



38 Small Shop
ESSENTIALS



Small Shop
BIG SOUND

7 Shop Floor
Covering
Options



JUNE/JULY 2017
ISSUE #108

CANADIAN Woodworking & HOME IMPROVEMENT

7TH Annual
**SMALL
SHOP**
Issue

Build a
**Shop Storage
Cabinet**

**Small Shop
FINISHING**

- + Ultimate
Finishing Rack
- + Build a
Spray Booth
- + Top 10:
Finishing Tips
- + Finish Selection
Centerfold

Small Workshops: **THE 5' RULE**



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FEATURES

10 Know Your Tools: Random Orbital Sanders BY CARL DUGUAY

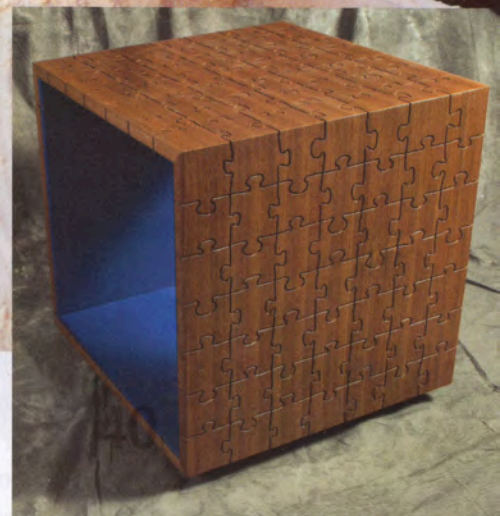
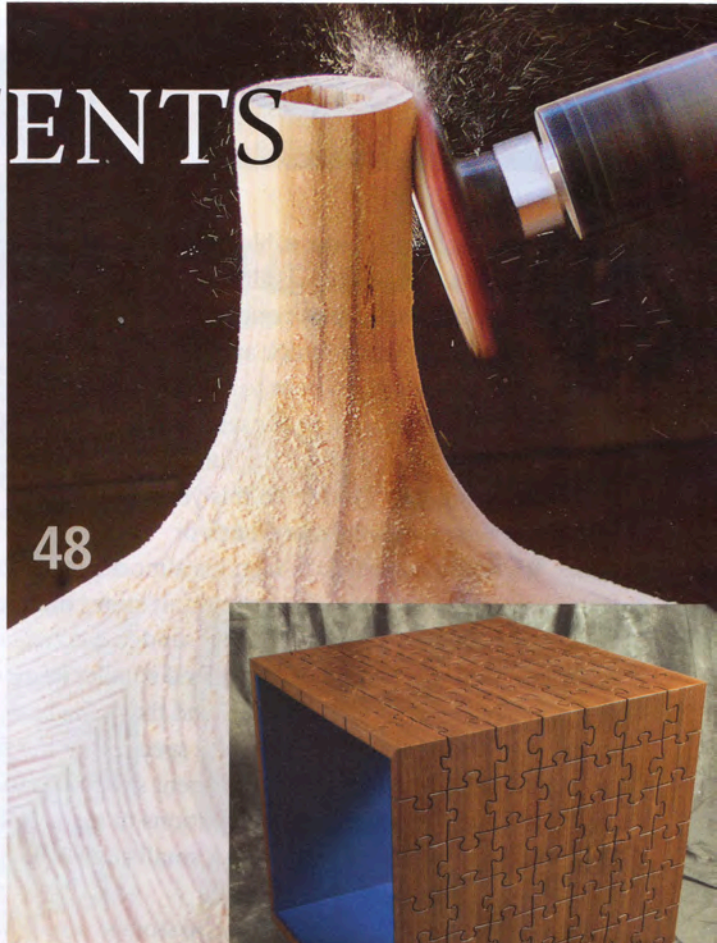
By far the most commonly used power sanding in your shop, learning the ins and outs of this workhorse will pay off wonderfully.

44 Small Shop Spray Booth BY MARK SALUSBURY

Spray finishing can be daunting, but this easy-to-make spray booth will surely make the jump to spray finishing simpler.

48 Hand Powered Sanding BY CARL DUGUAY

Learn how to use these tools to help you sand properly and you'll be well on your way to creating a finish to be proud of.



DEPARTMENTS

- | | |
|--|--|
| 2 Editor's Letter | 14 Canadian Quotes: Chris Wong |
| 4 Letters, Coming Events | 16 Home In On: Shop Flooring Options |
| 6 Web Shavings | 30 Build a Finishing Rack |
| 8 Home Page | 35 Finishing Selection Centrefold |
| 12 Top 10: Small Shop Finishing Tips | 39 The 5' Workshop |
| | 54 38 Small Shop Essentials |
| | 62 Smart Home: Shop Audio |
| | 68 Wood Chuckle |
| | Back Cover: "Wireframe Cabinet" |



COVER STORY

Cover photo by Rob Brown

22 Build a Shop Storage Cabinet BY ROB BROWN

With only simple joinery and cost-effective building materials you can build yourself this multi-purpose storage cabinet and worksurface.



In need of simple, accessible power tool storage, I recently built an open-faced wall cabinet out of 3/4" melamine. It was a 'quick and dirty' project that took all of an hour to make, but since it's been secured to the wall and loaded with everything under the sun I've been wondering why I didn't do this years ago. It's not gorgeous. It has no back or doors. It's nothing special. In fact, it's almost ugly, if I'm being honest. But it provides a very specific function. It stores often-used power tools – a couple of routers, a random orbital sander, a couple of other sanders, sandpaper and a host of accessories and smaller items – easily within my reach. It functions perfectly for me, and that's the basis for all great small shop storage solutions; there's no one specific answer for all of our storage requirements, as we all have different shops and tools. Think critically about what you need, make modifications to plans or ideas you come across, and get building. Outfitting a small shop so it works for you is really as straightforward as that.

In this issue we have three small shop storage projects for you. The cover story is a Japanese-inspired storage cabinet / work surface. I've always loved the look of a tansu, and it now offsets the look of my ugly shelving unit it sits right under. The other two small shop projects in this issue revolve around finishing. A knockdown drying rack will assist you with projects that include many medium-sized panels and parts. The last project is a collapsible spray booth that will allow you to enter into the wonderful world of spray finishing. These last two projects work very well in tandem, and can revolutionize the way you apply finishes from now on.

Still along the "finishing in a small shop" vein, is our Top 10 column focusing on finishing tips, our regular Finishing Touch column discussing hand sanding and our first woodworking pin-up 'centerfold,' covering all you need to know about the different types of wood finishes available today.

To round out this issue are articles on small shop flooring options, portable table saws, small shop audio options and what BC woodworker Chris Wong calls his 5' shop. It really is amazing what can be done in a small space.

— Rob Brown



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CANADIAN Woodworking & HOME IMPROVEMENT

Issue #108

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CANADIAN WOODWORKING & HOME IMPROVEMENT

One-year subscription (6 issues) \$27.95

Single-copy price: \$5.95

H.S.T. REG. #878257302

ISSN 1921-6432 (PRINT)

ISSN 2371-9028 (ONLINE)

PUBLICATIONS MAIL AGREEMENT No. 40035186

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MAGAZINE DIV. OF SAWDUST MEDIA INC.

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We acknowledge the financial support of the Government of Canada through the Canada Periodical Fund (CPF) of the Department of Canadian Heritage toward our periodical.



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- Table tilt: 10 deg. left, 45 deg. right
- Cutting capacity/throat: 16 1/4" left of blade
- Maximum cutting height: 12 1/8"
- Blade size: 131 1/2" L
- Blade width range: 1/8" - 1" W
- 2 blade speeds: 1700 and 3500 FPM
- Overall size: 73" H x 32" W x 32" D
- Approximate shipping weight: 342 lbs.



10" HYBRID TABLE SAW WITH T-SHAPED FENCE

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- Amps: 15A at 120V, 7.5A at 240V
- Table height: 35 3/8"
- Footprint: 21" L x 19 1/2" W
- Arbor speed: 3450 RPM
- Max. depth of cut @ 90°: 3 1/4"
- Max. depth of cut @ 45°: 2 1/4"
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- Knife size: 13" x 1/2" x 1/16"
- Cutterhead speed: 9000 RPM
- Number of cuts per inch: 87
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- Minimum stock thickness: 1/8"
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- Impeller: 12 3/4" balanced cast aluminum
- Bag capacity: 5.7 cubic feet
- Portable base size: 21 1/4" x 33 1/2"
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letters

Great 'Green' Project!

I completed a clothes drying rack (Feb/Mar 2017, Issue #106) for my son this weekend. I made it 41" long with a 10" overhang on one side and 1" on the other. The downsized drying rack will fit better in my son's apartment, and he can modify it to fit in a closet fully assembled. Lots of sanding was involved, but it was an important step to prevent clothes from snagging during use. Great project to make – thanks for the plans.

John O.
Via email



An Oldie and a Goodie

I feel bad not renewing my subscription, but we have downsized, and I had to give up my workshop. I am also getting older and don't need to build anything new.

I want to thank you for helping me over the years by showing me the latest tools and having articles on furniture I just had to build! And for the great advertisers.

In cleaning out a spare room I found the Dec/Jan 2001 edition. Boy, you have come a long way! Thanks for being there for me, and continued success.

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

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Forum Thread

Relocating a Wall Outlet

LarryT – Beaconsfield

I'll be doing some kitchen renovations that require moving a door and a wall outlet. The outlet has a connection to a dining room chandelier, and there won't be enough wire to reach after relocation. I don't really want to rewire that section, as all the wire is hidden in the ceiling and wall. Would I be committing a "felony electrical offense" if I used a junction box with metal cover, added the extra wire I needed and buried that junction box in the wall?

John Bartley

Typically, burying a junction box in a wall doesn't meet code. Any way you can make the junction box accessible.... say, by putting it in an attic so it's exposed?

Wally in Calgary – Calgary, AL

There are also access covers of all sizes that are easy to install in a wall or ceiling, that don't look too bad and can also be painted.

jgarrett forsborg

Great opportunity to add wall sconces or pot lights in an appropriate junction location.

LarryT – Beaconsfield

Thanks everyone for all your replies. They're all helpful. I'm thinking I'll do all the grunt work of running the wire through the attic and then call the electrician to do the final hookups. Better safe than sorry.

Also, check out these home improvement threads at forum.canadianwoodworking.com

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Photo Measures Lite

Constructing a house? Engineering a new project? Moving to a new place? With this app you take photos and then note the dimensions right on the photos so you can easily recall the exact layout.



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Random Orbital Sanders



These are the most popular hand-powered sanders for woodworkers and DIYers. Their combined rotating and orbiting motion produces a more consistently randomized scratch pattern than other sanders. For best results you should always finish by hand sanding in the direction of the grain. Most random orbit sanders are corded. All come with either a 5" or 6" backing pad (platen) that has 5 or 8 holes through which dust is extracted. Use sanding discs that have a matching number of holes. The orbiting motion, referred to as the 'stroke,' can be as small as 5/64" (best for fine-finish sanding) to as large as 3/8" (for very aggressive sanding). A 3/16" stroke is fairly common. Options to look for include a detachable front handle for sanding large panels, variable speed control (helpful when sanding veneer and plywood), a lock-on switch, quick pad stopping when the trigger is released, and a dust port that accepts a vacuum hose. If you do a lot of power sanding choose a model that offers vibration-dampening control.

Price: \$35-\$850
Pad Size: 5", 6"
Stroke: 5/64" – 3/8"
OPM: 3,000 – 14,000
Motor: 1.5A – 6A
Weight: 2.5 pounds

Get the Most Out of Your Random Orbital Sander

Don't Strain

Let the sander do the work and don't rush it. If you feel the need to apply downward pressure, change to a coarser grit. Don't let dust accumulate on your work – remove it periodically, and always before you begin sanding with a new grit.

Keep it Flat

To avoid creating depressions in your work surface or rounding over edges, keep the sander pad flat on the work surface and keep it moving at all times.

Start Off, Lift Off

To avoid swirl marks, start the sander when it's off the work surface, and wait until it reaches full speed before sanding. When you're finished sanding, lift the sander off the work surface and then turn it off.

Connect

You'll get much better dust control by connecting your sander to a dust extractor. If your sander doesn't have this option, empty the dust bag or canister frequently – well before it fills up.

Cover Up

Sanders generate a lot of very fine dust, so ensure you wear suitable respiratory protection. Wear gloves to absorb vibration if doing a lot of sanding.

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Top 10 Small Shop Finishing Tips

With the right approach, applying a gorgeous finish isn't that hard. These 10 tips will get you started in the right direction.

BY ROB BROWN

1 Do some research – Whether it's reading books and magazines or talking with experienced finishers, learn the science behind wood finishing. Learning the basics of why and how you finish wood is an important first step.

2 Learn proper sanding technique – No finish will be beautiful if the wood isn't sanded properly. It's more than just starting with a coarse grit and moving to a finer grit. Realizing that machine and hand sanding work hand in hand, as well as how to deal with end grain, different wood species and many other finer points of sanding will pay off down the road.

3 Make sample boards – This is where you can see how a specific finish will look on a specific species of wood, before ruining a project. Different finishes create different looks depending on the wood they're on, how figured the wood is and many other factors. Just because a finish looks good on one species doesn't mean it will look good on another.

4 Experiment – Like science, great things happen when you least expect them. Layering different colours, applying different top-coats over those colours, using different application approaches and using different faux finishing techniques can provide you with a great-looking project.

5 Keep the dust down – Not many small shops have dedicated finishing rooms, so clean up as best as you can before applying a finish. Dust can quickly ruin an otherwise beautiful finish.

6 Cover your machines if spraying – Overspray gets airborne if it's not properly dealt with, and will come to rest on horizontal machinery surfaces, where it will cure. Cutting thin sheet stock to fit nicely on machine surfaces or covering the entire machine with a sheet are two ways to quickly protect your machinery.



7 Finish before assembly sometimes – Applying a finish to inside surfaces and corners can be difficult, and it often leaves you with a less-than-satisfactory look and feel. Though it takes a bit of planning and some patience to hold off on assembling your project, it may pay off in the long run. Smaller, flat pieces are much easier to finish.

8 Don't rush it – Finishes need time to dry, and working against these timelines creates a finish with poor adhesion; it leaves you with a poorer surface. Once dry, a topcoat can be easily sanded smooth with fine sandpaper. Also, don't rub out the final coat of finish with extra fine abrasives until it has had adequate time to fully cure.

9 'Finish' the finish – When used properly, steel wool, wet-dry sandpaper and other very fine abrasives allow you to create an incredibly smooth, almost glass-like, surface on a project. This approach should be practiced with some sample boards. Be especially careful around edges and corners, as this is where you can abrade through a finish easily.

10 Perfect three finishes – There are many options when it comes to choosing a finish, but don't get frustrated because you don't know them all. Start by getting comfortable with applying three different types of finishes first. This way you can likely apply one of them to most of your finished projects. If a situation arises where you have to adjust your approach, do some research, create a sample panel, then enjoy the new look you have in your finishing arsenal.



ROB BROWN

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Golden Pecan	286778	0-20066-29388-8	302971	0-20066-32737-8
Early American	286784	0-20066-29394-9	302977	0-20066-32731-6
Dark Walnut	286786	0-20066-29395-6	302978	0-20066-32730-9
Provincial	286779	0-20066-29389-5	302972	0-20066-32736-1
Traditional Cherry	286780	0-20066-29390-1	286780	0-20066-29390-1
Black Cherry	286782	0-20066-29392-5	302975	0-20066-32733-0
Kona	286788	0-20066-29397-0	302980	0-20066-32728-6
Sun Bleached	286777	0-20066-29387-1	302970	0-20066-32738-5
American Walnut	286783	0-20066-29393-2	302976	0-20066-32732-3
Espresso	286787	0-20066-29396-3	302979	0-20066-32729-3
Chocolate	286789	0-20066-29398-7	302981	0-20066-32727-9
Cabernet	286781	0-20066-29391-8	302974	0-20066-32734-7
Weathered Grey	286776	0-20066-29386-4	302969	0-20066-32739-2
Ebony	316671	0-20066-34894-6	316666	0-20066-34889-2
Antique Aqua	316669	0-20066-34892-2	316664	0-20066-34887-8
Bleached Blue	316670	0-20066-34893-9	316665	0-20066-34888-5
Worn Navy	316668	0-20066-34891-5	316663	0-20066-34886-1
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946ml Case Pack: 2 – 236ml Case Pack: 4

RUST-OLEUM
CONSUMER BRANDS CANADA

Chris Wong

...on sculptural furniture, his dislike of cleaning and why he's often in the shop until after midnight.

BY ROB BROWN



Cherry Coffee Table – Made from a single slab of cherry, Wong wanted to showcase the natural characteristics of the wood, and a mitred table with waterfall edge seemed appropriate. He sanded only the outside surfaces and left the inside surfaces rough with chainsaw marks. It is finished with tung oil.

Chris Wong, Flair Woodworks, www.FlairWoodworks.com
Location & size of studio – Pitt Meadows, BC.
1725 cubic feet, or 215 sq. ft.
Education – Self-taught via experimentation

How long have you been building furniture?

About 15 years

What sort of furniture do you specialize in?

Sculptural furniture that highlights the natural characteristics of wood

Tell us a couple interesting things about your personal life

I got married a couple years back in a park under a canopy of trees. My wife and I worked together to make the arch, flower stands, Pacific Yew coasters, and I made my wedding ring from *Lignum vitae*.

If you were not a furniture maker what would you be?

A designer. I think of myself as a designer who communicates through wood.

In order, what are the three most important items in your shop apron?

No apron, but carpenter's pencil, 1" chisel, Magic Square - okay - 6" combination square.

Do you prefer hand tools or power tools?

Whichever is easier to use to get the job done. Probably power tools by a slight bit.

Solid wood or veneer?

Solid wood, as I find it easier to work.

Figured wood or straight grain?

Straight grain.

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

I appreciate the precision of many tools on the market today, but I enjoy using older hand tools more. I feel that it's valuable to understand the tools with which we work, and what better way than to start with an under-performing one and make it better?

Flowing curves or geometric shapes?

Mostly flowing curves complemented with geometric shapes.

Favourite wood?

Air-dried ash – especially if it has some interesting colouring. It has a strong grain pattern, bends well and is an all-around very versatile material. Honourable mention to black locust.

Least favourite wood?

Purpleheart. Blech! It's a very alien-looking wood and unfriendly to work. I think only palm splinters more.

quotes

I do my best work, and work at the quickest pace, when inspired, whether that means developing a design, exploring a concept, or batching out something while pondering something else. Although not recommended, I have been known to get out of bed in the morning, get dressed and head straight to the shop, only to emerge after dark for dinner. I also like to work from 10 pm to 3 am, as that's when my brain is most active.

I'm not big on cleaning up as I go – if glues cured instantly, my shop would get tidied up a lot less frequently.

I have surrounded myself with reliable tools that make my work easy and efficient. Some of my favourite tools include my Mirka CEROS sander, Pfeil carving gouges, Bridge City Tool Works CS-2 Centerscribe, Festool TS 75 track saw, Grizzly sliding table saw, drawknife, customized Veritas #4 Bench Plane, and Knew Concepts Coping Saw. My angle grinder with Arbortech carving wheel is a ton of fun to use, but it sure makes a big mess.

I enjoy the adventure of carving, and the tactile result of sharp hand tools.

Most of my inspiration starts with a question such as, "what would happen if I did this?" or "how can I incorporate this into a design?". Then, the design process is about sorting out the favorable answer(s) from the less favorable ones.

I'm not afraid to take chances and try something that might not work. In a lot of cases, whether something does or doesn't work cannot be determined immediately – it requires daily use and abuse.

In developing a design, I start with either materials and build something to utilize it, or I address a specific need or answer a question.

Build freely and build fearlessly. Pretend everything is a prototype.

I started making two very complicated pieces and ran into technical difficulties, which led to the abandonment of them. I'm not sure that "Insanity 1" can be built from wood, and "Insanity 2" got way too complicated, and there's no end in sight.

I have little interest in anything that's already been done – including my own designs. I want to see new, innovative designs.

Dovetails are definitely overused by woodworkers.

If you want to make a living at woodworking, either commissions or production runs of small, low-ticket items is the easier way. Speculative work, however, is much more enjoyable because woodworking is a creative outlet for me.



Deconstructed – This piece started with a piece of yellow birch that was separated along its annual rings. The split nearly separated the board into three pieces. Using wedges, Wong separated the three pieces and made them into a shelf using a form made of waxed melamine and a clear casting resin.

If a customer has specific requirements of the design, we discuss them before work begins. Then, I go to work and don't usually share any progress updates until it's complete.

I am fascinated with combining different materials, and experimenting with resins and metal has opened the doors to new design possibilities. ("Deconstructed" comes to mind.)

Instead of putting studio furniture in places where people can come see it (art galleries), it needs to get in front of people. It needs to be in public spaces where they can experience and interact with it.

My computer screensaver draws from a folder of designs that I find intriguing and inspiring. The one that captivates me most is perhaps Vivian Beer's chair, "With Birds and Beasts".

There seems to be a universal attraction and appreciation for wood, and everybody seems to have a story about a piece of woodwork in their life.

ROB BROWN
rbrown@
canadianwoodworking.com



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RELATED ARTICLES: Arthur Perlett (Oct/Nov 2015), Keith Logan (Dec/Jan 2015)
SLIDESHOW: View a slideshow of Wong's work in the Videos section of our website.



Shop and Garage Floor COVERINGS

Concrete and plywood are common options for shop floors, but concrete may be too hard on your body, while plywood likely isn't durable enough to stand the test of time. Learn about some other options that can be used to support you and your machinery for years to come.

BY CARL DUGUAY

Just about all garages and home basements – and the workshops located in them – tend to have concrete floors. Working on a hard floor, especially for long periods of time, can put a strain on your whole body. It can be especially aggravating if you have health issues such as arthritis, foot problems like bunions or plantar

fasciitis (jogger's heel), a herniated disk, or have had hip or knee replacements. And, over time, these floors can become gouged, chipped, cracked and stained.

Many woodworkers cover concrete floors with a layer of plywood, either right over the concrete or atop sleepers. Over time the plywood can delaminate – more often the case with cheap, imported sheeting – because of moisture penetration, excessive voids in the

plywood, inferior quality adhesives or improper gluing during the manufacturing process, not to mention from sustained normal use. They can also sag or crack if not properly installed.

Painting concrete or plywood floors is largely a cosmetic remedy. Even enamel paints won't hold up that long. What you need for a shop or garage floor is something that is comfortable to work on yet can support your shop machinery, is durable, and easy enough to clean. If the shop is in the basement of a house, you'll probably want a covering that has low VOC (volatile organic compound) emissions. For a shop that does double duty as a garage, you'll also want the covering to be resilient enough to support the weight of a vehicle, have good resistance to water, salt and oils, and it should not be susceptible to staining from hot tires.

There are a variety of coverings that can be applied over concrete and plywood floors. For concrete floors, epoxy is one of the most popular choices, while

Photos by manufacturers Lead Photo by Gladiator Garageworks

for plywood it's interlocking tiles and rolled sheeting. Epoxy isn't recommended for plywood floors because it has a tendency to seasonally move and, depending on the installation method, can sag or flex. Also, adhesives or other chemicals used in the plywood can compromise the ability of the epoxy to fully bond to the plywood.

Some of the floor coverings we list below don't require any specific preparatory work before installing. However, epoxy is the exception. It can't be installed over a floor that has moisture problems. To find out if your floor transmits moisture, tape a 1 sq. ft. piece of plastic sheeting onto the floor for 24 hours. If you find any moisture on the underside of the plastic you'll need to apply an epoxy sealer or primer before coating the floor.

Conscientious floor preparation is critical for epoxy to adhere properly, so you need to read and follow the manufacturer's instructions carefully. No skipping steps here. Usually this involves etching the surface with either an acid wash or mechanical grinding, patching cracks and holes, and cleaning the floor of dirt, dust, grease, oils and other contaminants. Do it right the first time so you only have to do it once.



Photo by Rustoleum

So, What is Epoxy?

Epoxyes are used both as adhesives and coatings. Even though epoxy can be brushed onto a surface, it isn't all like conventional acrylic or enamel paint. Rather, it's a thermosetting resin that consists of two components – a resin and a hardener. Just prior to use, these two components are mixed together. Once mixed, the two parts begin to chemically bond together to form a strong, rigid, plastic material that is significantly thicker and much more durable than paint. Epoxy is resistant to abrasion, impacts, chipping, stains, moisture and chemicals. Because it's thicker than paint it's much better at covering over minor imperfections on wood and concrete surfaces. Epoxy surfaces are fairly smooth, but under normal use will acquire fine scratches that make it less slippery, especially when wet. However, slip-resistant aggregate can also be added to produce a more non-skid surface. Epoxyes also yellow when exposed to UV light (water-based epoxyes less so). Some epoxyes contain UV blockers, or you can apply a polyurethane topcoat.

Single-Coat Epoxy

Rustoleum.ca, QuikRete.com, ValsparPaint.ca, Epoxy-Coat.com, EpoxyMaster.com

Epoxy applied as a single coat is probably the most popular DIY concrete floor coating, in large part because it's inexpensive and easy to apply. You'll see these products marketed as water based (the most widely available), solvent based, and cycloaliphatic (a curing agent added to some epoxyes to increase viscosity). Their effectiveness is, in large part, a function of the amount of solids in the product. Consumer products, available from big box stores, typically have a solids content of about 50%, and dry out to about 3 mils thick. These are the least durable epoxy options, and best suited for garages and workshops that don't see a lot of heavy-duty use. Solvent-based coatings provide a thicker film (around 5 mils) but produce more VOCs during application than water-based products.

There are also commercial-grade single-coat epoxyes, like Rust-Oleum's '6500 System' that have a 100% solids content. This means they maintain the same level of thickness when dried as when initially applied; there is no shrinkage in the film thickness. The dry film thickness on these products can be 10 mils or more – a thicker final film surface will be more durable and last longer, which makes them better suited for workshops. You can also add a glossy or satin topcoat of clear epoxy or polyurethane to increase the durability of these single-coat epoxyes.



Multi-Coat Epoxy

UCoatIt.com, Sherwin-Williams.com

You'll get superior durability and longevity from a multiple coat system. They give a dry film thickness that can be upwards of 40 mils. The process typically consists of applying an epoxy primer or sealer coat, followed by one or two coats of a 100% solids basecoat, and then one or two topcoats of a clear epoxy or polyurethane. Colour chips and anti-slip aggregate can be added – to the basecoat or the topcoat – depending on the grit size. While they do provide better floor protection, multi-coat epoxies are more involved and time consuming to apply than single-coat epoxies. If you've never applied a rolled-on coating before, you might want to consider hiring a certified installer.

do have the benefit of being more flexible, so they can absorb impacts better, are very abrasion resistant and are 100% UV stable. Typically they're applied in a two-step process – a basecoat followed by a topcoat.

An alternative to polyurethane is polyasparatic. It's also a two-part coating applied as a primer and a clear coat. It's VOC-free, 100% UV stable, has an abrasion and scratch resistance similar to polyurethane, is very flexible, and cures very fast. Polyasparatic is usually applied by a contractor, as it has to be applied very quickly, typically by spraying. Unlike epoxy, you'll be able to use the floor almost as soon as the coating is applied, rather than the three- or four-day wait needed for a multi-coat epoxy to dry.



Photo by Gladiator Garageworks

Interlocking Tiles

GladiatorGarageworks.ca, RymarRubber.ca, PlastiPro.com, SwissTrax.ca

The snap-together design of these tiles makes them super easy for anyone to install over concrete or plywood flooring. One of the advantages is that if a tile becomes damaged it can simply be popped out and replaced. Unlike epoxy coatings, you don't have to repair cracks or small holes in the concrete. And, because they come in a wide variety of colours, it's easy to plan a unique floor design. They're made of synthetic material (typically PVC or polypropylene).

Both poly and PVC tiles are durable, waterproof, UV resistant, and have good resistance to chemicals, oils, mildew and mold. They're also easier on the feet and legs than concrete or plywood, especially when standing for long periods of time. The amount of weight they can support ranges from a low of around 250PSI to upwards of 5,000PSI per tile. The tiles are recyclable, depending on the nature of local municipal recycling programs. Some tiles, like PlastiPro's UltraLock and Swisstrax's Rubbertrax, are made from 100% recycled content.



Polyurethane

FlexStones.ca, Sherwin-Williams.com

Polyurethane coatings are a newer floor covering option. They don't bond as well to concrete as does epoxy, and because they're solvent based they emit VOCs. However, they



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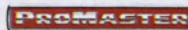
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Anti-Fatigue Floor Mats

If you don't want or need to cover your shop floor, but still find the floor hard to stand on for long periods of time, consider anti-fatigue floor mats. Standard carpeted floor mats wear out much too quickly, and they don't provide much in the way of cushioning. Thinner rubber mats – the type with a pattern of holes across the surface, and some interlocking mats – are durable, but not very resilient. A better choice are mats made from synthetic polyurethane resin; these are durable as well as puncture, tear, stain, moisture, and heat resistant, and don't curl or delaminate. They're available in a wide variety of sizes. You can place these mats near high-use areas in order to provide comfort while in the shop. Sources: CanadaMats.ca, GelPro.com, WellnessMats.com



Photo by Carl Duguay

Polypropylene tiles are hard, rigid and lightweight. They come in sizes starting at 12" x 12", can be from 1/2" to 3/4" thick, with either a perforated surface (to allow water flow through) or a smooth or patterned solid surface. They're a popular choice for garage floors. PVC tiles come in similar sizes but range from about 3/16" to 3/8" thick. They're softer, more pliable, and heavier than poly tiles, which makes them a good choice for use in workshops.

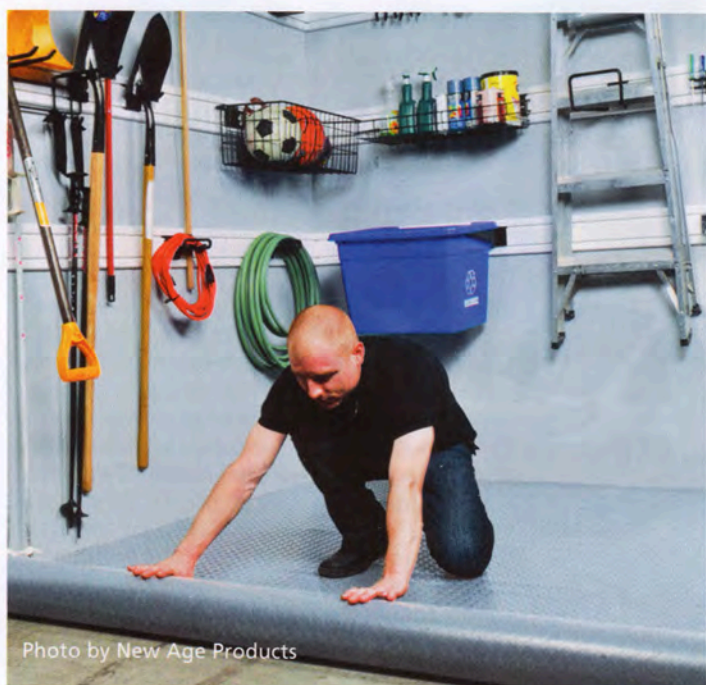
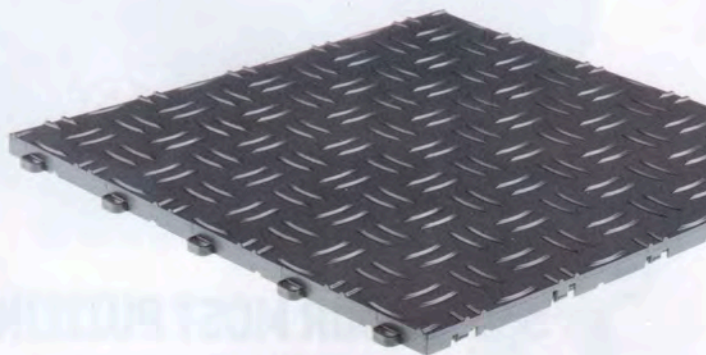


Photo by New Age Products

Roll Flooring

Bltlc.com, NewAgeProducts.com

You can also get PVC flooring in rolls. Installation couldn't be easier. You don't use glue, so essentially it's a matter of 'roll and go'. The flooring comes in thicknesses from about 1/16" to 1/8" and in various widths and lengths. The thicker flooring can be had in rolls 9' wide and 60' long. The covering is available in a more limited range of colours and patterns. Because PVC is impermeable, it's important to ensure that your garage or shop floor is free of moisture to prevent the growth of mold. If not, you'll need to apply an appropriate sealer. Borders and seams are typically secured with double-sided tape, and because it's not glued down it might shift when heavy loads are moved across its surface. If you're considering this product for a workshop, opt for the thickest flooring you can afford.



Rubber

Aurora-Rubber-Flooring.com, Eco-Flex.com

Rubber is a more expensive floor covering than PVC or poly, but it's more durable and will last a long time because of its high resilience. It's dimensionally stable, sound absorbent, and static, slip, oil, chemical and water resistant. It's natural anti-fatigue properties make it easy to stand on for hours on end. It's also very good at withstanding heavy impacts and scraping, and it can handle heavy machinery being dragged across its surface or dropped onto it. Rubber coverings are available in interlocking tile and roll formats, and both are made from recycled rubber products (typically automotive tires). Tiles come in a range of thicknesses from around 1/4" up to 1-1/4", and in sizes from 12" x 12" to upwards of 36" x 36". Rolled flooring, the kind you see in fitness centers, is typically 1/4" to 1/2" thick and available in rolls of about 4' wide and almost any length. It's usually glued down.



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Japanese-Inspired Shop Storage

It's nice to have at least some of your shop storage solutions look fantastic. This cabinet is inspired by the tansu that have been hand crafted in Japan for centuries. If this cabinet is a bit too nice for your shop, there's nothing saying you can't build a similar one for your home.

BY ROB BROWN

There are times when the shop storage solutions I build are bare-bones and strictly functional. Sometimes even ugly. But other times I like to take a bit of time and create something that not only functions nicely but is fun to build and looks nice. I've always enjoyed Japanese

design, but it's rare I get to make something along these lines.

Design

The main reason I built this cabinet was partially to store sanding supplies, with a large storage area for some medium-sized tools and boxes, but it could be used to store almost anything shop-related.

The dimensions were for the specific spot I had in my shop, but in some cases I tried to use materials carefully, to reduce waste. Feel free to adjust the overall dimensions to suit your needs.

Materials

Being that this was for a shop fixture, I didn't want to go overboard on spending. I opted for 2x4 materials for all of the solid wood, and was lucky enough to have a few pieces of plywood around, for some of the other parts. I purchased a sheet of 1/2"-thick, exterior-grade spruce plywood for a few of the remaining unseen parts, as it's not the best looking material. Other than the top, the two gables, the drawer faces and the door panels, the parts made of sheet goods will not be seen, so don't break the bank; scrap interior / exterior plywood, particle board or even MDF would all work fine, especially if it's what you happen to already have on hand.

2x4s are not as durable as many other woods, but I don't mind some wear marks as time goes on. 2x4s are cheap and fairly easy to use, and if you search you can often find somewhat clear, straight stock to work with. Allowing this material to dry is important, as it's often too wet to use right away.

Start with the frames

The two frame assemblies that make up the front and back of the cabinet is a good place to start. Both assemblies are the same size, and have a top, bottom and two side legs. The front frame assembly has an additional center divider, as well as three drawer rails.

Dress the parts flat, and to final width and length, then cut half lap joints to secure the top and bottom rails to the side legs and center divider. Also cut a half lap in the front top and bottom rails to accept the center divider. The drawer rails will be installed in the front assembly after it's together. When cutting the half lap joints, keep in mind many of the joints will be different widths, as the top rail, side legs, center divider and bottom rail are all different widths.

With the half lap joints fitting nicely, cut the ends of the top and bottom rails at 7

degrees. This shouldn't change the overall length of the rails, as the cuts should be aligned with the outside corner of these rails.

At this point I planed the side legs and the center divider down by about 1/8". This makes it unnecessary to flush the front faces of the half lap joints, and if there is any warping or movement down the road, it won't be visible.

Assemble both the front and back frame assemblies, making sure they're square. When the back assembly is dry, rout a rabbet in the inside edge of the frame with a rabbet bit. Cut and install the back panel into this rabbet. Trim both assemblies on the table saw, so they're the exact same width, and so the top and bottom edges are smooth.

Drawer rails

The drawer rails are cut 2" longer than the opening is wide, then a 1"-wide notch is cut into both ends of the rails, so they fit snugly between the side leg and the center divider. The depth of the notch should be cut so the front face of the rail sits about 1/8" away from the face of the divider and side leg.

A groove on the back of the drawer rails will accept a tenon on the solid wood drawer guide and help hold it in place. There are many ways to do this, but I chose to use a table saw, and cut stopped grooves centered on the rail. A router with a slot cutter will also work nicely, as will a straight bit in a router table. To accept the bottom drawer runner, a groove will also have to be cut into the inner face of the bottom front rail.

Two screws through the back of each drawer divider, along with some glue, will help keep them in place. When dry, drill a 3"-deep $\times$ 3/8"-diameter hole through the sides of the side leg and the center divider, into the drawer rails, then glue in a long piece of dowel rod to add some more strength. Trim them flush when dry.

Gable assemblies

The top and bottom gable rails, as well as the gable panel can now be machined. A groove in both gable rails accepts the panel. The assembly is created slightly wider than required, then ripped to final width. It's then edge glued between the front and back assemblies, with a few dowels to assist with location. When gluing the top and bottom gable rails to the panel, keep them about 1/8" away from one edge of the gable panel, so you can use that edge of the gable panel to run against the rip fence when ripping the gable assembly to final width.

When the gable parts were made, I stained the panels, as I wanted a two-tone look. Staining after assembly would surely result in getting stain on the gable rails. You don't have to stain your panels though. Use glue and clamps to assemble the gables, then trim the assemblies to final width on a table saw.

Drill for dowels

The gables are edge glued to the front and back frame assemblies, but dowels assist with locating the parts during final assembly. Although I drilled them later, it's safest to drill these dowel holes now, so you can create the grooves to accept the top and bottom panels, knowing confidently where the grooves should start and stop.

First, drill a hole in the ends of the top and bottom rails with



Install the Back Panel – To secure the back in place Brown routed a rabbet into the frame once it was assembled. A back was then cut to size, and its corners were rounded to fit the rabbet before being installed.



Groove Options – There are many ways to cut the groove in the backs of the drawer rails, and you should use a method you're comfortable with. Brown clamped a stop block to his rip fence, made a simple plunge cut, turned the piece end-for-end then repeated the plunge cut. This left a groove that was centered on the rail. A router with a slot-cutting bit could also have been used.



Assemble the Drawer Rails – Glue and screws do a good job of securing the drawer rails to the inside face of the front frame assembly. They're spaced to provide even drawer openings.

the help of a dowel jig. You can drill these holes freehand, but the bit tends to skate around in end grain. Next, insert a dowel center into the holes, position the gable in place and apply

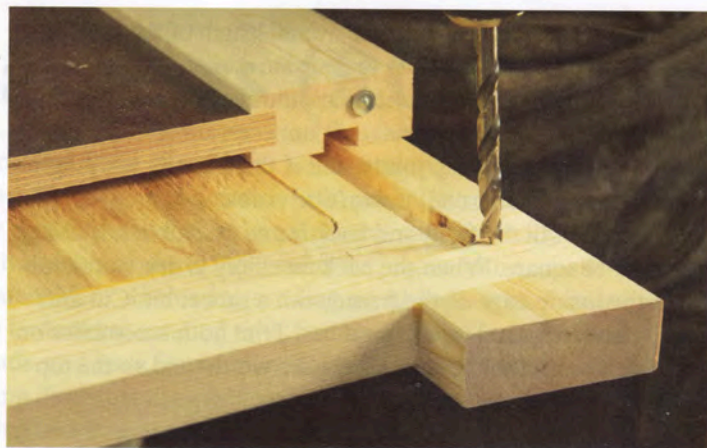


Stain First – Brown stained the gable panel, then assembled it to the top and bottom rails, so no stain would get on the rails. Notice the masked-off areas at the top and bottom of the panel. This stops stain from weakening the glue joint when the parts are assembled.

pressure to the gable assembly, leaving small imprints where the mating dowel holes are to be located. Finally, use a brad point bit to drill the holes in the frame assemblies freehand, being sure not to drill through the show face.

Grooves to accept top and bottom

Grooves in the inner faces of both front and back assemblies will be cut with a router equipped with a straight bit and an edge guide. When routing the top groove it should be



Dowels for Location – One dowel in each of the solid wood headers will assist with locating the gable during assembly. First, drill a dowel hole in the gable rails, then use a dowel center to transfer that location to the frame assemblies and drill those holes with a brad point drill bit.

positioned so the upper surface of the top will finish flush with the edge of the front and back assemblies. Use a 3/4" piece for the top, or the lip above the groove that will accept the top panel will be too weak. The position of the bottom groove isn't as crucial – somewhere near the center of the bottom rails will do nicely.

In terms of where to stop these grooves on the left and right sides of the frame assemblies, mark a pencil line where the

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Don't Drill Too Far – When Brown drilled the first dowel hole in the frame assembly he blew right through to the back of the assembly; luckily it was the back assembly and won't be seen. A simple shop-made collar can be fit over the drill bit and the drill bit adjusted for length in the chuck, to ensure holes are only drilled so far into the workpiece.

mating gable is located. Rout your groove so it finishes inside the lines. Once you have the grooves in the front and back frame assemblies, you can add a mating groove in the rails of the gable assemblies.

Top and bottom panels

Cut the top and bottom panels to size. I used a piece of 1/2" plywood for the bottom, so it simply fit into the 1/2"-wide



Getting Groovy – Brown drew the future location of the gable top rail on the inside face of the frame assemblies to visualize where the gables would meet the assemblies. This told him where to start and stop the grooves to accept the top. A similar groove was routed in the center of the bottom rails.

groove I routed into the frame assemblies. I used a 3/4" top, so it had to be rabbeted to fit the grooves.

I didn't add a shelf or a divider panel to separate the drawer bank from the main storage area, but if you want to, now is the time to cut those parts and machine the appropriate joinery.

Assemble the cabinet in stages

During the dry-fit stage my cabinet was assembled, then taken apart, many times. I slowly snuck up on fitting the top to

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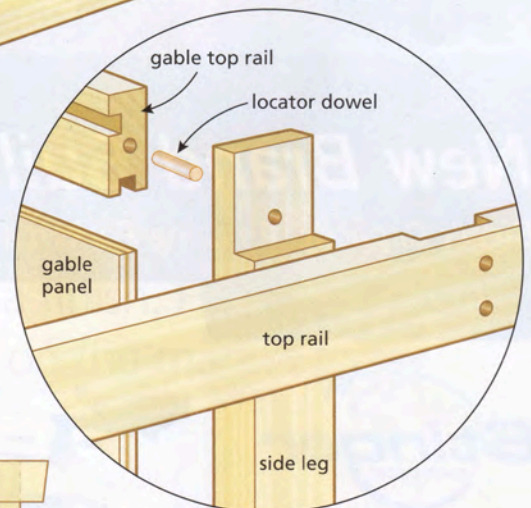
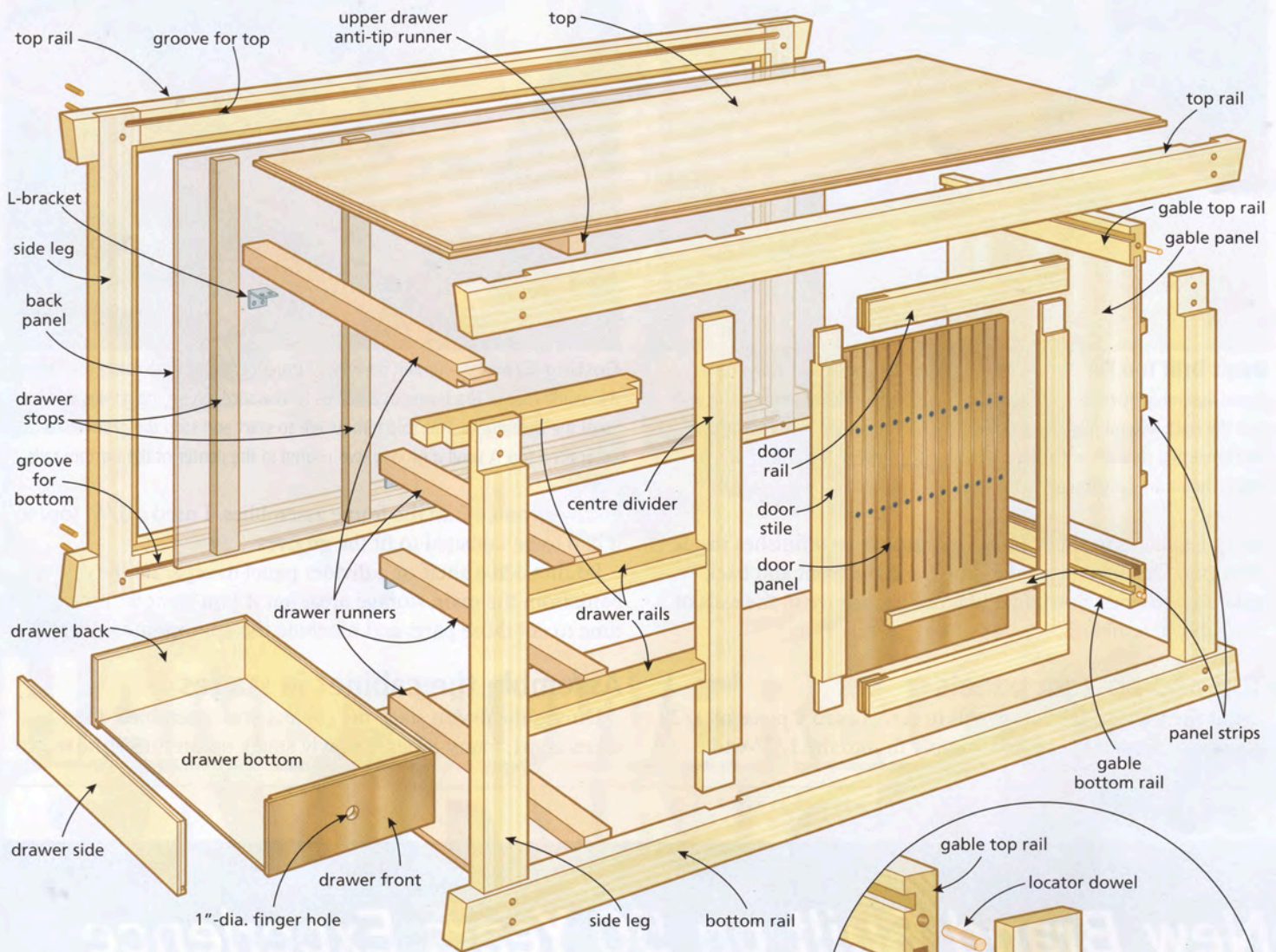
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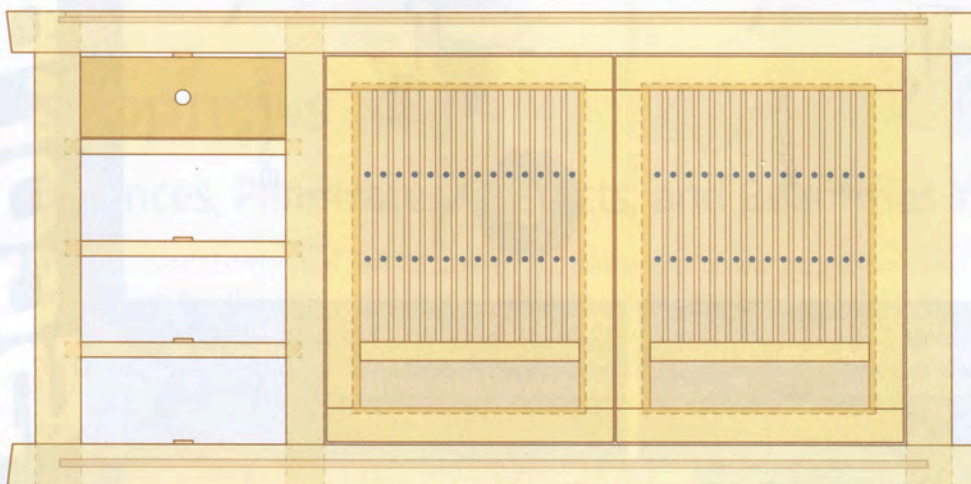
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SIDE/FRONT CORNER DETAIL



FRONT VIEW

the routed grooves and made sure all the components fit together nicely.

A cabinet like this needs to be assembled in stages, as it's too large a task to do at once. First, apply glue to the edge and dowel holes on the backside of one gable assembly, then install it against the back panel. Add some glue to the grooves that will accept the top, as well as a bit of glue on the rabbet in the top that will fit into the back and gable, then bring all three parts together. Without gluing any of the remaining parts, add the second gable and front frame assembly, before clamping the joints tight.

When dry, remove the unglued gable and front frame assembly. Next, apply glue to the rear edge of the second gable, as well as the groove in that gable assembly that will mate with the top panel. More glue goes in the grooves in the gables and back assembly that will accept the bottom panel. Assemble the bottom and the gable, then position the front frame assembly in place without glue, before clamping all the joints tight. When dry, remove the front frame assembly, apply glue, re-assemble, and clamp.

A quick note about assembling furniture in stages: It's important to assemble most of the parts during each stage, even if they aren't glued in place. This ensures the parts will fit back together during subsequent stages. Even if a piece is glued in place, if it is 1/16" off it will create havoc down the road.

Drawer runners

Each drawer runner supports and guides the back of the drawer. They also stop the drawer below it from tilting downward when it's open. These runners should be machined to 1/4" thicker than the drawer dividers, but their width isn't crucial. A tenon to fit the groove in the drawer rails can now be machined, and the pieces cut to length. You will need to cut the runner slightly shorter than needed, in order to be able to fit the runner in place, but don't install the runners yet.

Build the drawers

At this stage the drawers can be made, then their backs notched to fit the drawer runners. All the drawer parts can be cut to the same width. From there, cut the fronts

Materials List

Part	Qty	T	W	L	Material
Top Rails	2	1-1/4	2-3/4	64	2x4 Material
Bottom Rails	2	1-1/4	3-1/4	64	2x4 Material
Side Legs	4	1-1/8	3	31-1/2	2x4 Material
Center Divider	1	1-1/8	2-1/2	31-1/2	2x4 Material
Drawer Rails	3	1	2	15-1/2	2x4 Material
Drawer Runners	4	1-1/4	1-1/4	To Fit	2x4 Material
Upper Drawer Anti-Tip Runner	1	To	Fit	To Fit	2x4 Material
Drawer Stops	2	To	Fit	22	2x4 Material
Gable Top Rails	2	1-1/4	2-3/4	19-1/2	2x4 Material
Gable Bottom Rails	2	1-1/4	3-1/3	19-1/2	2x4 Material
Gable Panels	2	3/4	19-1/2	26	Plywood
Top	1	3/4	20-1/8	57-1/8	Plywood
Bottom	1	1/2	20-1/8	57-1/8	Plywood
Back	1	1/2	26	55	Plywood
Panel Strips	8	1/4	1-1/4	To Fit	2x4 Material
Door Rails	4	1-1/8	2-1/4	18-15/16	2x4 Material
Door Stiles	4	1-1/8	2-1/4	25	2x4 Material
Door Panels	2	3/4	To	Fit	Plywood
Drawer Fronts	4	3/4	5-5/16	13-7/16	Plywood
Drawer Sides	8	3/4	19-1/2	To Fit	Plywood
Drawer Backs	4	3/4	12-5/8	To Fit	Plywood
Drawer Bottoms	4	3/8	To	Fit	Plywood
Touch Latch Block	1	To	Fit	3	2x4 Material

Hardware List

Name	Qty	Size	Details	Supplier
3/8" Dowel Rod	1	6' long		Misc
No-Mortise Hinges	4	2"		Misc
T-Nuts	5	1/4-20 Thread		Misc
Leveller Feet	5	1/4-20 Thread		Misc
1/2" Carpet Tacks	As Needed	1/2"		Misc

to finished length, and the sides slightly oversized. Set up a dado blade to cut a rabbet in the fronts and sides, then all the drawer parts can be trimmed to final length.

Bottoms can be cut to size, and the drawers can be assembled. When machining the groove to accept the drawer bottoms you have to consider the height of the drawer runners. If the runners are 1/4" thicker than the drawer rails, you will want the lower surface of your drawer bottom to finish about 1/16" closer to

the bottom of the drawer sides – so about 3/16"; this is because once the notch in the drawer back is cut, the drawer bottom is what will be supporting the drawer on the runner. The 1/16" difference is so there will be a slight gap between the drawer front and the drawer rail when the drawer is closed.

With the drawers assembled, set your table saw blade height to cut a notch that is flush with the underside of your drawer bottom. After some math to determine the location and width of the



Drawer Runners (left) – Simple wood runners, and drawers with notched backs, make for a simple yet effective system. The runner above a drawer stops it from tilting when open. The two vertical strips on the back of the cabinet are simple drawer stops. Notice the drawer runners finish 1/4" higher than the drawer rails.

Apply a Finish (right) – A product like Varathane Professional Clear Finish is great for a situation where you want a durable yet simple finish. Brown brushed on three coats then used an aerosol can of the same product to apply a final coat.

notch, make repeated passes, adjusting the fence slightly each time, to create the notch.

Install the runners

Starting with the bottom drawer, locate the rear end of the runner and fix it in place with an L-bracket. Glue the tenon into the groove at the front of the runner. Work your way upwards, installing the runners so the drawer fronts have even gaps and work nicely.

To stop the top drawer from tilting downward when opened, glue a length of solid wood to the underside of the top panel, flush with the lower edge of the top front rail.

Finally, screw two strips of solid wood vertically onto the back panel. Customize the thickness of these pieces to position the drawers so they look good when viewed from the front of the cabinet.

Doors

There are many ways to make doors, but I chose an approach in keeping with traditional Japanese design, at least visually. First, I cut the frame members to size, added bridle joints to their corners and assembled the frames. When dry I used my router and rabbet bit to create a rabbet in the backs of the doors, and cut a piece of plywood to fit that opening. To mimic the strips of wood some Japanese craftsmen use, I tilted a rip blade to 45 degrees, then made a series of cuts to add grooves to the door panels. A stop was positioned so the lower portion of the panel would appear whole.

I stained the panels, as well as the drawer fronts, while I was at it, then glued them in place. I cut thin panel strips to act as a horizontal frame member, and glued them to the door panels. While machining these two pieces I did the same for the cabinet gables. When attaching these pieces I had to sand away some of the stain to ensure glue would hold the strips in place. All of these pieces are strictly for aesthetic reasons.

Strengthen with dowels

All eight corners are now strengthened with 3"-long lengths of 3/8" dowel rod. I used a simple drilling jig to align the holes and keep them straight. Two dowels were added to each corner, then trimmed flush.

Apply a finish

A quick sanding was next, and I made sure the edges were all eased heavily. To protect the wood from stains and wear I applied a few coats of Varathane Professional Clear Oil-Based Finish. It's easy to apply, builds quite quickly and is very durable. I brushed on three coats, sanding between each coat, then used an aerosol spray can to apply a nice, even coat.

The details

Black carpet tacks are now added to the door panels to add to the traditional Japanese look.

Hang the doors with no-mortise hinges, add a block of wood to support the double magnetic touch-latch and install the latch. Pulls would work fine, though my knees don't enjoy protruding hardware.

I installed T-nuts under the four corners and the center divider so the cabinet could be levelled once in place. It was now time to put it in its final home, fill it up and put it to use.



ROB BROWN

rbrown@canadianwoodworking.com



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Build a Knock-Down Finishing Rack

Photos by Rob Brown. Illustration by Len Churchill

This simple rack is easy to make, and provides a lot of storage for panels while they're being finished. It can also be adjustable to hold many more panels.

BY ROB BROWN

Space is always at a premium in my workshop, especially when applying a finish to something large like a wall unit, kitchen cabinets or another oversized project with many doors and panels. It's fairly easy to make a big rack to hold work to be finished, but I wanted to have something that could be dismantled and stored easily the other 99% of the time, so this was my solution.

This rack isn't meant to hold a massive amount of weight, but it works great with small- to medium-sized panels, even when fully loaded. It's more for small shop usage rather than larger industrial applications.

Design

When stored, my rack is broken down into two halves and a small panel that will hold the two halves together. It's so light I can screw the parts face-to-face and then screw everything to my ceiling, where it's completely out of my way.

The rack I made has 17 levels. If you want to make a larger rack, just use longer uprights and more rungs. When assembled the rack sits on the floor, against my workbench, and is clamped in place. You could temporarily fix yours to another shop fixture, or even screw it to a wall. The underside of my lowest rung is flush with the bottom end of the uprights. This helps when I'm setting the rack up, but the lowest rungs aren't strong enough to support the entire rack during use.

I used even rung spacing, keeping 2" between each rung, but you can either increase this spacing entirely if you often use thicker workpieces, or keep some rungs spaced 2" apart, and others spaced farther apart. After using this rack a few times, I found the 2" spacing to be a workable minimum and would probably use the same spacing again. Increasing the spacing to 2-1/2" or even 3" may be a bit better for you, though that means the rack will hold fewer workpieces.

Construction

The uprights need to be quite strong to support the weight of all the panels it will hold, but the rungs only need to be strong enough to hold one panel. I used 3/4" plywood for the uprights, and 3/8" plywood for the rungs, but you can increase the thickness of both the parts if you'll be finishing heavier panels. Just keep in mind, thicker parts mean a heavier rack to handle and store.



Quick, Square Assembly – With a square panel clamped to a worksurface, Brown was able to use it to keep the rungs perpendicular to the uprights. He also aligned the pencil marks on the uprights with the corner to speed assembly.

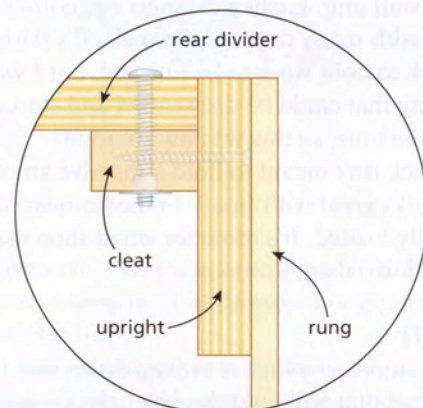
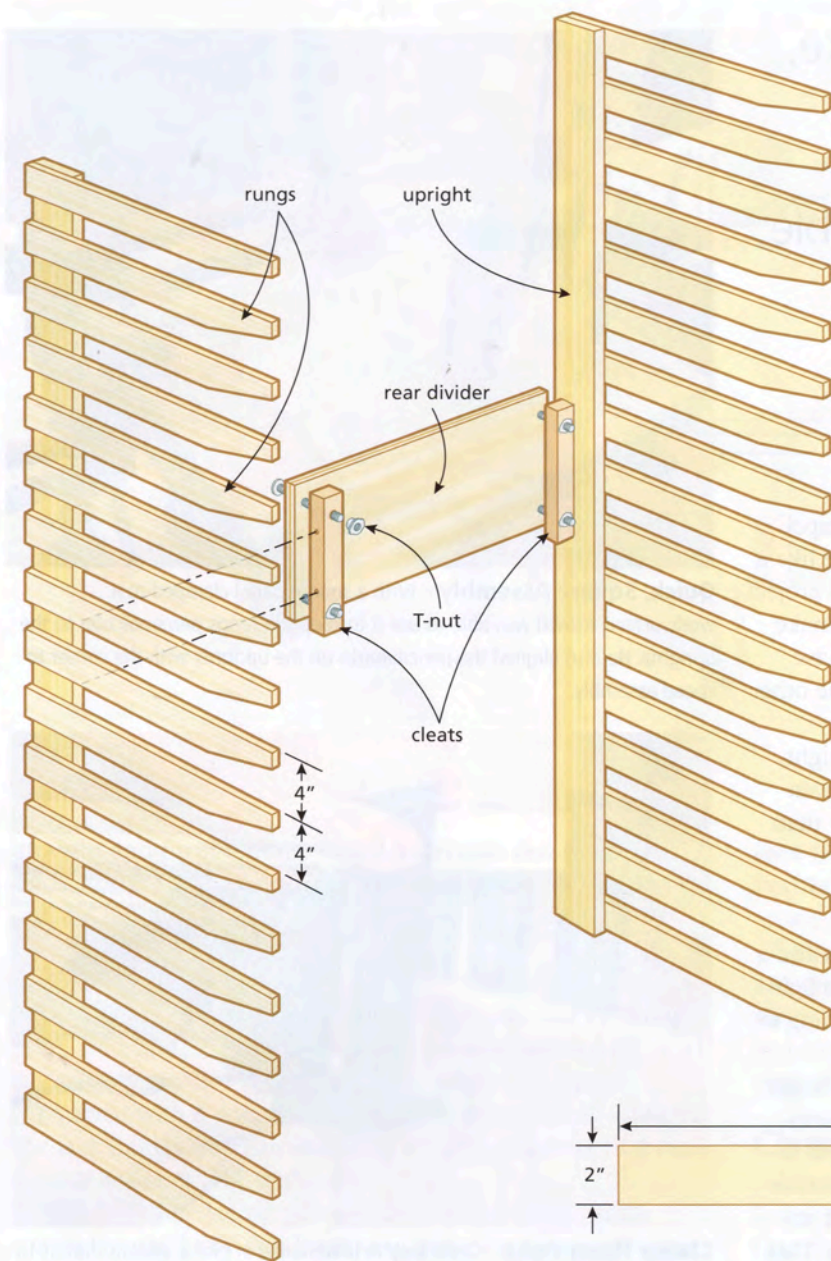


Clamp Them Tight – Once they're brad nailed in place, adding clamps to each joint ensures a strong rack.

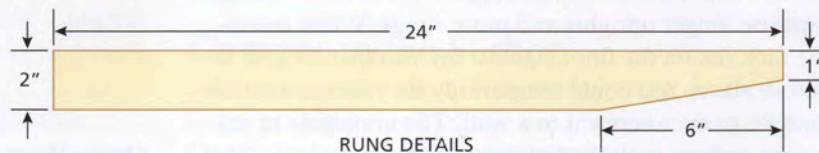
Break out the uprights and rungs to their final width and length. Use a ruler to draw a 6"-long angled line on the front, underside of each rung, then trim the waste with a band saw. This leaves the front of each rung 1" wide. This notch makes it easier to insert a finished panel into the rack during use. Heavily ease all edges of the uprights and rungs.

Starting from the top of the uprights, mark a series of lines 4" apart. These lines will locate the upper edge of each rung during assembly. Ensure both uprights match each other.

I used a 16" x 16" assembly panel to assist with keeping the rungs perpendicular to the uprights during assembly. It was clamped to a worksurface with enough room so the 4"-wide upright and a 2"-wide rung could be supported by the worksurface. With the square panel clamped in place, I applied some glue to the end 4" of the lowest rung, positioned it flush with the bottom end of the upright, pressed both the upright and the rung against the assembly panel and brad nailed the rung



REAR DIVIDER ASSEMBLY DETAILS
TOP VIEW

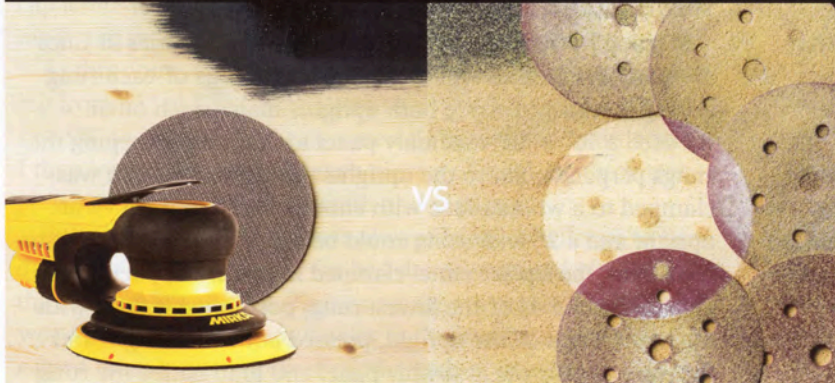


RUNG DETAILS

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in place. Moving fairly quickly, I was able to pin the entire 17 rungs to the first upright well before the glue dried. I then added a clamp to each joint and let the first half dry.

Mirrored assemblies

The second half was done the same way, except for one important difference; because the rungs needed to be on the outside of each upright, I repositioned the square assembly panel so I could assemble it to be the mirror opposite of the first assembly. The two solid wood cleats would eventually be glued and screwed to the inside faces of each of the uprights, and having rungs on the inside surface of the uprights would interfere with this.

Cleats

Machine the cleats and rear divider to final size. Bore a couple of countersunk screw clearance holes in the 7/8"-wide edge of the cleats. With one of the rung assemblies lain flat on a worksurface, and with its rung-side down, mark a line the thickness of the rear divider (3/4" in my case) away from the back edge of the upright. The distance of this line from the bottom of the upright depends on how high you want the rear divider to finish. I wanted the top of the rear divider to finish just above my workbench working height, but you might have different needs.

Materials List

Part	Qty	T	W	L	Material
Uprights	2	3/4	4	68	Plywood
Rungs	34	3/8	2	24	Plywood
Rear Divider	1	3/4	10	16	Plywood
Cleats	2	7/8	1-1/2	10	Maple

Hardware List

Name	Qty	Size	Details	Supplier
T-Nuts	4	1/4-20		Misc
Large-Head Bolts	4	1/4-20 × 2"		Misc

Align the backs of the cleats with the pencil lines, and temporarily screw them into the inside face of the uprights. Align the rear divider with the cleats, and drill 5/16" holes through both the rear divider and the cleat. Remove the cleat, hammer the T-nut into the hole on the front face of the cleat, then glue and screw the cleat to the upright for good. Adding a few more screws through the upright into the cleat was added insurance that the cleat would be strong enough to hold the rack side assemblies together during use.

If you really wanted a bomb-proof finishing rack, you could add a second rear divider, along with two more mating cleats. If you go this route I would suggest positioning one rear

divider so it is fairly close to the top of the rack, and the second one so it is near the midpoint. The rack could be fastened to a stud or large, stationary fixture while in use.

Using the rack

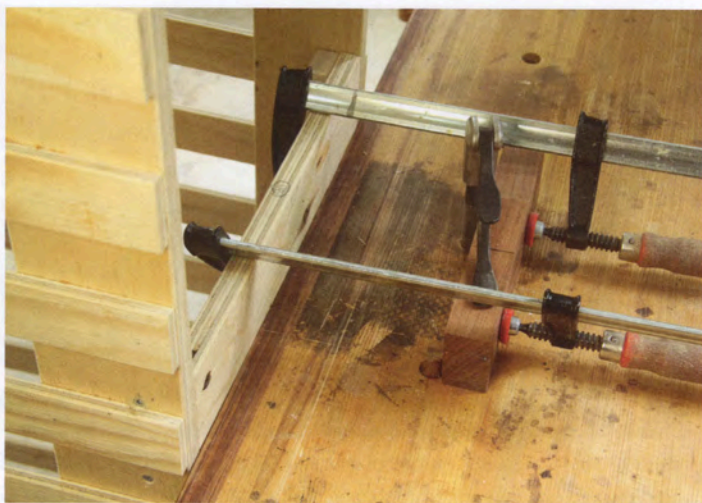
With the rear divider installed so it holds the side assemblies together, it's time to fix a clamping block to my bench so I can clamp the rack in place. I use my hold-down clamp through a bench dog hole and a bench dog in another hole to secure a piece of scrap wood to my bench, but there are many different approaches to doing this. A few clamps between the scrap of wood and the rear divider keep the entire rack in place nicely. There are likely dozens of other quick and easy ways to secure



Cleat Location – Using the rear divider as a spacer, Brown marks the location of the cleats on the uprights. Once the uprights were temporarily screwed in place, he drilled a clearance hole through both parts so he could use the T-nuts and large-head bolts.



Knock-Down Hardware – Once T-nuts are installed in the cleats, the cleats can be glued and screwed to the uprights for good. Using T-nuts and bolts make for quick setups.



Set It Up – Brown choose to secure his rack to his workbench for use, but there are many other ways to accomplish this. Select the best method for your space.

a rack for use, like screwing it to something solid or using oversized French cleats to hang it on a wall. Use your imagination to figure out what works best for you.

This rack has helped me out many times. I don't often have the need for finishing multiple medium-sized parts, but when I do this rack is a serious time saver, and helps me create a quality finish in a small shop.



Keep It Simple – When set up, the rack provides lots of room for small- to medium-sized panels, and should provide solid support for many years.



ROB BROWN

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What Finish Should You Choose?

BY MARK SALUSBURY

Have you ever wondered, what type of finish will give you the best result, or what will produce the best protection and appearance for a certain furniture part? Or even whether you should use the same coating for a wooden countertop as on a cutting board or salad bowl? The following easy-to-read chart will help you make those choices.

Arranged by products which offer greatest to least durability and protection, I've indicated which kinds of treatments, coating and finishes have worked for me over the years. Although this chart contains all the basic types of finishes available, you can cross-reference this chart with the article I wrote titled, "Friendly Finishes" (issue #106), to identify specific products in each group.

Briefly, let me explain what I mean by protection and durability (P&D). Protection helps the wood's structure; assisting the wood's pores and fibres to resist water, acids, stains, alcohol, ultraviolet (UV) rays and anything else that might be absorbed, destroying the wood's appearance and function. Durability reinforces the surface of the wood; hardening and forming a firming film or membrane at and/or within the wood's surface. Ideally, achieving both would be an asset, you say ... not necessarily.

A hard-working floor certainly demands both, but a wood countertop prefers to be sealed deeply, but its surface given a soft, easily replenishable, breathable coating which will never peel or flake off in use. However, a figured wood table top benefits from a film finish, often over a dewaxed shellac sealer, a drying oil or soft film finish to build visual depth plus a good measure of P&D. Table legs and stretchers that see less service and daylight may prefer an easier-to-apply, soft film finish complementary to the top. A salad bowl demands a food-safe, non-toxic treatment equally, inside and out, first with a non-toxic protectant to resist staining and/or regularly wiped liberally with mineral oil and beeswax.

A few words on treatments, coatings and finishes: it's useful to think of each differently to appreciate their part in the big "finishing" picture. I think of a treatment as a product that is absorbed by the wood but should have something else on top to complete the project; a coating builds a cured film over the wood's surface, while a finish is a product that creates a lustrous appearance, sheen, and some level of durability to the project. For instance, dewaxed shellac sealer (treatment) can be coated with a soft film finish. Or a drying oil may be coated with a soft film finish and left at that or may be further finished

with a hard film finish. Or a non-drying oil can be finished with a beeswax topcoat.

But remember, preparation is everything. The ability of any product to perform alone or over others depends on effective cleaning, sanding, good lighting during preparation and application and a clean working environment.

I hope this chart will help you decide how any products will yield the best results, appearance and ease of repair and maintenance throughout your project's life.



MARK SALUSBURY
mark@salusburystudios.ca



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What Wood Finish Should You Choose?

By Mark Salusbury

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decorative objects, lathework

flooring, trim / millwork,
furniture, decorative objects,
lathework

COMPOSITION:

Natural waxes and / or oils
based surface coating / finish

Solvent based to carry resins /
solids

APPLICATION:

One or two applications creates
a very durable, rich, natural
surface

Two or more coats builds to a
smooth film coating with sheen

FEATURES:

- ***Creates a protective molecular membrane***
- ***Easy repair and maintenance***

- ***Seals wood pores and builds a film quickly***
- ***Spirits based resin coating – varnishes, paints, urethanes***
- ***Water based resin coatings – varnishes, paints, urethanes***
- ***Thinner based coatings – lacquers***
- ***Alcohol based coatings – shellac containing wax***
 - ***Alcohol based sealers – dewaxed shellac (dewaxed shellac is the preferred sealer for all stains and hard film finishes)***

Should not be
topcoated with
any other
products

The Hard Film Finishes listed above can topcoat any finish in this category below it, and none above it. For example, a water based resin coating can topcoat thinners based coating, but not a spirits based resin coating.

Spirits
Water
Film
topcoat
So

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From the editors of

Woodworking
CANADIAN
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SOFT FILM FINISHES

low-traffic furniture, lathework, decorative pieces

Polymerized drying oils with spirits / oils / waxes added to enhance curing

Multiple thin applications create a rich, replenishable, lustrous, dry, medium-duty coating

- **Coats woods pores and builds slowly**
- **Danish oil**
- **Varnish oil**
- **Natural oil**
- **Countertop oil**

Soft Film Finishes can topcoat any cured Drying Oil but not Hard Film Finishes

ts and/or
Based Hard
Finishes can
coat any cured
ft Film Finish

DRYING OILS

lathework, toys, furniture, food-prep items, jewelry

Natural oils which cure slowly via exposure to air (oxidization)

Multiple thin coats produce a replenishable, rich, flexible, water-resistant coating

- **Creates a breathable membrane**
- **Includes tung oil, hemp oil, walnut oil**

Builds
very slowly

NON-DRYING OILS

salad bowls, food-prep items, toys

Non-toxic food grade vegetable and/or mineral oils which never dry or cure

Regular applications produce a low protection, rich treatment

- **Organic-based versions may go rancid if not cared for / aired properly**
 - Corn
 - Peanut
 - Olive
 - Canola
 - Safflower
- **Petroleum based versions do not go rancid – "Light Mineral Oil" from a pharmacy is recommended.**
- **Easy to repair and maintain**

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accept any
topcoat
other than
Beeswax

LESS PROTECTION / DURABILITY

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Small shop? A mobility kit under every machine isn't the only answer.

BY CHRIS WONG

When laying out a small shop, a common strategy is to put each machine on wheels so it can be moved around as required for working materials of different sizes. Depending on how the shop is organized, this approach may require machines to be stored against a wall, pulled out for use, then returned to their parking spots when work with them is complete, to make room for the next process. This maximizes the capabilities of each machine, but requires extra effort to get each machine ready for use.

When I laid out my machinery in the space of a one-car garage, I took another approach. Instead of mobilizing everything, I strategically placed them in such a way that I could process material up to 5' long without moving anything. This allowed me to work very efficiently most of the time. In my shop, there aren't many projects made with components over 5'; the only things I can think of are dining tables and beds, and I rarely work with sheet goods.

Machine layout optimized for efficiency

Like most woodworkers, I use a combination of hand-held and stationary machines. Material-processing machines in my workshop include an 8" jointer, 18" band saw, 10" sliding table saw and 17" drill press. I use a benchtop 13" planer which lives on a wheeled base and stores under the infeed table of the jointer, and a Veritas steel router table top, which I set up in the outrigger of my table saw when required. I also use a 2 HP canister dust collector on wheels, which lives behind the table saw, unless I use the saw to cut long and wide material.

It's possible to have an efficient and practical workshop set up in a small space without having wheels under most machines. Rather than present my shop as an ideal layout (which it's not), I merely wish to use it as an example of a practical design for my work and a possible starting point for your shop layout.

Working in the 5' shop

While putting all my machines on mobile bases would have allowed me to use them on much larger material than the current layout, it would have also required time to set up



Big Machinery – The largest machine in Wong's shop, his table saw with 60" sliding table, has ample room to operate. Most ripping and cross-cutting is done here.

for an operation. Since I knew what scale of work I would be producing, and what sizes of materials I commonly use, I felt I could be more productive with machines positioned for working material up to 5' long, and handling larger material with hand-held tools. Anything 5' or shorter could be processed on any machine efficiently without having to rearrange anything.

When processing lumber, my first step is usually to cut it to rough length using a jigsaw or circular saw. Once cut to rough length, the material is not only within the limits of the infeed/outfeed space of my machines, but lighter and easier to handle. Also, with shorter lengths, a greater yield can be had from bowed or twisted lumber. The odd time I need parts longer than 5' I use hand-held tools, which don't require the infeed/outfeed space of stationary machines.

When I need to work with larger material, I have to decide if it is worth the effort to reposition machinery for sufficient infeed and outfeed space, or use a hand-held tool. I usually find it more efficient to reduce material size with hand-held tools than move stationary machinery. Often, I



Convenient Storage – Cabinets above and below the workbench provide lots of easily accessible, and well-organized storage for commonly used items.

use hand-held tools to break down parts to rough size and stationary machines to precisely and uniformly dimension stock. While this sometimes adds an extra step to processing, I feel that I am, overall, more efficient working this way.

To illustrate the workflow in my small workshop, I have picked a few projects of different scales and described how the build of each was handled.

Case study #1: 21st century writing desk

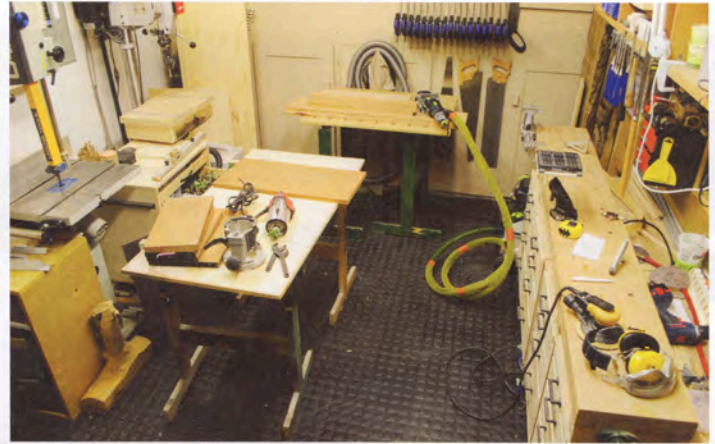
This desk featured a 25" × 12" mahogany top supported by an ash base at a height of 29". I started with an 8'-long board of 6"-wide mahogany for the tabletop, and several 5' boards of ash for the legs and stretchers.

Using my jigsaw, I cut two 28" lengths from the mahogany board before jointing and planing them. I joined the two boards to produce the required width, and then crosscut the top to final length at the table saw. Since the ash was quite straight, I jointed and planed it at full length, then cut out the components using the table saw.

Operation	Stationary Machine	Hand-Held Alternative
Ripping lumber	Table saw, band saw	Circular saw, jigsaw, hand saw
Crosscutting lumber	Table saw, mitre saw	Circular saw, jigsaw, hand saw
Cutting sheet goods	Table saw	Circular saw
Jointing lumber	Jointer	Track saw, power planer, router, hand plane
Planing lumber	Planer	Router and sled, power planer, hand plane
Cutting curves	Band saw	Jigsaw, coping saw, chisel/gouge
Resawing	Band saw	Hand saw, jigsaw, track saw
Cutting joinery	Table saw, router table	Router, hand saws and chisels, hand planes



Simple Support – To cut long stock on the band saw, the drill press table is lowered to provide outfeed support. Note the dry wood storage behind the doors at the right side of the photo and shelves for finishes above. During winter, finishes are stored in a closet inside the house where it's warmer.



Functional Worksurfaces – Consisting simply of sheet stock on top of saw horses, additional work surfaces are easy to set up when required. One top is a Festool MFT top, which allows Wong to use it as a crosscutting station with a track saw.

Case study #2: Relationship study

A table I made featured a pair of 8' maple slabs joined together to make a lazy S-shaped top nearly 4' wide in the middle. It was supported by a maple base, held together with robust, oversized mortise and tenon joints.

The top slabs were too large to process with my machinery, in addition to being too large and heavy to manipulate through machinery without a helper. I elected to flatten the slabs with a hand-held power planer, hand planes and sanders, then cut

them to shape with a jigsaw. With the slabs clamped on edge, I cut large mortises to join them together using a plunge router and glued them together with floating tenons.

The largest component of the legs was about 2" x 5" x 30" long, so after cutting material to rough length, components were easily jointed, planed and shaped with my machinery setup.

The 6'-long stretcher was irregularly shaped, and the only work it needed, aside from sanding, was to cut the ends

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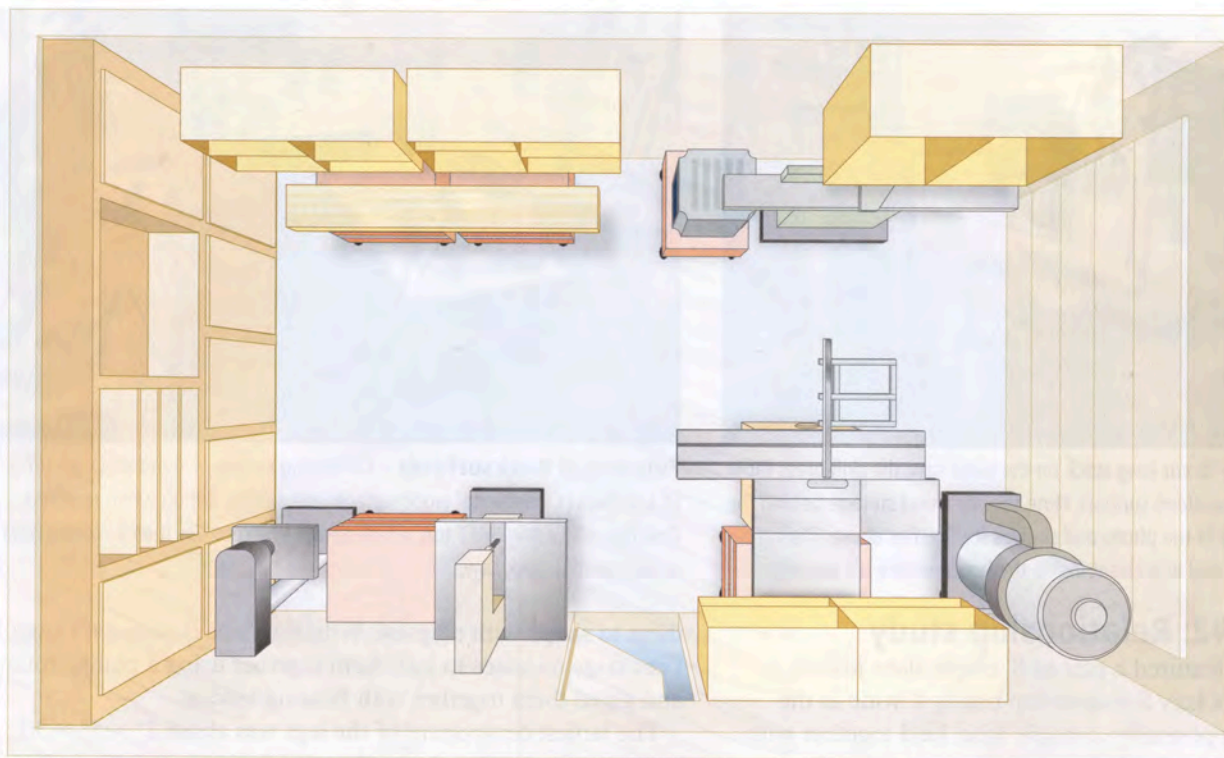


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straight and form tenons. I used a circular saw to cut the ends straight and a hand-held router with a special jig to cut the tenons.

Case study #3: Bed frame

This captain's bed frame measured 62" wide and 82" long, sized for a queen size mattress. It was essentially two 82" × 31" plywood boxes, 20" high with a solid wood face frame.

I started with 8'-long boards of 4/4 maple about 8" wide for the face frames. The internal framework and webbing for drawers was made of 3/4" plywood.

After carefully laying out my frame components on the maple boards, I saw that I was very tight lengthwise for materials. Although the boards were bowed, I was confident that solid joinery in the rest of the frame would be enough to make them comply.

To minimize the waste in length, I wanted to cut the maple components to length right away, as opposed to cutting them oversized first, then down to final length afterwards. Since the position of the required crosscuts was beyond the crosscutting capacities of my sliding table saw, I set up my track saw and made the crosscuts – I trust it to produce accurate, clean cuts.

At this point, the maple boards were in various lengths ranging from 13" to 82". To rip them to width, I pivoted my band saw 90° to allow me to feed material through the main door. I then jointed one edge of each piece and used my thickness planer to achieve the final width and thickness.

Full sheets of plywood have always been a challenge to handle in my small shop, and the bed design required plywood for the internal framework. To process the sheet goods, I laid plywood sheets down on sawhorses in the middle of my shop and ripped them to the required widths with my track saw. I also

used the track saw to crosscut parts longer than 6' to length. For the shorter parts I used my sliding table saw equipped with crosscut fence and flip stops.

Sub-assemblies were put together in the workshop, and final assembly with knock-down hardware was done in the bedroom. Even if I had enough room in the shop to assemble the bed without using knock down hardware, it would not have been able to be moved into place in one piece.

Changes to the 5' shop

I've been pretty happy with the layout of the shop over the last year, and haven't felt the need to make many changes. One thing I do intend to change however, is to convert the long workbench that spans two rolling cabinets for two shorter workbenches – one on each rolling cabinet. This will provide greater flexibility for working large or small workpieces. Additionally, I would like to modify my sawhorses to be able to match the height of my new workbenches.

CHRIS WONG

chris@flairwoodworks.com



Chris' inspiration comes from questions such as: "Is it possible to..." and "what would happen if...?" He prefers to work by eye - "cut once, then measure and draw the plans accordingly."



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RELATED ARTICLES: 21st Century Desk (Apr/May 2016), A One-Car Garage Dream Shop (Apr/May 2011), Useful Tools for the Small Shop (June/July 2012)

	Infeed (Increased)	To Increase Infeed Capacity	Outfeed (Increased)	To Increase Outfeed Capacity
Table Saw Rip	6'-6" (13')	Remove band saw blade	5'-6" (+20')	Open garage door for outfeed
Table Saw Crosscut	7'-6" (Left of blade)		3'-6" (Right of blade)	*On a sliding table saw, all crosscuts are done to the left of the blade
Band Saw	9'-6" (+20')	Open garage door	6'-6" *	*Reduced to 3'-6" if material to left of blade is greater than 10" and hits drill press column.
Jointer	5' (+20)	Open garage door	5' (13')	Angle jointer slightly, or move workbench forward so outfeed goes behind workbench.
Router Table	12'-15' *	Depends where outrigger is locked along table saw's sliding table.	4'-7'-6" * (+20')	*Depends where outrigger is locked along table saw's sliding table. Open garage door.
Drill Press	3'-6" (+20') (Left)	Move machine, or raise table to clear band saw table	2'-10" (Right)	Move machine



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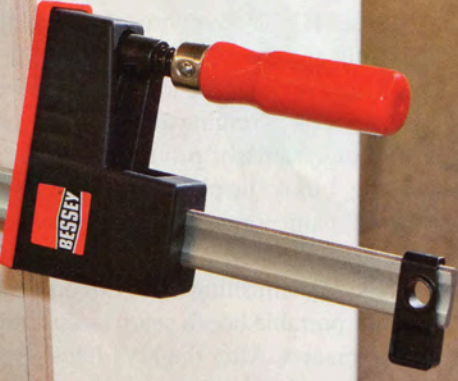
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Spray Booth for Small Shops

Simple, lightweight and functional, this shop-made spray booth is the perfect small shop companion for your HVLP spray system.

BY MARK SALUSBURY

A while back I embraced HVLP spray finishing, and I'm sure glad I did. I built a 200-square-foot shed in the summer of 2015, and sprayed the interior walls white for a bright, clean look. Cringing at the thought of brushing and rolling seemingly acres of protruding lumber and recessed plywood cladding, I took the plunge I'd contemplated often and bought an HVLP paint spray system. Wow, what a great way to apply finish!

Since then, I've enjoyed spray finishing furniture projects in my shop using a makeshift portable booth setup to draw away the little overspray HVLP creates. After the HVLP kit, a basic booth is the best friend you can have when spraying indoors; and in Canada, that's most of the year. My makeshift booth,

a large cardboard box cut and folded to form an alcove, with a furnace filter and window fan set in the rear to draw and filter air, was fussy to set up; floppy, requiring bracing, and it proved too small for anything but table-top projects. The concept worked fine but it needed refinement.

To be clear, this design is only for use using waterborne finishes, never for spraying finishes with flammable, potentially explosive solvents.

Simple and effective

Here's my redesign; light and portable, always fast and easy to set up, it's compact to store when not in use and modular, so I can set up as much or as little as I need. It's very budget friendly and made from readily available materials. The concept can be scaled up or down to fit anyone's needs, project size and available space.

The structural bones of the booth are 2' x 8' x 1/2" sheets of closed-cell foam insulation and 1-1/2"-thick clear pine frames that were milled and grooved to accept the foam. Two furnace filters, solid wood to create a cavity to secure the furnace filters, 2-1/2" loose pin hinges, a tube of translucent caulking and some 2" flathead wood screws to draw the mitred corners together are the only other materials needed.

I used 20" x 20" filters, as that's what my home furnace uses, but using 24" filters would simplify the construction of the two center frames. Alternately, you could adjust the width of the frames to accommodate the same size filter you already use at home.

The full setup is six 24" x 72" panels, but for most finishing projects I'll use only the central two or four panels, leaving the two "wings" on the shelf. Regardless of whether I'm spraying a small box, a chair or a cabinet, I can form an alcove with plenty of airflow and filtration behind any project so overspray can be drawn away effectively for a perfect result.

Furnace filters

The two centre panels are each made to hold 20"x 20" disposable furnace filters 32" above the floor, so one or two 20" window fans can sit fully flush to the filters. Typically, the fans(s) rest on a bench or other work surface behind the booth while the project being sprayed is supported on a versatile wheeled shop table, but this can be altered easily to suit my needs.

Construct the frames

The framed panels are joined by hinges with 'loose pins'. By accurately marking, mortising and inseting, the hinge halves can be joined or separated at will; panels can be inserted, added, removed or interchanged readily. The gap between panels is never greater than 1/8", easily bridged by painter's tape if preferred.

Beginning by jointing and milling my stock to 1-1/4" thickness, I then ripped 1" wide strips to make the frame material and machined a 1/2" x 1/2" groove in one face. As the foam sheets are never uniformly 1/2" thick, some finesse passes then tweaked the width of the grooves to firmly slip fit the individual panels.

With the foam sheets cut to length, the grooved framing material was mitred to snugly border the foam, leaving 1/16" room for final fit. Once dry-fit flat on my bench, I drew a sight line 45° across each corner, an eyeball reference to drill two countersunk holes across each mitre, centred 7/16" in from each frame face. I then sunk two 2" screws to bridge and unite the frame members at each corner.

Install the hinges

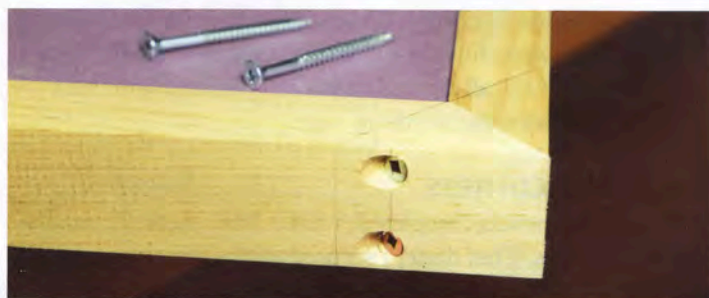
With all six panels assembled and screwed together, I sorted out which would be the centre, left-hand and right-hand pairs, pencil marking each panel to identify bottom, and mating sides for order of assembly. This showed me where to apply hinges, being sure to install them pin head up. Referencing from the bottom only, I mated, aligned and clamped each pair of panels, then marked each hinge location using a layout knife and machinist's square, bridging both panels for continuous layout across the assembly.



Groove Frame Pieces – Salusbury routed grooves to capture the insulation in the face of the pine frame stock. This operation could also be done on the table saw.

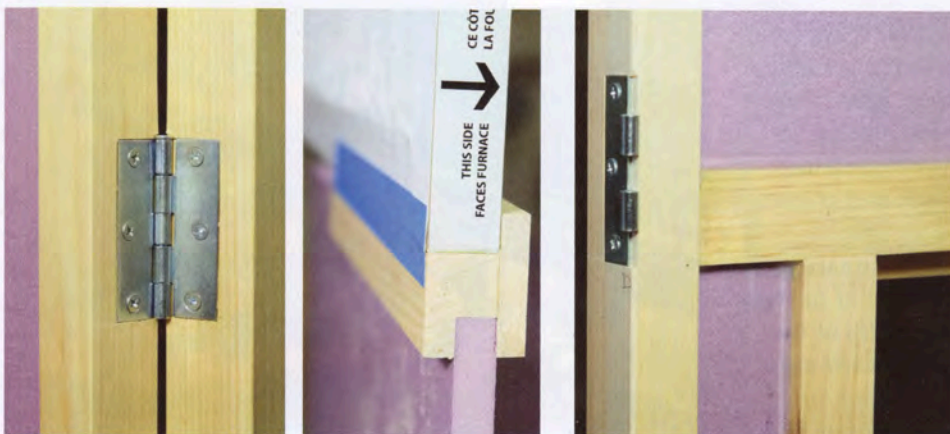


Mitred Cuts – A sacrificial fence on the mitre saw keeps the cut crisp and reduces the chances of airborne offcuts. Salusbury used a stop to ensure all like frame members were the same length.



Secure With Screws – Two screws installed in countersunk pilot holes keeps the corners together. Notice the pencil line at a 45° angle; it helps guide freehand drilling.

I repeated this process for each of the five mating edges. Next, with the panels paired, I routed out the waste within each hinge mortise, tuned the fit with a keen chisel, inset the hinges and using a self-centering drill bit drilled out the screw holes then installed the screws. With a pair of panels now united by hinges, I tapped out the loose pins and moved on to the next mating edges, repeating the process for all five mating edges.



Joinery Details (left) – Salusbury butt joined the vertical filter frame member in place with glue and pins. It has a groove on its edge to accept the narrow strip of rigid foam insulation. A narrow piece of wood was also attached to the opposite side of the frame, on the edge of the outer frame member, for the insulation to butt up against.

Ready for Action – When only a small project is being sprayed Salusbury sets up just three panels. Larger projects require all the panels to be assembled.

Large or Small Booth

– Precisely installed hinges assure interchangeability of booth sections down the road. The hinge pins are easily removed so the user can use all, or just a few, of the booth panels.

Filter Use – This cross-section shows the cut-away foam insulation panel fitting into the L-grooved horizontal filter piece, as well as how the added piece on the right helps hold the filter in place. Blue tape is the final addition to ensure the filter doesn't fall out during use, yet is easily removed for replacement.

Furnace filter cavities

Next, I focused on the centre pair of assemblies, creating the openings to receive the filters. I began by making framing material, some $1\frac{1}{4} \times 15\frac{1}{16}$ " with a $\frac{1}{2} \times \frac{1}{2}$ " rabbet in one edge. The foam panels would fit into the $\frac{1}{2} \times \frac{1}{2}$ " rabbet. I also machined some $7\frac{7}{16} \times 1\frac{3}{4}$ " flat stock to frame the backside of the foam while providing a $\frac{1}{2}$ "-wide backstop for the filters. With this trim dimension, plus the outside measurement of the filter, I used a sharp knife to cut an opening into the foam, cut the L-shaped filter trim to length so it would fit between the outer vertical frame members and then installed the horizontal filter frame using Titebond glue and a few pins. I also attached the flat stock to the 'L'-profiled inner frame/border to give the filter something to stop against. Considering differences between filter brand sizing, I allowed a $\frac{1}{4}$ " for a loose filter fit ($\frac{1}{8}$ " all around), the filter retained with blue painter's tape from the 'working' side.

Caulk the corners

With all the panels completed, I did a final check for square and straightness. That done, I secured all the elements with a tiny bead of translucent interior/exterior caulking spread everywhere the foam contacted the frame. Once cured, it provides a unifying bond yet will allow me to easily cut it away if I ever want to replace the foam.

In use, I use one or both central panels, as well as up to four side panels, depending on the size of the project and the volume of fluid I expect to be spraying. Simply removing and installing hinge pins is all it takes to set up as much or as little as required.

A permanent improvement over a floppy cardboard box!

I went for cost effectiveness, lightness and versatility using pine and foam, but this proven concept can be adapted. The foam could be substituted for stiff cardboard, or $\frac{1}{4}$ " plywood. What will you make for your shop?



Light and Stackable – The broken-down spray booth stores flat on a shelf, waiting for the next project. The panels are very light, and can be handled above head easily.

MARK SALUSBURY
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Photos by Manufacturers Lead photo by Carl Duguay

HAND-POWERED SANDING

Sanding with a power tool is the first and most efficient step for creating a surface that's ready for accepting a finish. Here's an overview of the different hand-held sanders on the market today, and a description of what jobs they excel at.

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BY CARL DUGUAY

Sanders are one of the most frequently and extensively used power tools in workshops. Given how much use they get, it makes sense to choose a sander that suits you ergonomically. If you do a variety of different types of sanding tasks in the shop – large flat panels, narrow edgework, molding and profiles – then you’ll want to consider purchasing task-specific sanders. Unless you work in a production environment and use a sander for hours every day, a power sander will likely last for many years, if not decades.

One of the most common problems with any sander is the presence of swirl marks and milling marks that haven’t been eliminated by thorough sanding. You can reduce both of these surface marks by using high-quality abrasives that have consistently uniform grain patterns, using a progressively finer array of sanding abrasives (typically 100, 120, 150, 180, and 220 grit), not hand-forcing the sander to work harder or more aggressively than it wants to and keeping the work surface clear of dust.

The best way to keep the surface you’re working on free of dust is with a dust extractor. You’ll also be glad not to have all that dust floating around when it comes time to apply a finish. And, of course, in the long run it’s a lot better for your lungs. A dust extractor will also prolong the life of your sanding discs or sheets. If you do a lot of sanding, then consider investing in an anti-static hose (which will only work with an anti-static dust extractor).



Getting Aggressive – Because of the way their pads move in dual directions, random orbital sanders (right) are more aggressive than sheet sanders (left). They can both produce the same quality surface, but random orbital sanders do it much quicker. (Photo by Carl Duguay)

If you’re a hobbyist woodworker or DIYer who only does occasional sanding, then a consumer-grade sander is probably the better value-conscious choice. A premium-grade sander will give a finer finish faster, provide better dust extraction, vibrate less, last longer and ultimately provide a better return on investment.

In this article we look at the four most common types of power sanders. In the next article in this series we’ll look at benchtop sanders.

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Random Orbital Sanders (ROS)

These are, by far, the most popular sanders, and for good reason. They're as effective for aggressively sanding large surfaces as they are for delivering an ultra smooth finish. Unlike other sanders, the backing pad moves in an orbital motion while at the same time moving in an eccentric (off-center) orbit, leaving an irregular scratch pattern of swirl marks that can be quickly removed by hand sanding or scraping before applying a finish. Sanders with a larger stroke (5/16") cut faster; those with a smaller stroke (5/64") cut slower. Many models use a compromise stroke of around 3/16". Increasing sanding speed (and/or downward pressure on the sander) will generally increase cutting power and help to decrease sanding time, but it will likely increase swirl marks. These sanders are available with both 5" and 6" backing pads, and have five or more holes in the pad through which dust is extracted. Pads take either PSA-backed or hook-and-loop sanding discs that are quick and easy to mount and remove. Most include a dust bag or canister while some have a port for connecting to a dust extractor, which provides superior dust extraction. From \$35 to \$850.



Festool ETS EC 125 EQ

FestoolCanada.com

\$545

A professional grade, general-purpose sander with a medium stroke of 3 mm (just under 1/8"), powered by a long-life 400-watt, 3.3-amp, brushless motor. Features soft-start (creates

less motor stress and reduces start-up torque), a carbide brake stop (so you can quickly change discs or set the sander down the instant you're done sanding), an electronically controlled vibration dampening system that makes for smoother sanding, as well as stepless variable speed control from 6,000 to 10,000 RPM, rocker-type power switch, constant speed underload, and thermal and overload protection. Includes Festool's JetStream system, which reduces heat build-up on the sanding disc, reducing clogging and prolonging disc life. Has an extra long 13' power cord and a low-profile design that is especially comfortable to use, particularly for long periods of time. Sound level ranges from 67 dB (minimum speed) to 81dB (max speed). Connected to any dust extractor you get almost 100% dust-free sanding. Also available in the 'EC' line are two 150-mm/6" models with 3-mm or 5-mm strokes.

Similar Products: BlackandDecker.com, BoschTools.com, DeWALT.com, HitachiPowerTools.ca, KingCanada.com, Makita.ca, Metabo.ca, MilwaukeeTool.ca, Mirka.com, RyobiTools.com, SkilTools.com



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Sheet Sanders

Also called orbital, finish or palm sanders, they generally have a pad that takes a 1/4, 1/3 or 1/2 sheet of sandpaper, with the 1/4 size being the most popular. The pad typically moves in one direction only, removing material more slowly than ROS sanders. The resulting scratch pattern is very consistent. I find it beneficial to orient and move these sanders in the direction of the grain for best results. Because they are smaller and sand less aggressively, they're very easy to use. They're also

less expensive to purchase. Some sanders take PSA or hook-and-loop paper, but most use simple metal clamps for attaching standard sandpaper you can cut to size or buy pre-cut. The shape of the base enables them to sand close to inside corners, and their small size makes them easy to control and useful for sanding narrow stock such as table legs, aprons and drawer parts. From \$20 to \$600.



Bosch GSS20-40

BoschTools.com

\$69.99

The 2.0-amp motor with a dust-sealed power switch produces a constant 12,000 oscillations per minute (OPM) and delivers a super-smooth surface reasonably quickly. In use, there is practically no vibration, and the recorded sound level was 76 dB. The sander uses a standard metal clamping system that is quick to adjust and holds paper securely. It also accepts PSA-backed paper. The microfilter dust canister is surprisingly effective, and you can also connect a 1-1/8" I.D. hose for use with a dust extractor. An integrated paper filter in the canister traps particles as small as .5 micron. With the soft-grip handle directly over the motor the sander is very comfortable to use with one hand and has very good balance, making the sander easy to control. A good choice for fine sanding corners, edges, narrow stock and refinishing projects.

Similar products: BlackandDecker.com, DeWALT.com, FestoolCanada.com, HitachiPowerTools.ca, KingCanada.com, Makita.ca, Metabo.ca, MilwaukeeTool.ca, RyobiTools.com, SkilTools.com

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Detail Sanders

These come in a few styles. Those similar to sheet sanders but with triangular pads (sometimes called corner sanders) are typically geared to DIYers and hobby woodworkers. Those with an oscillating head and an elongated body (often called oscillating multi-tools) are geared to tradespeople, renovators and cabinetmakers. Both styles are ideal for reaching into tight spots inaccessible to conventional sanders, such as drawer and cabinet corners, for sanding small, narrow stock, and for sanding trimwork and molding. Some come with interchangeable heads for use on concave and convex surfaces. They use either PSA or hook-and-loop paper. From \$35 to \$525.

Similar products: BlackandDecker.com, BoschTools.com, Makita.ca, Metabo.ca, MilwaukeeTool.ca, RyobiTools.com, SkilTools.com



Detail Palm Sander 8303N

KingCanada.com

\$37.99

Weighs only 2 pounds, and the 1.2-amp motor develops a speed of 26,000 OPM. Low vibration and a comfortable rubberized grip. Doesn't come with a dust canister, but has a dust port adapter for connection to a dust extractor. Comes with a two-year warranty.



Fein AFMT 12QSL

Fein.ca

\$399.00

A cordless version of the world's best-selling oscillating multi-tool, powered by a 12V 2.0Ah battery, weighing only 3.3 lbs. Delivers 11,000 to 18,000 OPM. Features the unique StarlockPlus tool mount with outstanding torque transfer. Precision sanding in the tightest of spaces. Its vibration decoupling system provides outstanding vibration and noise reduction. Has optional accessories for a wide range of cutting, grinding, scraping and polishing tasks.

Festool LS 130 EQ

FestoolCanada.com

\$580.00

A unique straight-line sander that has interchangeable pads for flat, concave and convex sanding. Powered by a 2.2-amp motor that delivers 4,000 to 6,000 OPM. Well balanced and weighs just under 4 pounds. Takes the common 80-mm × 133-mm Festool hook & loop abrasives. Takes an optional dust bag or connects to dust extractor with dust hose.

Contour Random Sander

ArborTechUSA.com

\$119.99 (StockRoomSupply.ca)

This is an accessory that is particularly useful for turners and carvers. It fits onto any standard angle grinder, converting it into a random orbital sander. The 2-1/2" shaft enables you to reach deep hollows. The backing pad flexes at the edges so you can sand over corners, into tight concave spaces and over convex edges without burning the wood. Takes 50-mm/2" PSA discs from 80- to 600-grit.



Belt Sanders

Ideal for removing large amounts of material very quickly, for leveling wide and long surfaces and for shaping larger curves. A popular choice among carpenters, flooring and cabinetry installers, deck builders and the like. The most common take abrasive belts from 3" x 21" to 4" x 24". Can be single speed or variable speed, up to around 1,600 ft/min and have manual or automatic belt tracking. Some have soft start or offer optional sanding frames that help reduce inadvertent surface gouging. From \$70 to \$350.



Makita 9903

Makita.ca

\$321.00

The 8.8-amp motor drives the 3" x 21" belt on this 9.5 lb. sander at a variable speed rate of 690 to 1,440 ft/min. Features comfortable front and side grip handles, auto-tracking with an easy-to-use belt-tensioning lever, fabric dust bag with excellent dustcollection and long 16' power cord. Very good vibration control with an 85-dB noise level. You can sand flush against surfaces on the right side of the sander.

Similar products: BlackandDecker.com, DeWALT.com, KingCanada.com, Metabo.ca, MilwaukeeTool.ca, Ridgid.com, RyobiTools.com, SkilTools.com, TritonTools.com



CARL DUGUAY

cduguay@canadianwoodworking.com



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RELATED ARTICLES: 5" Random Orbital Sanders (June/July 2014), Oscillating Multi-Tools (June/July 2011)
TOOL REVIEWS: Festool ETS EC 125 EQ, Bosch GSS20-40

Amana Tool 1/4 Inch Shank General Purpose CNC Router Bit Collection

8 - Piece 1/4" shank set (AMS-134) is designed for CNC profiling, 2D and 3D profiling and carving in plastics, aluminum and wood. The set features carbide tipped V-Groove bits, 2&4 flute solid carbide up-cut spiral nose bits, solid carbide spiral flute bits and solid carbide 2D & 3D carving tapered angle ball tip bit, featuring a Zirconium Nitride (ZrN) coating.

Why It's Essential: The AMS-134 provides the necessary tools for many projects on different materials, priced at \$179USD it offers a saving of 30% compared to buying individual bits and comes with a storage case to keep the tools protected.

www.amanatool.com



Bessey's Bar Clamps



There are many models of BESSEY's German-made bar clamps from which to choose. Throat depth ranges from 2.5 to 20 In., lengths from 6 to 79 In. and clamping force choices from 600 to 1540 lb ratings. Handles are offered as either a 2K handle for a sure grip, the traditional wooden handle or a selection of T-Bar handles.

Why It's Essential: There is a reason so many editorials feature BESSEY German made bar clamps! They work. They always work. Made in Germany at BESSEY's modern production facility and using the highest quality steels, these bar clamps are for serious woodworkers that need to depend on a durable, high quality hand tool.

Find out more at www.besseytools.com

Arbortech TURBO Plane

- Developed by woodworkers and acclaimed by professionals, engineered with performance, safety and versatility in mind to provide the ultimate woodworkers power attachment.
- Resharpenable, carbide teeth contribute to a long lasting blade that will cut the hardest timbers and leave a smooth finish.



Why It's Essential: Small workshops need versatile, compact and powerful tool options.

The TURBO Plane is an impressive universal wood shaping tool that will prove useful in many applications. Whether you need to plane timber to create a flat surface, rapidly remove excess timber, form rounded internal / external profiles or perform detailed work using guides and templates, the TURBO Plane will be your "go to" tool.

www.arbortechtools.com/turbo-plane
www.arbortechtools.com/mini-turbo

Porter Cable Cordless 20V Brushless Nailer

The 18 GA Brad Nailer has a fastener length capacity of 5/8" to 2" and a magazine capacity of 100 nails. The nailer is capable of driving up to 1300 nails per charge using a 4.0Ah PORTER-CABLE battery (sold separately), and up to 450 nails per charge** using a 1.5Ah PORTER-CABLE battery (included in kitted offering).



Why It's Essential: Weighing only 5.1 lbs without a battery, this light-weight and balanced tool contains a rubber over-mold ergonomic handle that provides maximum comfort and control during use. The Brad Nailer includes several tool-free features including a tool-free jam release, tool-free depth adjustment wheel, and a tool-free stall release lever.

\$299 Available at Lowe's and Amazon.ca
www.portercable.com

Festool Jobsite Radio

Festool's new SYSROCK Jobsite radio: Rock star quality sound with Bluetooth streaming for the jobsite! Light, compact and powerful, SYSROCK weighs in at only just over 1.5 lbs. (0.7 kg). Features include Bluetooth streaming capability, hands-free calling, aux-in, FM Radio reception, built-in microphone for taking hands-free calls and a 2.5", 10 Watt 8 Ohm Neodymium speaker and Digital Sound Processor (DSP).



Why It's Essential: SYSROCK jobsite radio and measures 3.97" W x 5.86" H x 3.70" D (102 x 149 x 94 mm) and can be powered with the supplied power cord or by Festool flat pack batteries (10.8 - 18.0 volt).

\$168.00

www.festoolcanada.com

Mitreset Precision Mitre Gauge Jigs

Transform your mitre gauge into a precision tool.

Made of an anodized aluminium plate with a 3/4" mitre gauge slot. The plate is perforated with a series of holes on both sides of the slot. The Standard gauge enables you to cut mitre angles from 0° to 50° in 5° increments. A staggered ruler, machined at intervals of 0.5°, makes it possible to obtain angles beyond the graduated perforation, from 0° to 52.5°, both left and right. The Segment gauge enables you to cut perfect polygons in segments from 4 to 20. Both jigs are accurate to within .001", and come with two stainless steel taper pins to provide support for mitre gauge adjustment. \$99.99

Why It's Essential: Trying to cut precise angles on the table saw can be frustrating. Most woodworkers attempt to cobble together complicated jigs to do the job. These Mitreset jigs simplify the process, and guarantee perfect, repeatable results.

www.normand.ca



Mirka DEROS and Dust Extractor Kit



This kit includes our finest NET product – Abranet, Portable Dust Extractor, 13-foot anti-static hose and Mirka DEROS electric sander with no external power supply. The DEROS Sanders feature a powerful brushless motor, constant speed load, vibration reduction system and many more advantages – all in a low-profile package weighing only 2.3 pounds. Abranet combines high performance and a longer lifespan, making it a cost-effective solution. Its true dust-free sanding characteristics result in a cleaner, safer work environment. The MV-912 is a 30-liter industrial-grade dust extractor with adjustable suction control and automatic electric start with tool-triggered activation.

Available in 5" and 6" with 5mm orbits, or 6" with a 2.5mm orbit sander

Why It's Essential: This kit provides the Perfect Dust-Free Solution. Sanding without disturbing dust particles provides a cleaner work environment, as well as a better surface finish. Dust-free is not only safer for our health, but it also makes plenty of sense time and moneywise.

www.mirka.com/en-CA/ca

Rockwell Duotech Oscillation Sonicrafter



Rockwell's fastest and most powerful Sonicrafter, the F80 Duotech Oscillation, features oscillating angles of 3.4 and 5.0 degrees. Powered by a 4.2 amp motor, the variable-speed multi-tool incorporates electronic constant speed control and Vibrafree technology. F80 features industry's-best maximum cutting load of 35 lbs. of force. Its Universal Fit accepts major

brand's accessories, and Hyperlock provides one ton of clamping force to prevent blade slippage.

Why It's Essential: Change the blade and the F80 handles any number of projects indoors and out. Dual oscillating angles enable the tool to work harder and run faster. Users can choose the angle that best fits the application.

www.lowes.ca

www.canadiantire.ca

Steel City SELECT Cast Iron Routing Table



The #45135 has a super flat, rigid 1-1/2" x 24" x 32" cast iron table with a double T-track, and a 36" precision aluminum fence with integrated dust hood, Plexiglas guard, and adjustable swing stop. It comes with a high precision cast iron router lift with an aluminum mounting plate and locking mechanism. Includes a mobility kit and leveling feet. On the side of the stand is a tray for storing 1/4" and 1/2" shank router bits. The dust collection box has a large access door for easy access to your router and also includes a utility drawer for storing accessories. [Photo shows optional perpendicular guide not included in this set.] \$1,469.00

Why It's Essential: A router table is an indispensable piece of equipment for anyone building furniture or cabinetry. It provides greater user safety, better control, a higher level of accuracy, and more versatility than freehand routing.

www.normand.ca

Centurion Tenoning Jig



Made of cast iron this Tenoning jig (#12110) has sufficient weight to eliminate vibration. A guide bar on the bottom of the jig fits conventional 3/4" x 3/8" mitre slots, ensuring that the jig rides smoothly across table saw and router table tops. A large rigid fence keeps stock parallel to the saw blade or router bit. The adjustable stock clamp has 2-1/2" of travel, enabling you to secure stock up to 3-1/4" thick. You can tilt the fence and the work stop to mill tenons up to 45°. Built as a tank, but machined as a cannon! \$174.99

Why It's Essential: Mortise and tenon joints have exceptional strength, in large part because of the ample glue surface they provide. And the most efficient way to mill tenons is with a tenoning jig used with a router table or table saw – you'll complete the job more quickly and with greater accuracy.

www.normand.ca

Fuji Mini-Mite 3 PLATINUM T-70

The Mini-Mite 3 PLATINUM T-70 awarded Canadian Woodworking Reader's Choice 2016 Power Tool of the Year utilizes a powerful 3-stage Turbine Motor. Designed with Heat Dissipation Box located at the rear of the case, reduces any heat build-up from the Turbine. It is also equipped with The Noise Reduction Covers to reduce turbine noise. The lightweight and ergonomic T-Model™ Non-Bleed Spray Gun with Stainless Steel Fluid Components features an exclusive side mounted Pattern Control Knob and a High-Efficiency Air Cap for even less overspray. A 25ft hose with air control valve and quick-connect coupler included.

Why It's Essential: The Mini-Mite 3 PLATINUM T-70 is a real favourite with cabinet makers and professionals. Spray anything from wood or metal. The Mini-Mite 3 PLATINUM Turbine develops 6.5psi. A powerful, portable system for all fine-finishing.

www.fujispray.com



DEWALT Brushless 20V XR Cordless Planer

DEWALT's 20V MAX Brushless Planer (DCP580B) features a brushless motor for maximum efficiency and that helps to maintain speed under load. With a 3-1/4" width capacity with 3/32" adjustments, a rebate capacity of 5/64", and up to 15,000 RPM, this tool offers premium performance for a variety of woodworking applications. Ergonomically designed, the 20V MAX Brushless Planer (DCP580B) has a comfortable grip and is well-balanced for horizontal and vertical planing. The planer weighs 6.7lbs and operates off



of the DEWALT 20V MAX battery system.

Why It's Essential: Lightweight and cordless, the planer can be easily transported around the jobsite without the hassle of a cord. \$279 (bare tool) and www.dewalt.ca for retailer availability.

DEWALT FlexVolt System Cordless Table Saw

DEWALT's 60V MAX* 8-1/4" Table Saw's brushless motor provides runtime, durability, and power and covers 95% of ripping applications on a variety of materials. Using one FLEXVOLT Battery, the Table Saw can rip up to 302 linear feet of 3/4" OSB material on a single charge. With a maximum rip capacity of 24" on the right side of the blade and a maximum rip capacity of 12" on the left side, the saw can easily handle full 4x8' sheets of material.

Why It's Essential: At only 45



lbs. (without a battery) and with the blade guard assembly and all other components stored onboard, the Table Saw is easy to transport using the integrated side handle. \$699 at Home Depot and other home improvement stores

www.dewalt.ca

CWI Work Bench Mobility Kit

The CWI-MB135 Mobility Kit can be attached to any workbench, tool stand, or accessory table. The four heavy-duty polyurethane and steel casters have a combined weight capacity up to 500 pounds, and are easily screwed or bolted in place. A convenient foot-activated locking level on each caster makes it easy to raise the bench off the ground so that you can move it the desired location. All four casters swivel a full 360°. \$99.95 per set of 4 casters.

Why It's Essential: This is the perfect solution for easily and safely positioning your workbench or other work table to any desired area of your workshop. Protects your floor surface from marring and your back from aching.

www.cwimachinery.ca



Home Hardware Benchmark Cordless Screwdriver Kit



Easily reach where other cordless screwdrivers cannot with the new Benchmark Twistor (1248-254). Always drive screws at the right angle with 380 different head positions and 360° orbital rotation and flexibility. It has a variable speed trigger, adjustable LED work light, quick release chuck and a rubber over mold for superior grip.

Why It's Essential: This kit includes an 8V LI-ION removable battery, a fast charger and 1" screw driving bits (PH1, 2 x PH2, PH3, SQ1, 2 x SQ2, SQ3)

www.homehardware.ca

King Industrial 13" Helical Style Planer

For today's woodshop, the planer is one of the most important machines to have. This helical style, 13" planer (Model KC-13HPC) has 26 two-sided cutter inserts, a handy material thickness gauge, 8 pre-set depth settings and many more great features for the serious hobbyist. The segmented cutter provides a perfectly smooth finish, minimal tear-out and is 50% quieter than a conventional planer.

Why It's Essential: This benchtop work-horse is at the top of the premium planer market. Smooth, quiet, and superior quality of finish makes the KC-13HPC the best choice as your main material sizing machine or as the second planer in your busy shop.

www.kingcanada.com



King Industrial 6" Helical Style Jointer

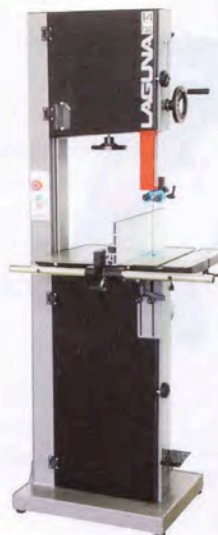
Coupled with your planer, the jointer makes your material sizing abilities complete. This 6" benchtop machine (Model KC-6HJC) has a dozen double-sided inserts providing an excellent finish, minimal tear out and effortless production. Even spalted or heavily figured woods return exceptional results from this helical style cutter head.

Why It's Essential: To plane a board smooth, it must have one flat side. For great glue joints, your pieces must have perfectly flat and square edges. The KC-6HJC delivers flat, square and smooth and is the best choice for all your jointing requirements.

www.kingcanada.com



Laguna 14|bx Bandsaw



The 14|bx features Laguna's exclusive disc brake system. The 14|bx is based on the hugely successful 14|12, but has been designed with a heavier gauge steel cabinet with no need for a stand. The unit is available in both 110 volt and 220 volt & like all Laguna Bandsaws, the 14|bx comes equipped standard with Laguna 10 Point Ceramic Guides.

Why It's Essential: The 14|bx is essential for any woodworker looking to improve his craft. Enhanced power and weight, Dual 4" dust ports, Solid one-piece Frame, Magnetic on/off switch, Reinforced Steel Physique and a Disc-Brake w/ Micro-Switch makes the 14|bx stand out.

www.lagunatools.com

Makita 18V LXT Cordless Blower/Vacuum

The model DUB182Z blower/vacuum features a Makita-built high torque motor with a no load variable speed of 0 to 18,000 RPM, and an air velocity of 179 mph at 92 CFM. Easily converts to a vacuum with the supplied dust bag. At its low speed setting, using an 18V 3.0Ah battery you get 75 minutes of run-time. At the medium speed setting you get 25 minutes, and at the high setting you get 12 minutes. An anti-static design prevents the buildup of static electricity. Weighs only 3.9 pounds (with battery installed) and is 20-3/4" long. Includes a nozzle assembly and dust bag. Battery is sold separately.

Why It's Essential: A small hand-held blower/vacuum is ideal for a wide range of dust management jobs around the shop and home, and is especially useful for cleaning out machinery, under workbenches, and other hard to reach places.

www.makita.ca



Next Wave Automation CNC

Next Wave Automation makes a complete line of small format, award-winning CNCs. From the CNC Piranha XL, to the CNC Shark and Shark HD4. Commercial grade builds and limitless possibilities await you!

www.nextwaveautomation.com



The **CNC Piranha XL** – Full-Size CNC Functionality at a fraction of the cost!

- Commercial grade construction
 - User-friendly, color touch screen pendant controller
 - Large, 12" x 24" cutting area
 - Exclusive Auto Edge, Center Detection and Virtual Zero
 - Design software included
 - Router sold separately
- Priced from \$2,499.99 US

The **CNC Shark** and **Shark HD4®** feature:

- Heavy duty, commercial grade construction
 - Use a 2-1/4HP router or our new water-cooled spindle – HD4
 - Perfect for heavy cutting, carving and machining on wood, soft metals or plastics
 - Software is included so you can be up and running in no time
 - Also available with an extended, 50" base
 - Router sold separately
- Priced from \$2,899.99 US



WORX Switchdriver

WORX 20V Switchdriver features two 1/4 in. chucks that rotate clockwise or counterclockwise with the push of a button. Drill a pilot hole and then rotate the second chuck with a driver bit to sink a screw. The 3 lb. drill has a two-speed gearbox and an 11-position electronic clutch. Includes two, 1.5 Ah batteries, charger, LED worklight and carrying bag.



Why It's Essential: Only drill on the market today with two revolving chucks. Load any combination of 1/4 in. hex shank drill and screwdriver bits to speed assembly work. Gets work done twice as fast without interruption. Compatible with WORX 20V Power Share Program.

www.lowes.ca www.canadiantire.ca

Fein Starlock Accessories

Starlock accessories are designed to work seamlessly with Fein's MultiMaster, SuperCut and MultiTalent oscillating tools, as well as with Bosch, Makita, Milwaukee and other tool brands. The unique Starlock design ensures a super tight fit between tool and accessory, for maximum power transfer to the accessory. Fein offers the largest range of oscillating accessories on the market, with many exclusive designs for unique jobs. They offer accessories for a full range of sawing, sanding, scraping, and other tasks.

Why It's Essential: While an oscillating tool supplies the power,



it's the accessory that does the work. Starlock accessories are made from premium steel in Germany, and provide fast, precise, clean cutting. Their long service life means better value for your money. Many of the Starlock accessories feature a stepped design that enables you to work flush to the surface for better accuracy. There are over 40 Starlock accessories to choose from.

www.fein.ca

WORX Pegasus worktable and sawhorse

The WORX Pegasus combination worktable and sawhorse is ideal for small shops. The 30 pound workstation features built-in channels to house two, 18 in. quick-clamps plus four clamp dogs to secure workpieces for cutting, sanding, gluing or staining operations. The 31 in. x 25 in. table-top supports loads up to 300 lbs. and 1,000 lbs. in sawhorse configuration.



Why It's Essential: Add two Pegasus worktables to expand work space area. Fold-up, space-saving storage also includes onboard storage for the 18 in. clamps and clamp dogs. Constructed of nylon resin and aluminum so it won't rust.

www.lowes.ca www.canadiantire.ca

Rockwell Compact Circular Saw



The Rockwell 4-1/2 in. Compact Circular Saw is half the weight of full-size 7-1/4 in. circular saws and cuts 2x4's in a single pass. The 5-amp, 3500 rpm saw cuts dimensional lumber up to 2 in. thick. Its thin kerf blade is less than half the thickness of 7-1/4 in. circular saw blades and takes less effort and motor strain to cut through materials.

Why It's Essential: Easy to transport and maneuver, the compact saw's slim, inline grip design provides comfort, balance, and control. It's great for cutting trim, siding and sheet goods, as well as plunge cuts, without the bulk or weight of full-size saws.

www.lowes.ca www.canadiantire.ca

Varathane Finishing

Achieve beautiful staining results with just ONE APPLICATION of the new Varathane Ultimate Stain.

Wait for ONE HOUR before applying just ONE COAT of the new Varathane Triple Thick Clear Finish – it is three times thicker than traditional polyurethane.

Why It's Essential: Your project is finished with professional results and you are free to get on with your day!

www.rustoleum.ca



SawStop Professional Cabinet Saw

Woodworkers take pride in their creations. Serious table saw manufacturers do the same. With the Professional Cabinet Saw, SawStop dedicated countless engineering hours to ensure nothing was missed. Offering two different motor configurations (1.75HP or 3HP) and three different fence and rail options (30", 36" or 52"), this saw gives you versatility around the shop matched with the ability to stop on contact with skin.

Why It's Essential: Skin detection, true vertical elevation, smooth repeatable cutting, and the industry-leading T-Glide Fence, gives you the highest quality cabinet saw that delivers repeatable cuts and overall excellence for all your project needs.

Starting at \$3,417

www.sawstop.ca



Sandpaper.ca Abrasives

Royce Sales (now Sandpaper.ca) has been Canada's 'Sandpaper Specialist' for over 25 years. They carry top quality sandpaper with both hook & loop and PSA backings, in sheets, discs, belts, rolls, and spindle drum sleeves. Their premium sheets and discs are made of open coat aluminum oxide with a top coating to reduce loading. They also carry micro-grit sanding sheets in 0.5 micron (4000-grit) to 6 micron (60,000-grit). Discounts are available for bulk orders.

Why It's Essential: Sandpaper is one of the most commonly used consumables in the workshop. With Royce Sales you get great pricing, prompt delivery, and consistent product supply.

www.sandpaper.ca



Steel City 2-Speed 6" Bench Grinder

This 6" grinder (# 70100S1) can be run at two speeds, 3600 RPM for quick stock removal, and 1800 RPM for final grinding and sharpening. It features a 1/4HP motor, a 3/4" x 6" 36-grit wheel and a 1" x 6" 80-grit wheel, two large aluminum adjustable tool rests with adjustable spark arrestors and transparent eye shields, two rear located dust ports, and four no-vibration rubber base pads. \$179.99

Why It's Essential: A bench grinder makes it quick and easy to put a new bevel angle on a plane blade or chisel. From there you can go to a sharpening stone for final honing. For turning tools you can go straight from the grinder back to work.

www.normand.ca



Tormek T-8 Sharpening System



The most advanced water cooled sharpening system available is Swedish made and allows you to sharpen your tools to the finest edge, without removing more steel than necessary. The Tormek T-8 is built for continuous duty and has a unique and efficient drive system which manages to hold a constant speed, even under full load. Your tool's edge is continuously cooled by the water, which means there's no risk it gets overheated. Supplied with the machine is a number of accessories, including the unbeatable Square Edge Jig SE-77. See tormek.com for more information about this versatile sharpening system.

www.tormek.com

BlackJack Spring Wire Hose Clamps



Managing dust in any shop can be challenging. When hoses need to be moved from one machine to another, no one wants to tighten a clamp to keep them in place. These spring clamps, designed to fit 4" and 2-1/2" hose, are your solution to fast, no hassle hose changes. \$8.69 and \$6.95, 2 clamps per package.

Why It's Essential: Wood dust is a known health hazard, building up like cake inside your lungs where it can't be removed. Make your shop more convenient to move dust collection where it's needed and have it stay put. These spring clamps solve that problem..

www.workshopsupply.com

Work Sharp Ken Onion Knife & Tool Sharpener

Using a fully adjustable precision sharpening guide, variable speed and wide flexible abrasive belts it sharpens pocket



& hunting knives, serrated knives, kitchen knives and any other type of blade you own. Professional blade makers like Ken Onion use flexible belts to put a razor sharp edge on their blades, now you can have the same technology in your home or shop. Work Sharp Engineered and Ken Onion Designed to deliver the pinnacle of knife sharpening with precision and repeatability.

www.worksharptools.com

Oneida Dust Deputy

The Oneida Air Systems family of Dust Deputy's are high efficiency cyclonic pre-separators for wet/dry vacuums and single stage collectors. Patented cyclone design separates 99% of the waste before it reaches your system. Made of static conductive resin and are simple to use. Compact footprint and can retrofit to any system. Made in the USA.

Why It's Essential: The Dust Deputy converts your single stage collector or shop vacuum into a super cyclonic dust collector. The Dust Deputy keeps the filter in your collector or shop vacuum from clogging during use and helps keep a constant air flow with no loss of suction.

See website for Canadian dealers

www.oneida-air.com



Drill Doctor

Sharpen dull and broken drill bits with Drill Doctor. Don't get stuck in the middle of a project and run to the store for a new bit- just sharpen it and get back to work. Drill Doctors can sharpen a wide range of point angles and drill materials, probably everything you own. Visit website to learn about special offers.

Why it's Essential:

- You already own a lifetime supply of drill bits. Now sharpen them and save money!



- Fast, easy, works every time
 - Sharper than new results
 - Saves money – pays for itself in just a few sharpenings
 - Models to fit any budget
 - Durable- three-year warranty
- www.drilldoctor.com

SuperMax Drum Sander

SuperMax Tools offers award-winning open-ended drum sanders which are perfect for the small shop or woodworking enthusiast. The 19-38 Drum Sander offers 19" of sanding width in a single pass and 38" in a double pass. The 25-50 Drum Sander is the largest open-ended drum sander on the market. Sand 25" in a single pass, and up to 50" in a double pass.

Why It's Essential: These sanders reduce the tedious process of sanding and produce more consistent results. Expand the scope of projects you're able to complete, while increasing speed and consistency in which you're able to do them!

www.supermaxtools.com



Grizzly Combo Jointer/Planer

The G0809 features 6" jointing and 13" planing with fully adjustable, precision-ground cast iron tables and independent dust ports, each driven by a 2 HP motor. The jointer fence adjusts from 90° to 45° left or right, and the 46" long table has a rabbeting ledge. The planer features speeds of 11 and 22 FPM to help ensure an ultra-smooth finish in both soft and hard woods. Other features include a built-in mobile base and infeed/outfeed extension rollers on the planer table. \$1395

Why It's Essential: No conversion or downtime is required when switching between jointing and planing – you don't even have to shut the machine off.

Available at
www.grizzly.com



Shop Fox 2HP 7" Planer/Moulder

The 2HP G0680 Planer/Moulder handles stock up to 7-1/2" thick and 7" wide. It features precision-ground cast-iron wings, standard T-slots, a one-piece enclosed stand, and a pedestal-mounted control switch with a variable-speed feed 1/8HP motor. It has a 7000 RPM cutterhead and delivers 14,000 cuts per minute. Open-end design allows you to make curved mouldings with the optional elliptical jig. Certified to UL & CSA standards! \$1650

Why It's Essential: If you make your own mouldings and frames, you need this machine. It's equipped with variable-speed feed control, planes stock up to 7" wide, and can do full-length radius moulding with an optional elliptical jig.

Available at
www.grizzly.com



Rikon Slow-Speed Bench Grinder



The 1/2 HP motor

delivers a speed of 1,750 RPM, half the speed of a regular grinder, all but eliminating the risk of tool damage from excess heat. There are two 1" by 8" aluminum oxide wheels – a 60-grit wheel for rough grinding and basic shaping, and a 12-grit wheel for final sharpening. The 80-805 features a cast iron body and has rubber feet for reduced vibration; dual tool rests and spark arrestors; a diamond wheel dresser to keep the wheels round and flat; and comes with a 5-year warranty.

Why It's Essential: Sharp tools are indispensable for woodworking, and a bench grinder is essential for putting a new edge on plane blades, bench chisels, and turning tools, as well as for a range of other metal grinding, shaping and polishing tasks. It will also keep your garden tools in top cutting condition.

www.rikontools.com

Rikon Combination Belt/Disc Sander



The 50-120 combines a 6" x 48" belt and a 10" aluminum disc in one small footprint benchtop machine. The base is constructed of cast iron to help reduce vibration. It features a 3/4 HP motor that delivers a belt speed of 2,030 SFPM (Surface Feet Per Minute) and a disc speed of 1,720 RPM. The belt tilts a full 90 degrees, and there is a large 8" x 14" disc table with a standard 3/4" miter slot that tilts up to 45 degrees. It includes a miter gauge and there is a 2" dust port. 5-year warranty.

Why It's Essential: Combo sanders are extremely versatile, enabling you to sand concave and convex shapes as well as shorter flat surfaces. They make quick work of smoothing templates, trimming tenons, dovetails and miter splines, flush sanding doors and drawers, and sanding a myriad of small parts.

www.rikontools.com



Wireless Audio For Workshop or Jobsite

Whether it's Beethoven or Beyoncé, Miles Davis or Dr. Dre, music can help the workday glide along more smoothly. We look at four general types of devices that wirelessly connect to your smartphone to help you keep your groove.

BY CARL DUGUAY

Most of us enjoy background music, radio or podcasts playing while undertaking maintenance tasks around the home, working on our latest projects in the shop or sweating away on the jobsite. These types of audio helps make repetitive tasks less onerous, noisy work environments less irritating and strenuous work more bearable by putting us in a better mood, relieving tedium and helping us to relax.

An important caveat however, is that listening to audio shouldn't distract us from the work at hand, whether that's doing something at all dangerous or learning a new task. Also, you need to be aware of the effect that listening to audio may have on your co-workers and clients, and how it can compromise everyone's safety. In particular, wearable listening devices can prevent you from communicating effectively with co-workers, or hearing alarms, sirens or other warnings, while cords connected to the devices can get caught up in power tools, scaffolding, and the like.

Photos by Manufacturers Lead Photo by Robert Brown

Otologists (ear doctors) warn that listening to music at high volumes for extended periods of time through wearable devices can result in permanent hearing loss.

There are two categories of wireless listening devices through which you can stream music from your smartphone using Bluetooth (BT) technology: wearable devices, consisting of earbud/earphones and on-ear/over-ear headphones; and standalone devices, consisting of speakers and radios.

Wearable: Earbuds/Earphones

The lightest and most popular of all wireless listening devices, earbuds are placed outside the ear canal, on the outer concha ridge of the ear. They can fall out while outside noise can seep in. Earphones (in-ear phones) are inserted inside the ear canal, and are generally covered by thick silicone or foam plugs (cushions or tips). They seal the air canal better so are more effective at noise isolation. Wireless models will have a built-in battery. Some have active noise cancellation technology and a built-in microphone so you can answer your smartphone. Playback time ranges from four to eight hours. Recharging is typically via micro-USB to USB. Plugs provide some noise reduction (NRR) value, typically in the range of 25dB. Some devices use one-size-fits-all plugs, while others offer a choice of small, medium or large plugs. Well-fitting silicone or foam plugs are crucial, so try to purchase from an outlet that provides a return policy just in case the plugs don't suit you. Devices specifically designed for sport, running and fitness will likely be more durable. These are a good choice for use at the workbench, for service technicians or working around the home or garden. From \$50 to \$400.

Pro-Comm TT-HFB-PN

ToughTested.com

\$66.91 US

Wireless range of 100 feet, up to 100 hours of standby time, 20 hours of music play and 10 hours of talk time. Have a flexible neck band and come with FlexFoam plugs (provide a 23dB NRR) and triple flange ear tips in both small and medium sizes. Kevlar-reinforced tangle-free cable with a durable braided nylon cover. Headset is IP54 rated for water, sweat and dust resistance. Battery takes one hour to recharge via a micro-USB cable. Neck band vibrates for incoming calls and low battery. Five-year warranty. Verdict: Secure, comfortable fit, easy-to-manipulate control buttons, very good sound quality, built-in speakers, clear microphone and good blocking of ambient sound.



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Liberate

Plugphones.com

\$99.00 US

Wireless range of 100 feet, delivers up to eight hours of play time, weighs 4-1/4 ounces. Single button for power on/off, BT sync, play/pause, and answer/end phone call. Separate buttons control volume up/down and song progression. Comes with four silicone and four foam user-replaceable one-size-fits-all plugs. Foam plugs provide 25dB NRR. The 14" model incorporates a microphone. USB recharging takes about two hours. Ninety-day warranty. Verdict: Good sound quality and super lightweight. Cord less durable than Pro-Comm, and I had to remove from ears to manipulate controls.

Similar Products: Audio-Technica.com, Bose.ca, Jabra.ca, JBL.com, MonsterProducts.com, SkullCandy.ca

Wearable: On-Ear/Over-Ear Headphones

Popular because they offer superior comfort, better sound and noise isolation. On-ear headphones rest on the ears, covering the ear canals, which can allow ambient noise to seep in. Over-ear headphones completely close over the ears providing superior noise isolation but make them heavier and more prone to overheating the ears. Those that offer active noise cancellation will perform better in noisy workshops. As with earbuds/earphones, wireless models will have a built-in battery, and some offer a built-in microphone. Wireless range can be up to 150 feet. Playback time can be in excess of 25 hours. Recharging is via USB or AC adapter. Ear pads can be made of polyurethane, fabric or leather and on all models are replaceable. Good choice for use in the workshop, in heavy noise environments such as construction and landscaping or working in and around the home. From \$100 to \$700.



Howard Leight Sync Wireless 1030945

HoneywellSafety.com

\$160.00

Wireless range of about 30 feet, delivers around 16 hours of playtime, weighs 14-1/2 ounces. Soft replaceable ear pads deliver a 25dB NRR. Nicely padded headband and easily adjustable ear cup housing that seals well around the ear. Features air flow control that provides better overall protection for both low and high frequency noise, and volume management technology that keeps noise below 82dB. Recharge via USB cable or AC adapter. Includes a standard 41" cable with 3.5mm input jack for connecting to other devices. Boom microphone has fabric sock to deaden ambient noise. Verdict: I can wear these for hours at a time without any discomfort. Sound is excellent, and controls are easy to manipulate. Does a very good job of blocking ambient noise, and the microphone worked well.

Similar Products: Audio-Technica.com, BeatsbyDrDre.com, Bose.ca, Jabra.ca, MonsterProducts.com, SkullCandy.ca

Portable Speakers

Vary widely in size, shape, durability and runtime. Those marketed by power tool companies are the most rugged and run on the company's 12V/18V batteries or AC power. Most others use built-in batteries that are charged via an AC adapter; those marketed as sport or outdoor speakers have more durable housings. Almost all have USB (to charge a mobile device) and AUX ports (to connect other devices like MP3 players). Some have a built-in speakerphone. From \$50 to \$550.

Makita DMR200

\$139.99

Makita.ca

Wireless range of 100 feet, runs on 12V MAX/14.4V/18V batteries or AC power. Separate buttons control volume, pausing and song progression. AUX port. Charge devices via a 2.1A USB port. Durable PVC plastic 7-3/4" cube-shaped body with top-mounted flip handle, heavy rubber overmold and metal speaker screen. Weighs 6 pounds. Carries IP64 rating – maximizes dust and water resistance. 4" and 1-1/2" 10W speakers. Enclosed storage for battery and mobile device. Three-year warranty. Verdict: Super durable design, handy enclosed storage, instant Bluetooth pairing, and clear, crisp sound.

DeWALT DCR006

\$89.99

DeWalt.ca

Wireless range of 100 feet, runs on AC with included adapter or any DeWALT 12V/20V MAX battery. Separate buttons control volume and pausing. Charge devices via a 1A USB port. AUX port. Durable PVC plastic body with carry handle and rubber overmold. Compact at 4-3/4" x 5-1/2" x 7" and weighs 4-1/2 pounds. Two 2-1/2" 3W speakers. Three-year warranty. Verdict: A compact, take-anywhere design with instant Bluetooth pairing, good sound but some distortion at maximum volume, no control of song progression and no IP rating.



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CB Audio Armor XL

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Cb3Audio.com

Wireless range of 33', runs on internal rechargeable 5.2 Ah battery for 10 hours+ play time. Connect two devices at once. Power/syncing, volume, pausing/speakerphone and song progression buttons. No auto shutoff. Built-in microphone. Charge devices via a 1A USB port. Comes with 24" AUX cable. Measures 2-5/8" × 3" × 8" and weighs 1.4 pounds. Hard plastic shell covered in a soft rubber, carries IPX6 waterproof/dust rating. Two 2" speakers, and two passive subwoofers. One-year warranty. Verdict: Great sound with no distortion at high volume. Durable case for optimal protection. Long six- to eight-hour charge time. Control buttons hard to see.



Braven Balance

\$189.00

Braven.com

Wireless range of 33 feet, runs on internal rechargeable 4.0Ah battery that is recharged via AC adapter. Up to 18-hour play time. Power, pausing and combined volume/song progression buttons. Built-in microphone. Charge devices via a 1A USB port. Comes with 14" AUX cable. Measures 1-3/4" × 5" × 8" and weighs 1.8 pounds. Thermoplastic polyurethane body with rubber foot. Carries IPX7 waterproof rating. Two front-facing speakers and side-facing passive radiators. One-year warranty. Verdict: Natural sound with no distortion when the volume is cranked up. The boost mode option increases volume to its maximum but increases distortion somewhat. Convenient size for workshop, in the truck, around the home.

Similar Products: IonAudio.com, KleinTools.com, MilwaukeeTool.com, MonsterProducts.com, RyobiTools.com

Milwaukee 2891-20

\$199.00

MilwaukeeTool.ca

Wireless range of 100 feet, runs on AC with included adapter or any Milwaukee M12/M18 battery. Impact resistant roll cage. Separate buttons control volume and pausing/pairing. Charge devices via a 2.1A USB port. AUX input port. IP54 rated for water and dust protection. 6.5" × 13.75" × 7.5", weighs 5.3 pounds. 40 Watt dual channel digital amplifier and 6 speakers: 2 high definition mid-woofers, 2 high-range tweeters, 2 passive radiators. One-year warranty. Verdict: Up to 16 hours play time with 5.0 Ah battery. Big sound for the small to medium size jobsite.



Jobsite Radio

These AM/FM radios have a built-in battery charger and are designed to withstand the drops, knocks and bumps of the workshop and jobsite. Some run on the batteries used to power cordless power tools, others have built-in batteries. Most can also be run on AC power. Some have separate control buttons, others have buttons that control multiple functions. The majority enable you to control your device from the radio interface. Virtually all have USB and AUX ports.

Festool SYSROCK Jobsite Radio

\$168.00

FestoolCanada.com

Wireless range of about 35 feet, runs on 18V battery or AC power and delivers four to five days play-time on medium volume. IPX3 (splash-resistant) rating. Single 2-1/2" 10 Watt speaker with Dynamic Sound Processor (DSP) that automatically adjusts sound at all volume levels. Built-in microphone. Four FM presets but no AM. Compact 4" x 6" x 4" size and 1.8 pound weight. Includes AUX cable, 1/4"-20 thread tripod mount, swiveling hanging hook and carry bag. Three-year warranty and 30-day satisfaction warranty. Verdict: Super compact and ultra light, with a distortion-free sound. Control buttons easy to manipulate. Long play-time.



Bosch Power Box PB360C

\$249.00

Boschtools.com

Wireless range of 150 feet, runs on 14.4V/18V batteries or AC power. Up to 22 hours runtime on 18V 6Ah battery. Separate power, volume, tuning, pausing, pairing, equalizer, memory, clock and song progression buttons. 20 FM/10AM presets. Easy view upward-tilting bright LCD display. Includes 1-amp USB and AUX ports plus 4 AC power outlets. 13-3/4" x 14-1/2" x 13-1/4" rigid frame with recessed top-mounted handle, thick rubber overmold, IP54 dust/moisture rating and metal speaker screens. Weighs 24 pounds. Four corner speakers and one bottom mounted speaker provide 360° sound. Enclosed storage bays with integral rubber seals for battery and mobile device. Free PowerBox app. Three-year warranty. Verdict: Fully featured, super durable and impressive sound at all volume levels. The ultimate sound box for the jobsite.

DeWALT DCR025

\$249.00

DeWalt.ca

Wireless range of 100 feet, runs on 20V MAX and FlexVolt batteries or AC power. Eight-hour runtime on 20V MAX battery, with 3-amp battery charging. Power/volume, tuning/song progression, mode, mute, equalizer, clock, pairing, buttons with 10 FM/5 AM presets. Easy view upward-tilting bright LCD display. Includes 2.1-amp USB and AUX ports plus two AC power outlets. Has 18" x 12-1/2" x 11" rigid frame with top mounted and four side handles, thick rubber overmold, and metal speaker screens. Weighs 14-1/2 pounds. Two 20-watt 3-1/2" speakers, two 1" tweeters, two air ports. Enclosed storage bay for mobile device. Three-year warranty. Verdict: Basic features in a robust roll cage design, great sound with minimal distortion at high volume levels. No enclosed battery bay.

Similar Products: IonAudio.com, MilwaukeeTool.com, RyobiTools.com, Sangean.com



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Students

Students come in many types, but Don's not sure why they have so many questions.

BY DON WILKINSON



As some of you may be aware, I am employed by Lee Valley in Kelowna, BC. I use the term *employed by* rather than *work for*, on the suggestion – nay, the explicit instructions of – the store manager. I'm not positive, but I believe I may have been insulted.

From what I understand, which admittedly isn't all that much, one of my duties at the store is to try to teach people about woodturning. For this purpose, they built an entire room and equipped it with a half dozen brand new lathes and what I can only assume is other equipment needed to learn woodturning. Then they printed a batch of ads and flyers extolling my teaching skills and the wonderful joys and benefits of woodturning. They might have been better off spending some of the money on a different instructor.

The ads must have worked however, and people had apparently ignored who their teacher was going to be, and every seminar date was booked solid in a matter of just a few months. I believe the seminar coordinator finally resorted to dragging people off the street and offering to pay them to take the course.

The day of the first seminar arrived, as did my first student. Then, much to my surprise, a second one arrived, and shortly after they were pouring into the little room until we had students stacked to overflowing. It seems that woodturning students aren't all that bright, as several were there on the wrong date, others thought it was an annex of the UFC gym next door and the lathes were some new and slightly weird piece of exercise equipment. It seems that gym people are

even dimmer than woodturners.

Eventually we got people sorted out, and I stood at the head of the class (the only time I've ever been head of any class) as the coordinator lied his little head off extolling my skills and expertise as woodturner extraordinaire. Woodworkers are quite obviously extremely gullible.

Then it was my turn. I was more than half expecting most of the class to walk out, but to my surprise they stood there listening in admiration as I rambled on. All except one guy who clearly thought he already knew everything about woodturning, a woman who watched me closely but clearly didn't grasp a thing I said and another guy who kept interrupting me to ask inane questions that I would have answered anyway if he only had a little patience, and if I had thought of them first. As any high school teacher will tell you, there are always people like those three in almost any class. I know, because I was quite often all of them.

Once I got the students started making a mess of their projects, I wandered from lathe to lathe, observing just how badly each one had paid attention to instruction. Typically, the lone woman was gingerly applying gouge to wood as if she were deathly afraid of the piece flying off and bonking her in the face. I've noticed before that women are more likely to be concerned about such a frivolous thing than men are. At the rate she was chipping away, her log would probably rot off the lathe before she had a recognizable bowl.

The *know-it-all* man was having issues with his tools. He bitterly complained that they must have been sharpened incorrectly because they were so dull they couldn't cut a strong cheddar, the lathe was cheap junk, the chuck couldn't hold a piece of stale bread, and everything else he could think of that was ruining his lathing experience and was entirely my fault. I listened politely, then leaned over and flicked the switch to forward instead of reverse.

In the meantime, *question-man* had been pestering me about nearly everything I had already explained as well as a few things I maybe should have. As in, *Should the lathe be turned on before or after I attach the wood to it? And, What side of the lathe is it best to stand on?*

And my all-time favourite, the one that convinced me the man was a few knots short of a board, "These tools look sharp as a razor, will they cut me if I run my finger along the....ow! Son-of-a-B&%\$@#."

Yes, teaching can be frustrating. But every once in a while, a student comes along that makes it all worthwhile.

I've never had one of those.

DON WILKINSON
YukonWilk@gmail.com



Illustration by Mike Del Rizzo

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Chris Wong

Wireframe Cabinet

This cabinet started with a question: what would a storage cabinet look like if it could house only one item? This specific concept was further inspired by single-line drawings, where one fluid line was used for an entire picture. Wong developed the form through several line drawings, and examined which would best frame and show off the item on display. The cradle – essentially a four-armed claw – was designed to hold a single object with either a flat or round bottom.

Turn to page 14 for more quotes from Wong.