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February 2015

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CNC manufacturers make another leap

Veneer use opens design opportunities

Learning to work with a 'live edge'

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W1812 Planer Moulder with Stand

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W1819 SHOWN

W1819 10" Table Saw
W1820 10" Table Saw with Long Ext. Table

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- Spindle travel: 3¼"
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6" x 12" HEAVY-DUTY COMBINATION SANDER

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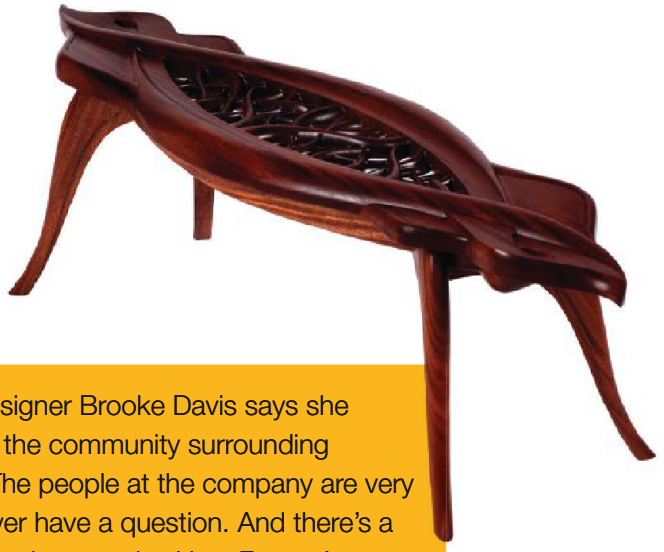
Helping woodworkers is how we got our start back in 1996. So it's a constant topic of conversation around ShopBot: How can we help more of them start their businesses…and grow their businesses.

Shown here: PRSAlpha CNC router, 96 X 48

"Since 2001 our full-size gantry tools have been helping Phillip Fletcher produce custom cabinetry and furniture at Durham Bookcases. He says he likes how quickly new employees get up to speed running the tool. **Thanks Phillip!**"



Furniture designer Brooke Davis says she appreciates the community surrounding ShopBot. 'The people at the company are very helpful if I ever have a question. And there's a very active and supportive User Forum.' **We appreciate you, Brooke!**

Joe May at Wood-Mode says flexibility is the biggest advantage of ShopBots. He can configure each one differently for different products, without the expense of a bigger machine. Wood-Mode now has 16 ShopBot Tools running. **Thanks Joe!**

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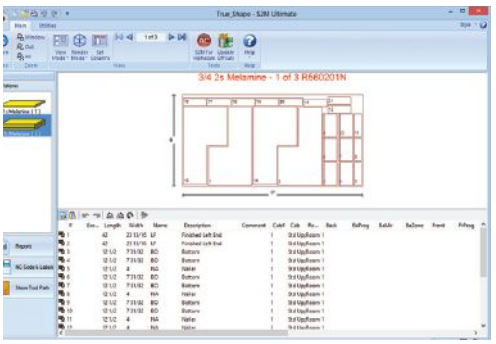

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Evolution

An inspired breakthrough in workholding technology emerges.

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BLOGS

Over the Workbench

Talkin' shop with former editor A.J. Hamler

This Business about Woodworking

Share an opinion with David DeCristoforo but don't expect to be right

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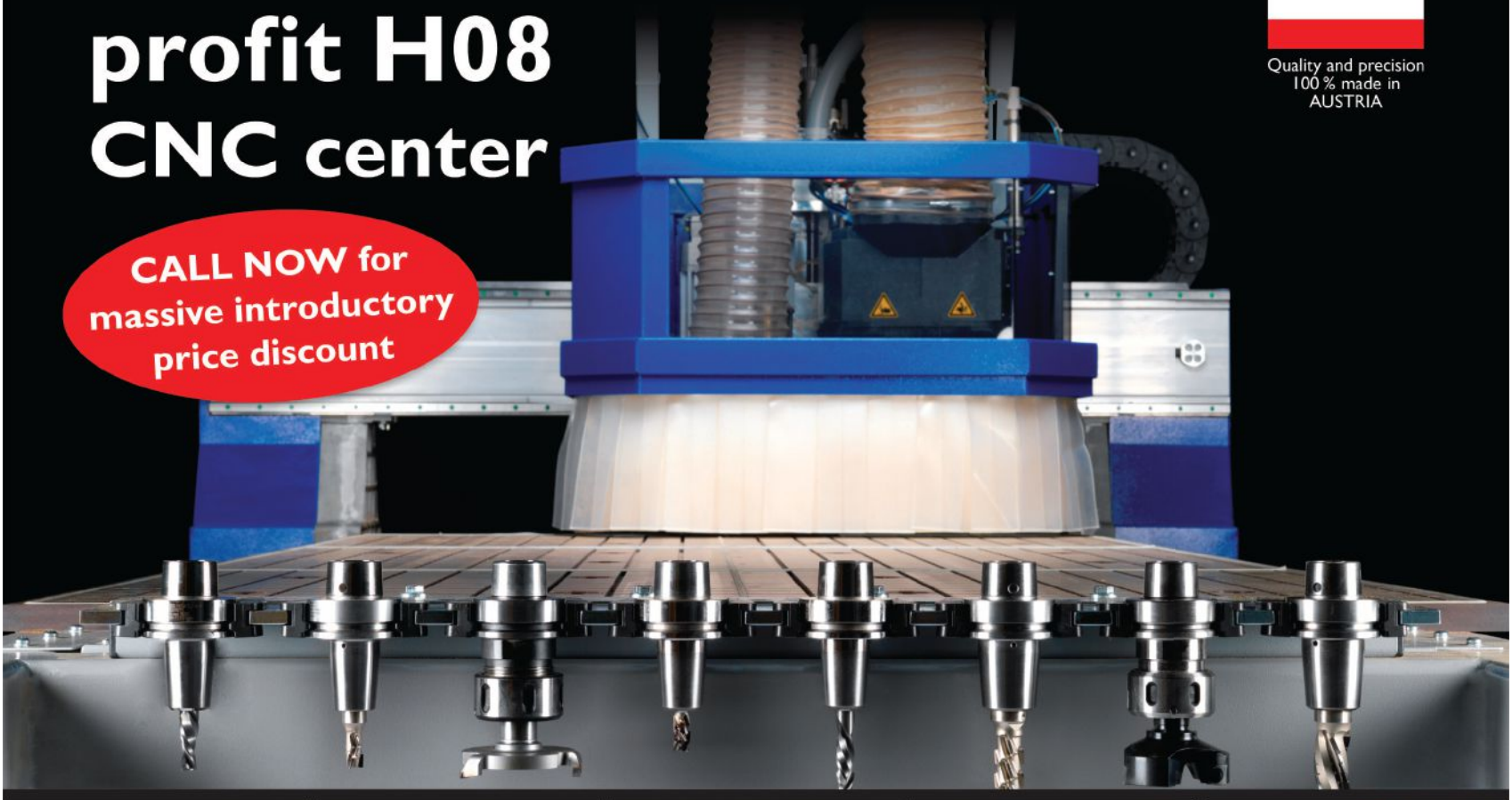

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Drilling head
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Nesting table
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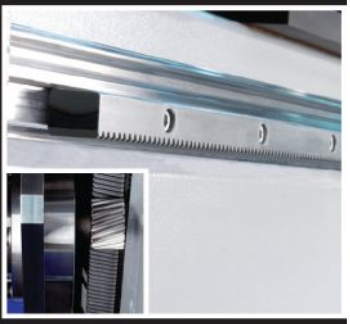

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Shaping the Successful Shop™

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TAKING STOCK

with TOD RIGGIO

It'll be a jam-packed year centered around AWFS

After a great holiday break — is there anything better than being a dad at Christmas with a six-year-old? — the staff at Woodshop News is rested and ready for what we hope will be a prosperous 2015 for all.

The wood industry is poised for growth and it is the magazine's responsibility, in good times and bad, to provide content that will help shape a successful shop (borrowed that from the cover). Our editorial planning is a continuous process that picks up steam after the year's major trade show — IWF or AWFS. It begins by writing "CNC" at the top of the page, in the margins and the other side with a permanent marker that you keep away from the kids.

This is one of six issues carrying CNC content on the schedule, featuring an extensive report ("Brave new world," Page 39) on the latest technology available. Manufacturers are releasing new machines and software at a rate not seen since before the Great Recession, so it's a topic that will be revisited often in subsequent issues.

Here's the rest of our 2015 editorial focus month-to-month.

March: Dust control; buying hardwoods; finishing equipment.
April: Work cells; CNC tooling; cordless and job-site tools.
May: The art of closing the deal; outsourcing options; vacuum presses.
June: Pneumatic tools; cutting tools; sanding and abrasives. Our new CNC supplement will be sent with the June issue.
July: AFWS show issue; working with non-wood materials; table saws; adhesives.
August: Finishing; working with lasers; edgebanding options.
September: AWFS post-show report; spindles and aggregate heads; engineered panels.
October: CNC for smaller shops; accounting and insurance; expanding revenue options.
November: Cabinet and furniture components; controlling waste; air compressors.
December: Servicing machinery; material handling; multi-purpose tools.

We think that's a fairly comprehensive list of relevant topics. But if there's a glaring omission or something in particular that you'd like to see, please contact me at *editorial@woodshopnews.com*.

I'll bet we haven't published an issue without at least one reference to CNC in the last 10 years. Since I'm not about to look through 120 issues — and my guess is you won't either — give me the benefit of the doubt.

I know for a fact that our last nine Cutting Edge columns have been devoted exclusively to understanding the mechanics and machining concepts of CNC routers. The author, R.W. Lee, is much more than a tinkerer, having built two CNC routers for his shop from the ground up. In this month's entry, he covers tool selection and the relationship between feed and speed rates.

I'd also like to steer you to our tool coverage, starting on Page 18. Festool has come up with its version of a multitool and SawStop is set to release a portable table saw featuring the company's finger-saving safety device.

We've also got some great information on incorporating veneer (Page 22) and working with 'live edge' stock (Page 48), tips for avoiding moisture problems with hardwoods (Pro Shop, Page 44), Bob Flexner's advice for applying stain (Finishing, Page 30) and much more.

I'll leave you with an important reminder about the 2015 AWFS fair in Las Vegas. It's coming fast — July 22-25 — so start making plans to attend. W

Working with tools and wood is inherently dangerous. We try to give our readers tips that will enhance their understanding of woodworking. But our best advice is to make safety your first priority. Always read your owner's manuals, work with properly maintained equipment and use safety devices such as blade guards, push sticks and eye protection. Don't do things you're not sure you can do safely, including the techniques described in this publication or in others. Seek proper training if you have questions about woodworking techniques or the functions of power machinery.

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NEWS DESK

Fine Furnishings shows see attendance gains

By Jennifer Hicks

Attendance was up at the two Fine Furnishings shows in 2014, according to producer Karla Little. The Milwaukee show, held Oct. 3-5, had a 17 percent increase at the gate, while attendance at the Nov. 7-9 show in Pawtucket, R.I., jumped 11 percent.

"I'm thrilled with the turnout," Little says. "It's just wonderful to see this happy atmosphere. When the economy was so sad and grim, it was painful to watch businesses close. But this shows a different outlook."

The retail shows feature custom furniture makers mixed with exhibitors of handcrafted accessories for the home. Little says she had a waiting list for exhibitors at both shows.

"What's really exciting is that a few years ago I was concerned about where the next generation of exhibitors would come from. Now I'm really pleased that there's a great group in their late 20s to early 40s that are talented and seem to be smart businesspeople too."

First-time exhibitor Toney Robertson of Galveston, Ind., had a great first day at the Milwaukee show, selling a walnut desk for $7,800. He also exhibited at Pawtucket in an effort to expand his market.

"I think the show is very well run and I like the venue. I thought the people were great and very friendly," Robertson says. "I probably will return. I'm always a little paranoid wondering if I did it this year, will I do it next year? I've been told by a lot of people the shows get better for exhibitors year after year and you build up a customer base and then it goes pretty well."

The Milwaukee show will be moving to a new venue in 2015. It's scheduled for Sept. 18-20 at the Muellner Building in Wauwatosa, Wis. The Pawtucket show will be held Nov. 6-8. W

For exhibitor and show information, visit *www.finefurnishingsshows.com*.

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Suzy and Scott Phillips, co-hosts of "The American Woodshop".

'The American Woodshop' returns for 22nd season

By Jennifer Hicks

"The American Woodshop," with co-hosts Scott and Suzy Phillips, is in its 22nd season on PBS, featuring projects based on the theme of "Bringing It Home."

Public television's only husband-and-wife team are bringing viewers 13 new episodes that Scott Phillips describes as "changing the way things can be done," as well as incorporating the different aspects of upcycling.

"How many times does a damaged piece of furniture just get thrown away? What a waste," Phillips said in a statement. "It is time for all of us to add value to life by creating new things from found parts. In one episode, we use a beautiful reclaimed top from a table found by the road and ready for the trash to build a trestle table that features through pegged mortise-and-tenon joints."

In a telephone interview with Woodshop News, Phillips says there's no end in sight to the long-running series and wants to encourage new woodworkers through this season's episodes.

"There are so many people that don't have years and years of experience and sometimes getting started is the hardest thing. We want to make woodworking approachable, not the exclusive domain of old-school masters with one way of doing something. There are lots of different ways for anyone with any skill level to increase the furniture count in their home and take ownership of their work," Phillips says.

"I have learned over the years that the reason people work with wood is because there's a satisfaction that comes from creating things with your own hands. Working with things in your shop to create your own furniture to enhance a home is priceless. The sense of accomplishment you get is really important."

The show airs on 350 PBS stations. For information, visit *http://wbgu.org*.

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WOOD MARKETS

Red alder maintains its regional appeal

By Jennifer Hicks

Red alder is the most abundant hardwood in the Pacific Northwest, available in clear and knotty grades nationwide. It's easy to work with, sands well and gives a pretty good cherry and mahogany imitation. And it's moving well in its neck of the woods, according hardwood dealers interviewed by Woodshop News.

"Our alder sales [in 2014] are way better than [2013] and it's our best year in six years," says Ron Wilson of Cascade Hardwood, which offers 23 grades of alder at its facility in Chehalis, Wash. "I would attribute this to the economy, primarily because the cabinet business has been better and there's a lot of alder sold there.

"It's real easy to work with. It has a closed-grain, smooth finish and a reddish color like cherry. It doesn't have the color variations in sap and heartwood, so people tend to like it as opposed to cherry because they don't have to get it selected for all heart or all sap. It takes stain better and is very stable."

Red alder (Alnus rubra), grows along the Pacific Coast, from the redwood belt of California to central British Columbia. It thrives near water and is most abundant around Washington's Puget Sound and in northwest Oregon, where trees can reach heights of 120′ and diameters of 36".

"It's a pretty small area that it grows in and there are very few producers. However, it's a very large-volume species," Wilson says.

At Arroyo Hardwoods in Pasadena, Calif., Mike Hugens says alder sales have been mostly up in the last year.

"It's not as popular as it used to be, but it's selling. I've got a big alder project right now that we're working on. People seem to be using it for countertops and cabinets," he says.

For those who haven't worked with alder, it is softer than other cabinet woods and dents easily. Availability is much easier in the Pacific Northwest, but chances are your local hardwood dealer can have some delivered on request.

Dealers say prices haven't changed much recently, with 4/4 clear alder averaging about $4/bf.

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TOOLS & TECHNIQUES

Festool puts you in control with Vecturo multi-tool

By Jennifer Hicks

Festool's latest innovation is the Vecturo OS 400, the company's first oscillating multi-tool, featuring a 400-watt motor, plunge base and depth-stop system.

The tool is basically designed to cut, scrape or score virtually any material, using a wide variety of accessory blades and the appropriate speed setting, according to the company.

"With its first-of-its-kind base system, the Vecturo adds precision and increased power to a tool that has traditionally lacked the performance and accuracy professionals need when in the workshop or on the job site," Festool vice president of marketing Michael Williams says. "Designed with end-user ergonomics in mind, the Vecturo is extremely versatile, making it ideal for nearly any application that needs cutting, scraping or scoring."

Festool says it has conquered an oscillating tool's long-standing problem — proper control — with the plunge base and depth stop.

The base helps with alignment during cuts and prevents blade wander, as well as vibration, thanks to the inclusion of a magnetic strip. The depth-stop system features two feet that can be used interchangeably to control the depth of cut.

The base and depth stop each rotate to use the tool at various angles.

The Vecturo sells $425. The plunge base and depth stop are accessories, which are bundled with the tool for $575. W

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SawStop rolls out new job-site table saw

By Jennifer Hicks

SawStop is introducing a job-site table saw with the company's patented safety device, which detects contact with skin on the blade, then stops and drops the blade in less than five milliseconds.

Product manager Matt Howard says the company wanted to expand into the portable category and the new saw features a host of innovations that increase accuracy, save time and improve results.

"One big innovation with this new saw is that it takes only one turn to raise or lower the blade, where a typical portable saw takes about 25 turns, which is very tedious. This is substantial because it makes it much easier for the operator to get their work done," Howard says.

The 15-amp, 10" saw has a 1-1/2-hp universal motor, Poly-V belt drive and T-style fence. The saw alone weighs 79 lbs., but can be rolled to the job site with a folding cart sporting 8" treaded wheels.

It's a left-tilt saw with a riving knife, low-profile blade guard, tool-free zero-clearance insert and a several micro-adjust features. For example, the blade can be tilted in 1-degree increments and fine-tuned in 1/2-degree increments.

The fence can be extended for 25-1/2" cuts, thanks to a pair of telescoping guide rails.

The saw weighs 108 lbs. with the rolling cart.

SawStop makes use of the empty space between the extended fence and table with a pullout shelf for work support. The shelf lifts up to reveal a handy storage drawer.

The company says a dado blade insert for the saw is coming soon.

The saw, available in March, sells for $1,299. W

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- Intake hole size: 10"
- Bag material: Plastic
- Impeller: 16" steel radial fin
- Suction capacity: 2184 CFM @ 1.9" SP
- Maximum static pressure (inches of water): 14"
- Collection drum: Steel, 55 gallons
- Sound rating: 83–86 dB
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- Intake hole size: 12"
- Impeller: 18½" steel radial fin
- Air suction capacity: 4029 CFM @4.3" SP
- Maximum static pressure (inches of water): 16.8"
- Sound level: 87–90 dB
- Collection drums: Steel, 55 gallon x 2
- Overall dimensions: 76¾" W x 60" D x 139⅜" H
- Stand: 13-gauge steel
- Cyclone body: 16-gauge steel
- Blower housing: 11-gauge steel
- Approx. shipping weight: 1264 lbs.

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A range of possibilities

Using veneer instead of hardwoods presents several design options

By John English

Deciding whether to use veneer rather than solid wood is a complex choice. The three main reasons that shops take this path are aesthetics, structure and cost.

Aesthetics means that veneer allows a designer to use a wider palette — both physically wider in that veneer can be laid up as wide as the substrate and visually wider in that veneer comes in more species, cuts and even colors than solid hardwoods.

Structure means that veneer can be applied to a stable substrate such as MDF, which eliminates or dramatically reduces many concerns about moisture that include expansion, contraction, warping and twisting among others.

And cost can be a big factor, too. It is often less expensive to purchase a veneered product and attach it to a substrate in-house (or to buy it already laminated onto a substrate) than it is to purchase the same volume of solid hardwood. Think of the time saved by not having to dress, flatten and straighten solid boards or deal with waste factors imposed by Mother Nature such as loose knots, tension wood, checking or even discoloration that is invisible until a board is planed.

Veneer isn't only used on flat panels in casework. It can also be bent, curved and formed to make furniture parts and, used wisely, it can deliver premium grain from all vantage points. For example, a solid wood quartersawn leg will have two quartersawn facets and two plain sawn. But with veneer, all four faces can be quartersawn and equally attractive.

Once the choice has been made to work with veneer, the first step is to become acquainted with the various buying options. These include the way veneer is cut and also the way it is matched.

VENEER CUTS

There are four areas of a tree where veneer can be harvested. These are the straight trunk (sometimes referred to as the bole), which yields the largest area, and figured wood from crotches, burls and bases. Trunks have both heartwood and sapwood and this can be an issue. Wood from the base or root system of a tree is collectively called stump wood.

Anyone who has ever used a hand plane knows how differently these different growth areas respond to tools, so the veneer industry has developed ways to cut and slice each of these challenging grain patterns.

By far the most common and least expensive veneer cut is a simple rotary method. This cut is used on the trunk, which is the area between the tapered stump and the dendritic crown. (Dendrite growth includes crotches, limbs, branches, twigs and leaves.) Commercial veneer logs tend to have long, straight and parallel trunks because the mills that turn out rotary cut veneer are high volume outfits that can't afford to waste time on unique setup. They like their logs uniform and not too tapered. A rotary veneer cut is made with a long, extremely sharp knife while the log is rotated on a lathe. Usually, veneer is about 1/40" to 1/32" thick and the mill allows for that plus sanding to determine how thick a slice to take during each rotation of the log. Initially, the blade slices in a hit-and-miss fashion until the log is trued up and, after that debris is removed, the machine delivers a continuous and long sheet of wood. Most machines are programmed to crosscut the veneer at specific intervals, so that the mill ends up with a pile of veneer sheets, each just a little bigger than the size of a sheet of plywood.

Rotary-cut veneer has a broad cathedral-shaped grain pattern. Because there are large distances between the annual growth rings, it can be very difficult to match up the edges seamlessly, so the transition from one piece of rotary veneer to another is quite obvious. Because of that, this cut is reserved for economy grades of veneered plywood. It is also used in the core of most plywood sheets, where the joints aren't visible.

The same plain-sawn grain pattern is achieved in a second veneer cutting method, which is called flat slicing. Here, the log is again cut from the trunk and after it is de-barked, it is sliced in two equal halves along the grain. The resulting half logs are

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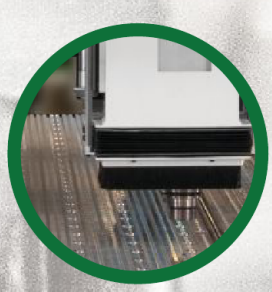

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then placed with the newly cut wide, flat face down, and a knife begins slicing across the top. The resulting slices are then restacked as they once lay in the log and this collectively is called a flitch. The width of each slice, or 'leaf', is restricted to the actual width of the log, but the edges usually have a tighter grain pattern that makes them easier to match and make up a wider panel.

A third method of cutting veneer is quarter slicing, where the log is sliced in four along the grain and then the wedges are sliced again to produce quarter-sawn patterns (and a flake pattern in some species such as white oak). Occasionally a cabinetmaker asks for a rift cut, which is essentially a quarter cut taken at 15 degrees to minimize the amount of flake and produce more comb (the very tight vertical grain closer to the outside of the log).

Rotary and quarter cuts are usually made on the trunk and slicing cuts are usually made on figured areas.

VENEER MATCHING

When a large log is rotary cut, the resulting sheet is usually crosscut every 4 or 5 feet so it's wide enough to cover a full sheet of substrate. But sliced veneers produce leaves that are only as wide as the trunk of the tree or the diameter of a burl, so several of these narrow pieces need to be used to make up a wide panel. The process of placing them together and forming aesthetically pleasing grain patterns is called matching.

The three main ways to match are book, slip and swing. In book matching, every other leaf in the flitch is flipped horizontally, so that they resemble the pages in a book. This is by far the most common method. Most cabinetmakers and furniture builders have done the same thing by edge-sawing a board and opening it up like a book and then edge-gluing the two halves to form a wider board. What is nice about this arrangement is that the grain patterns always match along the joints.

In a slip match, the leaves are simply slipped to one side and butted together. This delivers a dramatic effect where the joints are immediately visible. Some furniture builders like to slip to the left on left-hand doors and then flip the stack and slip to the right on right-hand doors. The end result is a pair of doors that match.

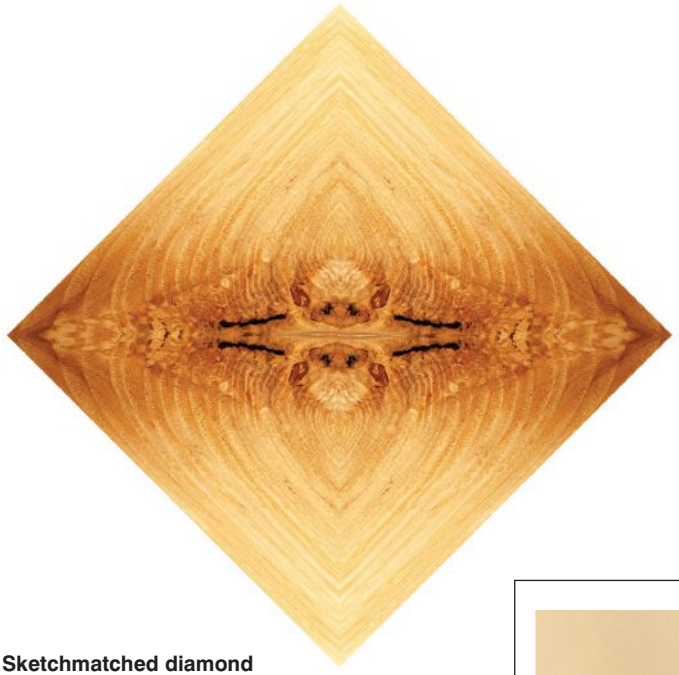
The third option can be a little complicated. Swing matching means that every second leaf is flipped end-for-end. However, a


Slipmatched


Bookmatched


Herringbone


Swingmatched book



Sketchmatched diamond

further dramatic effect is achieved when pairs of swing-matched leaves are then book matched (as was done in the example of swing matching shown here).

Matching the sliced leaves in these patterns provides a number of visual options for a cabinetmaker that are relatively easy to complete with veneer and rather difficult to do with solid wood. The number of leaves can also add variety. For example, there can be an odd or even number of leaves in a panel and this moves the visual center. If there are, for example, five leaves (a "balanced" match), then the middle of the panel is a complete leaf. If there are four or six leaves (a "center" match), then the middle of the panel lies on a joint. Sometimes the leaves don't match up well with the substrate and a builder ends up with half a leaf on one panel and the other half on the next. In that case, the pattern is called a "running" match.

When a builder really wants to get creative, sketch matching is a good choice. This process uses squares and triangles of veneer to create patterns that meet in the middle. They can be checkered (like the pattern in parquet flooring) or take the shape of starbursts, diamonds and other geometric layouts such as the traditional herringbone.

A FEW NOTES

If you bring a log to a veneer mill to have it sawn or buy one from them, keep in mind that they need to slice thin so they get the most square feet from a log. But you can choose to make it a full 1/16" thick if you like, instead of the industry standards of 1/32" or 1/40". That means less chance of accidentally sanding through it and, with crotch and other highly figured cuts that need to be flattened, there is less chance of it shattering, especially where end grain is dominant.

Sometimes the mill can clamp the entire flitch together and joint one or both edges. That means a lot less time playing with it later in the shop. If that isn't an option, then clamp the flitch between two boards and run it across the jointer — but make sure the clamps won't hit the knives or the fence!

The normal practice when creating panels that are wider than one piece of veneer is to stack two layers and use a veneer saw to cut the edges simultaneously so that they match perfectly. The wood is then taped together edge-to-edge before it is attached to a substrate.

Veneer tape without holes is used on thicker, difficult veneer, but most leaves can be joined using perforated tape. It shrinks a little as the glue dries, so it pulls the edges closer together. Tape is applied to the top (viewable) face of veneer, rather than the glue side (there are a few exceptions). The main advantage of the holes is that one can be a little more precise in placing, as the sawed edges are visible through the tape. And as veneer is so thin, there is rarely a good face, so it can usually be flipped. W

THE CUTTING EDGE

with R.W. LEE

The sound in a cut never lies

A good ear can help with a CNC router's performance, but only after careful consideration is given to tooling selection, and feed and speed rates

Here's the tricky bit about choosing bits for use in a three-axis CNC router: there's a lot to consider. You're probably going to start with the material that needs to be cut, but you've also got to factor in the router's spindle type and horsepower, the construction quality of the machine's base and gantry, type of work-holding system and much more.

Then again, it might be more helpful to start with the basics, such as the differences and applications of straight-plunge, spiral and compressions bits.

These bits cost more than general woodworking bits because they are subject to longer periods of use and required to cut at a faster rate. The amount of heat a bit has to tolerate and the amount of force the bit is subjected to are both are much greater and for longer periods of time.

Though there is much debate about how router bits are used on a CNC router, there is one aspect that is always true: The more expensive, industrial-quality bits are a bargain. These bits will have better engineering, materials and design, and incorporate features such as high-quality carbide; increased clearance geometry, polished flutes and razor-sharp cutting edges.

Straight-plunge, spiral and compressions bits are manufactured in different configurations so they can effectively and efficiently cut materials like MDF, plywood, melamine and solid wood.

Straight-plunge bits often have one, two or three carbide-tipped flutes that are parallel to the rotation of the bit's shaft. They tend to be used to cut at high-speeds in materials such as chipboard and MDF.

Spiral bits come in down-spiral and up-spiral configurations with any number of flutes. Down-spiral bits, as the name suggests, cut down into the material. This leaves a splinter-free top edge and helps keep the material tight against the work surface. However, the cutting action drives the removed material into the cut, causing additional wear and quicker dulling of the bit.

Conversely, up-spiral bits cut up from the material. This action ejects the removed material, helping to reduce wear on the bit and allowing for faster cutting speeds. But the edge of the cut will be prone to splintering and the material will be pulled off the work surface, which can cause inaccurate cuts.

Compression bits are a combination of down- and up-spiral bits. The cutting flutes spiral up from the bottom and down from the top. This drives the removed material to the middle of the cutter. These bits are used to cut completely through sheets of plywood, laminates and composites in one pass, leaving clean cuts on the top and bottom edges.

FEEDS, SPEEDS AND CHIP LOADS

Like all other aspects of digital fabrication, there is more to know about a tool than just its physical characteristics. This involves knowledge of the machine's characteristics and capabilities and a working knowledge of two machining concepts.

The first is the relationship between feed rate and speed. Feed rate refers to how fast the tooling will move through the material being cut or machined, which is measured in inches per minutes. Speed refers to the rotational speed of the spindle and is measured in revolutions per minute.

The second is chip load, a measurement of the thickness in inches of material removed by each cutting edge of the tooling during a cut.

To calculate the chip load, multiple the feed rate by the RPM.

But if you were to put four CNC operators in a room, they'd have at least a dozen opinions on the appropriate feed, speed and chip-load best-case scenarios and they will all be more or less correct. Feeds, speeds and chip loads are determined to maximize the rate of material removal rate, produce the best possible edge cuts and maximize tool life. Sometimes, you can only achieve two out of the three.

For example, if the goal is to maximize material removal and surface finish, then a moderate-to-high feed rate and a high spindle speed will probably get the job done. However, this combination will tend to cause the tooling to run at a high temperature and shorten its life.

But if you're cutting mostly sheet goods, where most of the cuts will be hidden in dados or rabbits, by edgebanding and sanding, a moderate feed rate and slow spindle speed might suffice, resulting in longer tool life.

SO WHO'S RIGHT?

The question that often arises is what feeds and speeds are moderate and what are high? The answer is ambiguous. Generally, many tooling manufacturers suggest spindle speeds of between 10,000 to 20,000 RPM, but that depends on the feed rate, the characteristics and capabilities of the CNC router and the material being cut, among others.

This leads, more often than not, to making educated guesses on the proper feed and speed rates while using the trial-and error approach. Some of this can be avoided by contacting your tooling supplier for suggestions. Ask if you can be referred to another shop for answers and offer to pay for their knowledge and time. Online forums are another excellent option.

When all else fails, lend an ear to the situation. The sound of a tool in the cut can be quite informative. A quiet cut suggests you've probably got everything dialed in correctly, while squealing or growling suggests something is running either too fast or too slow. W

Marwood Veneer gets nod in new book

Marwood Veneer says it was listed as a trusted veneer source for skateboards in the newly published guide, "The Handmade Skateboard," from Spring House Press.

The book is sold nationwide at skateboard shops, including Woodcraft retail stores and online.

"We are honored to be a trusted veneer source for this burgeoning industry. So many skateboarders are looking to make their own custom longboards, cruisers, or street decks from scratch, and this definitive guide is an excellent resource. Skateboarders know to come to our ecommerce online store, or visit their favorite skateboard shop to find Marwood Veneer," company CEO Jim Martin said in a statement.

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Biesse America expands edgebanding system

By Jennifer Hicks

Biesse America has made its AirForce System Edgebanding Technology available on different configurations of edgebanders. The system emits high-temperature compressed air through a slot nozzle directly onto the reactive layer of commonly available laser banding. This activates that layer and bonds the banding to the panel fibers.

Product manager Jason Varelli says the ease of use is what makes this system beneficial to custom woodworkers.

"Unlike an EVA (ethylene vinyl acetate) glue system, you just turn it on and use it. There's no tinkering with it and nothing to adjust. It's simple. The number one thing people become frustrated with on an edgebander is the glue system. So with this product, there are no glue adjustments. You just turn it on and you run it," Varelli says.

"There is no glue used with this product. It simply heats a functional layer on the back of the edgebanding so that it gets inside the fibers of the panel, which can be MDF or fiberboard, to create the bond. The alternative is to use an EVA glue system or a PUR (Polyurethane reactive) glue system."

The AirForce System allows changes based on banding colors without any setup. In addition, the AirForce System is environmentally friendly, providing a "clean-green" technology that eliminates glue and fumes. This has become increasingly important now that AirForce can use PVC, according to Varelli.

Other benefits include the absence of a glue line and resistance to heat and humidity.

The technology is offered on Akron, Roxyl and other edgebanding machines in many different configurations. The machine prices vary. Those without the technology and only EVA glue systems sell for about $110,000, while those with the technology can retail for up to $160,000, according to Varelli.

For information, call 704-357-3131 or visit *www.biesseamerica.com*.

Virutex offers combo miter/table saw

By Jennifer Hicks

From the "What Will They Think Of Next?" department, Virutex offers the TM33 combination miter saw and table saw.

That's right, it's a miter saw that can be turned upside down to become a table saw. The idea is to save a trip to the truck as the job site is set up.

Aimed specifically at the finish carpenter and floor installer, the combo cutter has been in production for more than a decade but is new to the North American market, Virutex president Alex Akavan says.

The tool runs on 110 volts, has a 2-1/2-hp motor, and uses a 12" blade as a miter or table saw.

It's your basic miter saw — albeit with a small table and fence attached to the top — available with an optional laser guide. The engineers got clever in table saw mode as the table is raised or lowered to get the appropriate blade height.

The saw comes with a removable rip fence and a second fence for angle cuts. It also gas a soft start feature and blade brake.

The saw weighs about 46 lbs. and sells for $950. W

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A wood stain is a colorant (pigment or dye) and a binder (some sort of finish) with a lot of thinner added so the excess stain is easy to wipe off. This leaves some color in or on the wood.

A stain can also be just dye and thinner with no binder added.

Pigment is ground earth or colored synthetic particles, so it requires a binder to glue it to the wood. Pigment settles to the bottom of the can and has to be stirred into suspension before use.

Dye is a colorant dissolved in a liquid, so dye penetrates along with the liquid and doesn't need a binder. Coffee and tea are examples of weak dyes.

You don't need to use a stain unless you want to change the color of the wood. If you do apply a stain, you do it before applying the finish.

TYPES OF STAIN

Common categories of wood stain include the following:

- Oil stain (thins and cleans up with mineral spirits).
- Water-based stain (thins and cleans up with water).
- Gel stain (thick like mayonnaise, it spreads and wipes off easily like mayonnaise).
- Dye stain (a colorant dissolved in a liquid).
- Combination stain and finish (doesn't color as effectively and is streaky with brush marks if brushed and left).
- Lacquer stain (a very fast-drying stain that's sprayed and wiped quickly; often applied by two people).
- No-wipe stain (a fast-drying stain thinned enough so it can be sprayed and left without wiping).

The primary differences in stains are as follows:

Ease of application — Oil stains are the easiest to apply because you have plenty of time to wipe off the excess. All the other stains dry quickly so you have to work fast or on smaller areas at a time.

Drying time — Lacquer stains, no-wipe stains and dye stains dissolved in solvent (not water) can be coated over within minutes. Water-based stains can be coated over after about an hour. Gel stains, and dyes dissolved in water, require four to six hours before coating over. Oil stains should be allowed overnight drying.

Grain definition — All stains provide good

grain definition if the excess is wiped off because more colorant is left in the grain. Dye stains produce slightly less definition than pigment stains. No-wipe stains produce no grain definition.

Color control — Dye stains provide the best control of color — that is, getting the color darker without obscuring the figure of the wood. Dye is see-through; you can apply as many coats as you want and still see the wood's figure. Pigment hides.

CONDITIONING THE WOOD

The purpose of "conditioning" or "washcoating" wood before applying a stain is to reduce blotching, which is uneven coloring caused by irregularities in the wood. A wood conditioner or washcoat is any finish thinned to 5 to 10 percent solids so it doesn't totally seal the wood. Some of the stain can still penetrate.

The woods that blotch are softwoods such as pine and tight-grain hardwoods such as maple, birch and cherry. There's no point in applying a wood conditioner/washcoat to medium- or coarse-grain woods such as walnut, mahogany or oak.

Lacquer and shellac washcoats dry rapidly, so they are the most efficient to use.

Varnish wood conditioners (the common ones found in home centers and paint stores) are varnish-thinned with about two parts mineral spirits (paint thinner). You can make your own. The key to getting the varnish wood conditioner to work well is to let it dry fully before applying the stain — at least six hours, better if overnight. This is different from the directions on most cans.

STAIN APPLICATION

The basic rule for applying all stains except no-wipe is to apply a wet coat and wipe off the excess before the stain dries. Unless the wood is naturally blotch-prone or you haven't sanded the wood well enough to remove all mill marks and other flaws, you will always get an even coloring.

You might need to divide your project into smaller sections or have a second person wipe as you apply to get good results using one of the faster drying stains. It's much faster to spray the stain onto the wood or wipe on with a cloth, wearing gloves of course, than to brush it.

APPLICATION PROBLEMS

Common problems and ways to avoid them:

- The stain dries in spots before you get it all wiped off, leaving an uneven coloring. If you are quick enough, you can wipe with more stain on smaller sections at a time to reliquify the stain so you can then wipe it off evenly. Otherwise, strip with lacquer thinner, acetone or paint stripper and restain smaller areas at a time or get a second person to help.
- The color of the stain doesn't match what you expected from the name on the label. Names are simply manufacturer's interpretations. There are no industry standards.
- The color of the stain on your project isn't the same as on the color sample in the store. Woods color differently. Always try the stain on scrap from your project and make adjustments (add pigment or thinner) if necessary to get what you want.
- Glue from squeeze-out or fingerprints seals the wood preventing stain penetration. Sand or scrape off the glue through the stain and restain that area or leave the splotch and disguise it by painting in the correct coloring after you have applied a coat of finish.

Stain problems such as blotching and getting the color wrong can be extremely difficult to fix. You can usually remove some of the color by wiping with the thinner for the stain. If the stain contains a binder (it isn't simply dye), you can use a paint stripper. But nothing short of sanding will remove all the color. W

Flexner is author of "Understanding Wood Finishing" and "Flexner on Finishing."

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- Depth of cut: 4⅛" @ 90°, 2¾" @ 45°
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- Max. cutting depth: ⅛"
- Feed rate: 16 & 30 FPM
- Cutterhead speed: 4800 RPM
- Approx. shipping weight: 666 lbs.

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- Max. cutting depth: ⅛"
- Feed rate: 16 FPM & 20 FPM
- Cutterhead diameter: 3⅛"
- Cutterhead speed: 4800 RPM
- Number of cutter spirals: 4
- Table size: 20" x 25¾"
- Table size with extension: 20" x 55½"
- Overall dimensions: 55⅝" L x 39" W x 45⅞" H
- Approx. shipping weight: 932 lbs.

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- Max. board thickness: 5½"
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UPDATING A CLASSIC

Armed with an MBA, Scott Reader bought Rainier Woodworking Co. in Tacoma, Wash., and turned it into a 21st-century operation

By Jennifer Hicks

In one form or another, Rainier Woodworking Co. has been making cabinets for Puget Sound customers since 1957. Scott Reader bought the Tacoma, Wash.-based shop in 2001 and has established an efficient nested-based manufacturing operation, building primarily off the 32mm system.

Rainier once had 138 cabinetmakers, producing 16 sets a day in the 1970s, according to Reader. Times have obviously changed. Today, the shop has 38 employees — including designers, craftsmen and office personnel — filling more than 300 custom and semi-custom orders per year with the latest CNC hardware and software.

Employees are either designers, engineers or dictators, according to Reader's theory.

"To grow the business we did a couple of different things," Reader says. "We changed the business processes. There were only five employees when I purchased the business and they were wearing so many hats. We got them focused on schedules and employed them at using different tools.

ENTREPRENEURIAL SPIRIT

Reader grew up in the Northwest during what he calls the "pre-Microsoft" era. He attended the University of Washington at Tacoma and completed several graduate programs, earning an MBA at the Kellogg School of Management and a masters degree in engineering at McCormick School of Engineering, both at Northwestern University in Evanston, Ill.

"After school I worked as a management consultant for a while, but I wanted to have a family and not travel as much as I had before. I also wanted to do something entrepreneurial. So my wife and I began to look into businesses to purchase. We looked at 83 businesses in total, all low-tech manufacturing firms. The one that both my wife and I could agree on was Rainier Woodworking," Reader says.

Reader's philosophy of running a successful shop, based on his own experience, is figuring out if an employee falls under the category of designer, engineer or dictator. He believes every individual naturally

PHOTOS: BEN ROOSA

falls under one of those. He says the designer creates a vision, while the engineer puts it together and the dictator makes a decision and, if it doesn't work, makes another one and moves on.

"The argument is figure out who you are and have the roles defined. As an organization we need to balance this out," Reader says.

"Woodworking is a bit like farming, it's become very high-tech. Farms are a lot larger now and the equipment is an incredibly sophisticated capital investment and that's what woodworking is. It's about the software and machinery, which requires a level of intelligence. So just think of it as a high-tech business: the processes, science and methodology are sophisticated. You have to know it."

PUGET SOUND AND BEYOND

To illustrate the shop's wide market, Reader points to a large map of Washington behind his desk.

"We focus on the central Puget Sound area and go up to the north end of Lake Washington. We can go up towards the Canadian border, but we don't go south of Olympia. We go from the far west of the peninsula to eastern Washington where there are a lot of resorts. Most of our product goes up the east side of Seattle to the Bellingham cascades area."

The shop predominantly serves the residential market. "I would say the homes we work in are mainly high end. There are a lot of large mansions, 3,500-sq.-ft. homes we work in," Reader says.

Work is acquired mainly through a network of contractors and remodelers. The company also works directly with homeowners, most of who have been referred.

"We are the worst at promoting ourselves. We suck at sales and marketing," Reader says. "Our business grows from customer referrals. We don't do any advertising. In 2001, I opened up a number of showrooms, did advertising and a number of home shows, but we made a lot of errors and all of that was not very profitable. So when the economy went down we focused on our core customers, the wholesale approach, looking at builders and remodelers so we could have an ongoing relationship with them for repetitive sales."

The Puget Sound customer wants a contemporary look with hints from the past. Dark stains and paints are in, according to Reader.

"I look at our design style kind of like Eddie Bauer merchandise — it's got a style of its own. It's not super-casual. It's elegant, but modern. That's what they want in the Northwest: simplistic with grain matching and a touch of Shaker design. I'm happy to accommodate anything. I prefer to do Euro-type construction. It's the most efficient use of material and, if you install it correctly, it's incredibly beautiful."

INTO THE FUTURE

At this point, Reader says, "We are not trying to grow the business. The business is growing us."

The plan going forward is to expand the shop. "We're at 21,000 square feet and we'd like to have a 35,000-square-foot open and modern facility, which would require a move. No little separate rooms and ramps like we have here so we can organize our workflow a little better. And we need more room to house more stock. It's definitely feasible," Reader says.

He always has one eye on the competition, which he says is currently offering an inferior product at a lower price. Reader would actually prefer competing against other "high-end" shops.

"The competition is dominated by commodity players, giving what they think is the right price," he says. "There was a company around here, no longer in business, that was known as the high-priced one. They were good for us to compete against because they were helping the homeowner understand there's high-end and low-end cabinetry. Right now there's nobody else promoting the high end." W

Contact: Rainier Woodworking Co., 3865 Center St., Tacoma, WA 98409. Tel: 253-272-5210. *www.rainierwoodworking.com*

A sampling of the shop's extensive portfolio.

PHOTO: JIM MCWILLIAMS/REDUX PLUS

BRAVE NEW WORLD

For woodshops thinking of upgrading their CNC capabilities or just entering the field of automation, these are exciting times

By John English

Any woodworker today with a bit of gray in his beard remembers the late 1970s when C.S. Onsrud Inc. came out with its magical "inverted router." It was a small, very affordable machine that let even a one-man shop safely use templates to turn out identical parts all day long.

Today, the great-great-grandson of that machine, the inverted router model 750 SS, is still making life easier for woodworkers all over the world. But it has a few relatives that have grown up a bit, like Onsrud's massive 720G20 CNC router that can travel up to 720" x 180". From 3-axis fixed bridge and moving gantry models to 4- and 5-axis machines, this North Carolina manufacturer (*www.cronsrud.com*) has evolved with the industry.

Since the 1970s, many of America's woodshops have changed from labor-intensive, small outfits building one box at a time to very efficient business models using large outsourced vendors that can mill dozens of kitchens a day. And Charles Onsrud's company has kept pace: it now offers almost 50 standard versions of CNC machines.

It is not alone. For woodshops thinking of upgrading their CNC capabilities or perhaps just beginning to enter the field of automation, these are exciting times. Manufacturers around the world, but particularly in the U.S., are releasing new machines and software at a rate not seen since before the Great Recession. And they're bringing impressive upgrades to customer service, too.

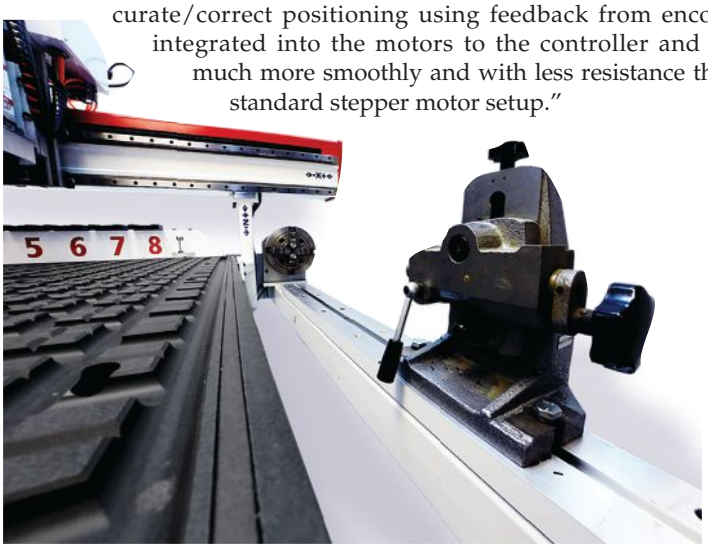
For example, Biesse America's distributor in Northern California, a company called Vision Machinery (*http://visionmachineryinc.com*), held a grand opening last November for its new 5,100-sq.-ft. showroom and training facility in Sacramento. This presents another opportunity for shop owners and managers who want to see machines up close and

witness demonstrations before they buy. Biesse's lineup includes the Klever, a compact, affordable router designed for small- to mid-sized shops. It comes with a monolithic steel bridge frame and helical rack-and-pinion technology.

WHAT'S NEW?

Innovation is everywhere right now. CAMaster (*www.camaster.com*) has recently introduced the Stinger IV CNC router, featuring 4.2-hp high-frequency automatic tool-change spindle, a four-tool gantry-mounted rotary carousel designed for quick changes and a digital closed-loop stepper system.

According to CAMaster, the stepper system "provides accurate/correct positioning using feedback from encoders integrated into the motors to the controller and runs much more smoothly and with less resistance than a standard stepper motor setup."



The lathe attachment for Freeman Machine Tool's Patriot router.

AXYZ, a Canadian-based CNC manufacturer (*www.axyz.com*), has recently developed a braille insertion tool that completely automates the process of creating braille signs. People who are blind or visually impaired can read the raised dots that the tool produces and signage made with the tool meets most local regulations. It can easily be attached to any AXYZ spindle and then, using provided software, the operator can not only engrave regular letters, but also program the machine to pre-drill precise location holes. Then the program will repeat its travels while inserting braille beads into the holes using a special applicator. This whole operation can be completed in minutes with no manual intervention, according to the company.

Laguna Tools presents a new leasing option with an online calculator at *www.lagunatools.com*. The California company also offers a wide range of machines that includes its new IQ model with a 24" x 36" capacity and handheld controls. The IQ is a smaller version of the popular Laguna SmartShop machines.

Thermwood Corp. offers an in-house machine training lab, where woodworkers can go and learn everything they need to know about operating the Indiana company's CNC machines. Training usually takes the form of hands-on completion of prescribed projects from concept to reality, a process that tends to inspire confidence in their students in a way that theoretical training just can't replicate.

Thermwood introduced the first-of-its-kind Cut Ready at IWF 2014, a cut center capable of producing cabinets and closets, for example, without the need of design software or CNC programming. New programming features were added in January, presented in a video demonstration at *www.cutready.com*.

Freedom Machine Tool (*www.freedomcnc.com*), a division of Diversified Machine Systems, builds a complete line of 3- and 5-axis machines. Its Patriot line includes units with 4x4, 4x8 and 5x10 beds. These tables come in a number of available vacuum options in either phenolic or aluminum and the spindle range includes 5-, 9- and 11-hp options.

Some of the newest available features include oscillating tangential knives, dovetail fixtures, optional absolute feedback, multiple table configurations, as well as additional options on the Patriot 4x8 CNC router with lathe.

Casadei-Busellato *(www.casadei-busellato.com)* offers the Busellato Easy Jet CNC router available in 4x8 and 5x12 table sizes with optional panel unloading device and integrated dust extraction, which means no more blowing dust off the table. The machine has a compact footprint, a bunch of easy-to-use and safety features and comes with Alphacam CAD/CAM software.

ENTRY LEVEL AND BEYOND

With the turnaround in the economy and an optimistic view of the industry's future, educating existing woodshop employees and potential future CNC operators is very much on the minds of many CNC machine manufacturers these days.

Last spring, Techno CNC Systems *(www.technocnc.com)* in New Hyde Park, N.Y., introduced the BT1212, which the company describes as "an affordable precision CNC router and educational tool." With an easy-to-use hand-held controller, the model features heavy-duty construction, a 1-hp Kress variable-speed spindle and a brushless micro stepper motor control system. Techno also supplies a comprehensive curriculum for students, so the unit is definitely an option for schools, art colleges, technical institutes and other facilities that introduce people to CNC technology.

Another great option for schools is the iCarver model 40-913 from General International (www.general.ca). This small CNC machine (13" x 18" x 3") comes on its own stand and the working parts are enclosed in a clear Lexan safety enclosure, so it's extremely safe to use. It would be an ideal option for a woodshop training new employees, too. A school or shop can purchase the machine alone for about $3,700 or with on-site training by a General-certified trainer for $5,200. A slightly

The Evolution vertical machining center, available from Holz-Her.

Freedom Machine Tool's Patriot CNC router, shown with a 5x10 table.

larger model, the 40-915 (15" x 20" x 4") comes with an eight-piece tooling kit and a larger model yet, the 40-946, has a full 24" x 36" bed. All three options come with unlimited technical support for both the machine and the software.

The new entry-level model from Felder Group USA *(www.felderusa.com)* is the C-Express 920 from Format 4. It looks like a wide drum sander at first glance. Workpieces weighing up to 66 lbs. can be fed in from either side and the boring head can be set up with as many as 14 drilling spindles. For larger shops, Felder has introduced a new Profit HO8 machining center, available in two size configurations.

Hendrick Mfg. *(www.hendrickmfg.com)* offers a broad range of CNC routers that include 3- and 5-axis machines, plus software and tooling. Its NXT series CNCs come with either a 4' x 8' or a 5' x 10' bed and a standard 16-hp spindle (there's also a 12-hp option).

MultiCam *(www.multicam.com)* has introduced some industry-standard-setting safety innovations, including a light curtain, safety mats and new laser safety eyewear. The company's light curtains are photoelectric transmitters that cast infrared light beams to a receiver unit around the MultiCam machine. They stop the cutting sequence once an object or person crosses the beams, making them ideal for both production environments and training facilities.

Stiles' extensive offerings include the powerTouch controller by the Homag Group.

Thermwood's Cut Ready.

PORTABILITY

For woodshops that need to bring CNC technology to the job site, the Shark from Next Wave Automation *(www.nextwaveautomation.com)* is extremely portable (capacity is 13" x 24" x 4.25") and it was designed for routing all types of wood, routing or engraving plastics and even etching or cutting tile. It comes with VCarve Pro software.

ShopBot Tools has the Handibot *(https://handibot.com)* a hand-held robotic power tool with 6-axis control. It ships with easy-to-use CAD/CAM software and can be used on a bench, the floor, even the ceiling or a wall — anywhere a woodworker needs to precisely cut, drill, or carve.

Busellato's Easy Jet CNC router with optional panel unloading device.

FULL LINE SUPPLIERS

At the other end of the scale, SCM Group North America *(www.scmgroupna.com)* offers one of the largest ranges of industrial woodworking machinery in the industry. The company provides task-specific CNC work centers for industry segments such as furniture, construction, doors and windows.

Based in Grand Rapids, Mich., Stiles Machinery *(www.stilesmachinery.com)* is one of the cornerstones of the industry, serving everyone from small shops to the largest production facilities. Its website lists 11 series of CNC routers, 10 different groups of CNC machining centers and a large variety of milling centers. Stiles has grown from the back of a station wagon in 1965 to becoming part of the Homag Group AG in 2014. Located in southern Germany, the Homag Group is the world's largest maker of manufacturing machinery.

Omnitech Systems *(www.omnitech-systems.com)* in Charlotte, N.C., offers the Selexx series of CNC routers, which are built by Anderson Industrial. As do several other companies mentioned here, Omnitech offers both new and, occasionally, used machines for sale. These are usually machines that a woodshop has outgrown as its CNC-based business expands. A woodshop owner or manager looking into CNC machinery should definitely ask suppliers about the used option. There aren't a whole lot of wear parts in these machines and if the heavy-duty bed and gantry are in good shape, almost anything else can be updated, including software and computers.

NEW AND USED

However, new toys are more fun and one of the coolest CNC machining centers on the market is the Holz-Her Evolution. Its 7403 and 7405 models are vertical work centers that only occupy about five square yards of floor space. Despite their size, these are fast machines with an innovative suction clamping system and up to six tool changes. If your shop needs to do a lot of work in a little space, you might want to check out a couple of videos at *www.holzher-evolution.com*.

For woodshops with carving needs, Oliver Machinery Co. *(www.olivermachinery.net)* offers the 13" and 15" IntelliCarve models. These benchtop tools are popular with woodworkers who need to do decorative carving and sign making. They're ideal for milling logos or even family photos in wood panels and because they don't require a complicated router tool path, both models are very simple to use.

Sauk Rapids is a suburb of St Cloud, Minn., which was made famous through the years by Garrison Keillor on his radio show "A Prairie Home Companion." Keillor's fictional universe centers on the town of Lake Wobegon, whose residents travel to the vast metropolis of St. Cloud to work, shop and play. Craig Sexton and Mike Noelting are the co-owners of SNX Technologies *(http://snxtechnologies.com)* and there's nothing rube-like whatsoever about these machinery builders. They recondition machinery and resell it. On a recent visit to their used equipment page they had a 2001 Komo VR 508 Mach I CNC router, a 2002 SCMi Record 130 CNC router and a 2000 Anderson Stratos WFD CNC router.

There are so many options today that searching for the right one might seem a little daunting — if it wasn't for one more great development that has happened since Charles Onsrud introduced his inverted router: Search engines. W

PRO SHOP

with JOHN ENGLISH

Deal with the moisture to minimize its adverse effects

With an understanding of the drying process, proper storage and humidty checks, you'll gain control of your hardwood supply

Seventy-seven-year-old Ken Froelich used to run a furniture repair shop in Rapid City, S.D. It was a half-hour from Ellsworth Air Force Base, where soldiers, airmen and even some diplomatic corps personnel would arrive home from overseas tours. Those who had been residents abroad for some time often had furniture with them. And frequently, those pieces had been built and had spent many years in subtropical climates, especially when the U.S. was more heavily involved in Southeast Asia. When this furniture arrived in western South Dakota — one of the driest places in America — the tables and chairs and cabinets would literally fall apart because the wood had shrunk so much that the joinery failed.

Rod Schaeffer runs semi loads of hardwoods from the Appalachians to places on the other side of the Mississippi River. One of the product groups he ships is large oak timber (8x8 and 12x12) for use as shoring in the mines and oilfields out West. On the 2,000-mile trip, the wood, which is harvested green, is strapped to flatbeds with no tarps. By the time it arrives, the gross vehicle weight can be as much as 40 percent less than it was when the product was loaded in Pennsylvania. Depending on the weather and time of year, the air-drying process induced by travel can remove almost as much water as there is wood in terms of weight.

Things have changed a bit since Froelich was reassembling the furniture of Korean, Vietnamese and Malaysian woodworkers. Most of the furniture nowadays is mass-produced from kiln-dried stock and uses aliphatic resin glues rather than traditional versions of hide adhesives or friction-fitted joinery. But one thing hasn't changed: wood still moves with moisture and woodworkers need to accommodate that. This is especially true if a furniture builder is buying local lumber or harvesting stock from downed trees. And it's a concern for shops building cabinet doors with floating panels, or using wide hardwood boards in counters, seats or even shelving.

Moisture is a bigger issue in solid hardwoods than it is in MDF or plywood panels or substrates. Fiberboard contains moisture-resis-

tant resins and the wood particles are so fine that they don't have the same constitution or behaviors as wooden boards. Plywood is laid up in alternating, cross-bonded layers, which take advantage of one of nature's quirks: wood moves dramatically across its width, but almost imperceptibly along its length. As the grain in each layer of plywood alternates 90 degrees in direction to the layer above and below it — and the laminations are thin to begin with — the various movements tend to counteract each other. Both types of sheet stock are manufactured from materials that have been dried mechanically and, while there is marginal movement in any wood product, it is relatively restricted in these. They still move, but not much.

All solid wood contains some moisture. People new to the field are amazed at the high levels of water in wood. A freshly cut oak board in the Midwest, measuring just 1" x 6" x 8', will have about a gallon of water in it. Oak is about 65 to 70 percent moisture content when felled. A thousand board feet of green oak weighs roughly two-and-a-half tons and the same load dried to 6 percent is about one-and-a-half tons.

BASIC RULES

The first guideline is that bowl turners and landscapers like to use green wood, but almost nobody else should. Green wood is lumber that has been felled and milled (cut down and made into boards), but has not yet been thoroughly dried. A good rule of thumb for hardwoods is that they should be in the 6 to 8 percent range before they are made into casework or furniture. That means the amount of water in the board needs to be reduced to the point where it physically weighs about 7 percent of what the wood weighs. (In some species, the water in freshly harvested logs can weigh more than the wood, so the moisture level is actually more than 100 percent.) The wetter the boards are, the more they move when they dry. And the more they move, the more they twist, cup, warp, bend and crack, too.

The next rule is that shop owners buying hardwoods from a local mill need to have a handle on the drying process. Too wet and too dry are both problems, as is the rate at which moisture is asked to evacuate. Wood generally won't be too dry for long, because as a fibrous, cell-based product it will eventually absorb some moisture from the air around it (a process called gaining equilibrium). Bringing stock into the shop and allowing it to acclimate for a few weeks before milling is a good idea. It will move (in width) to a point where it is comfortable and thus better behaved.

While it's hard to get it too dry, wood can most certainly be too wet. And just to confuse us, there are actually two kinds of moisture in a freshly milled green board. Free water sits in the voids of the cells and bound water sits in the actual walls of those cells. Free water will evaporate quite rapidly after sawing and this will bring most species close to the level desired in framing softwoods (a little under 20 percent moisture). But that bound water is a little trickier: in the majority of commercial species, it takes about a year per inch of thickness to evaporate under cover (such as a tarp or a shed). The traditional air-drying process

C.R. Onsrud adds national sales manager in Canada

Michael Schwartz joined C.R. Onsrud to lead the CNC manufacturer's sales efforts in Canada.

"This new addition to our team will allow C.R. Onsrud to have a full-time presence, who is wholly engaged and dedicated to meeting the needs of a diverse Canadian CNC machinery market," managing director Matt Jenkins said in a statement.

Schwartz has held previous positions with Benz, Schelling America and Ackerman and most recently was the director of business development for CNC Automation, according to C.R. Onsrud.

For company information, visit www.cronsrud.com.

requires that the boards are stickered (small spacers at regular intervals), that the ends are sealed with paint or PEG (Polyethylene Glycol) to avoid checking and that there is fairly even airflow and good venting around the stack to carry the moisture away.

Commercial kiln drying (and there are dozens of different types of kilns) reduces the process to a matter of weeks. The actual time depends on the species, the thickness of the boards, their width, the fuel being used (solar, gas, electric etc.) and other attributes such as how much air-drying occurred before the wood was placed in the kiln, where in the country the kiln is located and even the altitude and aspect of the kiln (which way it faces in terms of sunshine and winds). Higher altitudes tend to be drier.

Many kiln operators say that their speedy process (faster than air drying) affects and even locks in the color of the wood. But too speedy a drying process can also cause major problems. If the kiln operator doesn't really understand what he/she is doing, the result can be checks, splits, warps — and an evil outcome known as case hardening. This is when the outside faces of the boards are dried quickly and shrink and then the moisture in the center of the board heats up and expands. It's like a fat guy in Spandex. Something's gotta give.

SHOP GUIDELINES

Woodshop owners can do a lot to minimize the adverse affects of moisture. Boards stored flat will behave better than boards standing against a wall at an angle. The residue of moisture in the cells allows wood to be a little flexible and over time boards that are only supported at the ends (such as those leaning against a wall) will begin to bow in the middle as the cells closest to the wall expand slightly in length.

When storing boards flat, the base needs to be flat. If a stack of hardwoods is resting on three skids and one of the three is a quarter of an inch thinner or thicker than the others, the whole stack will eventually bow as a result of gravity.

It's a good idea to monitor the humidity in the shop, especially in locations with large seasonal swings. The 6 percent to 8 percent moisture content in a board is measured as absolute humidity, which is just the amount of water vapor in the air expressed as a percentage of the amount of dry air. Relative humidity, on the other hand, can be confusing. It measures the current absolute humidity as a percentage of the highest possible absolute humidity. In other words, how much moisture is in the air now compared to how much moisture the air could possibly hold at its wettest.

DMT announces new sales director

Diamond Machining Technology, a provider of diamond sharpening products, named Jeffrey Burns as its new director of sales for the Eastern region.

"We are pleased to welcome Jeff to the DMT organization," president Mark Brandon said in a company statement. "His experience and background with leading companies in consumer products for the sporting goods and hardware industries bring a new dimension to our team."

In his role, the company said Burns will help lead DMT's distribution strategy for continued growth, retail presence and brand awareness in the eastern U.S. and Canada.

"DMT continues to innovate and produce the best quality diamond sharpeners on the planet," said Burns. "The company is poised for expansion and I am looking forward to helping lead the growth in 2015 and beyond."

For information, visit www.dmtsharp.com.

People like the air to be around 50 percent relative humidity. The hotter the air in the shop is, the more moisture it can hold. If the relative humidity is 100 percent, then the air can't hold any more moisture and, outdoors, this triggers rain. If the air is cool, say 50 degrees Fahrenheit, it takes less moisture to get to 100 percent humidity than if the air is 90 degrees.

The bottom line here is that we should try to keep the shop air somewhere in the middle. In summer, dehumidifiers or air conditioners work well in regions of high humidity and swamp coolers work in drier parts of the country. In winter, adding a humidity pump to a furnace not only helps the hardwoods, it could also make workers less lethargic and more productive. Generally, what's good for people is good for wood when it comes to dealing with moisture. If your skin is dry in December and you're getting static shocks around the shop, the forced air furnace might be removing too much moisture. And if your shirt is soggy in August, the hardwoods in the shop are probably feeling the humidity as much as you are. W

Woodcraft volunteers turn over 13,000 wooden pens for military personnel

More than 13,000 one-of-a-kind wood pens crafted at Woodcraft's 11th Turn for Troops National Turn-a-Thon are on their way overseas and to rehabilitation centers — gifts for military personnel who serve to protect the United States.

Woodturners gathered at Woodcraft stores nationwide last November to turn 13,227 pens — 1,953 more than in 2013 — to bring the 11-year total to 119,489.

Turners at Woodcraft in Tucson, Arizona, made the most pens (3,180) for the fourth consecutive year, while the Nashville, Tennessee, store leads in total number of pens turned (11,571) in the last 11 years.

"Woodcraft extends sincere thanks to volunteer woodturners and store personnel who continue to make this annual Turn for Troops event a success," Woodcraft president Jody Garrett said in a statement. "We know from the recipients' notes that these pens carry an important thank-you message to soldiers overseas, as well as those who are recovering from injuries sustained in the line of duty."

For information, visit www.woodcraft.com.

Makita warns against using 'knock-off' batteries

Makita delivered a clear message to power tool users and dealers regarding the hazards and risks of non-genuine 'knock-off' Makita lithium-ion batteries: Don't do it.

"Makita has been the innovation leader in 18-volt lithium-ion cordless tool technology since 2005, and each day Makita cordless tools go to work on jobsites and in workshops across the U.S.A. and around the world," senior vice president of marketing Ken Hefley said in a statement. "Unfortunately, innovation and leadership breed imitation. Therefore, we are communicating to tool users and dealers about the hazards and risks of using non-genuine 'knock-off' Makita lithium -ion batteries."

Makita says by using a "knock-off" battery, users immediately void the company's warranty. Other possible consequences include the risk of a battery bursting that might result in fires, personal injury or property damage. Additional risks include possible fire damage to the tool, the battery and/or the charger as well as unknown tool performance.

For information, visit www.makitatools.com.

Living on the edge

Unusual stock offers several challenges that require some thought and planning

By John English

Every now and then a customer comes in who wants something a little different. One of the most requested items is a table with live edges — where the bark has been removed, but the edges haven't been machined straight. In some parts of the country, woodworkers get to play with immense slabs of redwood and cedar, but most of us aren't so lucky. We only occasionally come across a few thick boards with some decent live edge. To use those gems to build something spectacular, one needs to create most of the tabletop with standard milled boards and reserve those dramatic natural edges for the outside.

The maple table shown here is typical. If you're thinking of branching out and offering something more than square boxes to your customers, this project brings up a whole lot of issues that might spare you some grief. And walking woodworkers through a specific project seems like the best way to share some ideas on how to deal with something out of the ordinary.

Unusual stock offers several challenges that require a little thought and planning. For example, the three main boards here were 9/4 and highly figured. Of those, the two outside boards with live edges has lots of bird's-eye and the large centerboard had knots, spalt, heart and sap, plus a host of minor defects such as checking and voids. As if that wasn't enough, the stock for the two "beams" in the table top was quilted. To the kind of woodworker who spends hours sorting through bins at the lumberyard to find uniform, straight, knot-free stock, these boards would have looked like firewood.

The test here is to match your tools and experience to the grace of nature, to find a balance between the conformity that makes us comfortable and the erratic dynamism of growth. You'll need to marry nature's art to man's craft.

Getting a straight cut without a straight edge is a problem. An easy solution is to attach a plywood base.

ACCLIMATION

The initial step in working with challenging materials is achieving some stability. Our three wildest boards were harvested near the Olympic National Forest in Washington, sometime during the 1990s. They were air-dried locally after being run through a band mill. A few years later, they were transported to the high plains of western South Dakota, where they were stored in an outbuilding for more than a decade. So they grew in one of the wettest spots on the continent and lived in one of the driest.

The beams in the tabletop were made from well-behaved, kiln-dried, Appalachian soft maple. Although they, too, are figured (a lot of quilting), these boards were relatively stable. Mechanically dried to 6 percent, they were then stored at about 12 percent ambient humidity until they were shipped to our shop, where the air is a bit drier.

Considering the dramatic differences in their origins, all of the boards were allowed to acclimate at the shop for a couple of months before any milling began. This allowed them to reach equilibrium in a relatively stable environment. If they were going to change shape, the plan was that they would do so during this period before they were milled, rather than after they arrived in the client's dining room.

A moisture meter test on the Washington lumber registered 9 percent on arrival and 7 percent a month later. The Appalachian stock was at 7 percent and stayed there. However, the test was run with a pinned moisture meter in the wide faces of the boards: a more accurate test would have been to crosscut the boards and immediately test the newly revealed cut end. That was not an option, as our table was to be as long as possible and we didn't want to crosscut any of the stock.

FLAT FIRST

Erratic grain can often be an indication that one might be working with reaction wood. This is either compression or tension wood that will release energy in unpredictable ways as it is cut. Figured wood is often the result of abnormal growing conditions, where wind, gravity, drought or some other external factor (or combination of factors) has dictated the way in which the wood is formed.

Before running a figured board across the table saw, the first defense against reaction is to make sure that the bottom face is relatively flat. But figured lumber doesn't like jointer or planer knives: it tends to chip and tear out. A really coarse grit belt on a portable belt sander (40 or lower) is a good way to eliminate high spots in a hurry. A stationary drum sander or wide belt sander is a better choice, as it will work on the entire width of the board.

If a wide sander isn't available, very gentle passes (1/64") on a wide jointer with sharp knives can shave the high spots. Scribble pencil lines all over the face being jointed, so that the high and low spots are more apparent after a pass. The pencil lines on the high spots will, of course, gradually disappear. If the wood is lightly dampened (but not wet), this can help, but be sure to unplug and then dry off the jointer bed and the board as soon as possible to avoid rust. Reverse the feed direction for the second cut and compare the results to the first pass. Sometimes changing direction can help, but with a lot of figure it's hard to make grain work for you.

A hand plane can shave more gently than a thickness planer or jointer, but, man, is it work. Make sure the iron is very sharp, go with a high angle (55 or 60 degrees) and set the mouth thin. You might also consider a back bevel of maybe 10 degrees, but sometimes this can introduce a little chattering if you're not used to hand tools. A card scraper works well on figure, but removes such a small amount of stock that it's not a viable solution.

If the boards are wider than the jointer bed, one can always make an initial cut on the band saw and then joint the wide faces (and not the edges) of each of the two halves. One can then reassemble the board using the band-sawn kerf or joint the edges and use biscuits. If the band-sawn kerf will be used, it helps if the cut has followed a grain line: the resulting joint will be relatively invisible.

One mistake often made when judging whether a board is flat is to place it on a surface such as the table saw bed to see if it rocks. If it doesn't, one might assume that it's flat enough to saw. But that can be a fatal assumption. The board can just be suspended on three or four high spots. As the cut progresses, those dynamics can change and if the middle of the board nearest the blade then sags, it can bind on the teeth and cause kickback. The best solution is to eyeball the surface using a metal straightedge, mark the high spots and eliminate them by sanding or hand-planing.

Perhaps the best solution of all is to run the boards through a wide belt sander and this can be hired if the shop doesn't own one. Be aware

Mark the location of the router base as reference marks for the straightedge.

Leave the bark during glue-up to protect the sapwood.

that a sander isn't a jointer: if your board is bowed, it will come out smooth with the wide faces parallel to each other, but it might still be a little bowed.

STRAIGHT THINKING

With the wide faces of your boards flat, it's time to work on the long edges. The idea here is to harvest the live edges while creating a board that also has one long, straight edge that can be glued to the rest of the table top. As there are usually no straight edges to run against a table saw fence, you'll need to create some. The simplest way is to attach the stock to a plywood base and feed it through the table saw, running the factory edge of the plywood against the fence. Attaching the board to the plywood can be done with screws driven an inch or two in from the ends, if there is a little waste available (that is, if you don't need the full length of the board). One can also hot-melt-glue the board to the plywood: the suggested method here is to apply a dab of glue about every 16" along the board and use a pencil to mark the locations. The pencil marks allow the glue to be found and the two parts can then be separated with a chisel and mallet after the table saw cut is made. The disadvantage here is that glue residue needs to be sanded or scraped and also in some species one might have some tear-out if it sticks too well to the board.

Another option is to bring the boards to a hardwoods retailer or sawmill that operates a laser-guided straight-line ripsaw and pay them to

do the job. But the easiest and cheapest method is probably to go with the plywood.

Normally, one would rip boards using a thin-kerf blade with perhaps 24 teeth. But because of the thickness, length and weight of these boards, we find that holding them on edge against the fence on the jointer later on can be difficult. So we like to get as clean an edge as possible on the saw. For that reason, we use a more precise, full 1/8" thick blade. Because of resistance, the cut needs to be made in a few incremental passes. After each pass, the blade can be raised about 1/2". It takes a little longer, but the kerf is definitely cleaner. For the very last pass, we move the fence about 1/64" to the left, and this shaves the cut edge.

A full-thickness riving knife on the saw helps make sure that the kerf in this difficult stock doesn't bind on the blade, causing kickback.

JOINTING OPTION

If your boards are manageable and you have access to a large jointer, then straightening the edges for glue-up isn't a problem. However, if you only have a 6" or 8" wide jointer and you're building a dining table with long, heavy boards, here's a suggestion: clamp a metal straight-edge to the board and barely clean up the saw marks with a long straight bit chucked in a portable router.

To establish the location of the straight-edge, install the bit and, with the tool unplugged, place the router base on the board. Rotate the cutter so that the carbide insert isn't butting against the board and move the router so the shaft of the cutter is tight against the board. Mark the location of the router base, doing so at both ends of the board and also somewhere around the middle. Clamp the straight-edge to these lines. You might need to clamp some kind of low-profile support at the midway point, too, in case your straight-edge flexes. This can be a thin stick that is flat enough so that it doesn't interfere with the router's travel. Draw pencil marks along the edge of the board. Then take a very light pass. If all your pencil marks are gone, the edge should be flat and true.

GLUE-UP

Leave your boards as long as possible for now to avoid snipe. Don't cut the table top to length until all the sanding on the wide faces is done.

Draw pencil lines across the top faces of the boards about every foot along each joint, to locate No. 20 biscuits. By doing this, the top of the table will be relatively even. If the boards are slightly different thicknesses, any discrepancies will appear on the bottom. Remember to stay far enough away from the ends to ensure that your final trimming doesn't reveal half a biscuit. If the boards are more than 1-1/2" thick, consider doubling up on the biscuits. In that case, stack them one above the other with about 3/8" between them.

The only way this will work is with plenty of help and a level feed.

Flattening the tabletop was a chore, even with a borrowed sander.

In general, it's best to glue and clamp two boards at a time, waiting overnight for them to cure. That makes the process much more manageable, especially with doubled-up biscuits.

If possible, leave the bark on when the boards are being edge-glued. It acts as a natural pad to protect the sapwood underneath from the pressure of the clamp jaws. Use wooden hand screws to keep the bar or pipe clamps close to the board surface or the uneven edge could cause the clamp to open the bottom of the joint when pressure is applied. Alternate the clamps along the length of the joint (one above the boards, the next below), to spread the tension more evenly. And on the far end of the bar clamp, place the glue block low on the edge so that pressure is exerted toward the bottom of the board.

FLATTENING WIDE ASSEMBLIES

My old friend (and impressive woodworker) Ken Froelich says that the best way to smooth a large table top is with a series of hand planes and scrapers. While he's doing that, I like to load my projects in a pickup truck and take them to a local shop that has a wide belt sander. This machine can do in 20 minutes what it takes Ken three days to do with hand tools. And, frankly, I think it does a better job.

Be nice to the sander's owner and use a scraper to remove as much glue as possible before passing the assembly through his/her machine. Belts are expensive.

The only drawback with most wide sanders (belt or drum) is that they are limited to 36" wide boards. I like to make dining tables that are a bit bigger than that. The table top shown here finished out at 1-9/16" thick, 42-1/2" at its widest, and 89" long when trimmed. Rather than make up two equal halves and join them symmetrically after sanding, I like to offset the final joint so it isn't obvious. In keeping with that, this top was run as a 34" wide subassembly and an 8-1/2" wide separate board. It takes two or three people to handle an assembly this large, as it needs to be fed level with the floor. If it goes in tilted there will be snipe or a safety mechanism on the machine will shut it down. It's also important to have somebody at the infeed side to make sure the workpiece is tracking properly through the machine. Working this close to the sander's tolerance (within 2" of its 36" maximum width capacity) means that a small tracking error can accumulate over the length of the board and jam it against the sides, which will trigger the sensors in the machine that shut it down.

Because the biscuits were registered to the top faces of the boards, the top is probably flatter than the bottom. So, the initial passes need to be made with the bottom of the tabletop facing upward, so that this face is sanded first. The sander's owner will suggest grits: if not, then start with 80 and work down to 220.

REMOVING BARK

Most people working with live edges like to remove all of the potentially loose bark and bring the surface down to the sapwood. That way, bark doesn't fall off during the next heating/cooling cycle in the client's home, when the bark and sap expand or contract at different rates. (For some rustic furniture the bark is kept in place, but it usually needs to be stabilized using glue and finish nails.)

Removing bark without damaging the wood can be challenging, depending on the species. Plastic shims work well: one can tap the fat end with a hammer and the soft plastic doesn't do much damage. A putty knife works in some situations, when one can slide the leading edge under the bark and twist the knife for leverage. On burls and other nice shapes, use a series of nylon brushes chucked in a corded drill. Cordless ones don't generally have enough power. Wire brushes are too harsh for this delicate step. Dico Products of Utica, N.Y., makes 4" diameter gray 80-grit, orange 120-grit and blue 240-grit nylon brushes that are carried by most hardware stores. If necessary, follow up with Dico's cup brushes: they're a little gentler, and they can get into smaller places.

Some woodworkers use a pressure washer to remove bark. It seems rather violent and, of course, the wood needs to thoroughly dried afterward, but several people have reported good results. Practice on some waste material.

While Mother Nature was the artist, we are of course still artisans, so we are free to bring some of our own skills to the job. I like to use rasps, files and even an orbital sander to knock off pointy parts that might dig into a hip or to blend in areas that are a little out of character.

CLOSING THOUGHTS

One can formalize a live edge top by using the leg set as a sort of picture frame — a way to tame the top and make it acceptable in an otherwise traditional environment. However, I don't like going overboard here. Some builders like to attach live-edge tops to sparse metal legs and, while that might work in the stark environs of a minimalist room, it isn't very warm or enticing in a normal dining room. I like to use dimensioned lumber to make sturdy legs that add to the work without interfering too much with one's appreciation of the visual feast that is the tabletop. But I also like to remind people that nature is the artist and that can be done quite nicely by incorporating a couple of pieces of live edge in the legs. Suspending small natural panels in these formal frames is a great use for cut-offs, too.

When it comes to table-top finishes, there is almost always enough natural color in the boards, so I rarely stain. My preferred topcoat is a clear, oil-based, polyurethane, satin, floor varnish. This brings out the natural color, has enough hardeners to endure decades of dining and cleaning, is easy to renew, avoids glare and is widely available.

A nylon brush chucked in a corded drill will remove the bark.

Donation paves way for Peabody Essex exhibit

By Jennifer Hicks

The Peabody Essex Museum in Salem, Mass., is presenting an exhibition celebrating the beauty and sensuality of wood art called "Audacious: The Fine Art of Wood from the Montalto Bohlen Collection," and showcasing more than 100 singular works.

The exhibition, on view through June 21, coincides with Bob and Lillian Montalto Bohlen's donation of 47 works of contemporary wood art to the Peabody.

The six-part exhibition explores complex forms and techniques while spotlighting how artists use contrast, texture, color and pattern to develop technically sophisticated compositions, according to the museum.

The Bohlens, based in Massachusetts, have been promoting contemporary wood artists for the last two decades, leading an effort to promote artistic woodworking as a fine art, according to the museum.

"In 1996, we decided we wanted to convince the art world that the best artists working in wood were artists — not craftspeople," Bob Bohlen said in a museum statement. "So that's been our singular focus: to persuade the art world and the museum world that the great wood artists are equivalent to the great ceramic artists, painters and sculptors."

WINTERTHUR EXHIBIT

The exhibit, "A Colorful Folk: Pennsylvania Germans and the Art of Everyday Life", opens March 1 at the Winterthur Museum, Garden & Library in Wilmington, Del., exploring fraktur and folk art.

It runs through Jan. 3, 2016, and features 125 objects, many never before exhibited or published, including decorated manuscripts ("fraktur"), textiles, furniture, metalwork and pottery.

The tools and techniques used by fraktur artists also will be explored in addition to issues of authenticity, forgery and revivals, according to the museum.

"Winterthur is delighted to present this extraordinary exhibition celebrating the creative artistry of Pennsylvania Germans, whose elaborate handiwork so uniquely captured the ideals and events of the day," museum director of affairs J. Thomas Savage said in a statement. "Most objects in the exhibition are drawn from Winterthur's permanent collection, which now includes the fraktur and textile collection of

Fuller presents this cherry headboard by Tommy Simpson.

Fuller also presents this John Rais nightstand.

the late Pastor Frederick S. Weiser, a legendary scholar and collector of Pennsylvania German folk art. Winterthur's landmark acquisition from the estate of Pastor Weiser last year enables us to serve as one of the leading institutions in the country for the study of Pennsylvania German decorative arts."

Highlights include a painted chest decorated in 1783 by fraktur artist Henrich Otto and a Dauphin County (Pa.) tall-case clock inlaid with motifs from the Pennsylvania coat of arms and made in 1815 by John Paul Jr., who later designed the famous Horseshoe Curve on the Pennsylvania Railroad.

SHOWING NEW ACQUISITIONS

The Fuller Craft Museum, a contemporary craft museum in Brockton, Mass., is presenting "Crafting a Collection: Fuller Craft Museum Recent Acquisitions" through July 12.

The exhibition focuses on how handcrafted objects sustain and support our daily lives. It highlights the museum's new acquisitions from January 2012 through September 2014 and features 70 objects from 55 artists working in wood, glass, clay, fiber and metal. W

Contacts:

Fuller Craft Museum, 455 Oak St., Brockton, MA 02301. Tel: 508-588-6000. *www.fullercraft.org*

Peabody Essex Museum, 161 Essex St., Salem, MA. 01970. Tel: 866-745-1876. *www.pem.org*

Chris Ramsey's work in the Fuller exhibit.

Winterthur Museum, Garden & Library, 5105 Kennett Pike, Wilmington, DE 19735. Tel: 800-448-3883. *www.winterthur.org*

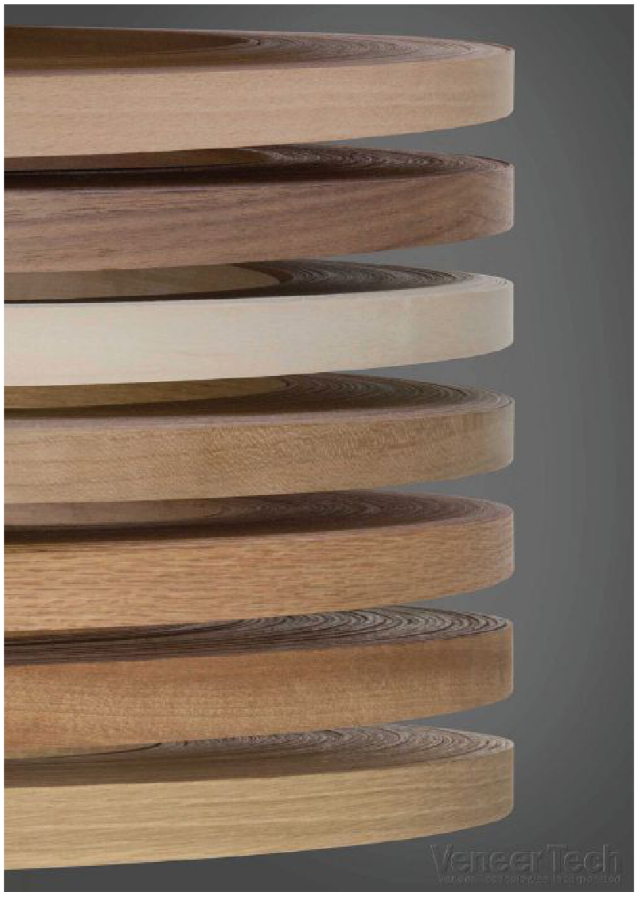
NEW PRODUCTS

MILWAUKEE TOOL added a portable vacuum, model 0850-20, to its M12 System lithium-ion category of cordless tools. The vacuum delivers up to 29 minutes of continuous run time on a single charge for job-site cleanup, according to the company. The vacuum comes with three accessories, including a crevice tool, utility nozzle and extension wand. It also has a 1-1/4" universal connection to fit most standard vacuum attachments. Visit *www.milwaukeetool.com*.

ONEIDA AIR SYSTEMS introduced Gorilla Duct, which the company describes as affordable, clamp-together ductwork. The ductwork clamps together with no rivets, welding, crimpers or screws needed. It is compatible with all existing ductwork by adding an adaptor. For information, visit *www.oneida-air.com*.

GRIZZLY INDUSTRIAL offers a new 4-1/2" track saw, model T10824, with four blades to cut a variety of materials. It's sold with a 20-tooth, carbide-tipped blade for cutting solid wood and sheet goods; a 40-tooth, carbide-tipped blade for cutting soft metals, melamine panels and plastics; an abrasive blade/disc for cutting steel and a diamond-tipped blade for cutting tile, stone, concrete and more, according to Grizzly. The saw works with an optional 24" track (model T10825). It features a plunge-cutting action and dust-extraction port that connects to a regular shop vacuum. The mini track saw sells for $109.95. Visit *www.grizzly.com*.

WALZCRAFT published its new Signature Series brochure with more than 70 new cabinet door and drawer front designs, ranging in styles from traditional to contemporary, and available in more than 100 different wood species and more than 50 stain or SolidTone (paint) finishing options. Each Signature Series design can be ordered with the standard specifications or customized. To request a brochure or download it online, visit *http://walzcraft.com*.



VENEER TECHNOLOGIES has a line of thick edgebanding for high throughput casegood applications as well as studio projects. Standard width is 7/8" and coil size is 328 ft. Stock species are red oak, maple, birch, mahogany, cherry, walnut, white oak, alder and beech, including thicknesses of 1.5mm (3-ply 1/16") and 3mm (6-ply 1/8"). Custom species, as well as thicknesses of 1mm (2-ply 1/25") and 2mm (4-ply 1/12"), are also available. For information, call 800-593-5601 or visit *www.veneertech.com*.

ROCKLER Woodworking and Hardware introduced the Router Table Spline Jig that attaches to a router table to create decorative splines for mitered box and frame joints. The splines also provide extra strength in the joint. The jig consists of the base, which attaches to the router table and the sled, which holds the workpiece at a 45-degree angle to the router bit. The sled slides in the tracks of the base to guide the spline cuts. There's also a Large Box Spline for use with a hand-held router. The jigs can be purchased at *www.rockler.com*.

CALENDAR

Organizations sponsoring meetings, classes or shows of interest to professional or hobbyist woodworkers are invited to submit items to: Calendar, Woodshop News, 10 Bokum Road, Essex, CT 06426; *editorial@woodshopnews.com*.

Include name, dates, location, description of event and a contact address or telephone number. Calendar items, which should be typed or printed clearly, must be received a minimum of 60 days before the event.

Please note that fees, as listed, might not include materials or shop fees. Check with a specific class for further details.

The complete national calendar of events is continuously updated at *www.woodshopnews.com*.

— Compiled by Jennifer Hicks

ARIZONA

Feb. 4-8 — Intermediate Carving with Mary May at the Southwest School of Woodworking in Phoenix. Fee: $680. *www.swcfc.org*

Feb. 20-22 — Furniture Design with George Walker at the Southwest School of Woodworking in Phoenix. Fee: $410. *www.swcfc.org*

March 7-11 — Joinery with Frank Klausz at the Southwest School of Woodworking in Phoenix. Fee: $680. *www.swcfc.org*

April 25-30 — Curved Front Cabinet with Paul Schurch at the Southwest School of Woodworking in Phoenix. Learn design, construction and veneering of a curved front cabinet. Fee: $816. *www.swcfc.org*

CALIFORNIA

Monthly — San Fernando Valley Woodworkers meetings are held on the third Thursday of each month at 7 p.m. at the Balboa Park Sports Complex, Gym Building, at 17015 Burbank Boulevard in Encino. *www.sfvw.org*

FLORIDA

Ongoing — The Dunedin Fine Art Center is offering six-week woodturning classes at its Cottage Campus taught by AAW professional member Tony Marsh for beginners and intermediate-level participants. Full day classes are held on Thursdays. Call 727-298-3322 or e-mail *education@dfac.org* for information.

Monthly — Woodcrafters Club of Tampa meets every third Thursday evening at 3809 W. Broad St. in Tampa. For information, visit *www.tampawoodcrafters.org*.

March 20-22 — The Tampa Woodworking Show, featuring new products and instructional seminars, will be held at the Florida State Fair Entertainment Hall. *www.thewoodworkingshows.com*

GEORGIA

March 6-8 — The Atlanta Woodworking Show, featuring new products and instructional seminars, will be held at the North Atlanta Trade Center in Norcross. *www.thewoodworkingshows.com*

ILLINOIS

Feb. 6-8 — The St. Louis Woodworking Show, featuring new products and instructional seminars, will be held at the Gateway Center's Center Hall in Collinsville. *www.thewoodworkingshows.com*

MARYLAND

Feb. 20-22 — American Craft Council Baltimore Show at the Baltimore Convention Center, featuring original work by more than 650 of the top contemporary furniture, home décor, jewelry and other craft artists from across the country. *www.craftcouncil.org*

MICHIGAN

Feb. 13-15 — The Detroit Woodworking Show, featuring new products and instructional seminars, will be held at the Suburban Collection Showplace in Detroit. *www.thewoodworkingshows.com*

NEVADA

July 22-25 — AWFS biennial tradeshow to

List your Events in our Calendar

Woodshop News welcomes event notices.
Entries must be received by the15th of the month, three months prior to the event.

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The events are also listed at no charge on the Internet: www.woodshopnews.com
Be sure to include: event name, date, location, sponsor, contact name and telephone number, and Web site URL if applicable.

be held at the Las Vegas Convention Center in Las Vegas. Featuring exhibitors offering new tools and products, educational seminars and networking opportunities. *www.awfsfair.org*

NEW JERSEY

Feb. 20-22 — The Somerset Woodworking Show, featuring new products and instructional seminars, will be held at the Garden State Exhibit Center in Somerset. *www.thewoodworkingshows.com*

NEW YORK

Monthly — Sawdust and Woodchips Woodworking Association meetings are held on the first Wednesday of each month at 6:30 p.m. at the Canton Woods Center in Baldwinsville. *www.sawdustwoodchips.org*

Monthly — Northeast Woodworkers Association meetings held on second Thursday of the month at various locations in Albany area. *www.woodworker.org*

Feb. 21-May 9 — Woodturning workshop. Location: SUNY-Purchase College. Tuition: $710, includes materials. *www.purchase.edu*

PENNSYLVANIA

April 10-12 — Philadelphia Invitational Furniture Show. Annual show featuring handcrafted furniture and other woodworking items to be held at the 23rd St. Armory in Philadelphia. *www.philaifs.com*

RHODE ISLAND

Nov. 6-8 — The Providence Fine Furnishings Show. Annual show featuring handcrafted furniture and accessories to be held at the Pawtucket Armory Arts Center. *www.finefurnishingsshows.com*

SOUTH DAKOTA

Monthly — The South Dakota Woodworkers Guild meets the last Thursday of every month (except August) at various members' shops. The club has hand tool and woodturning groups. *www.sdwoodworker.org*.

WISCONSIN

March 13-15 — The Milwaukee Woodworking Show, featuring new products and instructional seminars, will be held at the Wisconsin Expo Center Hall C in West Allis. *www.thewoodworkingshows.com*

Sept. 18-20 — Milwaukee Fine Furnishings Show. Annual show featuring handcrafted furniture and accessories will be held in a new venue this year at the Muellner Building at Hart Park in Wauwatosa. *www.finefurnishingsshows.com* W

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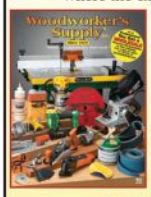

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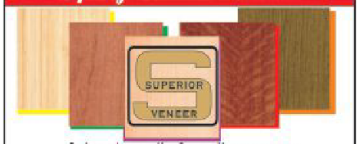

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Restoring a species helps students, too

The Lumber to Legacy program in Albany, Ore., raises money to support the city's white oak restoration efforts by having fallen or downed trees manufactured into auction items.

Students are also benefitting from the program in tangible ways. They're sawing the logs into lumber, building auction items and learning from generous local craftsman.

"When trees have to come down or fall naturally, the lumber is harvested with the help of many volunteers," says Ed Hodney, director of Albany's Parks and Recreation Department, which is the developer of the program. "It's offered to woodworkers willing and able to produce neat pieces that can then be sold."

One of those is Gary Rogowski, director of Northwest Woodworking Studio, a school in Portland, Ore.

"He invited 10 students to his shop last year to help produce café chairs of his design, which were sold at auction last November," Hodney says.

"What was so much fun was to see how engaged these students were," Rogowski wrote on the school's website about the visit. "No fear and no self-consciousness about their skills. They were here to learn, here to build. They also were willing to hear me talk about geometry and why it was important. To hear me talk about design and the several aspects of a good chair design. To try their hands at hand tool work. To learn about staining wood with an ebonizing solution. They loved it. It just goes to show what value kids place on being treated like adults. They have curious and vigorous minds and it was my pleasure to show them a little in those two days."

Auction funds are also used to support the city's year-round student internship program. But the bulk, of course, goes to the city's efforts to enhance the existing Oregon white oak habitat and to re-establish the species in publicly protected conservation areas. For information, visit *www.cityofalbany.net*.

Students' work for the auction included bowls, café chairs and a guitar.

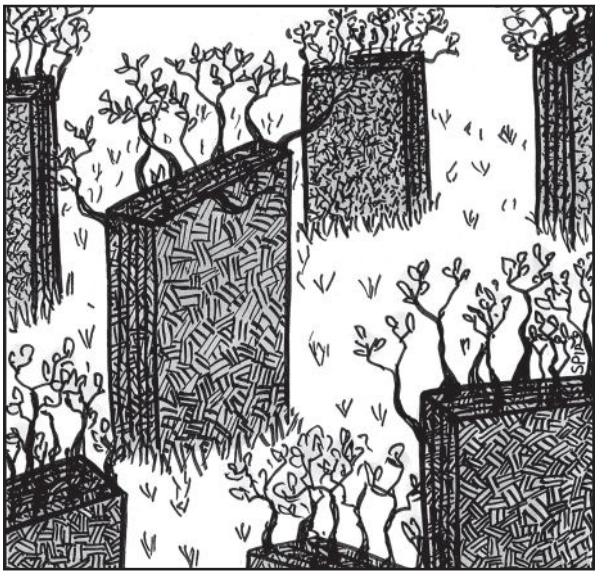
photo by Ed Hodney

Gary Rogowski (seated) with visiting students at the Northwest Woodworking Studio.

photo by Ed Hodney

photo by Ed Hodney

60 Grit — Rough humor by Steve Spiro



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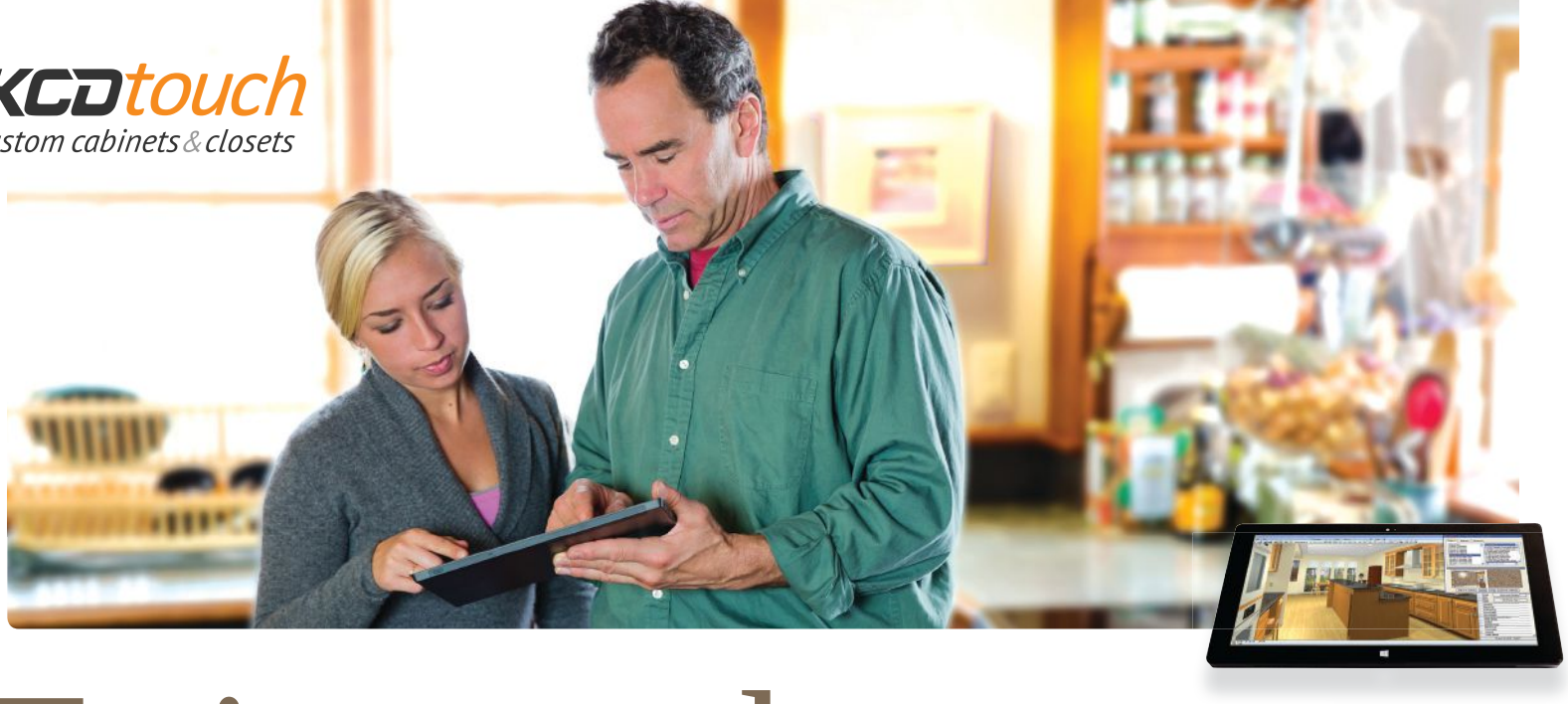

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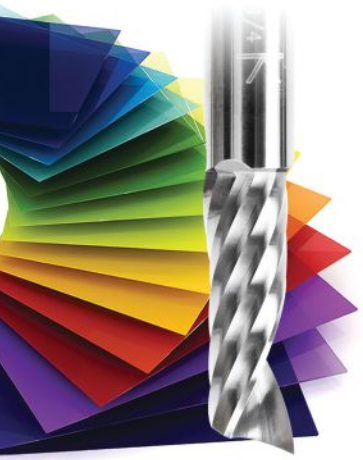

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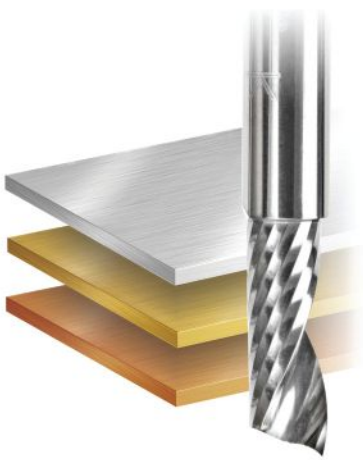

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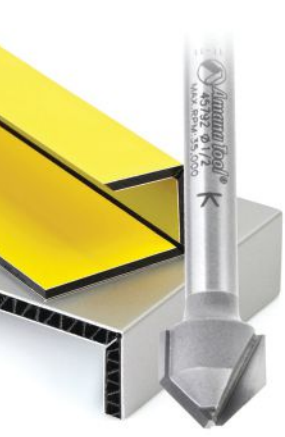

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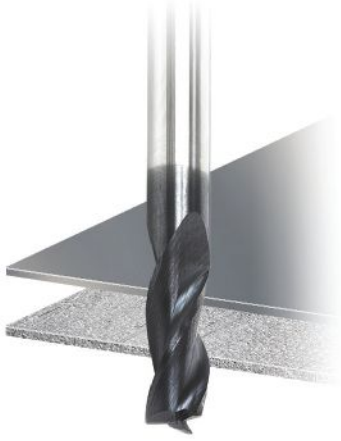

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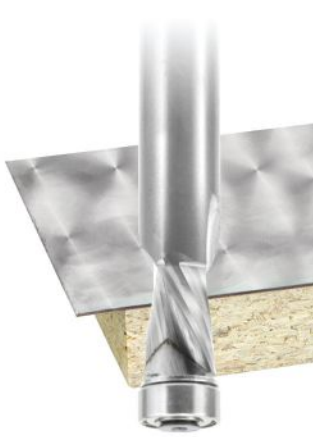

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