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ISSUE #112
FEB/MAR 2018

CANADIAN Woodworking & HOME IMPROVEMENT

Easy Kitchen Cabinet Update

TOP 10 Books for Beginner Woodworkers p.10

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Canadian Woodworking & Home Improvement

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Cover photo by Thomasville Cabinetry

editor's letter

Over the last couple of months I spent some time on a few smaller, simpler projects, mainly for Christmas gifts. While those projects didn't push my skills at all, they were a lot of fun to work on. Just having the opportunity to start and finish a project in one day is something that rarely happens.

On the other end of the spectrum is the type of project we woodworkers take on as a challenge. Working with new materials, using new techniques, or just starting a project that's larger and more involved than we're used to are what allows us to grow as creators. While (thankfully) not incredibly challenging, we have a few projects in this issue that will allow you to push yourself a bit, while not being so frustrating that you can't finish them. A turned-leg coffee table by renowned Canadian turning and furniture-making icon, Stephen Hogbin, offers a beautiful-looking table, allowing you a glimpse into his studio to see how he works. Two more projects, both home-improvement based, are how to create a copper countertop for a vanity, and our cover story shares some tips on how you can update your kitchen cabinetry yourself, without breaking the bank. Our final project in this issue is a turned salad bowl with a decorative textured band. It falls into that nice middle ground between the day-long and the season-long projects.

In addition to our four projects, we have articles on staining wood, home sensors, the new breed of batteries that power our shop tools, a west coast furniture exhibition and much more in this issue. Our ever-popular columns *Know Your Tools, Top 10* and *Canadian Quotes* are included too. If you know of a Canadian maker we should focus on in a *Canadian Quotes* column, or would like to see a topic covered in our *Know Your Tools* or *Top 10* columns, please let me know.

— Rob Brown

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CANADIAN Woodworking & HOME IMPROVEMENT

Issue #112

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letters

Flower Power!

Although I have no formal training in woodwork, I love doing it. I recently entered a contest where you had a 2" × 4" × 8' to build something. Ninety percent of the project had to be constructed from the 2 × 4. With my love of VWs, I decided to build a 1969 VW van. It is 1/7th scale at 24" long. The wheels turn, and it has working headlights and taillights. I'm very happy with the way it turned out.

Thanks
Mary J.
Lawrencetown, NS

Thanks for the Inspiration!

My name is Jeremias, and I'm a furniture maker and designer from Germany. I moved to Canada in 2011 and stayed for three years. Before I moved to Canada I didn't have much of experience in woodworking. I started reading some of your articles, and eventually I bought every issue you had. Soon I started making and selling furniture in Whistler and Pemberton. In 2014 I moved back to Germany. Now I can finally pay my bills by making furniture, and for me this is a dream come true! I just want to say a big thank you to you and your team for all the inspiration!

Jeremias I.
Via email

Great Project Plans!

I finished the Japanese-inspired cabinet featured in your Aug/Sept 2014 issue. I used a couple of coats of Osmo top oil as a finish. What a great product. This project kept me busy on some long winter days! Thanks for the plans.

Dennis D.
Trenton, ON

Subscription Draw Winners

Fritz H.
Victoria, BC
has won a Benchtop X-Y Mortiser from RIKON.

Dan P.
Rockwood, ON
has won a $250 gift card from **Lee Valley**.

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productnews

Festool's New Offerings

At the 2017 'Festool Connect' this past September, I had an opportunity to try out two new, interesting products. There are three 'hybrid' sanders (5" ROS, 3" × 5" orbital, 4" × 6" detail) that you can use cordless (30-minute runtime) or corded. They're very comfortable to use, and dust extraction, even just using the dust bag alone, is phenomenal. I also got to use their new 1500-lumen surface inspection light. It has a color temperature of 5000K, and shining it across a work surface really highlights mill marks, dried glue and other defects before you apply a finish. Visit **FestoolCanada.com** for details. – *Carl Duguay*

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- Motor: 2 HP, 240V, single-phase, 9A
- Impeller: 12¾" aluminum
- Air suction capacity: 1700 CFM
- Max. static pressure: 10"
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- 6" inlet has removable "Y" fitting with three 4" inlets
- Canister filter size (dia. x depth): 19½" x 23½"
- Bag capacity: 4.5 cubic feet
- Overall size: 37½" W x 31½" D x 71" H
- Approx. shipping weight: 150 lbs.

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- Conveyor motor: ⅓ HP, 115V, single-phase, variable speed 5–55 RPM, 0.3A
- Drum surface speed: 2127 FPM
- Maximum board dimensions: 12" W x 3½" H
- Minimum board length: 8"
- Sanding drum size: 4"
- Sanding belt size: 3" x 70" hook and loop
- Dust collection port: 2½"
- Approx. shipping weight: 166 lbs.

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10" HYBRID TABLE SAW WITH RIVING KNIFE

- Motor: 2 HP, 115V/230V[1] (prewired 230V), single-phase Amps: 16A at 115V, 8A at 230V
- Precision-ground cast-iron table with wings measures 40" W x 27" D
- Table height: 34¼"
- Arbor: ⅝" • Arbor speed: 3850 RPM
- Capacity @ 90°: 3⅛" • Capacity @ 45°: 2⅜"
- Cutting capacity: 31½" right, 11⅜" left
- Overall size: 62" W x 39" D x 47¾" H
- Footprint: 20½" L x 19½" W
- Approx. shipping weight: 442 lbs.

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[1]110V operation requires part T23999 circuit breaker and wiring procedures that must be completed by an electrician or other qualified service personnel.

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- Number of knives: 3 (reversible HSS)
- Knife size: 13" x ½" x ⅛"
- Cutterhead speed: 9000 RPM
- Number of cuts per inch: 87
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- Cutting capacity/throat: 13½"
- Max. cutting height: 6"
- Blade size: 93½" (⅛" to ¾" wide)
- Blade speeds: 1800 and 3100 FPM
- Overall size: 27" W x 67½" H x 30" D
- Footprint: 23½" L x 16½" W
- Approx. shipping weight: 247 lbs.

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- Table tilt: 10° left, 45° right • Floor-to-table height: 37½"
- Cutting capacity/throat: 16¼" L of blade
- Max. cutting height: 12¼" • Blade size: 131½" long
- Blade sizes available: ⅛"–1" wide
- Blade speeds: 1700 and 3500 FPM
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- Overall size: 32" W x 73" H x 32" D
- Footprint: 27" W x 17¾" D
- Approx. shipping weight: 342 lbs.

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- Motor: 3 HP, 240V, single-phase, 14A
- Max rip: 8" left, 26" right of blade
- Max. depth of cut @ 90°: 3"
- Max. depth of cut @ 45°: 2½"
- Assembled table size: 48" W x 27" D
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Tool Reviews

Bosch Flexclick 5-In-1 Drill/Driver System

Wood River Bevel Edge Socket Chisels

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Hamilton, ON

Edmonton Renovation Show
Jan 26 - 28, 2018
Edmonton, AB

The Hamilton Woodworking Show
Feb 23 - 25, 2018
Hamilton, ON

Wood Art in the Cities
Mar 16 - 17, 2018
Waterloo, ON

Niagara Woodcarvers 38th Annual Show & Competition
Mar 24 - 25, 2018
Niagara Falls, ON

Kingston Wood Artisans Symposium
April 7, 2018
Kingston, ON

Best Build

Check out the **Woodworking** section of our forum for our latest "Best Build" thread – an inlaid and carved picture frame. This month's winner, Bob Stirk, 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

Craft a Curved Wall Cabinet

As the winter sets in, spend some quality time in the shop building this challenging, yet rewarding, curved-front wall cabinet.
View this plan and more at:
canadianwoodworking.com/free-plans

Product Watch

Outdoor Decorative Hardware

Outdoor Accents is a new line of decorative hardware, featuring ornamental wood connectors and fasteners. The seven-piece selection is hot-dip galvanized and powder-coated for maximum rust resistance, and can accommodate 4× and 6× lumber sizes.
StrongTie.com

Video Links

www.canadianwoodworking.com/**videos**

Joinery In Curvy Furniture with Jeff Miller

Canadian Quotes:
Paul Lemiski

Forum Thread

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

- **LED recessed lighting** – Learn about some pros and cons associated with LED recessed lighting, and what some DIY'ers are doing about it.
- **Engineered hardwood flooring quality** – With many different brands and types available, which ones are the best value?

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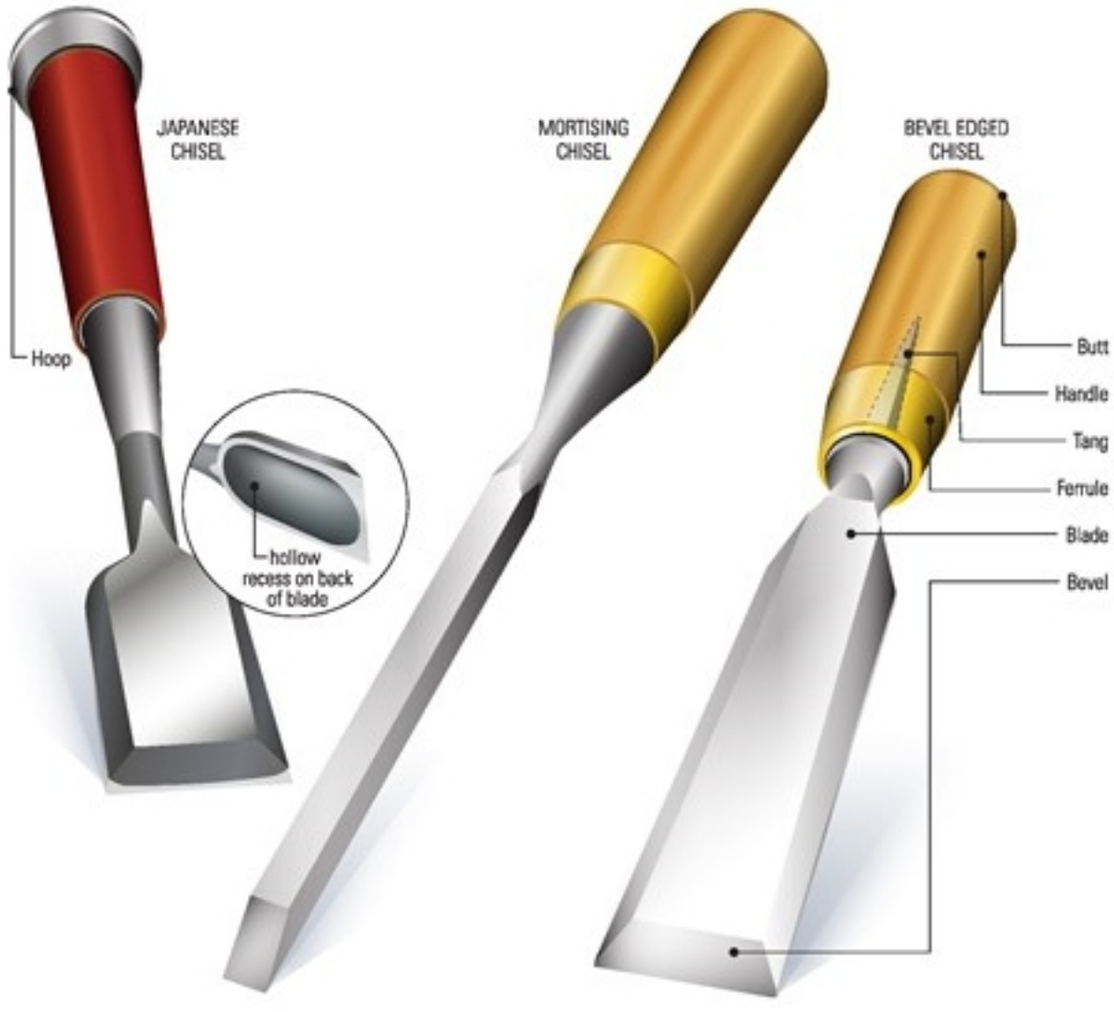
Chisels



A very simple tool, the chisel's job is to accurately remove small amounts of wood from a workpiece. Sold in sets or individually, it's great to have at least four different widths available as you work. Having a few cheaper 'utility' chisels around comes in handy when doing rougher tasks, but there's no substitute for a proper, sharp chisel. There are many different types on the market, but a **bevel-edged chisel** is all the beginner woodworker needs, unless they're focusing on hand-tool-only woodworking. Less expensive chisels will work well; they just don't get as sharp, retain their edge as well or look at nice as more expensive versions. Learning about the different bevel angles at which to sharpen chisels will allow you to fine-tune your chisels, depending on the work you're doing.

Price / Chisel: $15 - $150
Common Types: Bevel-Edged, Paring, Butt, Mortising, Japanese
Common Widths: 1/4", 3/8", 1/2", 3/4", 1" and 1-1/2"
Common Metals: A2, O1, PMV-11

Get the Most Out of Your **Chisels**

Invest in Sharpening Equipment

A chisel is useless unless it's sharp. Deciding what type of sharpening system you want to purchase is the first step to using chisels properly.

Don't Pry

A chisel isn't a hammer or pry bar, unless you have a dedicated chisel for that type of usage. Refrain from using a chisel in an inappropriate way, and it will treat you well in return.

Store Them Properly

Chisels without a safe home will easily get damaged and may even cause you harm. Whether it's in a drawer, dedicated box or hanging on the wall, keep your chisels safe.

A Sharp Chisel is a Safe Chisel

Resharpen a chisel at the first sign of it getting dull. A dull chisel is erratic and will cause damage to the user and workpiece. A few minutes is often enough to create a razor sharp edge.

Use a Guide

Purists would disagree, but a honing guide is a great tool to assist with creating super-sharp tools, especially for the beginner to intermediate-level woodworker.

Photos by Rob Brown. Illustration by Len Churchill

"SUPERB PERFORMANCE FROM A FULL-FEATURED DUST COLLECTOR BUILT TO LAST A LIFETIME"

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topten

Top 10 Books for Beginner Woodworkers

While there are lot of resources to help you become a better woodworker – courses, blogs, videos, wood shows, and the like – books are still a great reference tool.

BY CARL DUGUAY

Understanding Wood: A Craftsman's Guide to Wood Technology, Bruce Hoadley (ISBN: 978-1561583584)

The definitive book on the nature of wood, how and why it moves, how this movement affects the things you build, how you can deal with wood movement, how to store your wood, and how to mill your wood. The best way to learn about the material that is central to your work.

Understanding Wood Finishing: How to Select and Apply the Right Finish, Bob Flexner (ISBN: 978-0875965666)

Often referred to as the 'Bible of Wood Finishing', this is simply the most comprehensive yet practical book on finishing ever written. Flexner explains the chemistry and mechanics of finishes, in clear language, supplemented by very informative illustrations and colour photos.

A Cabinetmaker's Notebook, James Krenov (ISBN: 978-0941936590)

Krenov is one of the most influential woodworkers of the past four decades. This, the first of his five books, explores the deeper meaning of the craft – our relationship to the materials we use and the approach we bring to our work. It's more than making sawdust.

Getting Started with Hand Planes: How to Choose, Set Up, and Use Planes for Fantastic Results, Scott Wynn (ISBN: 978-1565238855)

Hand planes remain one of the defining tools in the woodworker's repertoire, and every woodworker should know how to use the tool effectively. This is the book that sets you on the path to plane mastery, and it helps you stay true along the way.

Essential Woodworking Hand Tools, Paul Sellers (ISBN: 978-0993442308)

This is the book I would have loved to have had when I first started woodworking. It's an excellent primer for both novice and hobbyist woodworkers on selecting, using, and caring for woodworking hand tools, from a man with some 50 years of woodworking experience under his tool belt.

The Complete Illustrated Guide to Joinery, Gary Rogowski (ISBN: 978-1561584017)

Putting boards together is what woodworking is all about. You won't find a more thorough treatment on joinery. Rogowski, the director of the prestigious Northwest Woodworking Studio, covers in detail just about every joinery method under the sun.

Illustrated Cabinetmaking: How to Design and Construct Furniture That Works, Bill Hylton (ISBN: 978-1565233690)

Hylton takes you through the construction details of a wide range of furniture. Everything from tables to desks, to cabinets, showing you how each piece goes together. The text is clear, concise and informative, and the illustrations are invaluable.

The Perfect Edge: The Ultimate Guide to Sharpening for Woodworkers, Ron Hock (ISBN: 978-1440329951)

Sharpening is a fundamental woodworking skill. You can't do your best work with dull tools. Hock takes the mystery out of tool steel and abrasives, covering all the various sharpening techniques, both hand and powered, for all the tools you'll ever need to sharpen.

Woodworking Basics: Mastering the Essentials of Craftsmanship, Peter Korn (ISBN-13: 978-1561586202)

A good house is built on a strong foundation, and this book provides the fundamental techniques you need to learn to master the craft. Written by a master furniture maker and founder of the Center for Furniture Craftsmanship.

Workbenches Revised Edition: From Design & Theory to Construction & Use, Christopher Schwarz (ISBN: 978-1440343124)

Building your own workbench is, for many woodworkers, a rite of passage. It's also one of the most important tools in your shop. Schwartz knows more about workbenches than anyone, and his book takes you through the process of designing, building and using two great styles.

CARL DUGUAY
cduguay@canadianwoodworking.com

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Photo by Rob Brown

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Paul Lemiski

…on full-sized templates, Instagram and how technology is changing woodworking.

BY ROB BROWN

How long have you been building furniture?
7 years.

What sort of furniture do you specialize in?
Sculpted Maloof-style chairs as well as urban live edge salvaged tables.

Tell us a couple interesting things about your personal life.
I recently got married and had a beautiful wedding on our country property, and I enjoy mountain biking and snowmobiling.

If you were not a furniture maker what would you be?
A teacher. I find when I teach my rocking chair classes, it brings me great joy.

In order, what are the three most important items in your shop apron?
I do not wear an apron, but my go-to small items are a center-finding steel ruler, a 6" engineers square and a pen…yes, a pen, not a pencil.

Do you prefer hand tools or power tools?
As a modern woodworker I find I have to balance the efficiency of power tools with the accuracy of hand tools.

Solid wood or veneer?
Solid wood.

Figured wood or straight grain?
Figured.

Inherited Vintage Stanley Sweetheart or fresh-out-of-the-box Veritas?
Fresh out-of-the-box Veritas, although I have some vintage items that have been passed down from my wife's grandfather.

Flowing curves or geometric shapes?
I enjoy both.

Favourite wood?
Canadian black walnut.

Least favourite wood?
I enjoy all woods.

Bali Chair – Salvaged Canadian black walnut, with curly maple bent laminated back supports. Simple yet comfortable lines, featuring floating tenon joinery done by the Festool Domino. (Photo by Steve Hindle)

Photos by Paul Lemiski (Lead Photo by Aimee Lemiski)

Paul Lemiski, 33, Canadianwoodworks, www.canadianwoodworks.com

Location & size of studio –
Countryside of Erin, Ontario, Current shop size 1500 sq. ft., moving to a 4600 sq.-ft. pole barn

Education –
I don't believe I would be where I am without the guidance from my high school shop teacher. From there I decided to be hands on and learn on my own.

quotes

Walnut Credenza – Lemiski was inspired by Jory Brigham's work when designing this walnut, zebrawood and steel credenza. Gluing up the mitred case with floating tenons proved to be a challenge.

My studio is located in the country, near Erin, Ontario. I'm fortunate to be on a beautiful farm where my 30x50 studio is located, but we are transitioning into the 4600 sq.-ft. barn at the same location.

My days are go, go, go. I have three employees, so my day starts with some discussion on what is going on that day. I run two kilns, which require my eye first thing in the morning and throughout the day.

My hero is Sam Maloof.

These days there is so much design floating around – sometimes it's better to just close yourself off and find your own.

I typically like to draw full-size templates on plywood. I'm quickly and easily able to design a piece in full size right in front of me.

I am a big fan of simple designs. If something can be removed from the piece, and it can accomplish its intent, maybe it should not have been there in the first place.

Some clients want zero input, while others want every detail discussed. I accomplish this via text message and face time, giving my customer a first-hand look of the details we decide upon.

I get a decent amount of word-of-mouth business, but my main source of new work is from being seen on Instagram.

I think young people are open to woodworking, but they just need the opportunity to get some tools in their hands. I feel like right now there is a resurgence in the handmade furniture world being transformed by social media.

Without a piece of furniture right in front of my clients, they just don't understand the quality and love that goes into beautiful, functional furniture.

I follow masters all around the globe on Instagram, and get a glimpse into their day via daily pictures and videos. To name just a few, Konrad Sauer, The Wood Whisper, William NG, Clarke Kellogg, Anton Gerner, Benji Reyes, Jory Brigham, Rundell and Rundell, Brian Boggs, James McNabb, Craig Thibodeau, Matthias Pliessnig.

Technology will drive design, being able to 3D print, CNC cut and laser engrave will let wood workers do things we've never been able to do.

I think Canada is having a surge of young makers. The market understands handmade, local furniture is worth the extra money for the quality and connection.

The Muskoka chair, one of the first pieces I ever made, is an iconic piece of Canadian furniture. I own them, and almost everyone I know owns some. Travel into cottage country and you'll see them on every dock.

ROB BROWN
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canadianwoodworking.com

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RELATED ARTICLES: Karen McBride *(Aug/Sept 2016)*, Jamie Russell *(Apr/May 2013)*
SLIDESHOW: Visit our website to view a slideshow of Lemiski's work.

John Marston
"Spiritual Messenger, Salish Owl"
Chemainus, B.C.
Photo by Sherstone.com

One Tree
2017 Exhibit

Randy Mugford
"Marina Foyer Table"
Halifax, N.S.
Photo by Randy Mugford

Between November 16th, 2017 and January 31st, 2018, the Robert Bateman Centre and Live Edge Design are partnering to put on an exhibition showcasing 53 works of art that all came from one century-old black walnut tree that grew in the Rockland neighbourhood of Victoria, B.C. Here is a selection of works that are a part of the exhibition.

BY ROB BROWN

Joe Egan
"Jean Mustard"
Ladysmith, B.C.
Photo by Joe Egan

Gary David
"A Crack in Time"
Duncan, B.C.
Photo by Jon Mark Wiltshire

Larry Martell
"Sea and Sky"
Victoria, B.C.
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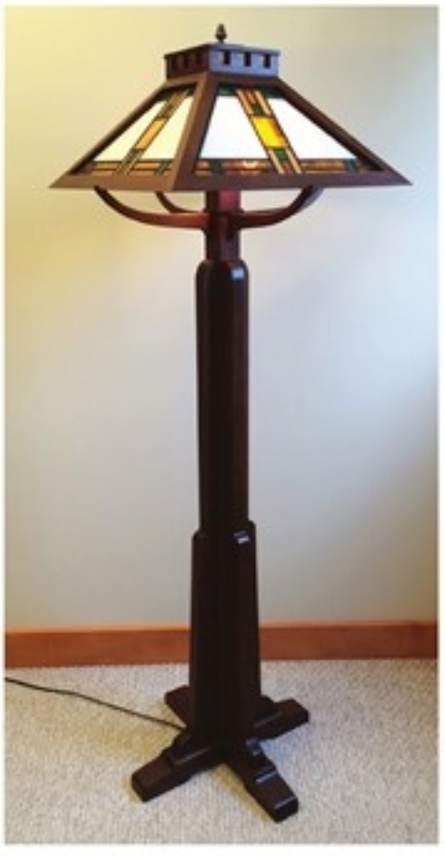
Merlayna
Snyder
"Mystique"
Victoria, B.C.
Photo by Jon Mark
Wiltshire

Tim Motchman
"Encounter"
Sointula, B.C.
Photo by Sheila Roote

Ken Guenter
"Springboard"
Victoria, B.C.
Photo by Ken Guenter

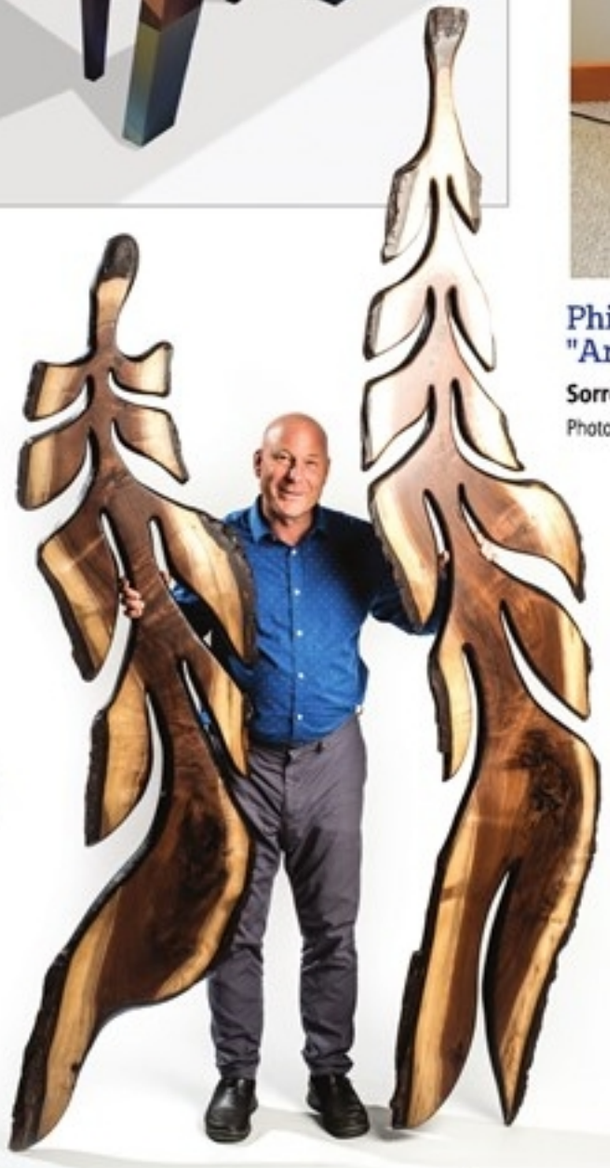
Geoff Vickers — "Occasional Pedestal Table"
Victoria, B.C.
Photo by Jon Mark Wiltshire

John Lore
"My Dinner with Andrew"
Duncan, B.C.
Photo by Live Edge Design



Phil Clark
"Arts & Crafts Floor Lamp"
Sorrento, B.C.
Photo by Phil Clark

Charlie Pickard
"Believe in the Magic of a Gnome Home"
Nanaimo, B.C.
Photo by Charlie Pickard



Frank Armich
"Dancing West Coast Trees"
Parksville, B.C.
Photo by Jon-Mark Photography

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RELATED ARTICLES: **OneTree 2015 Exhibit *(Apr/May 2016)***
SLIDESHOW: **Visit the Videos section of our website to view a slideshow of many more pieces built for the exhibition.**

ROB BROWN
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Kitchen Cabinet Makeovers On a Budget

When it comes to giving your kitchen a bright new look, you don't necessarily need to rip out and replace everything. Repainting or replacing just the cabinet doors, drawer fronts and shelves, along with installing new hardware, can make for an amazing facelift.

BY CARL DUGUAY

Most of the wear and tear on kitchen cabinets, along with the outdated look, is on the outside of the cabinets, on the doors and drawer fronts. If the structure of your cabinets (the cabinet boxes) is in fairly good shape then there really is no need to replace them. The only reason you might want to do so is if you're planning a complete kitchen remodel, or if the boxes are in really poor condition.

Kitchen cabinets can be either frameless (Euro-style) or face-framed. If you have framed cabinets, you'll probably want to refinish or replace the face frames as well.

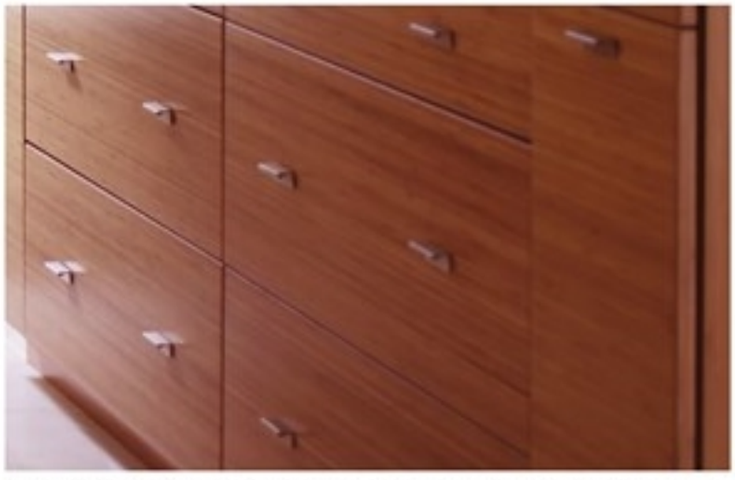
Cabinet doors, drawer fronts and the shelves can be made of plastic – MDF with a polymer covering (aka Thermofoil), melamine or laminate – plywood, or solid wood. If your plastic doors and drawers are in good shape, they can be repainted successfully. However, if they're damaged, consider replacing them. Thermofoil can be removed, but it's an arduous and time-consuming process. Melamine and laminate can't be removed; small chipped pieces can be replaced, but it can be a difficult job to do. Most avid DIYers should be able to manage repairs to plywood and solid wood doors.

Repainting or replacing all the doors and drawer fronts is time consuming, especially if you want to do it correctly. Take your time, rather than rushing through, and you'll end up with a great job.

Lay the groundwork

Proper preparation is the key to getting good paint adhesion and a smooth look – this is especially important if you have plastic doors and drawers. Remove the doors and drawer fronts (and shelves if these will be painted) and all the hardware. Make sure you label where they go, to make reinstallation easier – hinges are often adjusted for the box they're installed on. If you plan to install new hardware it's best to fill the old holes.

The very first step is to clean everything with a heavy-duty cleaner such as Rustoleum's Krud Kutter rather than using a mild cleaner like dishwashing soap, which won't do as good a job at removing grease and oil. Needless to say, now's the time to clean



Keep it Simple – Slab doors are the simplest and fastest option for a do-it-yourselfer. Adding iron-on edge banding to the edges of the doors is very easy, but solid wood edging will be more durable down the road. Creating end panels or gables to cover exposed exterior faces of existing cabinets will hide any hint of your previous set of kitchen cabinets. (Photo by Thomasville Cabinetry)

Purchase a Kit – You can purchase a kit, like this Rustoleum product, to help prepare your old doors and cabinets for a fresh coat of paint.

the inside of the cabinets as well. If you plan to install any under-the-cabinet lighting, now is also the time to do so. You can get really easy-to-install LED strip and channel lighting from Lee Valley.

Next, fill small holes, cracks, or gouges with a paintable filler, sand when dry, and spot prime.

You'll then want to sand all surfaces – 180- to 220-grit on wood and 320-grit on plastic – just enough to dull the surface so the primer will better adhere. Use a vacuum, tack cloth, or lightly damp cloth to remove any residual dust.

Painting is the economical option

Your options for painting include brush, pad, rollers, or spray. If you don't have experience using a sprayer, then this might not be the time to begin using one. You can do just as good a job, although it will take longer, using a brush. In fact, most professional painters I spoke to prefer using brushes. Their overwhelming preference is for oil-based primer and paint, as it adheres and covers better than water-based products. They also recommend using premium nylon-polyester brushes. You can also use a filler/sealer, such as Aquacoat, in place of the primer on wood doors with prominent open grain. For plastic doors, two good primers are Kilz Complete and Insl-X Cabinet Coat. After the primer has dried, sand it lightly, wipe up the dust, and then apply your topcoat.

An alternative is to use a cabinet coating kit, such as Rustoleum's Cabinet Transformations. Each kit covers about 100 sq.ft., so you'll need to calculate how many kits to purchase. Kits come with everything you need, except a paint brush. One advantage of this kit is that rather than having to sand your cabinets, this kit includes a deglosser and scrub pads that you use to abrade the surfaces.

Sources: AquaCoat.com, Insl-x.com, Kilz.com, LeeValley.com, Rustoleum.ca

Make and replace for a custom look

For woodworkers, this is where the fun begins. This option gives you the greatest control over how your kitchen will look – you can design and build the doors and drawer fronts exactly as you want – and you'll get a tremendous sense of satisfaction (plus bragging rights). And of course, if the boxes are in poor shape, you can build these, too.

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Get Fancy – Purchasing doors from a door manufacturing company will give you lots of door design options, and will be easier and quicker for you to complete your kitchen renovation project.

Choose a design style – Shaker, mission, contemporary – that not only blends into the general decor of your kitchen but is one that you'll be comfortable making many of. Building the doors and drawer fronts is pretty straightforward. I find it quicker and more efficient to make all the components of the same dimensions in batches. I also make a template for each different door size that I use, to locate hinges on the new doors. Remember, you'll need to replace (or veneer over) the face frames to match the new doors. I often use clear or coloured glass in place of wood panels for cabinet doors that house china – it's a great way to show off the contents.

If you haven't made doors before, consider a simple slab door (also called a contemporary or Euro-style door). They're easily made from solid wood or, better yet, cabinet grade plywood. Either will require a solid wood edge banding but not any specialized joinery.

A final option is to purchase and install ready-made doors and drawer fronts, which you can order from home improvement retailers such as Home Hardware. They generally offer a variety of styles, colours and price points in either MDF, wood, unfinished, or pre-finished. A more expensive alternative, but one that might offer greater design options and possibly a higher quality end product, is to contract a local cabinet shop to build custom components for you.

Considering the time, money and effort you'll end up putting into your kitchen upgrade, it makes sense to replace the old doorknobs and drawer pulls. You might also think about installing new soft-close door hinges and drawer sliders.

Sources: HomeHardware.ca, LeeValley.com

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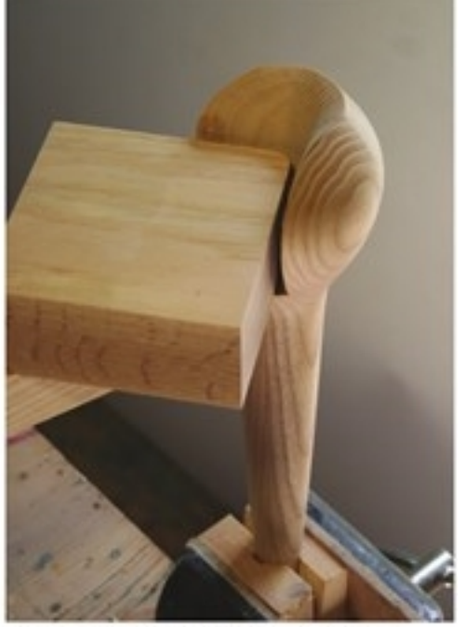
Build a HUON PINE 'CLASP' TABLE

Join one of Canada's most prolific furniture makers as he turns a very special board, gifted to him decades ago, into a beautiful coffee table.

BY STEPHEN HOGBIN

In 1978, I was given a 2"-thick, rough-sawed board. It didn't look exceptional – that is until the tightly packed annual rings were counted. To my amazement they came to nearly fourteen hundred years of growth. It was Huon pine, and it comes from Tasmania, Australia. Don McKinley, who gave me the board, was at the University in Hobart working as a Craftsman in Residence for the university and the timber industry. They were grappling with issues around this rare and endangered wood. At that time, the valley where the Huon pine grew was being flooded for a hydro project. He worked for

Photos by Stephen Hogbin (Photo Lead by Michael McLuhan) Illustration by Len Churchill



Mock-Up – A mock-up gives you a much better sense of how 3D objects relate to one another, and how size and proportion affect the overall look. Hogbin developed a sleeker version of the turned leg after seeing his mock-up.

A Bit of Glue – A bead of glue near both ends of the glue-up keeps the four legs aligned during the turning process.

Clamps and Curved Cauls – Hogbin used simple pipe clamps, along with shop-made curved cauls, to clamp the four legs together while the glue dried.

months in a workshop in Tasmania then returned to Sheridan College in Ontario with several pieces to continue his explorations in this unique wood. The gift of such a special piece of Huon pine was exceptional.

Finding the appropriate time and place took time. It occurred to me a client from a couple of years ago had many unusual woods in the architecture and furniture of their home. I contacted them, suggesting a side table with the Huon pine board making the tabletop. The client liked the idea, and I went ahead with developing a design.

The leg frame was made with the regional white ash, which is about to become an endangered species as the Emerald ash borer arrives in the area. Trees are under siege, and it's important for woodworkers to treasure all the woods from around the world, especially those at home.

Concept

I wanted legs that would hold and present this special piece of Huon pine top. The gesture was to present this beautiful piece of wood, similar to how a precious stone is held in jewelry, while still enabling a regular function.

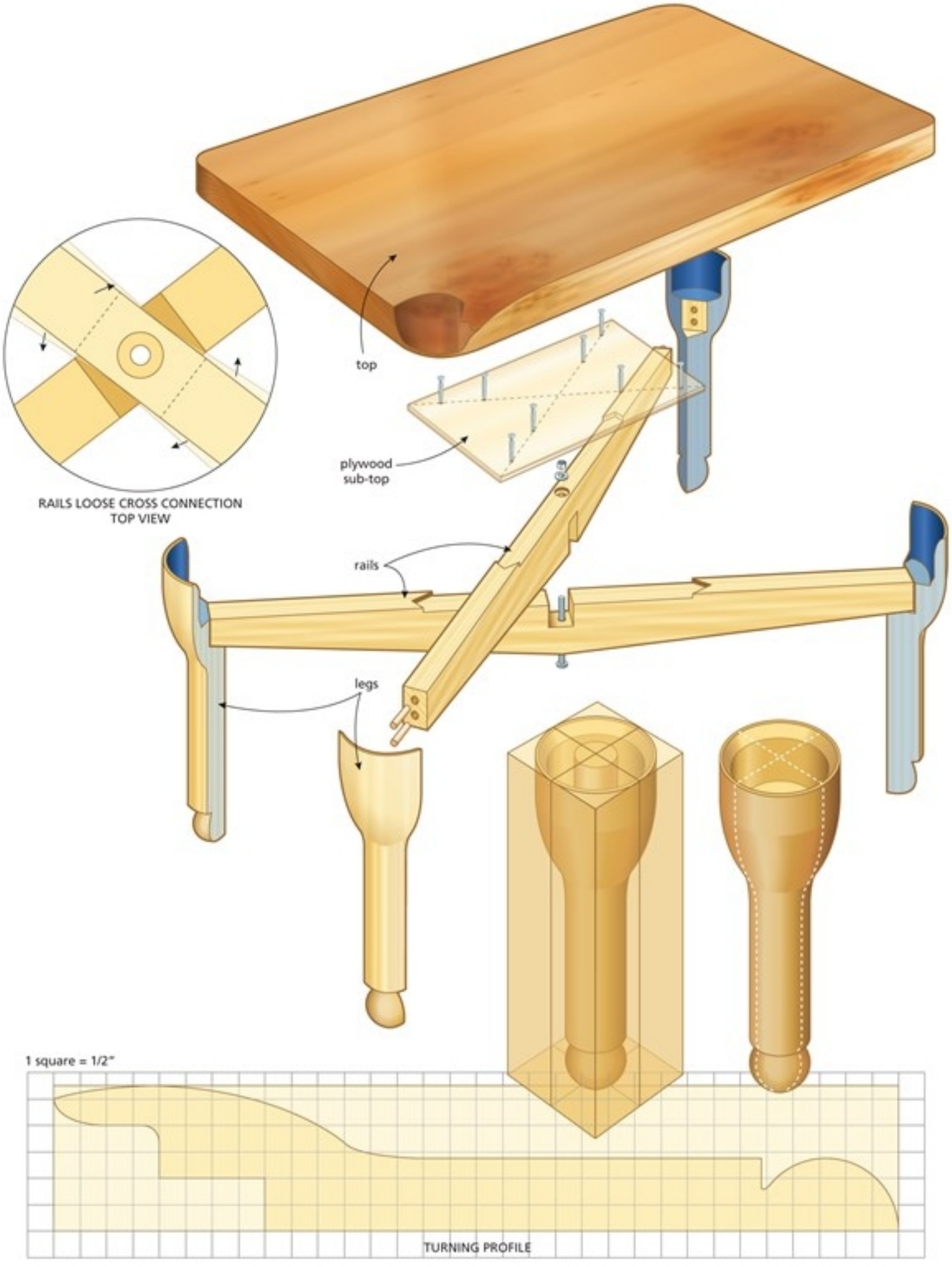
Sample joint

Making a sample joint gave me the opportunity to see the problems and get the feel of this sculptural connection. In some ways it worked very well, although I found it bulbous, so the overall shape was changed. It was also complicated to make. For me it lacked the rightness of form with the means of production. It lacked elegance in its relationship of visual appearance to structure.

I went back to a familiar approach used before, which would make four legs from one turning. It also had an angularity that fit the client's aesthetic and related to the dining chairs I made a few years ago. After the drawings and full-sized detail, the way forward was clear. While the concept of a clasp came quickly, the means of production was slower to be resolved. For me, it's an interesting chicken-and-egg situation. Does the concept, form or construction drive the finished piece?

Workpiece for turning

There are two different approaches for holding the blanks ready for turning. The parts for the legs include four milled 2-3/4" (70 mm) square blanks. Finish the inside of the legs where they are put together for the turning. The height of the table will be 16", and I add 4" for waste.


top
plywood
sub-top
RAILS LOOSE CROSS CONNECTION
TOP VIEW
rails
legs
1 square = 1/2"
TURNING PROFILE

Bevel Then Re-Clamp – Once the glue dried, and he bevelled the four corners of the blank, Hogbin added a different pair of pipe clamps to help keep the four legs together while turning them.

Simple Drawing – A drawing on the shop wall behind the lathe helped Hogbin create the shape he wanted.

Select the right length band clamp and crescent spacers. Run a tiny bead of glue on the ends of the four blanks, and clamp the parts together. This bead of glue, when dry, will prevent the four blocks from slipping if the chisel catches while turning.

On some designs it's best to keep the square cross section on the ends as a base for drilling or cutting a mortise. This way is a little slower but more accurate later in the process. For this table it's not necessary. Once dry, the four blanks can now be machined with a 45° angle to remove the bulk of the waste. Metal band clamps are then clamped to both ends of the blanks to help keep everything together.

Start turning

I use a lower speed for turning. The cut is not quite so good, but it's safe. Turn the four legs in the band clamps into a cylinder, making sure to keep your turning tools away from the metal clamp. Attached to the wall behind the lathe is a full-sized drawing of the profile. It could also be a thin cardboard template if I were making many tables. The drawing guides the shape. Lay out the major dimensions on the blank.

Take dimensions from the drawing, and use calipers to see where the turning needs to be thinner. It's easy to get this stage wrong, as there are four legs in one. It looks heavy, and this is where it's useful to have a sample made up or an already-finished piece nearby. Sometimes the drawing looks right, and then the turned object does not. Going from two to three dimensions will often need adjustment.

Subtle forms

Things can change as the idea becomes three dimensional. Think about the end product and how it will look and function. The leg is horizontal on the lathe and may look great until it is stood on end.

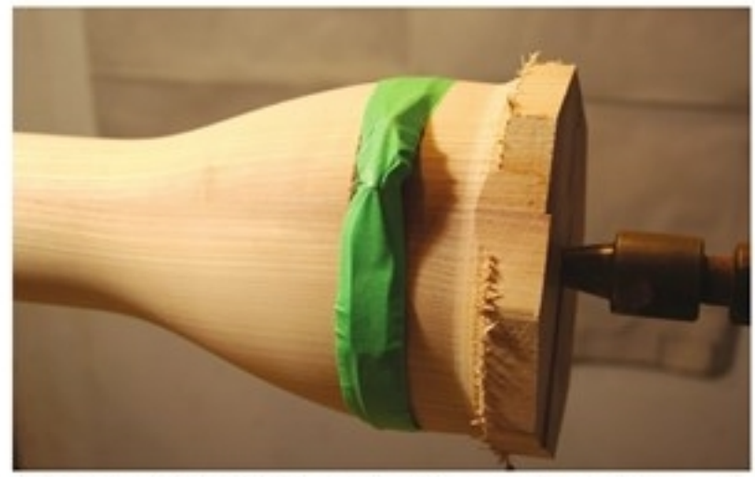
The top of the leg

Since the shape is established, the band clamp can be moved onto the finished form so the top can be completed. Use a thick leather pad 1/8" (3 mm) to protect the finished surface from the band clamp. The band clamp is covered with masking tape to reduce the problem of coming into contact with the screw whipping around looking for loose clothing or a wayward chisel. Finish the outside first, then go into the end of the leg. There's no waste material on the end of this design.

When turning into the end of the blank to create the hollow, you will be weakening the glue bead. Material is being removed so the work is becoming more vulnerable. Keep the centre core as large as possible. Getting inside to give a perfect finish is hard on the hands. It's one reason I use paint and colour after seeing my fingers beginning to twist. Also, I really like introducing colour into my designs. Turn into the end using a round-nosed scraping chisel. To separate the four legs, use a sharp broad chisel. Stand the legs upside down on a soft cloth or thick-piled carpet. To remove the core, mark out where the table top will rest, and with a hand saw, remove the core.

Table top

Cut the table top to size, and mark out where the rails will fit. It was difficult to make a decision about where the rail should connect to the leg. A square table is straight forward, as it's a symmetrical frame. When the table is rectangular, should the leg be angled to the rail? On a very long rectangular table, it becomes necessary with this design. The table has a ratio of 2:3, so it's not so far off square. On this occasion I decide to keep it simple for the joinery. There are



Turn the Ends, Too – With the majority of the outer surface of the legs turned, Hogbin moves the pipe clamps to the turned face so he can shape the last portion.

Move to the Inside – Hogbin hollows out the inner area of the tops of the legs, but is careful to not remove too much material and cause the center core to break during the process.

no difficult angles to work out. Set up the legs on the table top. and measure between the legs to establish the length of the rail on the diagonal.

Rail and leg connection

Cutting a face on the leg at 45° for the rail attachment is done on a band saw or with a hand saw. Mark out on the leg where the rail will join the leg. The leg is cut on the band saw to expose a face for

Huon Pine

Huon pine (*Lagarostrobos fraklinii*) is a conifer native to Tasmania, Australia. Australia's oldest living tree, Huon pine may live for 3000 years. It only grows in the west and southwest of Tasmania in cool, wet areas on river bank rain forests.

The wood is highly prized for boat building and furniture making. It is resistant to rot and insects due to an essential oil, methyl eugenol, which gives it a unique and pleasant odour.

The smell of spruce and cedar are the equivalent of Huon pine, and when worked in the studio the air is filled with its wonderful aroma. The wood is a light honey colour when first cut, and like many woods, darkens closer to bronze with age. The tree grows very slowly, and the annual rings are fine. The difference between summer and winter growth is quite noticeable. Huon pine has about the same density and works similarly to North American white pine. It works beautifully with sharp cutting tools. Turners like the fineness of the grain. Carvers would find it similar to basswood. Abrasives tend to gum up due to the high oil content of the wood.

Photo: Michael Mcluhan

A Quick Trim – A hand saw makes quick work of the center core that remains on each leg.

Angle It – A band saw, with its table angled, creates the rough face for the leg to rail joint. Hogbin trues up the surface afterwards.

the connection to the rail. The triangular stem is cut off and the face cleaned up true and square, ready to receive the rail.

With the help of a caul to hold the legs so the faces that will join to the rail ends are level, and a clamp to hold the leg in place, drill holes for the dowel connection on your drill press. I used 3/8" dowels. Mating dowel holes were eventually drilled in the ends of the rails.

The rails

I used 1-3/8" × 4" stock for the rails and tapered the ends to 2" wide. The connection at the centre is a loose cross, held together with a bolt. A wide table top in solid wood will expand and contract, and with this design, it will accommodate the changes.

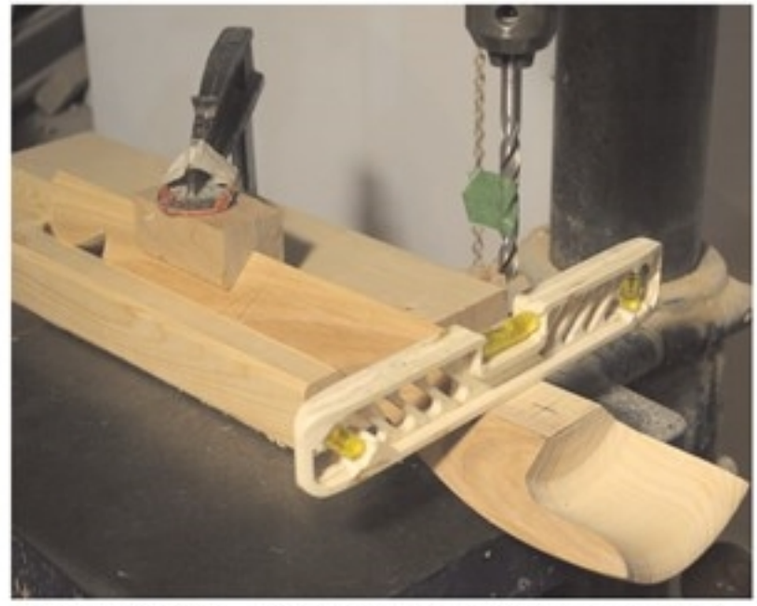
Dry test fit

A dry fit is always a good idea. I had to make an adjustment on one dowel that was not perfectly aligned. If I had glue at that point, it would not quite have been a disaster, just a big mess of glue and dead dowels.

Another Quick Trim – The shoulder for the rail to sit against is created with a hand saw.

Gluing the parts

PVA waterproof glue was used to connect the legs and rail. The band clamp was applied first. It works well to a point but tends to twist the leg to the rail. The two bar clamps pulled the connection tight after the initial pull-together. A snug connection with a tiny bead of glue squeezed out. Don't forget the spacer at the feet of the legs to keep things square during glue-up. The clamps pull up against the spacer, making an accurate square set of relationships between leg and rail.



Two Straight Holes – With the help of a caul and clamp, Hogbin bores two 3/8" dowel holes in the legs.

Assemble table frame

Slide the bolt in, and adjust the legs to receive the top. Make sure it stands level on the floor. Fit the top just to make sure all dimensions are right before applying finishes.

I proceeded with the rails as they were, but it wasn't until the table was complete that I realized it rocked too much. A 1/4"-thick × 12"-wide rectangular piece of plywood was inset into the upper edges of the rails and screwed in place. The edge of the plate was eventually finished to match the legs. Although I did this work later, it would be best to add this plywood plate now.

Colour the legs

Teal was complimentary to the orange/brown of natural wood, and it's a very dynamic contrast. As the wood ages, oxidizing to a mid-brown, the colour will remain a vibrant contrast.

First was an off-white undercoat, followed by reddish/orange background or under-painting. This colour should have a tiny amount of blue included. Next, a light blue with a touch of green to take it towards the teal colour I was aiming for. All these colours and amounts depend on what you're after. You can also go with a natural wood if you'd like.

Final colours

The blue and red did not look like the teal colour we had in mind. Not enough green and white in the blue. Painting sometimes does not work out, but continuing to work on the surface does often develop a richer look. Let the previous colours show through, giving the surface depth and complexity. It's the hand finish with the brush marks, layered colour, and textures I prefer. A final skim of iridescent turquoise catches the light beautifully. These five layers are capped with clear urethane, as the bare wood gets a further two coats of finish.

Finishing the table top

Next, I applied Lee Valley tung oil. It is oh-so-slow, with each

Square Assembly – Band clamps bring the first leg assembly together, but long bar clamps provide the necessary pressure to bring the join together squarely.

Add Some Colour – Hogbin layers colour onto the top of the rail and the inner surface of the legs. Starting with reddish/orange, then adding layers of blue to finish with the colour he was after.

coat needing to dry 48 hours. The board, however, looks like solid gold. With a coffee table, it really is necessary to give the wood some prevention from partying. Lacquers are more difficult to repair, and with the flexible nature of the tung oil it is less likely to chip than a sprayed industrial lacquered finish. It all takes a bit longer but makes for better quality, and it's easier to repair.

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Hand Saws

WESTERN-STYLE SAWS

- Have thick blades
- Cut on the push stroke
- Blade is rarely replaceable
- Tend to larger and heavier than Japanese saws

Dovetail

For cutting dovetail and other small joints, small (about 14" long), kerf about .025", available in rip and crosscut, typically 14-20 tpi

Carcass

For cutting small to medium sized carcass joinery, small to medium (about 16" long), kerf about .025", available in rip and crosscut, typically 12-15 tpi

Tenon

For cutting tenons, medium (about 20" long), kerf about .030", available in rip and crosscut, typically 9-12 tpi

Panel

For misc. rough cutting, large (about 25" long), kerf about .035", available in rip and crosscut, typically 4-10 tpi

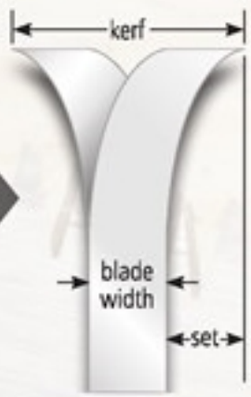
Gent's

For cutting small joints and dovetails, small (about 13" long), kerf about .025", available in rip and crosscut, typically 17-22 tpi

Veneer

For cutting veneer, small (about 9" long), kerf about .015", available in rip and crosscut, typically 20-40 tpi, available in standard saw design or offset handle design

TOOTH GEOMETRY



From the editors of
CANADIAN Woodworking & HOME IMPROVEMENT

JAPANESE SAWS

- Have thin blades • Cut on the pull stroke
- Blade is often replaceable
- Tend to be smaller and lighter than Western-style saws
- Some blades will fold away for storage

Coping

For cutting curves or irregular shapes, small (about 12" long), kerf about .025", available with multipurpose blade, typically 15 tpi

Fret

For extra-fine and accurate cutting of curved or irregular shapes, small (about 15" long), kerf about .020", available with wide selection of blades, typically 10-20 tpi

Dozuki

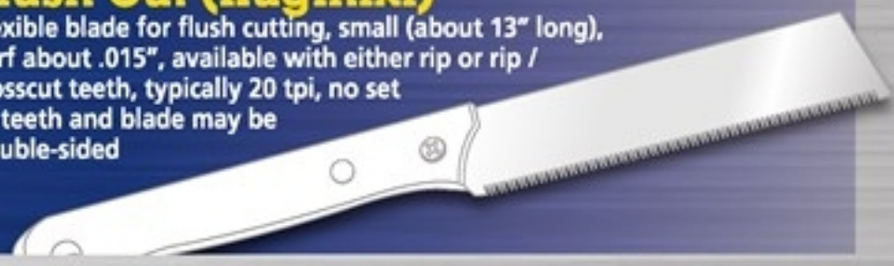
For cutting of misc. small to medium sized joinery – blade often has spine, medium (about 18" long), kerf about .015", available in rip or crosscut blades, typically 10-20 tpi

Ryoba

Double-sided blade, with no spine, for wide range of joinery, medium (about 20" long), kerf about .025", blade has one rip and one crosscut cutting edge, typically 8-20 tpi

Flush Cut (Kugihiki)

Flexible blade for flush cutting, small (about 13" long), kerf about .015", available with either rip or rip / crosscut teeth, typically 20 tpi, no set to teeth and blade may be double-sided



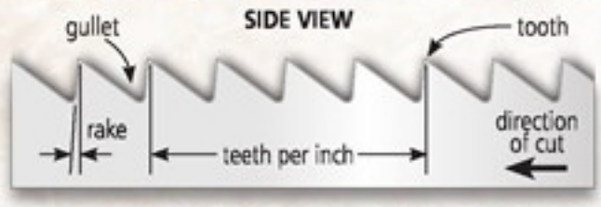
COMPARE

Crosscut Teeth

STRAIGHT-ON VIEW

RESULTING SAW KERF

Rip Teeth



STRAIGHT-ON VIEW

RESULTING SAW KERF

NEXT GENERATION BATTERIES

What Manufacturers Are Doing to Enhance User Productivity

There has been a lot of innovation in the cordless power tool sector in recent years. We recap the recent developments that strive to bring more power, longer run time, faster charging, and greater convenience to the workshop and jobsite.

BY CARL DUGUAY

There seems to be a never-ending demand from users, and a corresponding drive among manufacturers, to increase both power and run time, not only to increase efficiency and productivity, but also to bring a wider range of corded tools into the cordless domain.

To do this, manufacturers focus on a range of components that make up the typical cordless tool – motors, batteries, chargers, and the digital controllers that enable these components to communicate with each other – along with Bluetooth wireless technology to make it easier to manage your power tool investment using your smartphone or tablet.

All these components work in tandem to deliver every last ounce of power and minute of run time. The technology around brushless motors and digital controllers seems to have leveled off over the past few years, while batteries and chargers have been the focus of the most recent developments.

Mega Amp-hour batteries

Manufacturers have pretty well settled on 18V (Volt) as the standard for power tools, along with 12V for compact and lower-power-demand tools, and 36V for some outdoor gardening and landscaping

Photos by Manufacturers

Getting Bigger – About a year ago Makita (left) and Festool (right) both introduced 6.0 Ah or greater batteries for their cordless tools.

tools. Only a year or so ago they introduced a new crop of 18V 6.0 Ah (Amp-hour) batteries to market. These 6.0 Ah batteries offer a significant increase in both power and run time over 4.0 and 5.0 Ah batteries. Makita's BL1860B 6.0 Ah battery, for example, delivers 108 Wh (Watt-hours) of battery capacity, with a 50% and 20% increase over their 4.0 and 5.0 Ah batteries, respectively. Festool's 6.2 Ah battery, part of their new Airstream line, has a 111.6 Wh capacity, a 20% increase over the 93.6 Wh capacity of their 5.2 Ah battery. For those of us who use power tools intermittently throughout the work day, 6.0 Ah batteries can provide all the power and run-time we need.

However, these 6.0 Ah batteries still don't provide enough power for high-draw tools such as SDS rotary drills, grinders, mitre saws and contractor-style table saws, nor do they provide the run time needed in shops and on jobsites where tools are used on a more continuous basis.

Milwaukee and DeWalt have responded to these needs by introducing mega-size 9.0 Ah batteries. Both the Milwaukee High Demand 48-011-1890 and the DeWalt Flexvolt DCB609 are made up of 15 3.6V cells. Each provides an impressive 162 Wh of battery capacity. Both batteries are backwards compatible; they can be used with all the power tools each company has on offer.

Even Bigger – Milwaukee (left) and DeWalt (right) have recently introduced 9.0 Ah batteries. Both batteries are backwards compatible, so they can be used with all the power tools each company offers.

Brushed vs. Brushless Motors

A brushed motor consists of wires, magnets and brushes. An armature rotates within a stator (a fixed magnet) and is connected to a drive shaft and commutator. Carbon brushes provide the electrical connection between the power source (the battery) and the commutator, which reverses the direction of current flow to the armature so that the magnetic fields maintain rotation. And it's that rotating force that produces torque.

A disadvantage of this design is that the brushes constantly remain in contact with the armature, creating friction and heat, which reduces the efficiency of the motor. The constant friction between the brushes and the commutator wear each other down, reducing motor performance.

A brushless motor does away with the brushes and the commutator. Like a brushed motor, it has permanent magnets and electrically induced magnets (the stator). However, in place of brushes that provide the electrical connection, a brushless motor uses an external electronic speed controller that creates the revolving magnetic field between the two magnets and causes the shaft to spin.

A major advantage of this system is reduction of friction inside the motor, resulting in less wear on internal components and less heat build-up, resulting in a longer motor lifespan. Because the electrical connection is controlled digitally rather than mechanically (by brushes), brushless motors run more efficiently, transferring more power to the drive shaft, and for cordless tools, this translates into longer run time. Like brushed motors, they can heat up, particularly under a heavy load. However, they can be more effectively cooled.

Bosch has chosen a somewhat different approach. Rather than adding more cells to its 6.0 Ah battery, they've switched to a larger battery cell (the Panasonic 20700). The result is that the new CORE 18V GBA18V63 6.3 Ah battery is rated at 113.4 Wh, delivering a 1440W output, an 80% power increase over their 6.0 Ah battery.

The trade-off to more power and a longer run time is a larger, heavier battery. There's likely a practical limit to how large and heavy battery packs can get, so it's somewhat doubtful that a 12.0 Ah battery, which would require 20 individual cells, will hit the market anytime soon. However, if companies can increase battery cell density without compromising size and weight then who knows what will happen?

A Different Approach – Bosch has introduced a 6.3 Ah battery (above). They took a different approach; they used a larger battery cell, the Panasonic 20700 (below right). (Photo by Panasonic)

Voltage switching batteries

DeWalt's Flexvolt cordless system consist of a line of dual 'voltage switching' 6.0 and 9.0 Ah batteries – labelled as 20/60V – that work with the new line of Flexvolt power tools. While Flexvolt batteries are backwards compatible, in that they'll work with the current line of DeWalt 20V MAX tools, the 20V MAX batteries will not work with any of the Flexvolt power tools.

These new batteries consist of 15 cells wired in two ways. Three sets of five cells are wired in parallel to deliver 6.0 and 9.0 Ah of run time, respectively. As well, all 15 cells are wired in series, to provide 54V (60V MAX) of power. When the batteries draw power in series, they deliver 2.0 and 3.0 Ah of run-time respectively. The battery works in tandem with the tool to deliver the voltage required – a lower voltage but higher run-time for power tools that run on 18V (the existing line of 20V MAX tools), and a higher voltage with a shorter run-time for DeWalt's new line of power tools that run on 54V (60V MAX).

For tools that require even more power (such as the DeWalt 12" Sliding Miter Saw), two of these Flexvolt batteries can be used simultaneously to deliver 108V (120V MAX) of power. It offers the prospect of cutting the power cord on a range of benchtop machines such as mortisers, drill presses, and belt/disc sanders.

Wireless battery charging

Bosch seems to be the only company involved in wireless charging. With the WC18CF-102 charger you don't need to remove the battery from the power tool, you simply place the tool on the charger when the tool is not in use, which has the effect of incrementally charging the battery, and saves you the hassle of regularly removing/reinstalling the battery. However, it doesn't work with existing Bosch 18V batteries, only with wireless-ready batteries, and currently there are only 2.0 Ah slim pack and 4.0 Ah fat pack batteries. The technology is similar to what's used for wireless phone chargers. Current is transmitted via an alternating magnetic field

Wireless Charging – Bosch's new charger allows their 2.0 Ah and 4.0 Ah batteries to be charged without removing them from the tool. Just place the tool on top of the charger, and charging will immediately begin.

from a coil in the charger to a coil in the battery. A full battery recharge takes about the same time as a standard charger. The greatest beneficiaries for this technology will be production shops and assembly lines where power tools are used on a constant basis throughout the workday.

Battery cooling

Excessive heat is an issue that affects more than just motor performance – it can have a real impact on both the durability and performance of batteries, particularly for the newer crop of 6.0 and 9.0 Ah long-runtime batteries. Companies strive to limit heat build-up during charging and discharging. They use digital controllers to monitor battery temperature as well as charge and discharge rates so that the batteries can be shut off before overheating occurs. Here is what three companies are doing to cool their batteries.

DeWalt's new DCB118 8-amp fast battery charger cools batteries during charging. An internal fan pulls air across the battery to cool it. Their Flexvolt 6.0 Ah DCB606 battery takes about 60 minutes for a full recharge.

Festool has its own fan-assisted cooling charger, though it's more elaborate than the DeWalt charger. The Airstream SCA-8 is an 8-amp quick charger that works by pulling air through intakes on the battery, channeling the airflow through the battery cells, and then exhausting the hot air through vents in the charger. Festool claims that this reduces charging time by 60%. Currently there are three 18V Airstream batteries: 3.1 Ah, 5.1 Ah, and 6.2 Ah.

Bosch has taken a different approach with its new CoolPack 2.0 technology, featured in their CORE18V 6.3 Ah Battery, by cooling the battery while it's in use. CoolPack 2.0 batteries have a high-density polyethylene (HDPE) casing that surrounds the battery cells and helps transfer heat to the outer surface of the casing where cooling fins dissipate the heat. An added benefit of HDPE is that it helps reduce overall battery weight and electrically insulates the battery.

Bluetooth connectivity

When you only have a handful of power tools and batteries on the go, it's relatively easy to keep track of them. But what about the renovator who might have a dozen or more, or the contractor with three or four dozen (or more!) tools and batteries kicking around? Two of the major tool companies are integrating wireless mobile technology into batteries and power tools, enabling users to better manage their product inventory.

Cooler Times – Festool's new chargers cool their batteries by circulating air through intakes on their batteries, reducing charge time dramatically.

What's Inside?

All battery packs are made up of individual battery cells. Each cell has a specific **voltage (V)**, which is the amount of power it produces. Cells in lithium-ion batteries used for power tools typically have a nominal voltage of 3.6V. Manufacturers have settled on two battery platforms: they wire three cells together in parallel to make up a 12V battery pack, and five cells for an 18V pack. Some companies refer to 18V battery packs as 20V MAX. This is because lithium-ion cells have a maximum voltage of 4.0V without a work load. However, the nominal voltage they deliver is still 18V.

All batteries have an **amp-hour (Ah)** capacity, depending on the density of the battery cells. The Ah is a measure of battery capacity, commonly referred to as the 'run-time' – essentially how long the battery will produce power. It's comparable to the size of the gas tank on a car. The larger the tank, the more gas it carries, and the further the car can travel. How much further the car will travel depends on a variety of factors – foremost the efficiency of the motor. Likewise, a 9.0 Ah battery will theoretically deliver a current of 9 amps for 1 hour, 1 amp over 9 hours, or 18 amps over 1/2 hour. Runtime will, of course, depend on the environment and application in which the power tool is used.

Another measure of battery capacity is the **watt-hour (Wh)** rating – the amount of watts the battery can supply per hour. It's comparable to the gas in the gas tank of a car. Watt-hours are determined by multiplying the battery voltage by the amp-hour rating. An 18V battery with a 9.0 Ah rating supplies 162 nominal watt-hours of power, while an 18V 6.0 Ah battery would supply 108 watt-hours.

DeWalt's Tool Connect mobile app enables you to use your Smartphone to connect and control DeWalt Bluetooth (BT) enabled 18V batteries. Currently DeWalt offers 2.0, 4.0, and 5.0 Ah BT batteries. With the app, users can receive alerts when the battery

More Than Just Drills

Years ago, when rechargeable batteries first came onto the woodworking scene, their main purpose was for powering drills. Since then, manufacturers have found many new ways for woodworkers and DIYers to harness the power of a battery in our work. From circular saws and belt sanders to angle grinders and work lights, rechargeable batteries are now almost everywhere in our shops. Recently, the advent of new, high-powered batteries has allowed manufacturers to let their imaginations run wild and create cordless tools that will make our day-to-day tasks easier, both in and out of the workshop.

One new tool that immediately comes to mind is the Makita DCU180ZX2 Power-Assisted Wheelbarrow. With the power of dual 18V batteries and the strength to carry large weights, moving a load of gravel or soil has never been easier. Visit **Makita.ca** for more details.

is in need of charging, is finished charging, begins to overheat, or when the battery is removed a predetermined distance from a specified area.

The Milwaukee One-Key also uses BT connectivity, but unlike DeWalt, it integrates its technology into their power tools. At last count there were 16 BT-enabled power tools available. Users can track the location of Milwaukee One-Key-enabled tools within 100′ of a smartphone. They can also organize and catalogue tools (including non-Milwaukee tools), and even custom control some functions of One-Key-enabled tools.

Stay Connected – DeWalt and Milwaukee both offer Bluetooth battery connectivity. You can keep track of many stats, as well as the current condition and location of their batteries with their app.

Given the pace of change in power tool technology over the past few years, we shouldn't be surprised to see even more new innovations over the coming years.

CARL DUGUAY
cduguay@canadianwoodworking.com

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3.0Ah BL1830B
with **Charge Level Indicator**
194205-3

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STAINING

Don't listen to the naysayers. Staining can be an easy, straight-forward process.

BY CARL DUGUAY

All wood species are beautiful in their own right, but not all are perfect when it comes to woodworking, materially or aesthetically. Sometimes they need a little pick-me-up. At the lumber yard, it can be difficult to get boards that match reasonably well in grain and color. It's not uncommon to end up with boards that aren't harmonious in appearance – for example, with too much sapwood in a field of otherwise-darker heartwood. Or, while your heart might be set on walnut or mahogany, your budget might limit you to alder or red oak. Sometimes though, you just want to add a splash of colour to a project, regardless of the wood you're using. In cases like this you can choose to colour the wood to even out those variations, to mimic the appearance of a different species, or to walk a bit on the wild side. Staining is a way of doing this.

In a broad sense, a **stain** is any liquid that contains a colouring agent (aka 'colourant'). This can be a pigment, a dye, or a combination of the two. **Pigments** are finely ground, insoluble natural or synthetic materials that are suspended in a binder (such as linseed oil, varnish or lacquer) that bonds the pigment to the wood. A carrier (such as mineral spirits or water) spreads the pigment and binder over the wood surface. Pigments remain on the surface of wood, lodged in pores and surface scratches, which makes them good for highlighting surface textures. However, many pigment stains will also contain some dye, so that the stain delivers a more intense colour with less obstruction of the grain pattern. You'll know that the product you have is a pigment stain if the contents settle to the bottom of the can. This is why you want to thoroughly stir the contents before applying the stain – so that the pigment is dispersed throughout the liquid. Most often, stains that contain pigments (or a blend of pigments and dyes) are simply referred to as 'stains', and they're available as 'oil-based' or 'water-based'.

Dyes, on the other hand, are soluble chemical substances that do not require a binder. They come in either a liquid or powder form, though they're rarely available at hardware or home improvement stores. In the liquid form they never contain any pigment, which is why you don't get any goop at the bottom of the container. Dyes saturate wood fibres, giving a more uniform colour to wood (which is why they're often added to pigment stains). We'll look at dye stains in an upcoming article.

Photos by Carl Duguay

Stir it Up – Before stirring most stains the product will separate, leaving a thinner liquid on the top (left). Once the stain has been stirred it will look richer, and be a bit thicker (right). You will feel the sediment on the bottom of the can when you start stirring.

Oil, water and gel

The stains that you do get at your local hardware or home improvement store come in three types: as a free-flowing liquid that is either oil based or water based, and as a gel that is oil based. Most manufacturers offer products in all three formats.

Oil-based stains (sometimes referred to as penetrating stains or wiping stains) are probably the most popular type. They're easy to apply, especially on large surfaces, as they don't dry out too quickly. On open-grained wood you'll see a more dramatic result – the stain will darken the grain but leave the wood surface lighter in colour. Close-grained woods accept stain more evenly, resulting in a more uniform colour. Leaving the stain on longer before wiping it off will allow more of the carrier to evaporate, resulting in a more intense colour. As well, you can apply a second coat of stain to increase the colour intensity.

Water-based stains are less odorous, less toxic, and easier to clean up than oil-based stains. However, they do dry faster, making them more difficult to apply over large surfaces. Also, they raise the grain, so you want to dampen the wood and then lightly sand it before applying the stain. For anyone who works in a small shop with less-than-optimal ventilation, they're a better choice than oil-based stains.

Gel stains are the consistency of peanut butter. Because they don't run, they're ideal for use on vertical surfaces and where you have a lot of narrow edges and crevices, as well as on carvings and turned items. They're also the best choice to use on blotch-prone woods (see below).

In general, any topcoat will go over any of these stains. However, it's important to ensure that the stain is completely dry before top coating. You can get stains that contain both the stain and a topcoat all in one can, such as Varthane's One Step Stain & Polyurethane (a water-based formulation) and Minwax's PolyShades (oil-based). They're applied in much the same way as a conventional stain, though they dry faster than oil-only stains.

Any of these three types of stain will deliver great results as long as you apply them in the right way. If you're new to wood finishing you might want to test all three. This will enable you to choose the one you find easiest to use. Most are available in 236 ml cans. Select the same colour for all three types of stain, and apply them to cut-offs of solid wood and plywood, then once dry, lay on your favourite topcoat. As with most things, a modicum of practice will help you refine your staining skills.

Brands: GeneralFinishes.com, Minwax.ca, MyOldMasters.com, Rustoleum.ca (Varathane), Saman.ca, SwingPaints.com

It's all in the sanding

The key to achieving a great stained finish is how well you prepare the surfaces before applying the stain and topcoat. Make sure that you do a final sanding by hand, in the direction of the grain. Shine a light across the surface of the wood at a 45° angle – it will help you see any imperfections that need attending to. It's important to remove excess glue completely, particularly around joints. On coarser, open-grained species (like ash or oak) you can sand up to 180- or 220-grit, but on close, tight-grained species (such as maple and cherry) sand up to 120- or 150-grit. If you sand these woods too smooth they'll have difficulty absorbing the stain.

Gel Stain – Gel stain is very thick. Because of this, it tends to not penetrate into the wood. It remains on the woods' surface, where it more evenly colours the wood.

How Many Coats? – Here, Duguay stained an oak sample once, then taped the left half of the sample off, and stained it again. The wood is darker with two coats of stain. There are diminishing effects as you apply more and more coats.

Wipe-on, wipe-off

Stains can be applied with a paintbrush, foam brush, by rag, or spray. Liquid stains dry fairly quickly, so it's best to heed Mr. Miyagi's advice to 'wipe-on, wipe-off' in quick succession. On large surfaces you want to maintain a wet edge, to avoid lap marks. If they do occur, lay on a second coat of stain after the first one has dried. Of course, the best way to avoid this problem is to spray on the stain, though this is really only efficient if you have a lot of square footage to cover.

Not all wood is the same

Different wood species will stain differently, and even boards of the same species may take stain quite differently. The grain pattern that each board exhibits, the presence of sapwood and heartwood, the way that the boards were milled (quarter sawn, flat sawn or rift sawn), and even the relative humidity level in your shop

Wood Conditioner – When working with blotchy woods, like cherry, maple and pine, using a wood conditioner will even out stain penetration, and leave you with a more uniform look.

will have an impact on the final look.

As well, woodworkers often use the same wood species in both a solid wood form and as a plywood. Cabinet sides, shelves and doors are often made of plywood, with the framing done in solid wood. Typically any exposed edges of plywood are covered with solid wood edging. This can pose a problem when applying a stain, especially if you use low grade plywood, which tend to have very thin veneer. The discrepancy is much less evident when you use good quality cabinet grade plywood (or shop made ply). Options to deal with this include applying a wood conditioner, using a gel stain, or applying a second (or third) coat of stain to the plywood to darken it sufficiently to match the solid wood. Invariably though, you'll need to go through some trial and error first.

Some woods blotch

Some woods, such as pine, cherry, maple, and birch, are blotch prone – they absorb stain unevenly. There are two options to deal with woods like this. I've had pretty good success using gel stains. Because they're thicker, they don't penetrate wood grain as much as oil- or water-based stains. A second option is to apply a wood conditioner before staining – there are different conditioners for oil- and water-based stains. The wood conditioner will help the wood absorb the stain more evenly. Be generous with the conditioner, and remember to wipe it off before it dries on the wood. Once dried, lightly sand. Optionally you can apply a thin coat of shellac, though I've found that this results in a lighter colour once the stain is applied.

Take care of the ends

Pay special attention to end grain. The deep open pores provide cavities for the stain to lodge in, which is why end grain usually stains darker than face or edge grain. You can resolve this by sanding the end grain much smoother (which burnishes the pores and reduces their ability to absorb stain), or applying a wood conditioner, or you can do both.

Not all colours are the same

It's good practice not to mix stain brands or types on your project. A cherry stain from one manufacturer won't necessarily look the same as the same cherry stain from a different manufacturer. Nor will an oil-based cherry stain look the same as a water-based or gel cherry stain. If you don't like surprises, test any new stain before using it. Make sample boards (from cut-offs of the solid wood and plywood from the project) to test the stain that you plan to use. If you anticipate using the same species of wood and colour of stain again, you might want to record details on the back of the sample boards and retain them for future reference. It's very discouraging to discover that the stain you just applied to a finished project is much too dark. You'll have to sand down to bare wood in order to apply a lighter stain (or live with the darker stain).

More Sanding, Less Absorption – Duguay sanded the face grain of this sample to 150 grit, and the end grain to 600 grit. The higher sanding grit lessened the end grains ability to absorb the stain, and therefore creates a more even look.

What's in a Name? – This douglas fir sample was stained with four different stains, though they were all called "cherry".

Create your own custom colours

Most of the time you'll likely want to purchase an 'on the shelf' colour and use it for your project, but if you're the adventurous type, you can create your own custom colours by intermixing stains of the same type (just don't mix oil- and water-based stains). You'll need to do some testing to tweak the right colour, so start with measured small amounts (say, 15 to 20 mL). Keep track of the amount and ratio you use so that you can then blend larger volumes of the custom stain for your project.

CARL DUGUAY
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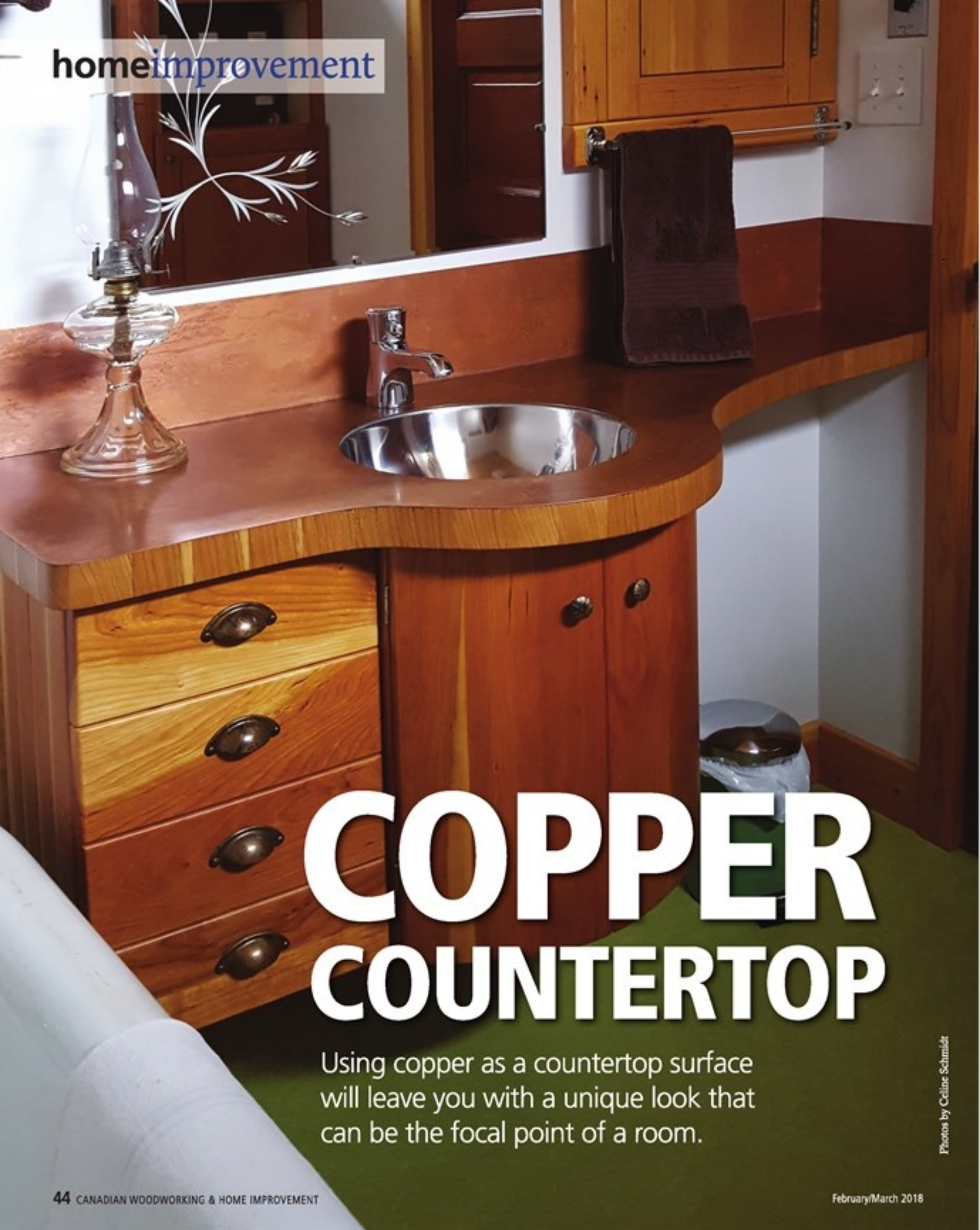

COPPER COUNTERTOP

Using copper as a countertop surface will leave you with a unique look that can be the focal point of a room.

Photos by Celine Schmidt

BY CELINE SCHMIDT

In renovating my rather small bathroom, I had a few goals in mind, most of which revolved around ease of cleaning, storage and usability. I wanted an undermount sink, wall-hung cabinets, more storage and counter space, and I wanted to minimize the effect, ergonomically, of a 32" door swing into the vanity area. A copper countertop was not really on my radar until I was well into the design stage.

Door swing was critical, as it was very close to my vanity, so I went directly to the bathroom floor to start drafting the countertop full-scale with a roll of newsprint. In this way I was able to mark the swing of the door, the centerline of the sink and plumb the outside lip of the bathtub directly onto the paper. Along with sink size and faucet placement, these were my constraints.

Time is always an issue when you are renovating, and my initial design did not involve a curved-front sink cabinet. However, I realized that 4" of clearance for the door swing and a sweeping curve on the counter would be much more pleasant on a daily basis than 1" of clearance and a pointy corner. I threw caution to the wind and decided to address the challenge of curved doors when I got to them.

Material choice

Making a metal countertop has long been on my list of things to try when time permitted. Originally, I was drawn to steel with its industrial look, but I had concerns about runaway rust in a wet and humid bathroom environment. I wandered into my neighbourhood metal supplier to see what was available in a gauge thin enough for me to work with and thick enough to be dent resistant. A 19-gauge copper sheeting, sold by the square foot, seemed a very likely candidate; 19 gauge is less than 1/16" (16-gauge = 1/16") but still thick enough to not dent easily. Copper is rather expensive but certainly within the realm of reasonable for a highend DIY countertop project. The copper for this project cost $275 (+$90 for the backsplash), and remaining materials were relatively inexpensive.

I did a little reading up on copper as a countertop material before I committed myself. Copper is rather soft and will scratch. It will develop a patina over time, as the colour will change with the application of liquids, chemicals or oils. Copper hit my natural materials preference spot on, but be aware that some people would rather their countertop did not change with time. As a bonus, copper is antibacterial (if unsealed).

Final Design Template – You can include a lot of information on a top-view drafting. You can even cut out parts to use as subtemplates, like this under-the-counter shelf Schmidt may add later.

Countertop Base – Two layers of 3/4" construction grade plywood with hardwood edging can be used.

Make the countertop base

Since I had picked a surface material, I still needed a sink and faucet to finalize my design. I choose a stainless steel sink over ceramic because I thought it would contrast nicely with the copper. Additionally, metal sinks have a lip that can be installed between the plywood and copper so that the weight of a full sink of water is hung on the plywood and not just suspended from the copper sheeting by adhesive. Depending on the thickness of the metal, the weight of the sink could deform the countertop surface over time.

These days, sinks come with templates that give you all the options for layout and faucet placement. My finished drawing contained basin and faucet placement, accounted for the thickness of the backsplash, and included top view plans for cabinetry. Typically, the countertop template is made after the cabinets are

Mark Edge of Sink – Use your router to cut an inset the depth of the sink lip.

Rough Cut Copper – Rough out the countertop shape and sink hole.

Finish Cut Sink Hole – To avoid damage to the sink, this edge needs to be final and finish sanding before the copper is glued down.

already installed, but due to space constraints in this bathroom, the countertop dictated the cabinet shapes.

You will need two different 1/4" plywood templates. The first template is full sized for the copper laminate. The second template is for the countertop substrate (a double layer of 3/4" spruce plywood, construction grade), which should be cut back approximately 1/4" to allow for a finished wood edging. Glue and screw the 3/4" plywood together. This will be the main thickness of the countertop. I did not have any cherry appropriate for a bent horizontal edging, so I milled up some short lengths of cherry to 1/4" thick and used masking tape to glue pieces to the edge in a vertical fashion. I used my stationary belt sander to angle and fit the pieces one by one around the curves. After cutting the rough hole for the sink (according to the template

Faucet Test Fit – Cut hole(s) for faucet based on manufacturer's instructions, and test the fit.

Ready for Patina – The countertop is sanded to a smooth look, and the wood on the sides and bottom are sealed with polyurethane.

that came with your basin), set the sink in and trace around the edge of the lip. This is where the plywood must be relieved to allow the sink to sit flush with the plywood surface .

Cut the copper

I had a friend rough cut the copper with a plasma torch but have since discovered that a jigsaw with metal blade is easier and less problematic. At this point, it did not appear that this shiny, much-scratched, heat-burned piece of rough-cut copper would ever be pretty . Here, the rough edge of the copper is the same size as the base below, and the hardwood edging is also still rough. The front edge will be machined after glue-up, but the sink hole must be perfect and sanded prior to glue-up. I made a rudimentary circle jig for my router and slowly cut the sink hole to size . My personal preference was to make the sink hole about 1/8" smaller than the manufacturer called for, to have a bit of an overhang on the sink. Sand the sink hole edge by hand or with a palm sander prior to glue-up, as the sink may be damaged when sanding afterward.

Test the fit and glue up

Once the sink has been fit flush into the plywood base, the copper can be test fit. If you are satisfied with how the finished sink hole and sink line up and the other edges look roughly flush, you are ready to glue up. I used Surebond SB-190 Everseal for the glue, but silicone would probably work great too. Clean the back of the copper with solvent, and rough it up by sanding. Set the sink into the plywood on a generous bead of silicone. Smooth a fairly even layer of silicone over the surface of the plywood and over the lip of the sink and apply the copper sheet. Use squeeze clamps, clamps and cauls as necessary to coax into position. The 19-gauge is thick

Install Cabinets and Countertop – Installing the faucet before the countertop is often easier.

Patina – Splash-effect patina is easily created with vinegar and salt. Play around with some copper offcuts before using the real thing.

enough to not require hard and perfectly even clamping as veneer would. Clean up any squeeze-out, especially around the sink. Leave overnight to set up.

Shape and sand

After years of practice, I am very good with a belt sander and am quite comfortable using it to shape the edges of a countertop (checking regularly with a square). A more precise method would be to make a router guide template.

Now would be a good time to cut the hole for the faucet. A

Rounded Door Fronts – Small doors can be made from thick material rather than coopering or laminating. Here, Schmidt has bevelled both edges of the two doors, and hung them on hinges attached to the cabinet.

1-3/8" hole saw is typical for this purpose, although a pilot hole and jigsaw works in a pinch.

Once the countertop edge is shaped, sand the edging as is your preference. I used a random-orbital and palm sander for both the edging and copper top. Sand the copper until it is quite uniform in appearance and soften the front and side edges . Varnish the cherry edge and underside of the counter prior to creating the copper patina, but try to avoid touching the copper after it is sanded as it is easily marked.

Create a patina

On the freshly sanded copper surface, start by wiping away any copper dust and residual oils with solvent. Create a patina by splashing on vinegar and salt and letting it dry. I made multiple applications over a few days until I was happy with the results. I especially liked the effect of sprinkling cheesecloth with vinegar to create bits of random pattern. Play around with your offcuts to find a patina you like . The blue dust created by this process should not be inhaled, so it is very important to wash down the surface with clean water and a soft cloth until the residue has been washed away. Lightly rub out the surface with 0000 steel wool. An occasional application of beeswax and oil keeps the finished surface from changing too much with use, but it will evolve further over time, especially with harsh cleaning chemicals. Install your cabinets to the sink centreline and scribe and fit the countertop to the wall . Attach the countertop to the cabinets with screws from underneath.

Tips on fitting round doors

As I was working on the countertop, I was also building the somewhat simple cabinets to support it. I went with a bank of drawers and a pair of curved doors below my sink, but your requirements will likely be much different from mine. I did find the curved doors added a lot to the overall appearance, and they weren't overly hard to create, so I will share some tips on how to make them here.

By measuring my initial top view drawing, I found that I could get away with shaping the front of 8/4 material for the doors rather than a bent lamination or coopering. Loose pin butt hinges allow for mounting and dismounting the doors multiple times during fitting.

After milling the cherry roughly to size and cutting to final height, set a sliding T-bevel from the drawing and mark the angle on the centre edge of each door. Stand the doors together on top of the drafting to mark the hinge edge angles. Make the doors slightly larger than finished so that the centre edges can be adjusted once the doors are hung. Use a stress curve to mark the bottom of the doors and chisel out material to accommodate the cabinet bottom, rather than curving the entire inside faces of the doors. Relieve for the sink, if required.

Once the doors are fit, use a stress curve to transfer the curve from the drawing to the top and bottom of the doors. Curve the fronts using a handheld power planer, hand planes and belt sander. To keep the fronts true, I made a jig to hold the doors in position for final smoothing with a random orbital sander. Confirm the fit one last time before varnishing.

Relieve Bottom Edge – Chisel a curved area out of the bottom of the doors rather than curving the entire inside surface.

Copper is a durable countertop surface that adds warmth and character, is relatively easy for a woodworker or DIY enthusiast to work with and is a satisfying alternative to commercially available countertop materials.

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Celine Schmidt brings her perspectives of furniture maker, builder and timber framer to projects in Saskatoon, Saskatchewan

Smart Sensors

These two smart sensors can help make your home safer and your life less stressful.

BY CARL DUGUAY

Water, along with fire and smoke, are major causes of property damage in Canada. Early detection can help prevent loss of life and property. Fortunately, there are smart sensors that help detect these impending disasters and notify you of imminent danger whether you're at home or not. Prevention is always easier on the wallet and mind than a renovation.

(Photos by Manufacturers) Photo Lead by Leeo.com

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RALI Chisel Case is Ready for Action

Do you carry heavy tool boxes around and still don't have the right tool for the job? The RALI Chisel Case is what you need! The high-quality chisels are made in Switzerland, the case includes three chisels with interchangeable knives in nine different widths varying form 10mm – 40mm, a scraper and 3 adaptors for jigsaw blades. The chisel blades are easily changed –one tool is enough for many jobs. Get rid of old paint or glue lines with the easy-to-use scraper. The jigsaw adaptors turn your chisel into a hand saw in no time. Please visit **www.tersaknives.com** for more info.

Smoke and CO Detection

A frayed or damaged power cord, faulty electric appliance, cookware left unattended on the stove, failing to clean the chimney or fireplace, careless smoking – all of these and more can lead to devastating impacts for you and your family. It's not just fire you have to be concerned with – more people succumb to smoke inhalation than fire.

Carbon monoxide is another potential threat to personal safety. A CO detector measures levels of this nearly odorless, naturally occurring chemical compound in the air and issues a warning if concentrations approach the danger level (70 ppm). You can get sensors that detect only smoke, or CO, or both. All are battery powered except Nest, which is available in battery and hardwired models. Some sensors also monitor other pollutants (dust, pollen, soot), temperature, and humidity levels. Most of these sensors have a 10-year life expectancy, at which time they'll need to be replaced. Typically you'll want a smoke detector in each room of your home, so if you plan to install more than one sensor, ensure the model you choose interconnects with multiple units. Any of these sensors can be user installed.

Along with smoke detectors are wireless alarm monitors that simply plug into a wall outlet and notify you if your smoke alarm goes off, and smart batteries that add wireless capability to any standard smoke or CO detector.

Prices quoted below are taken from the company websites. American prices have been converted to current Canadian dollars. All prices exclude shipping costs.

Nest Protect

Nest.com

$149.99

A combined smoke and CO detector, available in both a battery and hard-wired (120V) format. Has a siren alarm and voice alerts. Senses heat, humidity, ambient light, and room occupancy, and can shut off your HVAC unit in an emergency (when connected to the Nest Thermostat). It self-tests both the battery and sensor. A voice feature lets you know if it detects smoke or high levels of CO and where in your home it's located. Enables interconnectivity between multiple units and integrates with all the various Nest smart home devices.

OneLink Wi-Fi Smoke + CO Alarm

FirstAlert.com

$149.99

Offers both smoke and CO detection and is powered by a sealed lithium-ion battery rated for a 10-year lifespan. Has features similar to the Nest, including a siren alarm and voice alerts. Enables interconnectivity between multiple units. Apple HomeKit compatible.

Leeo Smart Alert

Leeo.com

$70.00

Unlike the Nest and OneLink, the Leeo isn't a sensor. Rather, it listens for the alarm set off by a smoke or CO detector, and then notifies you (or anyone on your emergency contact list). You then dial 911. It plugs into any standard 120V outlet. It does sense temperature and humidity and has a built-in nightlight.

Water Leakage and Moisture Detection

Some water disasters, such as a burst water pipe, failed sump pump during a severe rainfall, or washing machine gone berserk, can happen almost instantaneously. Other calamities happen over time – condensation in the attic or a leaking water heater or dishwasher. If you're fortunate, you'll be at home when something like this occurs, and can take remedial action as soon as you're aware of the issue. But if the issue goes unnoticed, or if you happen to be at work, out of town for any reason, or on vacation – you're out of luck. A slow, undetected leak can, over time, be just as destructive and costly as a sudden deluge of water. You can't always prevent these problems from occurring, but knowing about them as soon as they happen can give you time to mitigate their effects.

A smart moisture detection sensor will notify you the moment a water leakage or moisture problem occurs so that you can take immediate action, not after most of the damage has been done. These sensors can be installed around any potential source of water leakage, and if water is detected, the sensor sends you a notification over your mobile device. Most sensors also emit an alarm.

These water sensors can be battery or line powered (usually by a 12/24V DC power supply). Some connect to your mobile device via Wi-Fi and the app that the sensor uses, and others connect via a wireless hub (such as Wink or Samsung SmartThings) and the app that the hub uses. Sensors with longer sensor cables, or add-on extension cables, enable you to monitor hard to reach places. A few models incorporate temperature sensors that notify you when the temperature within the vicinity of the sensor drops below a specified level – a practical feature for areas in your home that might freeze over during the winter months.

Water sensors only notify you when they sense water. For maximum protection, you can connect some sensors to automatic shut-off valves that turn off your main (incoming) water supply if there's a leak. Not all sensors work with shut-off valves. Expect to pay considerably more for these sensors and valves, and, unless you have some requisite experience, anticipate having to hire a plumber to install the valve.

Roost Smart Battery

GetRoost.com

$70.00

This battery-powered add-on (which is itself not a sensor) enables you to add wireless capability to any battery or wired smoke or CO detector that uses a 9-volt main or backup battery, so you can get notifications when you're not at home. Includes a low-battery alert and the option of notifying an emergency contact (in case you're not reachable). Doesn't provide interconnectivity between multiple units.

Similar Products: BirdiHome.com, RemoteLync.kidde.com, Z-Wave.com

Water Sensors

D-Link DCH-S160 Water Sensor

ca.dlink.com

$89.99

Plugs directly into a 120V wall outlet, connects via Wi-Fi, and has a 70-decibel siren alarm. It uses a 0.5-meter sensor cable that detects water along its entire length, and comes with a 1-meter extension cable so you can more easily reach hard-to-access areas. The sensor cable can be further extended using any standard RJ-11 phone cable.

Fibaro Flood Sensor

Fibaro.com

$79.99

Powered by battery (that lasts up to two years without incident) or a user-provided 12/24V DC power supply, connects via a Z-Wave hub (such as the Fibaro Home Center 2 or Samsung SmartThings), and has a 70-decibel siren alarm. A separate Apple HomeKit model is available. Unlike the D-Link, it detects water using three self-leveling telescopic probes on the base of the sensor unit. However, there is a terminal on the sensor to which you can connect an external sensor cable. The Fibaro includes a tilt sensor that lets you know if the sensor has been moved, and a temperature sensor that warns of impending freezing conditions. It can be connected to a camera and almost any wired alarm system. The other distinguishing feature is that it can be connected to an electrovalve such as the Fortrezz Wireless Water Valve (see below).

Lyric WiFi Water Leak And Freeze Detector

YourHome.Honeywell.com

$89.00

Battery powered (lasts up to 3 years without incident), connects via Wi-Fi, and has a 100-decibel siren alarm. Uses a 4-ft sensor cable that is optionally extendable up to 500 ft. Also includes humidity and temperature sensing. Doesn't integrate with any home automation systems.

Similar Products: GetRoost.com, Insteon.com, SkyLinkNet.ca, SmartThings.com, Wink.com

Sensors & Shut-off Valves

LeakSMART 2nd Gen. Complete Home Water Leak System

LeakSmart.com

$540.00 and up

Consists of a water sensor and an automatic water shut-off valve – an electronic motorized brass water ball valve that connects directly to the main water supply. It requires a Zigbee-compatible hub such as Wink, Iris, Nest, or the LeakSMART ($194.00). There are models for 3/4", 1" and 1-1/4" water mains. The shut-off valve comes with a 9V power supply, and you can also install batteries as a precautionary power back-up. The sensor is battery powered and has a siren alarm. Up to 32 individual sensors can be connected to the system.

Fortrezz Sensor and Water Valve

Fortrezz.com

$62.00 (sensor), $527.00 (shut-off valve)

This company offers both a sensor and shut-off valve that can be used together or independently of each other. Similar to the Fibaro, the sensor has bottom-mounted probes that check for water every four seconds. Powered by batteries that last up to two years (without incident). Also monitors temperature. Does not have a siren alarm. The shut-off valve will work with almost any Z-Wave water alarm sensor, including Wink, Honeywell and Fibaro. It plugs directly into a 120V wall outlet and is available for NPT pipe sizes 1/2", 3/4", 1" and 1-1/4". There is an override handle in case of power loss. Comes with a 9' probe. Both the sensor and valve work with any Z-wave network.

Similar Products: Domeha.com, SmartHome.com, WaterCop.com

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DIY Hidden Beds

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INFO: DIFFICULTY – 2/5, LENGTH/TIME – 2/5, COST – 2/5

Turn a Salad Bowl with a Textured Band

Photos by Allan Cusworth

One of the most sought-after turned wooden pieces is a large wooden bowl to prepare a tossed salad. Here's how to turn one that you can be proud of.

BY ALLAN CUSWORTH

The bowl in this project is approximately 8" in diameter by 4" high, however, any size of block can be used. This bowl has some unique design features. First, there's a decorative textured band just below the rim. Second, there's a slight undercut inside the top of the rim to allow the bowl to be picked up more easily and to help direct the salad leaves back into the bowl rather than onto the table.

Preparing the blank

This bowl is made from an 8-1/2" diameter by 4-1/2" round disk. The first step is to decide the best grain pattern in the blank. Select and mark the side that will be the top of the bowl. Put a dimple at the center of the block on both sides. Drill a perpendicular hole in the center of the top suitable for a woodworm-type screw mount for your chuck. A drill press is best for this. I drilled a 5/16" × 1"-deep hole to fit the Woodworm screw in my Super Nova chuck. Check your chuck's requirements, as each manufacturer is different.

Mount the chuck on the lathe spindle, and twist the blank onto the screw chuck until the face seats firmly against the chuck jaws. If you don't have a chuck, you can center the blank on a faceplate and modify the mounting procedure to suit.

Shaping the outside surface and base

Place the tool rest on about a 45° angle to the ways of the lathe and about 1/4" away from the highest point of the blank's corner. Set its height so a 1/2" bowl gouge will cut at the centerline of the lathe's axis.

Bring the tailstock up for support, tighten and lock it in place and hand spin the blank to make sure it does not hit the tool rest. Select a slow speed (about 500 RPM), and shape the outside surface of the bowl while moving the tool rest frequently to keep it close to the cutting surface of the blank.

Make the gouge cuts following the wood grain from the narrow diameter to the wide diameter of the blank to reduce tear-out. If the blank has an uneven grain pattern you can often reduce tear-out by using Claphams sanding and cutting compound to soften the wood fibers. To date, this product has not caused any problems with my final finish.

You can increase the lathe speed as the vibration level decreases. A faster speed not only removes wood more quickly, it also provides a smoother surface for easier sanding.

Make a tenon at the tailstock end to fit your chuck. Some chucks require a straight-sided tenon. While others, like the Nova chuck that I use, require a dovetailed tenon. Make sure that the tenon length will allow the tips of the chuck jaws to seat firmly against the bowl at the base of the tenon, and the tenon does not touch the inside bottom of the jaws. This provides a stronger and more accurate hold on the bowl blank.

Remove the bowl from the Woodworm screw and reverse it into the chuck jaws. Because it is virtually impossible to remount the blank perfectly, there will probably be a little wobble when the blank is reversed. True up the outside surface to reduce the vibration. True up the face of the blank.

Turn the lathe speed down to about 500 RPM, and finish sand the outside surface. I usually sand with 4"-diameter disks on a 3"-diameter sanding pad with a sponge spacer in an angle power drill/sander. The 4"-diameter disks allow them to flex and do not gouge the surface. I sand through the grits starting at 80-grit to remove the tool marks, all the way to 320-grit, and then hand sand with 400- or 600-grit. Hand sanding the entire outside surface will also work; it just takes a lot longer.

Woodworm Screw – A hole drilled in the blank will allow Cusworth to secure the blank to his lathe.

Spin it On – The hole in the back of the blank will thread right onto the Woodworm screw, and ready the blank for turning.

Turn a Tenon – Cusworth shapes the outside of the bowl, then adds a tenon on the bottom of the blank that will be used to secure the workpiece while turning the inside of the bowl.

Finish Sanding – Though you could use your hand, machine sanding is faster while the blank is still mounted in the lathe.

Making the textured band

The textured band should be done before hollowing out the inside, because the bowl walls have not been turned and will not flex. The textured band on this bowl is 3/4" wide and is located 3/4" from the top of the rim. Mark the location of the edges of the band on the bowl surface. Locate the tool rest about 1/4" from the surface and placed so a skew will cut on center. Make two small grooves where the marks are.

Create a texture pattern between the two grooves. You can use whatever texturing tool you prefer. The tool I used is a Robert Sorby Spiraling/Texturing tool with the 1-1/2"-diameter texturing cutter attached. I located the adjustable tool saddle 90° to the cutter. Position the tool rest so about 3" from the bowl's surface. Place the texturing tool on the tool rest so it can be pivoted up to create the texturing design. The texturing cutter should contact the bowl surface just below the center axis of the bowl to prevent a catch. With the lathe speed at about 500 RPM, using a lever action, press the cutter against the wood between the grooves. You can experiment with the cutter wheels, settings, and lathe speeds to create the texture design you want.

The textured band can be left natural; however, if you want to colour it later, the ends of the wood pores must be sealed in the grooves so the dye used to colour the textured area will not bleed past the grooves. To do this, it is necessary to burn these grooves with a wire wood-burning tool.

The burning is done by creating friction heat in the groove, which will burn the wood and seal the ends of the pores. It also makes two dark lines that emphasize the textured band feature. It is important that the wire tool not be wrapped around your fingers because it gets very hot and could easily burn them. Turn the dust collector off during this process in case a hot spark is produced.

Using a faster lathe speed, around 1500 RPM, hold the wire burning tool in the grooves till the wood is charred. This only takes a few seconds. After the grooves are burned, you can burnish the textured area with some shavings to remove any fuzz. The band is now ready for finishing.

Colouring the textured band can be done later but I like to do it at this time to give it time to dry completely while I'm turning the inside of the bowl. I prefer to use dye rather than stain so that the colour penetrates the wood. Metal acid dyes provide the best colour fastness but aniline dyes will work. Carefully brush the dye onto the

Wire wood burning tool

A wire wood-burning tool is used to char grooves in a wood surface and is used in this project to seal the wood pores to prevent the dye from bleeding past the textured band.

It is made using a 12"-long piece of 20-gauge wire, or as I prefer, a used wrapped 3rd (G) guitar string. Any guitar player or music store that tunes guitars should be able to give you one or two of these.

Cut two 2"-long pieces of dowel, and make a groove at the middle of each one. Twist the ends of the wire onto the dowel pieces and the tool is complete. I like to wrap the twisted wire with masking tape to cover the exposed sharp point.

Define the Boundaries – Two narrow grooves are added to the outside of the bowl in order to define the width of the textured band.

Add Texture – A texturing tool, in this case a Robert Sorby spiralling / texturing tool, is used to create the detailed band on the side of the blank.

Add Some Colour – A band of colour helps highlight the textured band. Be very careful to not get any colour outside of the band, as it sticks out like a sore thumb.

textured area with the lathe turned off. Take your time, as a mark outside the band is very difficult to remove.

Forming the inside surface

It's a good idea to establish the inside depth of the bowl by drilling a depth hole to about 1/4" - 1/2" less than the finished depth dimension. I do this with a long shank 3/8" drill bit mounted in a handle. Place the tool rest to align the bit on center. Mark the desired inside depth on the bit shank with a piece of masking tape and then align the drill bit with the ways of the lathe and drill straight into the blank using a very slow lathe speed (around 250 RPM). Remove it often to clear the flutes until the required depth is reached.

Adjust the tool rest height to allow the 1/2" bowl gouge to cut at the center line. Start cutting with the gouge set at 90° to the tool rest, and with the bevel rubbing, make cuts towards the center. Cutting in this direction allows the cut to follow the direction of the wood grain and will help reduce tear-out. If you have a curved tool rest, it can be used to reduce the gouge's extension over the tool rest. Continue making long, sweeping cuts following the contour of the outside surface. Gradually rotate the gouge to about 45° to make the cuts a little more aggressive and remove the wood a little faster.

Depth Hole – Cusworth uses a long 3/8" drill bit to mark the depth of the bowl, so while he's turning he doesn't go through the other side by accident.

Take frequent wall-thickness measurements with calipers. I like a double-ended caliper because it lets you see the wall thickness immediately on its outside end.

As you get closer to the completed bowl wall thickness near the bowl rim, create an undercut just below the top of the inside.

As you get to the bottom of the bowl you will notice that the bottom of the depth hole disappears, letting you know that the bowl bottom is close. Switching to a bowl gouge with a steeper bevel makes it easier to get a good cut on the bottom surface because you can continue to rub the bevel. This will also ensure that you have enough wood to form the outside of the base. Use a depth-measuring tool to keep track of the bowl's depth. Take the measurement, and then align the tool across the rim so you can sight along its end to see where the inside bottom of the bowl is.

Make light cuts to finish shaping the bottom. Leave the bottom of the bowl a little thicker than the walls to make the bowl more stable in use. I often shear scrape the surface with a large side scraper to make it smoother. Make the edges of the rim crisp but not sharp.

Sand the inside surface the same way I described earlier, with sanding disks and a sponge spacer to allow the sandpaper to conform to the inside surface without digging into the surface.

Hollow the Inside – Use the tool rest and proper tool selection to safely remove the waste from the center of the bowl.

A Quick Look – Double-ended calipers will give you an instant visual of how thick the walls of your turning are.

Depth Gauge – A shop-made depth gauge will help you tell exactly how deep your turning is.

Power Sanding – Sand the inside surface of the bowl to produce a nice, even finished piece.

Completing the base

After the bowl is sanded to your satisfaction, you will need to remove the tenon and complete the base. The bowl has to be reversed and mounted with the bottom exposed. There are many ways to do this, including a vacuum chuck and making a jam chuck. There are various other chucks that will grasp the bowl. For this project, I chose to use Cole jaws mounted on the chuck. These jaws are also called jumbo jaws.

Remove the bowl from the chuck, and set the depth gauge at the inside depth of the bowl. This depth measurement will be needed later to see where the inside bottom is as the base is being turned.

There are two ways to mount a bowl in Cole jaws. Compression mode clamps the bowl by its outside edge while expansion mode holds the bowl by its inside edge. If you are using expansion mode, as I did for this project, do not overtighten the chuck to expand the jaws too far and split the bowl. Also, make sure the bowl is pressed securely against the chuck base to provide maximum holding strength.

Place the tool rest about 1/4" away from the bottom surface and hand spin the lathe to make sure the bowl does not hit anything. Chucks with Cole jaws attached are designed to turn at a maximum lathe speed of 600 RPM. Start the lathe at a very slow speed. Gradually increase the speed. Using a sharp 1/2" bowl gouge and very light cuts to nibble away at the tenon.

Shape the base creating a slightly concave surface. This prevents the bowl from wobbling on a table. Check the thickness of the bottom with the depth gauge that was set earlier. The bottom of the bowl should be a little thicker than the wall to increase its stability when the bowl is being used.

Sand the base to 400- or 600-grit, and add any decorative rings. I like to engrave my signature on my bowl while it's still on the lathe so I can give the base a final sand to remove any fuzz created by the engraver. Remove the bowl from the lathe before finishing.

Concave Bottom – Remove the tenon, and create a slightly concave bottom. This will help protect against the bowl rocking on your table when it's complete.

Finishing

There are numerous materials that can be used to finish bowls. I prefer to finish my salad bowls off the lathe with three to five applications of curing oil. The number of coats depends on the absorption quality of the wood and the amount of surface finish desired. A curing oil penetrates the surface of the bowl, leaves a little surface buildup, and seals the wood as it cures. This prevents salad oils, etc. from seeping in and becoming rancid. Some curing oils include tung oil, walnut oil, linseed oil, and some proprietary combinations of these. I mostly use a Danish oil, which is mostly linseed oil. Vegetable, mineral and other non-curing oils never cure, and some can become rancid after application. I don't use them.

When applying oil, flood the surfaces, and let it soak in. After a few minutes, wipe off the excess oil, and let the bowl dry for a few hours. Apply succeeding coats the same way, and leave the last one to cure until no odor can be detected. This can take a few weeks. The final finish can be buffed if desired.

Some turners prefer to use a polyurethane finish to create a shiny surface. These provide a film-type finish and in my opinion are not satisfactory because they can crack and peel off and are difficult to repair.

After the finish has cured, your beautiful salad bowl is ready to prepare your favourite tossed salad for the dinner table.

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2017 Readers' Choice Awards

CANADIAN WOODWORKING
READER'S CHOICE
TOOL OF THE YEAR
2017
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Woodworkers and DIYers from across Canada have chosen the best tools of 2017.

We are very pleased to announce the winners of our 2nd Annual *Canadian Woodworking & Home Improvement* Tool of the Year Awards. The awards recognize the best woodworking products released during the year. Winning products were voted on by woodworkers and DIYers from across Canada, from a list of 10 candidates pre-selected by contributing editors at *CW&HI*. You can learn more about each of these great new products by visiting: www.canadianwoodworking.com/TOY2017

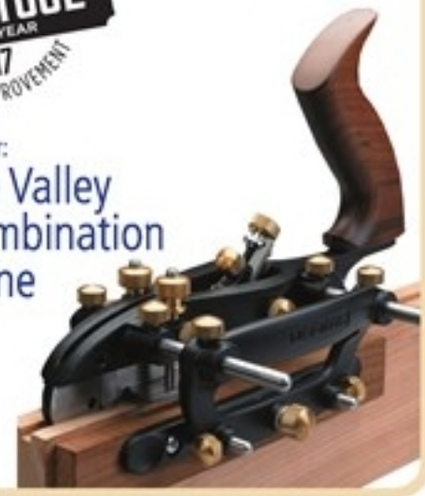
Congratulations to all the winners and runners up, and all the best for a great 2018.

Hand Tool of the Year 2017

Runner-Up: **Bessey I-BEAM Clamp**

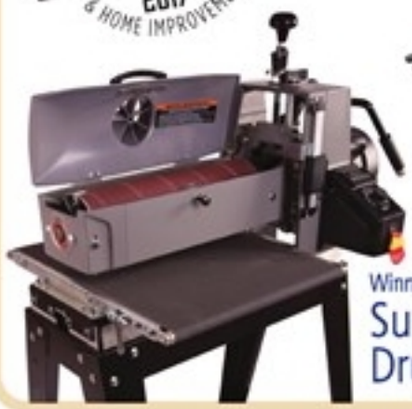
Runner-Up: **Milwaukee Wide Blade Tape Measure**

Winner: **Lee Valley Combination Plane**



Machinery of the Year 2017

Runner-Up: **Milwaukee Dual Bevel Sliding Compound Miter Saw Kit**



Runner-Up: **Oneida Dust Gorilla Pro Dust Collector**

Winner: **Supermax 16-32 Drum Sander**

Power Tool of the Year 2017

Winner: **Festool HK 55 Portable Track Saw**

Runner-Up: **Bosch Flexiclick 5-In-1 Drill/ Driver**

Runner-Up: **Milwaukee M18 FUEL 1/4" Hex Impact Driver**

Accessory of the Year 2017

Runner-Up: **Ridgid Hybrid GEN5X Cordless Folding Light**

Runner-Up: **Arbortech Ball-Gouge**

Winner: **Kreg Accu-Cut Circular Saw Guide**

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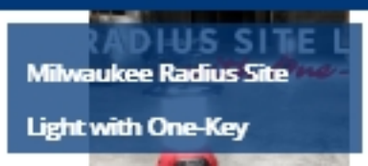
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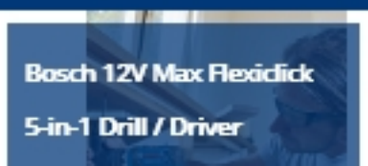
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