vacuum press is a great tool for serious



ROB BROWN

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Tape it Together – Veneer tape comes in a few different forms. Here, Brown is using a tape that needs to be dampened immediately before use, but some other types can be applied straight from the roll.

veneer craftspeople, but even flat platens, cauls and clamps go a long way to pressing veneered panels.

Hopefully, this can help fill in one of the blanks regarding working with veneer. I think of veneer as just another type of material I can use to create strong, beautiful and lasting pieces of furniture, and reach for this simple jig whenever I want to make veneered panels.

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Introduction to PLYWOOD

Understand your plywood options before starting on your next furniture, cabinetry or home improvement project.

BY CARL DUGUAY

Plywood is part of a category of wood-based construction materials referred to as 'sheet goods'. Other components of this group include MDF (medium-density fibreboard), particleboard, melamine, OSB (oriented strand board) and hardboard. There are dozens of different types of plywood on the market, some designed solely for interior use and others for exterior applications. These include structural plywood (a.k.a. softwood plywood) used for sheathing, flooring, roofing and underlay applications; marine plywood used for projects that will be subject to high humidity or wet conditions (decks, boats, outdoor furniture

and the like); and bendable plywood. In this article we look at the characteristics of interior plywood used primarily for cabinet and furniture construction.

Plywood is a structurally versatile product available in large dimensions and a variety of thicknesses. Compared to solid wood, it has excellent dimensional stability and a high strength to weight ratio. In many cases it can be a less expensive and more convenient alternative to use in place of solid lumber.

All plywood is comprised of a sandwich that consists of a core (made up of a single layer or multiple layers of solid or composite wood) and a veneer covering on both top and bottom. The core can be a different sheet good (such as MDF or particleboard). Various

Photos by Columbia Forest Products

adhesives, including urea-formaldehyde, phenolic, melamine and soy-based, are used in the production of plywood, depending on its intended application.

Plywood is typically available in 4' × 8' sheets in 1/4" to 1-1/4" thicknesses. Larger sheets are available from some manufacturers.

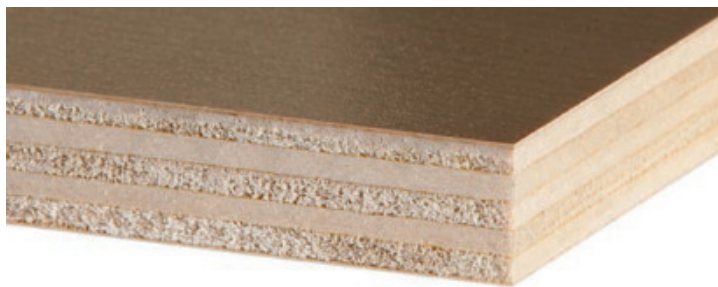
One of the most important things to consider when purchasing plywood is the core. Here are four of the most commonly used cores for interior plywood, each with its own advantages and limitations.

Veneer Core – the preferred choice

This is probably the most popular type of plywood core, and comes in a wide variety of thicknesses and face veneers. A veneer core (VC) is comprised of three or more layers of wood (called plies) sandwiched between two layers of veneer (the face and back veneer). Each ply is rotated 90° to its neighbour before the



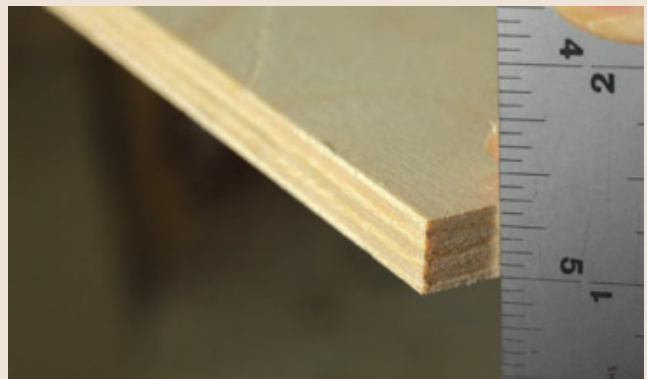
Cross Grain Strength – By alternating grain direction in the laminations of plywood, the resulting panel is stronger and more stable in both directions.



Veneer Core Plywood – A very common option, veneer core plywood is available with many different face and back veneer options, as well as in many different thicknesses.

Baltic Birch

Baltic birch (ThomasCanada.com) is a popular plywood used as a substrate for shop-made veneered panels, for jigs and templates, for drawer components, and as a bending plywood. Imported from Europe, it's constructed from very thin plies of birch, which makes it very stable and strong – a 1/2" thick panel has 12 plies. There are both interior and exterior versions, in thicknesses from 1/8" to 1-3/16", and typically in 60" × 60" panels (however, panels up to 72" × 96" can be special ordered). Also becoming more common are 4' × 8' panels. Baltic birch does not have face veneers, but the two outer veneers look smooth and are either without blemishes or with imperfections that are patched by veneer cutouts. Similar products include: Finnish birch (LeeValley.com), made with a waterproof adhesive for exterior use and available in thinner formats (1/64" to 3/32"); Europly PLUS (ColumbiaForestProducts.com) in thicknesses from 1/4" to 1" and faced with different veneer species; and ApplyPly (StatesInd.com) in thicknesses from 1/4" to 1-1/2" and also faced with different veneer species.



sandwich is glued together. This is what provides the integral strength of the plywood across all directions and reduces expansion and shrinkage.

The plies can be made from softwood or hardwood. The term 'softwood plywood' refers to panels that have a face and back veneer made of softwood, while 'hardwood plywood' panels (the type most widely used in furniture and cabinet construction) have a face and back veneer of hardwood, regardless of what wood is used for the core.

VC plywood is very strong, flat, reasonably light in weight and has excellent screw-holding power. However, unlike MDF or particleboard core plywood, panels can vary slightly in thickness. Its availability in a wide array of wood species makes VC plywood a favoured choice for both furniture and cabinetry.

MDF Core – super flat and consistent thickness

Medium-density fibreboard (MDF) is a sheet good made of wood fibres bound with a resin. Because it has a consistent thickness (within a single sheet and from sheet to sheet), it's exceptionally smooth, super flat, dimensionally stable and free of knots and grain patterns, and is widely used in cabinet construction. The

Plywood Off-Gassing

Formaldehyde is a naturally occurring organic compound that's emitted by all wood species. Fortunately, when the wood is processed into plywood, most of the formaldehyde is exuded at the mill. However, the adhesive commonly used to bond the alternating plies in plywood – urea-formaldehyde resin – also off-gasses formaldehyde. By the late 1980s, it was considered a probable carcinogen. Companies have looked at other adhesives to use. Columbia Forest Products, for example, uses a soy-based adhesive in its line of 'PureBond' hardwood plywood, which makes this product virtually formaldehyde-free. (ColumbiaForestProducts.com)

panels are available without a covering veneer (in which case they are typically sealed and painted before use) or they have a factory-applied, high-pressure laminate overlay.

MDF panels are also used as a core in plywood. MDF core plywood is less expensive than VC plywood. They're also easily milled with machinery or power tools without the risk of splintering or tear-out. However, they do split and crack more easily than VC plywood, are appreciably heavier, have lower screw-holding power and can off-gas formaldehyde (see 'Plywood Off-Gassing').

Particleboard Core – the economical choice

Particleboard is another sheet good that's used as a core in plywood. Where MDF is made from wood fibres, particleboard is made from sawdust and resin adhesives, which makes it less expensive to produce than MDF. It weighs about the same as MDF (on the heavy side), has a consistent thickness, is very flat and smooth, and has high tensile strength. However, because it's made from larger dust particles that are less uniform in size, it has a weaker screw-holding ability than MDF (special screws are generally used to fasten particleboard), and is easy to crack or chip. It's also more prone to warping if exposed to moisture, and deflects more under weight. Particleboard core plywood is not available in as wide a variety of face veneers as VC or MDF plywood.



MDF Core – When flatness and evenness is of highest importance, using a plywood with an MDF core may be your best option.



Particleboard Core – If extreme strength isn't important, using a plywood with a particleboard core will likely be the most cost-effective approach.



Combination Core – The best of both worlds, the plywood provides strength, while the MDF outer layers add a level of evenness to the board.

shopnews

Home Depot Now Ships Plywood Pieces to Your Home (or the Store)

Sponsored: What's the hardest thing about working with naturally beautiful hardwood plywood? For many, it's handling it. It can be quite a challenge to wrestle a 4' x 8' sheet home, especially if you don't have a big truck. Home Depot now offers convenient, ship-to-home PureBond project panels in a wide range of species choices. This can mean less time on the road, and more time in your workshop. Panel species include maple (in raw and pre-finished forms), red oak, white oak, aromatic cedar, walnut, poplar, birch, mahogany, alder, hickory and innovative new rough-sawn faces in red oak and birch. Maple and walnut are also available with an exposed-edge "EuroPly" core. All of these 2' x 4' panels are available in 1/4", 1/2" and 3/4" thicknesses. Visit www.homedepot.ca today and search for "Columbia Forest 2ft" to learn more.





Veneer – Although it's often thought of as lesser quality, veneer is a very useful product to incorporate into furniture and woodwork. It's very thin, but if used properly, it can be used with great success. Some of the best pieces of furniture in the world are built with veneer.

Combination Core – the compromise plywood

Combination (combi) core plywood is typically made of an inner core of wood plies (like VC plywood), an outer layer (on both sides) of MDF or particleboard, and a face and back-veneering veneer. The thickness of the MDF or particleboard panels can vary from manufacturer to manufacturer. The inner core of wood provides good screw-holding power, while the outer layers of MDF or particleboard ensure a super smooth and flat surface. These panels weigh about the same as VC panels. As with particleboard plywood, combi core plywood is not as widely

available, nor is it available in as many veneer options as VC or MDF plywood.

Beauty is only millimetres deep

Veneer is produced by either peeling or slicing thin layers of wood from a log, and each method results in its own distinctive appearance. Rotary cut veneer is the most common method. The veneer is peeled from a log similar to paper towels coming off a roll. When applied to a plywood panel the result is typically a fairly irregular grain pattern.

Veneer can be sliced from a log in three ways. Plain-sliced veneer is usually characterized by a cathedral grain pattern; quarter-sliced veneer produces a straight grain appearance; and rift-cut veneer produces a straight, striped grain appearance without the flakes that can occur in some quarter-sliced veneer.

Once sliced veneer is cut from a log, the sections (or leafs) can be laid out (matched) in several different patterns on a plywood panel – the most common are book matched, slip matched and plank matched.

The veneer on plywood is pretty thin – about .85mm (1/30") on premium grade plywood, much less on lower quality plywood. Regardless of the veneer thickness, you need to be careful not to sand through, especially when using power sanders.

Home improvement retailers usually carry plywood with a limited selection of face veneer – typically oak, birch, maple, spruce and pine. Specialty lumber suppliers, such as The Wood Shed, Exotic Woods and A&M Wood Specialty, carry a much wider range. They may also carry pre-sanded and pre-finished plywood.



CARL DUGUAY

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Reviews

Our staff writers review new tools and products on the market that are ideally suited to the woodworker and DIY'er.



Lee Valley Replica Bevel Square

I like my 12" Starrett combination square, but there are times I wish I had a smaller version as well. Along comes the Lee Valley catalogue and I notice a very interesting and shiny new tool. I

(Photo by Lee Valley)

can honestly say I'm in full control of impulse buys, even those with shiny surfaces. I have achieved this level of zen after many years of woodworking.

The bevel square is a replica of a Stanley Rule and Level Company tool that was, interestingly enough, developed and patented, but never brought to market. This model is an improvement over a previous version made a couple of years before. It has an 8" stainless steel rule with no graduations, and it slides on a triangle-shaped head. It provides two 45° surfaces, as well as a 90° edge with an extended lip. The tool is a good weight and fits nicely in the hand during use. A thumb screw allows the rule to slide up and down, and provides a positive lock when engaged. There is also a slotted screw that holds an eccentric washer, allowing you to make sure the tool stays accurate even after some wear.

I've been using the bevel square mostly as a combination square

Lee Valley Replica Bevel Square

Retro homerun from Lee Valley

Rali 105 Evolution N Hand Plane

Rali's revolutionary offering

Mpower Fasttrack MK2 Sharpening Jig

A quick, keen edge for the beginner woodworker



All the Basics – Both 45° and 90° marks are easy to make. With an eccentric washer on the locking nut, you can be sure the square will remain accurate for decades to come.



Parallel Lines – By setting the location of the blade precisely, you can mark a line parallel to any straight edge with ease.

in the shop, a smaller brother to the Starrett. This square is great for marking perpendicular lines to an edge or marking 45° angles, such as those on the blade beds of wooden planes. Much like the larger version, it can also be used to directly transfer measurements from one surface to another without being cumbersome. Unlike the combination square, it has no level nor a pullout scribe buried in the head. Then again, I can't remember the last time I used either of those features from that tool. One of the many uses for a combination square is the ability to set it to a specific length and have the head ride along an edge to mark a parallel line. At various points of drawing that line, our pencils will inevitably dip in and out of the groove on the edge of the ruler. With the bevel square, you just let the pencil ride at the end of the center slot.

I'm glad I bought this tool. I tend to reach for it first, especially when working on appropriate-sized projects. It also looks good in my tool cabinet. If its shiny good looks outweighed its usefulness, only then would it have been an impulse purchase. See, I'm getting better.

Lee Valley Replica Bevel Square

MSRP: \$69

Website: www.LeeValley.com

Tester: Steven Der-Garabedian

Rali 105 Evolution N Hand Plane

This is a unique block plane. Not only does it look different than the western block plane you're used to, but it feels different in your hand. It's manufactured unconventionally, too. Not surprisingly, the 105 Evolution N has a number of critical benefits, so don't think for a second that this block plane isn't for you.

Though the plane I reviewed had anti-corrosion nickel sides, Rali has another offering (for \$10 less) with anti-corrosion blackened steel sides.

I'd say the biggest problem with most woodworkers' block planes is that they're not sharp enough to work properly. I'm not saying the Rali 105 Evolution N will never get dull, but rather than needing to take time to sharpen it, the blade can simply be rotated for a new razor-sharp cutting edge, and eventually just replaced. For those of us who don't enjoy the tedious task of honing a blade, this is a massive game changer. The blades are double-sided, and rotating or swapping one takes all of five seconds. When you have only an hour or so to spend in your shop, it's nice to know part of that time won't be spent sharpening your block plane. The benefits range far wider than this, though. A carpenter on the jobsite would surely benefit from having a sharp edge on their block plane whenever they reached for it. Okay...sharp.

Depth adjustment is unbelievably simple. So simple, in fact, that it took me 10 minutes to figure it out, as I didn't believe it was really that simple. Sometimes I'm not the sharpest tool in the shed. A handy lever is either pressed downward for a heavier cut, or pulled upward for a lighter cut. And like that, your depth of cut is set. I took very heavy shavings off black cherry, and feathery light shavings off hard maple end grain, stopping for only a few seconds



(Photo by Tera Knives)



Easy Depth Adjustment

– By raising or lowering the position of the red lever, the depth of cut is quickly and easily adjusted. Here, you can see thick black cherry shavings, as well as very light shavings from the same material, all created within moments of each other.



Precision Placement

– The series of notches on the blade allow the blade to only be accepted by the plane in one way, ensuring proper blade installation each time.

between woods to adjust the depth of cut. All right...sharp and quick.

The replacement blades are available in chrome steel or carbide, so you can select the right option for you. The blades are precisely aligned by a male / female pattern on the blade holder's surface that mates with cutouts on the blade. This process is foolproof. Well then...sharp, quick and easy.

If sharp, quick and easy are how you'd describe your deepest block plane desires, you may have found your next block plane. And with a small selection of larger hand planes available, all with the same basic features, you might want to consider your entire hand plane lineup.

Rali 105 Evolution N Hand Plane

MSRP: \$125

Website: www.TeraKnives.com

Tester: Rob Brown

M-Power Fasttrack MK2 Sharpening Jig

If you put 10 woodworkers in a room and ask them about dovetails and which to cut first — pins or tails* — you'll get a decent debate. Now, put those same woodworkers in the same room and ask them about sharpening. The police will need to be called to break up the fight. Aren't we funny that way? Woodworking and sharpening go hand in hand, and there are a lot of jigs out there and plenty of methods. If you want to work wood, you need to sharpen. Finding a method that's not a chore will work best.

The M-Power Fasttrack MK2 sharpener is one of those many jigs. The bundle comes with the Fasttrack MK2, centre clip, five tapered diamond stones from 100x to 1000x, an already attached 1000x de-burring plate, a grip mat and cleaning block, as well as a mounting screw, storage case and instructions. For those who like to finish with a bit of stropping, there is a leather strop attached to the bottom of the base. There are four available angles that can be achieved with the jig: the most common 25° and 30° as well as 27-1/2° and 32-1/2°. The Fasttrack jig can accommodate blades or chisels from 1/8" to 2-1/2". Rubber feet on the base provide a surprisingly steady grip. The mat in the kit is similar to non-slip drawer liners, and by using the mounting screw, the base can be securely attached to a bench or a piece of plywood.

Most sharpening jigs will hold the blade to allow you to slide it across a stone, diamond plate or sandpaper. The MK2 is more like a crosscut sled on the table saw. The tool is held steady while the diamond plate is run back and forth over the blade. It's not hard to hold a plane blade or chisel in place against the perpendicular shoulder or centering clip. The de-burring plate provides the necessary friction, although I found my thumb getting sore at the end of working through all the grits. It's not a hard jig to use, but you will need to get a feel for how far into the carriage you need to have the blade. Running through the different grits goes fast and leaves a cutting edge that is quite sharp.

The de-burring plate does a good job of knocking down the burr after each grit. The cleaning block, which seems very much like a white plastic eraser, cleans the grit off the diamond plates easily enough. The instructions say you can use the tool dry, but I found adding a bit of oil made the job easier. It's also a good idea to keep the carriage lubricated and free of sludge. Changing plates couldn't be easier, as they're held on securely with a rare-earth magnet and small position mouldings. The labels on the carriage clearly show which way the tapered plates are attached for specific angles.

The system does have its downsides. It can only handle the four previously stated angles, although those will handle most woodworkers' needs. You will spend a lot of time sharpening your tools if they're not already ground to 25° or 30°, or if they're in rough shape. It cannot hone or flatten the back of plane blades or chisels. You might be able to do it on the de-burring plate on the base, but you're going to be there for a long time.

I would argue that water stones and a honing guide will do a better job in the hands of a skilled sharpener, but I was pleasantly surprised with this jig. It's well designed and efficient. I think it's well suited to those who aren't sure about sharpening and need somewhere to get started. It will also do well in a school shop or club setting.

* Oh, by the way, the correct answer is pins first!

M-Power Fasttrack MK2 Sharpening Jig

MSRP: \$144.95 (US), Special *CW&HI* intro price of \$129.95US until May 31, 2020

Website: www.m-powertools.com

Tester: Steven Der-Garabedian



(Photo by M-Power)



Thumb Pressure – While moving the carriage back and forth, thumb pressure keeps the blade in place so it can be sharpened.



De-Burring Plate – After each grit has been used on the blade, it's necessary to pass the blade over the de-burring plate a few times to remove the burr. It's a quick and easy part of the process.

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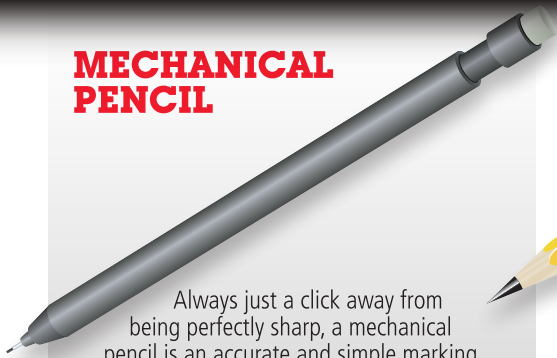
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INTRODUCTION TO

Marking Devices

MECHANICAL PENCIL



Always just a click away from being perfectly sharp, a mechanical pencil is an accurate and simple marking device. Available in a few different widths, the most appropriate for shop use is probably the wider version at 0.7mm.

LEAD PENCIL



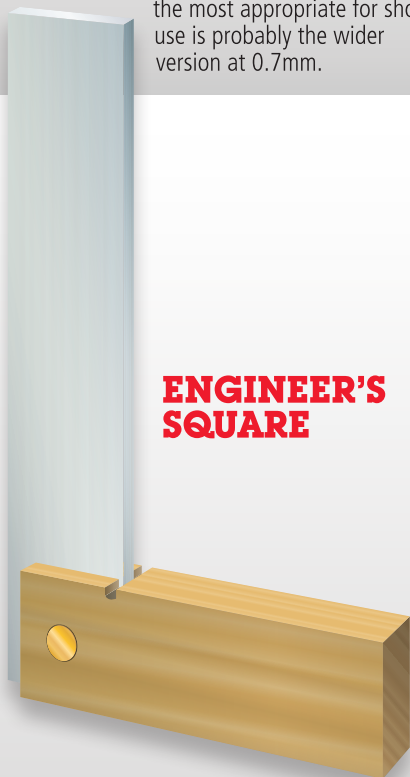
Available in the common style or a carpenter's version (with a larger, rectangular or elliptical cross-section), as well as in many different hardnesses. It's great to have a selection of sharp wooden lead pencils around. Don't forget the sharpener.

MARKING KNIFE



When an accurate mark is needed to help locate a sharp chisel, a sharp marking knife is the perfect solution. Generally speaking, make multiple light scoring cuts, as opposed to a single, heavy cut, so the knife doesn't mistakenly follow the grain.

ENGINEER'S SQUARE



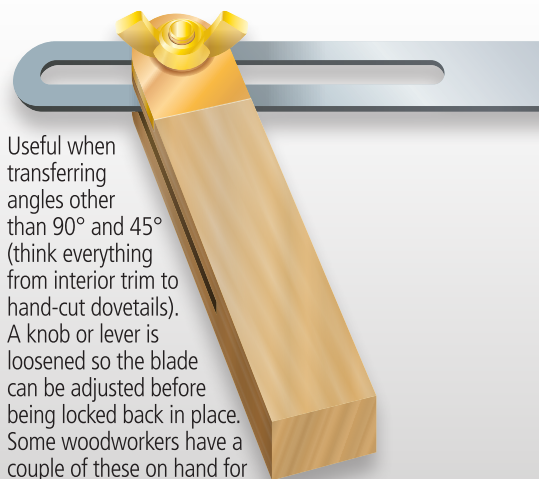
Simple and accurate, an engineer's square will assist with machine setup and joinery layout. Graduations are generally not included, as this square is more about checking for extreme accuracy on what should be a 90° corner. Unless you're setting up larger machines, a small- to medium-sized square will likely work best.

SADDLE SQUARE



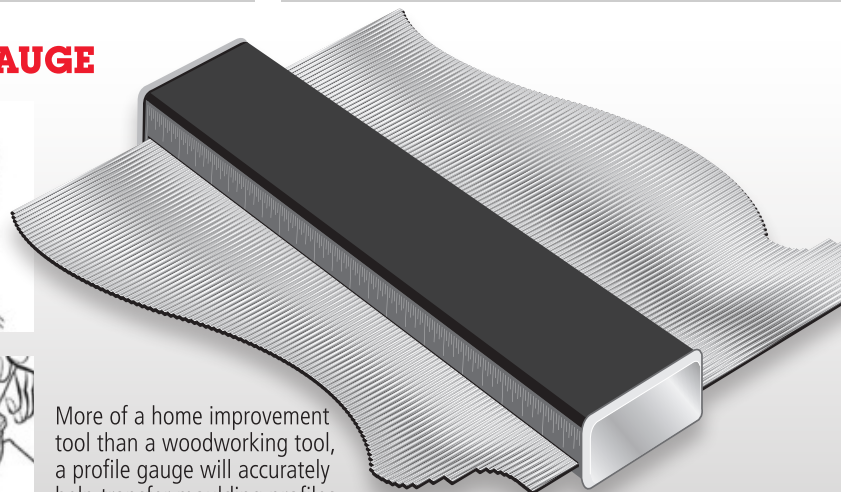
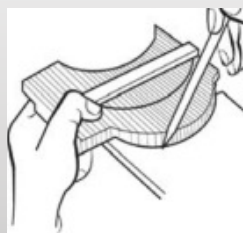
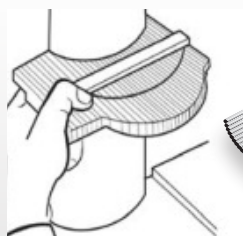
Mainly used for marking a line on two perpendicular surfaces at once. Also available in a larger size, it's generally used for 2x4 construction purposes. A simple, cost-effective tool.

SLIDING BEVEL



Useful when transferring angles other than 90° and 45° (think everything from interior trim to hand-cut dovetails). A knob or lever is loosened so the blade can be adjusted before being locked back in place. Some woodworkers have a couple of these on hand for when they're working with multiple angles at once.

PROFILE GAUGE



More of a home improvement tool than a woodworking tool, a profile gauge will accurately help transfer moulding profiles and unique shapes to a workpiece so they can be trimmed accordingly. Turners have also used them to assist with accurately replicating a portion of their turning.

This Workshop Poster sponsored by:

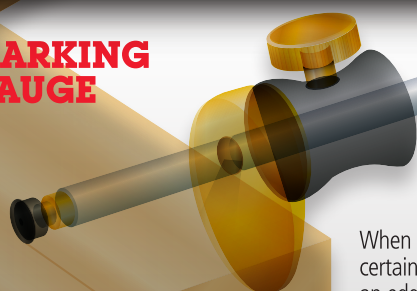


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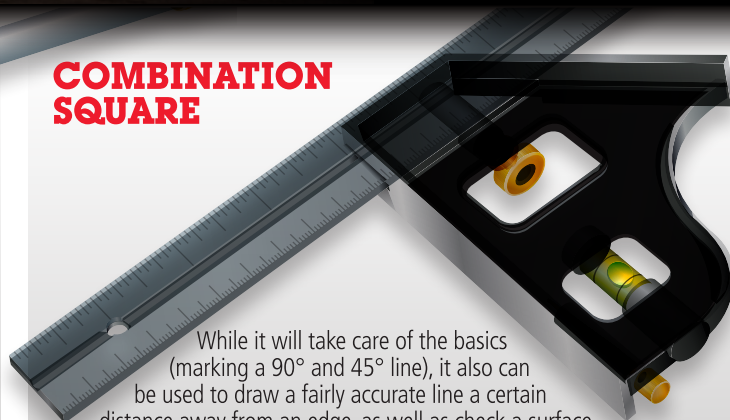


MARKING GAUGE



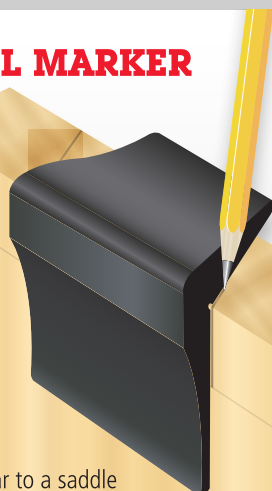
When scoring a mark a certain distance away from an edge is needed, a marking gauge is accurate and saves time. Available with dual rods for simultaneously marking both sides of joints like a tenon or groove. Multiple light passes are usually more accurate than one heavy pass. Quality gauges are equipped with either a wheel or knife rather than a pin.

COMBINATION SQUARE



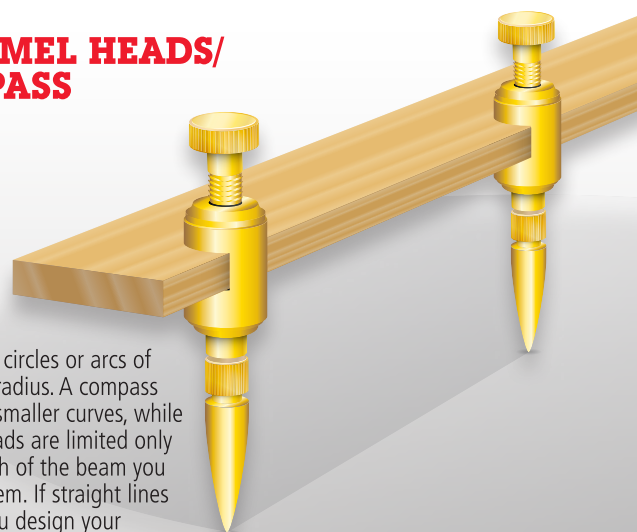
While it will take care of the basics (marking a 90° and 45° line), it also can be used to draw a fairly accurate line a certain distance away from an edge, as well as check a surface for level. The small awl included in the tip of the head can be used in place of a marking knife and awl.

DOVETAIL MARKER



Similar to a saddle square, but includes one angled edge on each side of the tool for marking dovetail angles. Available in a variety of different ratios or angles depending on the type of dovetails you're marking.

TRAMMEL HEADS/COMPASS



For drawing circles or arcs of almost any radius. A compass is great for smaller curves, while trammel heads are limited only by the length of the beam you make for them. If straight lines are what you design your furniture around, grab a trammel head set, get familiar with your bandsaw and hand tools, and start adding some graceful curves to your work.

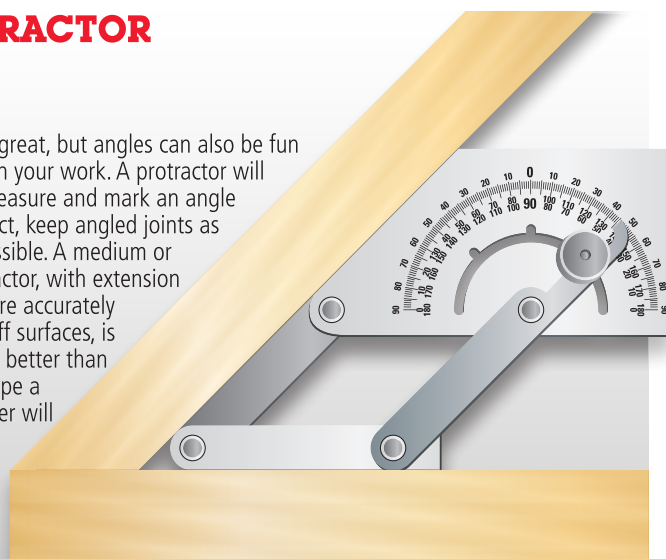
FRENCH CURVE



Once you're familiar with your new trammel heads, step it up a notch and bring a French curve into your design process. For smoothing hand-drawn arcs, as well as fairing transitions between a curve and a straight line, this is where design really starts to take off. They also just look cool hanging on your shop wall. For proof, check out Steve Der-Garabedian on page 50 in this issue.

PROTRACTOR

Curves are great, but angles can also be fun to include in your work. A protractor will help you measure and mark an angle and, in effect, keep angled joints as tight as possible. A medium or large protractor, with extension arms to more accurately reference off surfaces, is going to be better than the small type a fourth grader will be familiar with, though both can be useful.





Extreme Life CNC Router Bit Set

Amana's Spektra solid carbide router bits feature a micro-thin, nano-composite ceramic coating that enables the tool's cutting edge to retain crucial sharpness and lubricity, providing up to a 2.5 times longer

service life. The coating prevents high heat build-up and oxidation, which is detrimental to cutting performance. The **Amana Spektra 8-Pc Router Bit Collection** includes v-groove, round over, ball nose and spiral plunge bits with 1/4" shanks designed specifically for a wide variety of applications in wood, plastic and composite materials. The kit comes with a solid wood showcase storage box with a Plexiglas clear lid.

Amanatool.com



One Hand Power Clamping

Bessey EHK Trigger Clamps are not your average one-handed clamps. They have been engineered from the start to offer a clean design, comfortable handles, up to 600 pounds of potential clamping force, and the ability to quickly transform from clamping to spreading without using tools. All that is required is

a quick push of the locking mechanism to disengage the fixed jaw, move it to the opposite end of the rail and re-engage.

Besseytools.com



Combo 16" Helical Jointer/Planer

The **Scorpion CWI-JP1604HC** is built for size-challenged shop

spaces and convenience of operation. Its powerful 4 HP motor drives a 2-7/8" diameter Stinger Carbide helical cutter head that can remove up to 1/8" at each pass. The 80 knife cutterhead (five rows of 16 knives) produces a super smooth surface and virtually zero tear-out even on the most difficult to thickness woods. A 16" x 65-1/2" heavily ribbed cast iron jointer table provides excellent support with longer boards. Other features include an electronic digital height readout for the thickness planer table, Euro-style guard and mobility kit.

CWMachinery.com

Self Feed Drill Bits

The two-cutter **Diablo Self Feed Bits** are designed to strict tolerances that result in energy-efficient drilling with up to two times life per battery charge. The two-cutter

design and an aggressive low thread count feed screw deliver up to two times more holes per charge. The replaceable feed screw features a pull-out stop mechanism that prevents the screw from slipping out when the bit is removed from the material. Equipped with 7/16" hex shanks, and the bits are available in diameters from 1-1/8" to 3-5/8".

DiabloTools.com



Convenient Quarter Sheets of Plywood

What's the hardest thing about working with naturally beautiful hardwood plywood? For many people, it's the handling part. It can be quite a challenge to wrestle a 4' x 8' sheet home, especially without a big truck!

Introducing convenient, ship-to-home **PureBond Project Panels**, in a wide range of species choices, available through The Home Depot Canada website. (Just search for "Columbia Forest 2 ft" at HomeDepot.ca and you'll see these great choices!)

Panels include maple (in raw and pre-finished forms), red oak, white oak, aromatic cedar, walnut, poplar, birch, mahogany, alder, hickory, and innovative new Rough-Sawn faces in red oak and birch. Maple and walnut are also available with an exposed-edge "EuroPly" core. These 2' x 4' Project Panels are available in 1/4", 1/2" and 3/4" thicknesses.

PureBond Project Panels are made with a soy-based technology instead of added urea formaldehyde. Better for you in the workshop; and in your home!

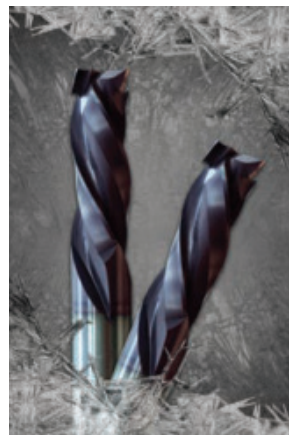
HomeDepot.ca (Search for "Columbia Forest 2 ft")



16" Nova Viking DVR Drill Press

The 1HP DVR (Digital Variable Reluctance) Smart Motor on this **King Canada 16" Nova Viking DVR Drill Press** doesn't have any belts, pulleys, brushes, permanent magnets, or electrical connections to moving parts, and no current flow in the rotor. This means you get smooth, vibration-free, constant torque drilling. The model 83705 features simplified menus, large icons, built in LEDs and laser guidance. It's capable of drilling wood, metals, plastics and glass.

KingCanada.com



Black ICE CNC Router Bits

Designed for CNC machines utilizing "nested base" manufacturing or "pod and rail" for high-speed applications in laminated materials, Freud Black I.C.E (Industrial Cooling Element) bits deliver double the cutting life and flawless finishes. The coating shields the solid carbide cutting edge by creating a slick, lubricant-like action for friction, heat and pitch build-up. Combined with Freud's exclusive TiCo (Titanium Cobalt) Hi-Density Carbide, these radical new

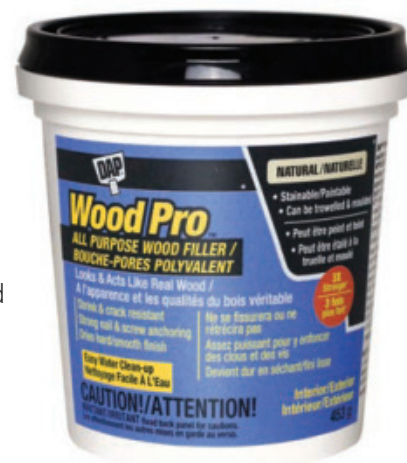
bits offer a sharper edge with precise cuts for less wear, resulting in two times increased life and performance compared to standard uncoated router bits. The bits are optimized for fast-feed rates and high-heat applications.

FreudTools.com

The All Purpose Latex Wood Filler

Cracks, gouges, holes and other surface defects happen. But with **DAP WOODPRO** you don't have to worry. This high-quality, latex-based indoor/outdoor wood filler is formulated to create a surface and body that looks and acts like real wood. You can use it for repairs on furniture, woodwork, moulding, cabinets, panelling, plywood, windows, doors and painted surfaces. This easy-to-use filler is low in odour and cleans up with water. The thick, knife-grade formula can be moulded and sculpted, making it ideal for corners as well as vertical and unsupported surfaces. It offers easy handling by spreading smoothly and evenly. When dry, DAP WOODPRO can be sanded, cut, planed, drilled, nailed or screwed, stained and painted. It's shrink-, crack-, and crumble-resistant, and provides strong nail and screw anchoring.

dap.ca



Wood Filler That Goes on Pink and Dries Natural

A distinct advantage of **DAP WOODPRO-X** is that it goes on pink so you can easily see the areas you're repairing, but then dries to a natural colour. The colour change lets you know when WOODPRO-X is cured, ready to be sanded, stained or painted. It's low in odour and cleans up with water. This all-purpose, high-quality, latex-based wood filler is formulated to create a surface and body that looks and acts like real wood. Use it to repair cracks, gouges, holes and other surface defects on indoor or outdoor furniture and woodwork, as well as moulding, cabinets, panelling, plywood, windows, doors and painted surfaces. The thick, knife-grade formula can be spread smoothly and evenly, and easily moulded and sculpted for corners as well as vertical and unsupported surfaces. Once it's dry, WOODPRO-X can be sanded, cut, planed, drilled, nailed or screwed, stained and painted, and it's shrink-, crack-, and crumble-resistant.

dap.ca



Miter Wood Blade

The **Norske Miter Wood Blade** is designed for all miter, sliding compound miter and radial arm saws. Thick micro-grain carbide teeth are precision sharpened on all sides. The laser-cut body incorporates anti-vibration and expansion slots.

Available in 80-tooth 10" and 12" sizes, this blade is ideal for professional cabinet makers and trim carpenters.

NorskeTools.com



Reversa Cut Framing Blade

With revolutionary TWIN TOOTH technology, the **Norske Reversa Cut Framing Blade** is the ultimate framing blade. Manufactured from Japanese tool steel, it features a radical bi-directional tooth profile that doubles the blade's

cutting life, effectively giving you two blades in one. This blade is specially designed for ripping and cross cutting dimensional lumber. The C3 micro-grain carbide teeth are precision sharpened on all sides for more precise cuts and longer cutting life. Available in 24-Tooth 5-3/8", 6-1/2", 7-1/4" and 8-1/4", and 28-Tooth 10" and 12" sizes.

NorskeTools.com

Composite Decking Blade

Specially designed to maximize cutting life in composite decking materials and cellular PVC, the **Norske Composite Decking Blade** features a Modified Triple Chip Grind (MTCG) tooth profile for clean, cool and "melt-free" cutting. The ultra-thin kerf design, along with a 5° hook tooth angle, provides fast and clean cuts with minimal material removal, while the Protec non-stick coating reduces drag and shields the blade against gumming, corrosion and heat. Available in 48-tooth 7-1/4", 64-tooth 10" and 72-tooth 12" sizes.

NorskeTools.com



Melamine Plus Blade

With a special 35° high ATB (Alternate Tooth Bevel) tooth design, the **Norske Melamine Plus Blade** provides ultra-smooth cutting of melamine, laminates, hardwoods and laminate flooring. The C3 micro-grain carbide teeth are precision sharpened on all sides. The laser-cut body incorporates anti-vibration and expansion slots. Available in 40-tooth 7-1/4" and 8-1/4" sizes and 10" (80-tooth) and 12" (100-tooth) sizes. An excellent choice for professional cabinet makers and trim carpenters.

NorskeTools.com



Sock-Tooth Framing Blade

The **Norske Sock-Tooth Blade** is designed to withstand extreme load and maximum impact. It features professional grade C-3 micro-grain tungsten carbide teeth that provide a superfine cutting edge and longer life. The teeth are precision ground (top, face and sides) for superior performance, while the thin kerf design maximizes cordless tools' battery life. The fully hardened high-grade tool steel body delivers superior performance in heavy load applications. The anti-kickback shoulder design eliminates grabbing and jamming. There are 11 blades to choose from in the Sock-Tooth line, ranging from a 24-Tooth 5-3/8" blade to a 60-Tooth 12" blade.

- Laser cut tooth seats that matches 100% the shape of the carbide that would be brazed in place.
- Maximize tooth support in both sides of the carbide (front and back).
- Increases brazing surfaces by 15%.
- Eliminate tooth forward movement if unexpected nail is encountered.

NorskeTools.com

Mast-R-Fence III Router Table Fence



No other router table fence performs quite like the **JessEm Mast-R-Fence III**. A red phenolic base pro-

vides a solid platform that has a 100% flat surface. The 6061 aluminum extrusion is precision machined and covered with a black anodized finish. The entire fence is constructed using stainless steel hardware and other components to give it a beautiful look that will last a lifetime. The maple sub-fences, which can be adjusted tool-free, are laser engraved. The dust port on the fence accepts either a 2-1/4" or 2-1/2" vacuum hose fitting.

Jessem.ca

Veritas Card Scraper/ Burnisher

A new take on typical single-handled burnishers, the **Veritas Card Scraper/Burnisher** permits a two-handed grip, improving control so you can roll precisely the sort of hook you



want on your scraper. As comfortable to grip as a spokeshave, it is held between the thumbs and forefingers, keeping your fingertips close to the carbide rod. This gives you much better tactile feedback, which helps you maintain control of both force and angle as you run it along the edge of a scraper (typically clamped in a vise). Made in Canada.

LeeValley.com



Veritas Small Fine-Tooth Crosscut Saw

Optimized for material 1/2" and thinner, the **Veritas Small Fine-Tooth Crosscut Saw** is designed for fine joinery projects. The teeth are set at

0.003" per side and are filed with a 15° rake and a 60° included angle. They also have alternating 15° bevels that act as small knives to sever wood fibers. This blade geometry provides a fluid starting cut, followed by a smooth and accurate final cut, with almost no tear-out. Made of high-carbon steel, the 22 tpi blade is 9-1/4" long and 0.020" thick, with a cut depth of about 1-9/16". Made in Canada.

LeeValley.com

Mite-R-Excel II Miter Gauge

A bold new class in a precision miter gauge, the **JessEm Mite-R-Excel II** features nine miter detents with a spring-loaded indexing pin that will ensure accurate cuts at the most common angles. The front fence extrusion is 20" long with a telescopic stop that extends up to 36".

The adjustable flip stop can be used with a sacrificial fence up to 3/4" thick. JessEm's patent pending fence locating knob will allow you to quickly reset your fence back to the correct distance to the blade. Bar snuggers ensure your miter gauge slides perfectly into the miter slot for smooth, perfect cuts every time.

Jessem.ca

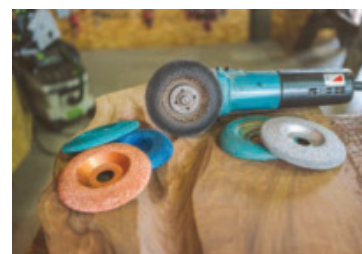


The Must-have, Most Versatile Angle Grinder Accessory

When it comes to freehand carving on your larger projects, no other tool gets the job done better than **Kutza Shaping Wheels**. Paired with a quality right angle grinder, these wheels have helped

skilled craftsmen create truly remarkable things. The rugged tungsten-carbide coating allows for superior material removal and outstanding wear life. With their minimal clogging and effortless control, you'll use them project after project.

Kutza.com



The Ultimate Man-Powered, Hand Shaping Instrument

Kutza Hand Rasps strike a fascinating balance between the shaping and smoothing function of a conventional file and the aggressive stock removal of a wood rasp. Each rasp is made with a rugged tungsten-carbide coating, providing you with an aggressive, multi-directional tool that will cut efficiently, resist loading and stay sharp project after project. Available in flat, half-round and warding.

Kutza.com





Sanding With Downdraft Tables

If you want a cleaner, healthier workshop, then you need to collect dust at the source with a **Sandman Downdraft Sanding Table**. They're portable, durable, quiet and powerful. For the serious hobbyist or for sanding smaller pieces, there's the Sand Pro M4826 with a 48" wide top. Larger dedicated stations,

like the Sand Pro DL9648, provide 96" wide surfaces that double as a workbench. For objects too large for sanding tables, there's the Sand Pro Sanding Booth SBP10, a complete self-contained 9,300 CFM backdraft unit. With the Sand Pro Inspection Light you can easily see scratches, swirl marks and other imperfections before the material is finished.

SandManProducts.com



Rali Cut Disc Cutting Machine

The **RALI Cut disk cutting machine** is the perfect tool for making successive rapid, clean and precise cuts on wood, steel and plastic up

to 25mm/0.98" in diameter. It enables you to cut solid and hollow pipes and square stock, as well as shorten screws and bolts, and make a precise range of angle cuts with the angle cut accessory (sold separately). Also includes a deburring wheel that quickly deburrs and finishes.

TersaKnives.com



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A new revolutionary product without methylene chloride, NMP, or other highly toxic chemicals.

Super Remover is North America's strongest and safest paint and varnish remover in its product category. This new formula does not contain any EPA Hazardous Air Pollutants or California Prop 65 chemicals. Super Remover effectively removes up to five coating layers and works on most coatings – it's safe for use on wood, metal and masonry. Easy water cleanup.

SuperRemover.com



Dust Deputy Deluxe Cyclone Separator Kit

Upgrade any make and model wet/dry vacuum into a two-stage dust control system with the patented **Oneida-Air Dust Deputy** cyclone separator. It removes over 99% of dust and debris from the airstream, containing it in an easy-to-empty five-gallon bucket before it ever reaches the vacuum — virtually eliminating filter clogging and suction loss. The kit includes

everything you need to connect to a shop vacuum including, 3' vacuum connection hose, elbow adapters, caster wheels and a dual "sidecar" bucket for mounting to the vacuum directly.

Oneida-Air.com

Instant Bond Adhesive

Titebond Instant Bond ethyl-cyanoacrylate-based adhesives offer ultimate strength, speed and versatility for Canadian woodworkers and DIYers. This product bonds almost virtually anything, fast, without clamping. Four viscosities - thin, medium, thick and gel - offer set times from three to 60 seconds, and a spritz of Instant Bond Accelerator quickens cure time to split seconds. Titebond Instant Bond provides a strong, permanent bond and is ideal for hard to reach joints or surface areas that are difficult to clamp. Designed primarily for wood and wood products, this adhesive is also very effective on a wide variety of materials and substrates. In addition to typical bonding applications, it is ideal for filling knots and voids in wood, adhering pen tubes to blanks for pen-turning applications, and for soaking end-grain to prevent splitting. It's triple distilled for purity and consistency, offers a two-year shelf life and is certified for use in Canada.

Titebond.com



Air Stealth N100 Safety Respirator

The **Trend Air Stealth** is a new generation N100 half-mask respirator with dramatically improved features that will benefit users in low and strenuous activities for extended periods of time. This lightweight and compact half-mask respirator fits under visors, safety glasses and all personal protective equipment. The industry best 99.97% filter efficiency (to 0.3 microns) is attributed to a special HEPAC filter material (exclusive to Trend) in combination with a unique protective grill that deflects dust away from the dual filters. The Thermoplastic Elastomer (TPE) special medical-grade material moulds to the face immediately and the unique one-strap pull mechanism keeps the mask secure and snug. The large non-return exhaust valve points downward which assists in ease of breathing and virtually eliminates the fogging of visors and safety glasses. The unique blend of next-generation features makes the Trend Stealth over three times easier to breath with than other typical N100 half-masks. The Trend respirator is ideal for all non-oil based airborne particles, mists and fumes. Trend Stealth half-mask respirators come in small/medium and medium/large sizes and N100 replacement filter pairs are available individually and in five packs for heavy users. Nuisance N100 filters are also available.

Trend-UK.com



Mid-Sized Full-Featured Lathe

The **Laguna Revo 15|24** lathe fills the gap between the compact Revo 12|16 and the full-size legendary Revo 18|36, providing space-constrained users with more power and capacity. Key features include: a super-smooth steel bed (not cast iron) that provides strength and stability; a surface

that the banjo glides across smoothly; a sliding headstock for ergonomic outboard bowl turning; infinite electronic variable speed from 50 to 4,200 RPM with a three-step pulley; Laguna Pulse Width Modulation that delivers extraordinary torque even at low speed; and adjustable-height legs that allow a more ergonomic working position tailored to individual needs.

LagunaTools.com

Variable Speed Benchtop Lathe

With the **King Canada KWL-813VS** lathe you can turn stock up to 8" diameter over the bed and up to 13" long, making

it ideal for pens and other small detailed turnings. The high-performance 1/3 HP motor delivers variable speeds from 750 to 3,200 RPM. The lathe features precision-machined cast-iron bedway, headstock and tailstock construction to ensure stability and minimize vibration for smoother turning. It comes complete with 4-1/4" and 7" tool rests with 1/2" post diameter; 5-3/4" faceplate; MT#1 live center and MT#1 spur center; steel knock-out bar; and adjustment keys and hex keys.

KingCanada.com



10" Sliding Table Tile Saw

Cut tiles easily, quickly and efficiently with the **King Canada KC-3310TS** tile saw. It's powered by a heavy duty 2.5 HP, 15 amp motor with a GFCI protected power cord. It has a 3-3/4" cutting depth and a 24" cutting capacity at 90° and 18" at 45°. The head tilts 0° to

45° for bevel cuts. Two removable rubber nozzles maximize water efficiency to the blade and provide easy maintenance. A convenient laser guide system indicates the cut line and an LED light improves visibility. The saw comes complete with a folding stand, 10" diamond continuous rim blade, aluminum rip guide, blade wrench and hex key.

KingCanada.com

Dual Fuel Generator

With a powerful 18 HP, 4-stroke, air-cooled OHV engine, the **King Canada Dual Fuel Generator KCG-12001DF** is perfect for home or workshop backup and for jobsite use

without power hooked up. You can run the generator on either gasoline or propane. It features an automatic voltage regulator and electronic ignition and an auto low oil shut-off to protect the engine. The KCG-12001DF has six receptacles: 120V appliances; 120V NEMA L5-30 plugs; and 120/240V NEMA 14-50R plugs.

KingCanada.com



Mini-Mite 4 PLATINUM

The **Fuji Spray Mini-Mite 4 PLATINUM** HVLP spray system is a real favourite with cabinet makers and other professionals. This award-winning model is equipped with a Heat Dissipation Chamber that removes any heat build-up from the turbine case, and Noise Reduction Covers that reduce noise for a quieter overall spray experience. The four-stage turbine, which develops 9.0 psi, is powerful, portable and perfect for all fine finishing. Additional power allows the user to apply heavier coatings and thicker viscosity finishes faster and with less time spent on preparation of materials. The system is easy to operate and maintain. Included with the turbine are a professional grade non-bleed spray gun, 25-foot Hi-Flex hose, #4 Ford viscosity cup, wrench and cleaning brush. Comes with a two-year warranty on parts and labour.

FujiSpray.com



Handheld CNC Router

Bring the most advanced precision cutting solution to your workshop. The **Shaper Origin** and **Shaper Workstation** combine to make even the most demanding projects approachable and intuitive. Enjoy unrivalled precision cutting for a variety of applications — create complex joinery, tight-fitting box joints and much more. Origin + Workstation is the “complete system” solution to unlocking next-level projects in your shop.

ShaperTools.com

shopnews

Hultafors at Big Bear Tools

Sponsored: Hultafors Group is the proud winner of this year's iF Design Award for its Dry Marker HDM and SFRP 18 A Snap-off Knife. For 67 years the iF Design Award has been the benchmark for quality and exceptional design. With 7,298 entries from 56 countries it was an intense competition, with Hultafors proudly taking home one of the most important design prizes in the world. Hultafors products are available for wholesale through Big Bear Tools in Langley B.C. Please see **www.bigbeartools.com** for information regarding becoming a dealer of these, and other, innovative and high-quality products.





Magnum Industrial 13" Helical Head Planer

With 26 double-sided long-lasting carbide inserts and a precise helical cutterhead, the versatile **Magnum Industrial 31-160 13" Helical Head Planer** excels in short-run applications with either hard or soft wood. It features a 15 Amp motor that delivers a 10,000 RPM cutterhead speed at a feed speed of 26 FPM. Its redesigned infeed and outfeed tables fold up for easy storage and feature four adjustable support posts to minimize snipe. You can plane stock as short as 5" in length and up to 6" thick. This portable planer is ideal for small shops and jobsite applications where a high-quality finish is critical.

KMStools.com

Magnum Industrial Deluxe 14" Wood Band Saw

Whether you are buying your first band saw or looking to upgrade, the **Magnum Industrial 91-350 Deluxe 14" Wood Band Saw** offers performance and versatility at an outstanding price. Designed to meet the needs of small to medium shops, its dual voltage 1HP motor, pre-wired for 120V, delivers dual blade speeds of 1,800 and 3,000 FPM. Features include a 6" resaw capacity and 13" cutting width, ball bearing guides, heavy cast-iron dynamically balanced wheels and cast-iron frame, a 16" square table that tilts 10° to the left and 45° to the right, a deluxe fence system, and a 4" dust collection outlet.

KMStools.com



Magnum Industrial Heavy-Duty 12" Disc Sander

The **Magnum Industrial MI-16240 Heavy-Duty 12" Disc Sander** is designed and manufactured to provide long-lasting service for busy production shops, educational facilities and serious woodworking enthusiasts. Powered by a 1HP motor, its 12" precision-ground cast-iron disc spins at 1,720 rpm, so you can accurately and efficiently sand workpieces of various shapes and sizes. The cast-iron table has a tilt range of +15° to -40° with crossing mitre slots. These features make it easier to perform repeatable sanding tasks, especially helpful in production settings. Includes a on/off switch with large STOP paddle that allows for quick, easy shut-down.

KMStools.com



Magnum Industrial 1 HP Two-Bag Dust Collector

The fully enclosed continuous-duty 1HP motor on the **Magnum Industrial 11-100 1 HP Two-Bag Dust Collector** provides an air flow capacity of 750 CFM, yet only draws 7 Amps of power. It has a washable 2 micron filter bag and a 20 gallon clear plastic bottom

dust collection bag. Quick-release metal straps secure both bags and allow quick bag changes. Built-in swivel-style casters deliver excellent mobility, allowing you to position the 11-100 close to machinery to collect dust at its source. It's the perfect dust collector for professionals and serious hobbyists working in smaller shops.

KMStools.com

Magnum Industrial 8" Jointer

The **Magnum Industrial MI-81360 8" Jointer** is tough enough for commercial applications, yet it's also right at home in smaller workshops. Featuring a rugged 2 HP motor that delivers a 5,500 RPM cutterhead speed, a helical cutterhead with 22 carbide inserts, and an extra-long (73") ground cast-iron table, this jointer is designed to deliver high-quality, accurate results time after time. The centre-mount fence features double keyways for added stability, and a rack-and-pinion fence adjustment allows for quick, precise adjustments. Includes hand paddles and magnetic safety switch.

KMStools.com



Magnum Industrial 10" 1.75 HP Cabinet Saw

Equipped with a true 1.75 HP motor, the **Magnum Industrial MI-51180 10" 1.75 HP Cabinet Saw** is among the most powerful 110-volt cabinet saws available. And it arrives prewired for 110 volts—no rewiring necessary. The saw features a router table extension wing and deluxe self-aligning rip fence assembly, as well as base-mounted trunnions for stable, vibration-free operation. Its trunnion guides are silicone-coated for smooth action when raising and lowering the blade, and a forged one-piece blade arbor limits runout, helping to make this saw both durable and precise. For even more power, it converts to 220 volts—further adding to the MI-51180's versatility.

KMStools.com



10

WOODWORKING RULES OF THUMB (and exceptions)

You know the old saying - there's an exception to every rule. This applies to woodworking, too. Here are some woodworking rules of thumb, along with why each rule is valid, and when it's okay to break the rule.

BY CHRIS WONG

Mitre Gauge Danger – Using a mitre gauge and rip fence at the same time can result in an airborne workpiece if the outcut gets trapped between the fence and the rip fence and it's not being held in place. Sliding the rip fence behind the blade, or using a thick enough stop block clamped to the fence, are both workarounds to the rule.
(Photo by Chris Wong)

Photos by Rob Brown

Never use a table saw miter gauge and rip fence for the same cut

This rule exists to help prevent kickback. If your miter gauge is to the left of the blade, and you're using the rip fence to the right of the blade as a stop, once the workpiece is cut through, the offcut will be trapped between the blade and the fence and could easily get thrown backwards by the back teeth of the saw blade.

Using the rip fence as a stop for repeat crosscuts done with a miter gauge is logical, and there is a safe way to do it. The key is to ensure the offcut is free to move away from the blade after the cut is made. This can be achieved with a block of wood clamped to the rip fence (just subtract the width of the wood from your fence reading), or by sliding the fence back on a European-style fence (e.g. Unifence).

If at any point you are not controlling a piece of material trapped between the rip fence and blade, it is a kickback hazard. A short fence or stop block needs to be set back far enough that by the time the material is separated, it is beyond the fence or stop block.



Rule of Thirds – While the 'rule of thirds' often makes sense to adhere to, when members of a different thickness are to be joined, it's more important to concentrate on making the joint as strong as possible.

to one but not the other. For example, I might cut a 1/2" thick tenon on a 3/4" thick table apron and cut the matching 1/2" wide mortise into a 2" leg. Another instance to ignore the rule is when joining materials with dissimilar strengths. If using a hardwood spline to join two MDF parts, use a tenon less than one-third the thickness of the particleboard because the hardwood tenon is very strong and the particleboard is comparatively weak.

In the end, the goal is to create a strong joint by ensuring that each part is equally strong.

Rule of thirds for joinery

This rule states that for housed joints, such as mortises and tenons, the thickness of each component should be a third of the overall thickness. For example, if using 3/4" thick stock, the tenon and each mortise cheek should be 1/4" thick. This is to ensure that each component is not weakened more than others. In the case of the mortise and tenon joint, a 1/2" thick tenon is definitely stronger than a 1/4" one, but if this means reducing the cheek thickness to 1/8" in creating a stronger tenon, we have weakened another part and will result in a joint that is weaker overall.

When would you want to deviate from this rule? If two parts being joined are of uneven thickness, the rule of thirds may apply

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Proportions are Important – A workpiece is usually longer than it is wide, and if crosscut with a rip fence, can send the workpiece flying. When the workpiece is actually wider than it is long, or isn't too far off from being evenly proportioned, the likelihood of an accident is extremely low. (Photo by Chris Wong)

Never use the rip fence for crosscuts on a table saw

This rule is also about preventing kickback. The less material registered against the rip fence and the further away from the blade the fence is positioned, the greater the risk. If the workpiece rotates away from the fence, kickback is probable.

This rule assumes that the material length (the dimension in which the grain runs) is always longer than the width (the dimension in which the grain runs across). I feel it's okay to crosscut a board which is close to square or wider than long with regards to grain.

Always feed against the rotation of the cutter

Another kickback rule. Feeding with the rotation of the cutter can be very dangerous, as it is harder to maintain control and can lead to a workpiece suddenly becoming a projectile. There is the risk of damage or injury caused by the flying workpiece, and to your hands that used to be holding the wood if they are near or moving towards the cutter, or even if your hands get in the way of the quickly moving workpiece.

Cutting with the rotation of the cutter, or climb cutting as it's known, is a useful technique that can be safely done with a hand-held router - in fact, I teach climb cutting in my entry-level router seminars. Always take light cuts, and be aware of knots or other trouble areas that might be harder or more likely to grab and cause a catch. Start with a smaller diameter bit if you haven't tried the technique.

Climb cutting is also acceptable when using a power feeder or other equipment that controls the movement of both the workpiece and cutter, such as a CNC router.

Climb Cutting – Moving the workpiece in the same direction the cutter is spinning has caused many problems to unsuspecting woodworkers. Taking off a very small amount of material per pass, or using a power feeder to feed the workpiece, is much safer and also has some other advantages.





Seasonal Movement – A solid wood panel which is glued into a groove will very likely cause the panel to split. Adding a dab of glue to only the center of the groove will stop the panel from rattling or shifting, yet will allow the panel to grow and shrink in width.

Never glue in a floating panel

This rule also applies to breadboard ends, and other cross-grain assemblies. A frame and panel door relies on a four-piece frame to minimize any changes in size. The panel sits in a groove and is given room to expand and contract freely within the frame. Generally, floating panels are made of flat sawn solid wood with grain running vertically that could expand and contract horizontally by 1/4" or more seasonally across the grain. Conversely, the rails, with grain running horizontally, may not register a measurable change in dimension horizontally. Running a bead of glue down the groove of the rail during assembly would result in a broken panel because

the panel will want to either expand or contract and the rail will not. Eventually, the panel will split.

One annoying thing about frame and panel doors is that sometimes the panels shrink so much that they rattle. There are a number of solutions, but the simplest is to apply a small amount of glue in the rail's groove at a single point at each end. This is usually right in the center of a door panel, but may be at one end of a breadboard cap. The glue will keep the panel from rattling, and still allow horizontal expansion. If you use sheet goods for your panels that are dimensionally stable, you can apply glue all around the frame. This can substantially increase the strength of the door.

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* Compatible with wet/dry vacuums only - not for use with low pressure wood dust collectors.

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No Splits – Many situations call for a healthy predrill diameter in order to stop splitting. There are also times when drilling too large of a predrill hole will reduce the screw's ability to hold onto the material. (Photo by Chris Wong)

Pre-drill for screws with drill bit equal to root

The root of a screw is what you have left if you remove the threads. Using too large of a drill bit to predrill reduces the amount of material for the screw threads to engage, lessening the screw's holding power.

For hard woods, this is a good rule. Drilling a smaller hole, or not drilling one at all, will increase the chance of the wood splitting when driving the screw. However, for softer woods which compress, choosing a drill bit 1/64" or 1/32" smaller is a good idea. Some screws have a self-drilling tip (look for a section of missing threads) that are capable of being driven in some situations without a pilot hole. Remember that a workpiece is more likely to split if it is narrow, very dense, has compromised grain strength (e.g. an existing split or other defect), if the screw is near an end, or multiple screws are going in the same line of grain. When in doubt, test, or pre-drill.

Sharpen your blades at 25°-30°

A bevel angle for a chisel produces an edge sharp enough to cut well and is also strong and durable enough not to need sharpening too frequently. In a bench plane, this angle range affords enough clearance for springback so the plane can cut effectively, and a lower angle would affect edge retention without a proportionate benefit elsewhere since the effective cutting angle isn't being changed.

For general-use chisels, 25°-30° is fine. However, chisels for fine work such as paring can be sharpened at a much lower angle such as 20°, or even 15°. A blade sharpened this way cuts with noticeably less effort and easily shaves end grain. However, the thin edge is more fragile and more likely to require sharpening sooner. For tough tasks such as chopping mortises, an angle 30° or higher will ensure the edge is durable enough to drive with a mallet to cut many mortises.

When sharpening bevel-up planes, such as block planes and low-angle planes, the bevel on the blade affects the effective cutting angle, so must be taken into account when choosing a cutting angle. Lower angles require less effort to push through a cut, but higher angles can produce cleaner cuts in difficult grains.



The Perfect Angle – What angle your edge needs depends on a lot of factors. While 25°-30° is a good middle ground, there are times when a steeper or shallower angle might work best. (Photo by Chris Wong)

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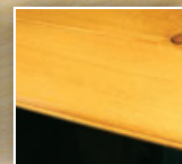
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Sneak Up to a Perfect Fit – There are many ways to fine tune the amount of wood to remove to get the perfect fit. One approach is to use a wood block clamped to a fence with a screw in its end. The screw can be turned slightly to adjust the amount of material being removed.

Measure twice, cut once

Perhaps the most well-known rule of thumb, this one suggests that you double check your measurement before cutting.

When the highest level of precision is required, I would instead suggest measuring twice and cutting two or more times. If using a machine, set up and cut a test piece (preferably of the same material as the actual part). Check the fit of the test piece and, if required, make adjustments and cut another test piece. Once satisfied with the fit, cut the actual part. If using hand tools, cut it once oversized, then trim it to fit with a plane or chisel, pausing frequently to check the fit.

When exactness is not required, there may not be a need to measure at all, let alone a second time.

Your workbench should be at the same height as the palm of your hand resting at your side

This is a time-tested height for using hand planes and doing other handwork at the bench. For me, this measurement is 31".

However, depending on what kind of work you do, and what tools you use and your personal preferences, this could vary quite a bit. When using a router, you may prefer to work at a much greater height, with the bench top up around your elbows (around 43" for me). Without such a bench, I find I am often crouching to get a better angle to see the bit.

The Moxon vise and bench-on-bench concepts have gained popularity in recent years. They effectively increase the height of your bench by 8" or more and reduce stooping when cutting joinery by hand and doing other intricate tasks. As an experiment, I used a 42" tall workbench for a year and I quite liked it. It was, however, difficult to use when planing large workpieces as my reach was reduced. When doing detail work at the tall bench, I tended to sit on a stool at the bench.

And, of course, if you sit on the ground when working, as is traditional for the Japanese, the work surface can be much lower.

Don't forget to consider the typical range of workpiece heights when you choose your workbench height, since most work happens not directly on the workbench top, but on top of the material on the bench. Build a shorter bench if you work with a lot of 8" thick timbers.



Moxon Vise – A Moxon vise is a great way get a closer look at your work. There are many other ways to adjust the position and height of a workpiece. The right decision depends on your specific situation.



Against the Grain – As long as your tools are sharp, working across the grain will shear the fibres of the wood, reducing tear-out. (Photo by Chris Wong)

Always work with the grain

Working with the grain usually produces the smoothest surface when cutting. When abrading the surface, the scratches in-line

with the grain are more difficult to differentiate from wood grain and therefore less visible.

Working across the grain has its benefits, too. Stock removal with a belt sander or hand plane is significantly quicker when working perpendicular to the grain direction. Some highly figured woods – especially those with reversing grain – can be smoothed most successfully without tear-out with a finely set plane working across the grain. Shear-cut planing heads work in a similar manner and as a result can produce a smooth surface regardless of figure or direction of grain.

Chris is a self-taught woodworker who builds sculptural furniture, live-edge cribbage boards and more. As a father of two young boys, he feels he must teach rules and enforce them without exception.



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Build a TALL VISE

Raising a small- to medium-sized workpiece that you're working on will allow you to see it more clearly, and will ease the stress on your back. This tall vise will give you lots of options when dealing with the finer points of sawing and paring.



Cross Pieces – The magic parts that makes this vise work properly are the cross pieces that keep the jaws parallel during use. Start off by taping them together and drilling a hole in the center of the pair.

BY STEVEN DER-GARABEDIAN

I've been wanting to do this project for quite some time. While I have a Moxon vise that I built more than five years ago, I don't seem to use it as much as I thought I would. The Moxon vise raises my work above my bench, however, I wanted to hold my work a bit higher, hence this tall vise.

I also wanted to prove that it could be made this way. In fact, I made a couple versions out of standard 2 × 4s that proved my theory and got me excited. Most shop-made versions have a post or indexed bar at the bottom of the jaws in order to keep them parallel. We're going to go a different route and make ours using a mechanism sometimes called a St. Peter's cross. The scissor-like action has been utilized in keeping all manner of items parallel for a very long time.

What's in a name?

I think this might be a good time to put names to our parts. These labels are nothing new and you're probably familiar with them already. The wooden part of the vise that is on the inside and doesn't move is called a leg. The matting piece is typically called a chop. The scissor-like pieces we will call a cross and the thin plate that sits in the mortise, and that the bottom half of the cross presses against, we'll name the rub plate. Lastly, the cleat is how we will attach this tall vise to our work surface.

Where wood meets metal

We will need four pieces of flat steel and a short piece of round bar. My home centre didn't have the exact sizes I needed, but give yours a try. I ended up at Metal Supermarkets and the staff there were very helpful to a woodworker who knows very little of their world. I did a bit of research and ended up settling on hot-rolled steel, which is not as precisely milled as cold-rolled, but very close. We will need two pieces, 1/4" × 3/4" × 9". These will become our cross pieces. We will also need a pair of 1/8" × 1/2" × 6" pieces for the rub plate. Lastly, purchase a short length of 1/4" round bar, enough to get two 4" pieces. The cost of all these pieces came to less than \$12.

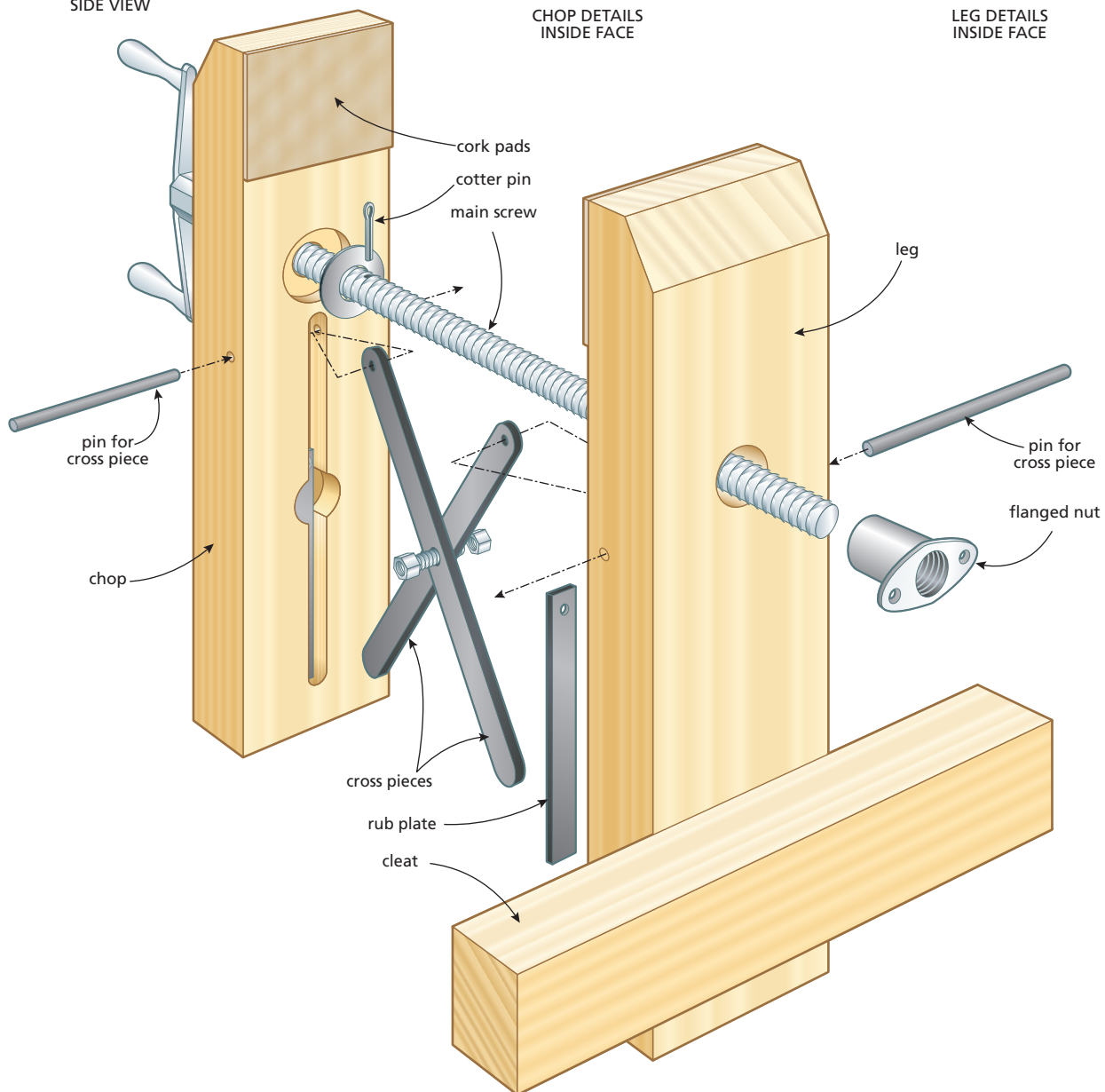
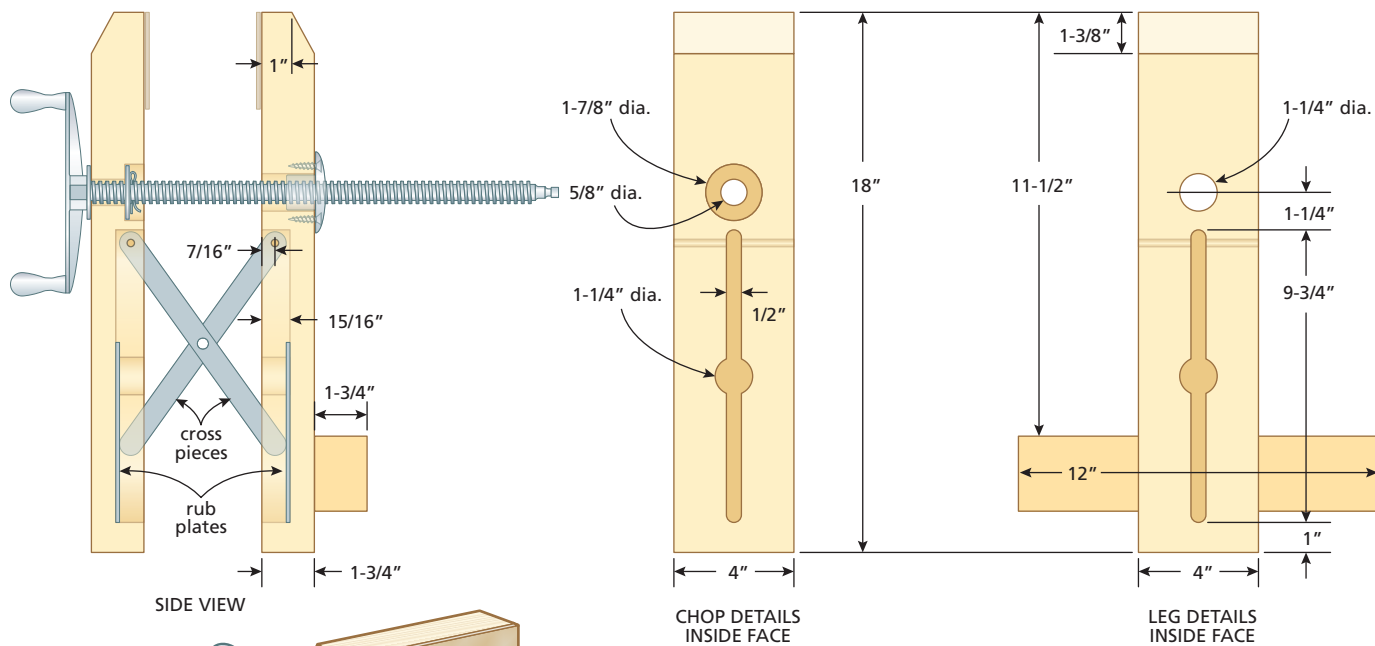


Oil Helps – Drilling metal is similar to drilling wood, but with a few main differences. Oil will help lubricate the bit. Also note the clamp that will act as a stop if the metal parts grab the drill bit and cause the metal to spin out of control.

At the hardware store, I picked up some other needed items, including a 5/16" × 1" carriage bolt whose head we will cut off. I wanted to find a matching washer but the normal washers seemed to be a bit on the thick side so I wandered through the bulk section until I found a metric washer that was slightly thinner. You'll also need a 5/32" cotter pin, a pair of 5/8" fender washers, a pair of 5/16" lock washers, one regular 5/16" washer and a pair of 5/16" × 2-1/2" lag bolts and washers.

For the main screw, I had a leftover Shop Fox veneer press screw available from woodworking stores or Amazon. I've seen these screws as low as \$12 and as high as \$30. While the action of the acme threads on these screws is not perfect, they worked extremely well for this application. Another option is to use a bench vise screw, although the ones I found seemed a bit on the long side. A second option is to buy a length of acme threaded rod and matching nut and make your own handle.

Finally, we are also going to need some wood. I found a nice 4' piece of European beech that gave me all the parts for this vise.





Round Their Ends – As these metal cross pieces will be rotating when they're fixed in place, their ends need to be rounded to allow for the rotation.



Cross Pieces – Once the parts are cut to equal length and joined in the middle, the cross brace structure is simple and effective.

You'll need two pieces that are $1\frac{3}{4}" \times 4" \times 18"$. You'll also need a cleat that will let you attach it to your bench that is $1\frac{3}{4}" \times 2\frac{1}{2}" \times 12"$.

Get to work

We will first work on our cross, and it is easier and more accurate if we temporarily join them. Flush up the two pieces and simply wrap masking tape around both ends. Now that's my kind of metal-working. Find the center, and using a center punch, create a dimple for a twist bit to settle on. Drilling metal is not quite like drilling wood. I've had pieces grab and rotate on me so I locked down the drill press table and also set up a clamp that would act as a stop should the drill bit catch. I found a piece of scrap hardwood and clamped the bar to it perfectly centered under the $\frac{5}{16}"$ drill. You may find it easier to drill a smaller hole before drilling the larger hole. This helps keep the location exact.

By using some oil and a sharp bit, the drilling went smoothly. Cut the head off the carriage bolt, leaving it as long as possible for now. Run the regular nut at the opposite end of the cut and thread it through to straighten out any bent threads. Next, place a lock nut on one end, then both pieces of the flat bar. Lock it in place with the regular nut. You can also leave the tape on.



Rub Plate – Just because you're already at the drill press, it's a good time to drill a screw clearance hole as well as counter sink the hole in one end of both the rub plates. Again, notice the workpiece positioned against the clamp in case the bit catches it.

My grinder came with a wheel that was not good for anything to do with woodworking until now. For the cross to work smoothly, and for clearance, we need to round both ends. Grind these radiuses, checking your progress often, and dip the ends in cold water as they get hot. The curve doesn't have to be absolutely perfect, but get it as close as possible. A file will refine it a bit



Mock-up – To ensure the dimensions of the parts are appropriate for grasping workpieces, Der-Garabedian makes a quick and simple mock-up with 2×4 stock.



Marking the Mortise – Lay out the mortise location on the workpieces so the likelihood of a mistake is reduced.

more as well as remove any burrs that develop from drilling and grinding.

Next, we are going to need a 1/4" diameter hole with which to pin the top of the cross to the wooden vise pieces. Locate this hole 3/8" down and center it across the width of the components. With them locked together, use a center punch to mark the location. Drill the hole using a 1/4" twist bit along with some oil. Remove the regular nut and one of the cross pieces. Place the thin washer between the two pieces and lock it in place with the remaining lock nut. Trim the length of the now decapitated bolt flush with the nut.



Create the Mortise

– Making multiple passes, Der-Garabedian used a router table to create the mortises in the two main wood workpieces. The rub plate will eventually be fixed in place at the base of this mortise.

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Thread Hardware – Holes to accept the thread hardware are now marked. To determine the depth of these holes requires a bit of math.

While you're at the drill press, drill the holes needed at one end of each of the rub plates. The diameter of this hole needs to be $11/64$ " and countersunk for a flat head wood screw. Drill this hole centered across the plate and $3/8$ " down from the end.

Back to working wood

Mill up your chop and leg pieces, as well as the cleat. Use the cabinet maker's triangle to keep track of which part is which, as well as what is the inside, outside, top and bottom of the pair.

Start off by marking the mortise that will house the rub plate and cross. This mortise is centered across the width and starts 1" from the bottom of both the chop and leg. It will be $9-3/4$ " long. Find and mark the center one inch of this line. Create a dimple for the point of a $1-1/4$ " Forstner bit using an awl. This hole is for the pivot point of the cross, needs to be $15/16$ " deep and can be drilled now. Using your router and a $1/2$ " wide bit, create the $15/16$ " deep mortise along your mark on the chop and leg. This should be done with multiple passes.

Next, mark the location of the hole for the main screw, but don't drill it quite yet. We will start off with the larger hole for the inside fender washer on the chop. To determine the depth, drill a hole in the main screw for the cotter pin.

The combination of the fender washers and cotter pin act as a garter, pulling and pushing the chop back and forth. Without it we would manually have to pull the chop open when opening the



Cotter Pin Hole – In order for the chop to open every time the thread is rotated counter-clockwise, a washer needs to be held in place on the thread with a cotter pin. Der-Garabedian bores a small hole now to accept the cotter pin.

vise. Using a drill vise, clamp the main screw and drill a $5/32$ " hole in the center, $1-1/2$ " down from the inside of the handle. Use oil as before and proceed slowly. Put the two fender washers and the cotter pin on the screw. Measure the distance between the two washers. This number (in my case $1-1/4$ ") needs to be subtracted from the thickness of the chop, which is $1-3/4$ ", to determine how deep to drill the clearance hole for the fender washer. In my case, it was $1/2$ " deep using a $1-7/8$ " diameter Forstner bit. Center this hole $1-1/4$ " above the top of the mortise.

Drill a $5/8$ " hole for the main screw in the chop using the Forstner bit's center point as your starting point. The nut on the leg side needs a $1-1/4$ " through hole once more centered $1-1/4$ " above the top of the mortise. Secure the nut using two $\#8 \times 1$ " screws with the flange located on the outside.

A couple more holes

Transfer the center of the $1/4$ " holes in the cross to their side. Seat the cross in the chop's mortise and transfer this mark to the chop. Carry this mark around the side and, using an awl, dimple a mark $7/16$ " back. Repeat this process for the leg. Next, using a $1/4$ " bit, drill a through hole for the two pins. My drill press doesn't have the drilling depth to go through a 4" wide piece. To work around this, I drilled the hole as far as I could, then moved the table up a couple of inches, allowing me to drill right through. You may also find that you need a long series drill bit to finish these holes.

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How Thick? – With the cotter pin holes drilled in the thread and the washers in place, you can measure the distance between the inner faces of the washers. This should be the thickness of the material left between the washers in the chop.

Almost there

To allow a bit more access to the item being clamped, we'll need to remove some of the squareness at the top of the vise. I ended up cutting a chamfer, although an ogee would work just as well. This can be initially cut on the band saw then smoothed with a block plane or even with sanding. Be careful not to thin the top too

much. I started the cut 1" back from the inside and finished it at a point 1-3/8" down, creating a roughly 30° angle.

I chose to place the cleat 11-1/2" down from the top of the leg. Normally a cleat like this sits on top of the bench and the whole assembly is secured with clamps or hold-downs. With a lower placement of the cleat, I can secure it below the bench or above if I want a bit more height. If I need it a little lower still, I could place a filler piece between the top of the cleat and the bottom of the bench. Temporarily clamp the leg to your work surface and determine what works best for you.

Take care in securing the cleat perpendicular to the leg. Find your center points on both pieces and clamp it in place, double checking its alignment with a square. Drill clearance holes for the washers and finally pilot holes. Remove the clamp and create clearance holes in the cleat with a 5/16" bit. With some glue and the pair of bolts, attach the cleat to the leg.

In order to insert and bend the cotter pin, cut the sliver of wood between the top of the mortise and fender hole on the chop. Using a sharp chisel, carefully remove this material. Place a fender washer on the main screw and push it onto the chop. Place the other washer on the screw and secure it all with the cotter pin. To help cut down on friction, place some wax between the washers and the



Pin Locations – A pin, which extends through the full width of the chop and leg, will hold the upper ends of the two cross pieces in place. Der-Garabedian is marking the pin locations here, and will drill them on his drill press.



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chop. At this point we can also install the rub plates. Secure them in each mortise with a #8 x 3/4" flat head wood screw ensuring they are pushed towards the bottom of each piece and bottomed out in the mortise.

Start clamping

Stand the chop and the leg assembly and thread them together about an inch or so. Insert the cross and pin one side to the chop

The Cleft – Clamp the cleft in place, ensuring it's perpendicular to the leg before drilling clearance holes for the bolts. When the pilot holes in the leg are drilled, apply glue and bring the two parts together for good.

and the other to the leg using the 1/4" rods. I cut mine just shy of 4" so they would be slightly recessed. I used a pair of PG Series clamps from Bessey Tools to secure the vise to my workbench.

The full opening of the clamp is just over 4", although I haven't really clamped anything wider than 3". This tall vise works

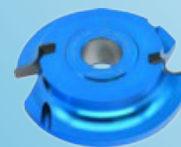
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Tidy Things Up – A small amount of waste needs to be removed between the top of the mortise and the hole. This waste gets in the way of properly installing the cotter pin.



Bend it Like Der-Garabedian – The cotter pin can be slid in place and bent into position. This secures the chop to the thread during use.



Reduce Friction – At this point the rub plate can be screwed into place inside the routed mortise.



Drive in the Pin – Der-Garabedian inserts the pin through the sides of the two main sections of the vise, fixing the top of the cross parts to the chop and leg.



Soften the Grip – Cork, or another softer material, can be applied to the working faces of the chop and leg. Although you can skip this step, it will help ensure the workpieces you work on down the road won't be marred while in the vise.

extremely well and I found I could actually move my bench after securely clamping a piece of wood in the vise. While the chop wiggles a bit when not clamping, once a piece of wood is placed between the jaws, this vise bites down hard. I found the perfect tension is about a quarter turn past the point where the jaws first contact the wood.

When looking at the vises on my bench, I noticed that the top

of the jaws would touch slightly before the bottom. I found this to be the case with my tall vise as well. If this is not the case for you, remove some material from the bottom of the chop, either with a hand plane or with some careful sanding.

I lined the jaws with PSA cork, but leather or even leaving it raw will also work just fine. If you plan on holding round or odd-shaped objects, some V-notches might work for you. My plan after assembling and testing the vise was to take it all apart and spray paint the metal parts to inhibit rust and even help the cross slide better. However, I've found it handy and have been using it so much that I don't want to take the time to stop.

A number of years ago I tried making a leg vise in the same manner, but I found with the longer cross pieces they flexed quite a bit. I was never truly happy with the results. That's not an issue with the shorter pieces in this tall vise.

Steve has decided to stick with woodworking, even after numerous calls to play the next James Bond. Building this vise was the deciding factor, as he hasn't stopped using it.

STEVEN DER-GARABEDIAN
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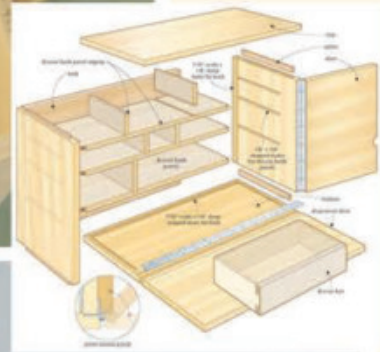
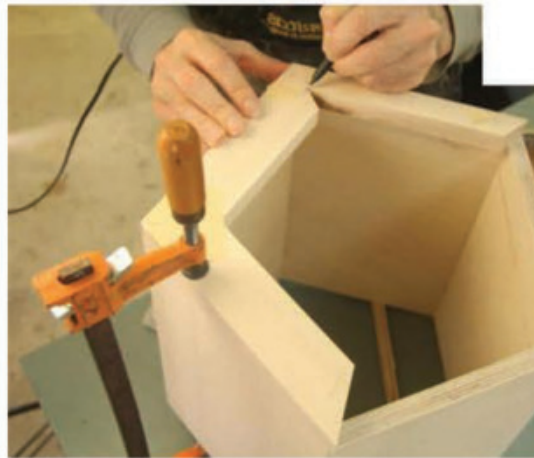
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Looking for the Right Inspiration

How do you get inspired to go back to the shop each day to start a new project?

BY JAMES JACKSON

Where do you find your inspiration? More specifically, what inspires you as a woodworker? I've been wrestling with that issue for some time now.

As I've written in previous columns, I'm a newspaper reporter by day and one of the big perks of the job is that many of the stories I write come to me without a lot of extra effort.

The really successful local fundraiser. The neighbourhood house that catches fire. The government press release for new hospital funding that lands in my inbox. The company that goes bankrupt. None require a ton of inspiration to find.

That doesn't mean the job is completely devoid of creative work that requires outside-the-box thinking. As a journalist, my job is to look into the community I cover and find those underreported stories or the trends that others miss. It takes a lot of hard work to be successful.

All of this brings me back to the topic of inspiration.

I've heard it said that by the time a creator begins to notice a trend, or realizes what's popular, that trend has already passed you by. Remember a few years ago when those octagonal or hexagonal shelves were all the rage? It's been months since I've seen anything like that posted on Instagram or YouTube.

How do you become the trendsetter instead of always being the one that chases the newest trends?

A YouTube woodworker I subscribe to recently posted a pretty honest video about how the number of videos he'd produced for his channel had begun to decline in recent weeks, mainly because he'd simply started to lose inspiration.

He was losing the drive needed to get out into his shop every week and create a new project, then spend three or four days perfecting it, making a video, editing that video, then posting it online for fans.



I imagine that's what it's like for professional woodworkers who rely on the craft to pay their bills every day. Sure, there are the bread-and-butter projects like tables and cabinets, but no doubt that gets mundane very quickly.

I don't think there's a profound answer to this question, either. I've had several conversations with my dad about how to stay engaged while in the woodshop.

But is anything truly timeless? Mid-century modern furniture enjoyed a massive renaissance thanks to period-specific TV shows like "Mad Men".

Maybe that's the trick - if you enjoy making a specific style of wooden objects, and you wait long enough, it will eventually come back around and become trendy again.

And if the items you made didn't sell the first time around, you've just given yourself a head start on becoming the next trendsetter in two or three decades.

JAMES JACKSON
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Illustration by Mike Del Rizzo



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Jason Wheeler

White Oak Built-In

This project was a unique build using white oak. The designer, Orsi Panos, had a vision for something different, but they worked together to add a traditional wood presence to a beautiful contemporary space. The curved doors were the most challenging part of the build.

Turn to page 14 for more quotes.
(Photo by Natalie Borsella)