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SB1108

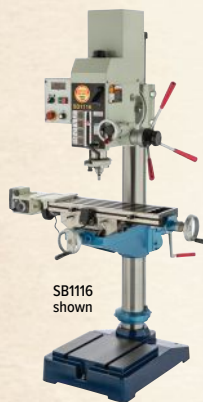
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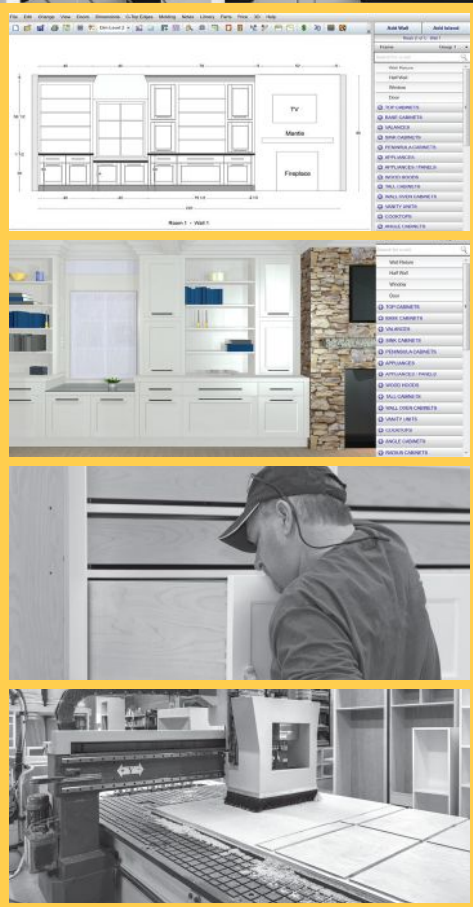


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MY ABRASIVE BELTS ARE LOADING UP! WHAT'S WRONG?



What are you sanding? Make sure you are using the correct abrasive for what you are sanding. In some cases, loading is simply unavoidable. Materials such as paint, varnish, lacquer, glues, fillers, or soft woods WILL LOAD UP to some degree with any abrasive belt.

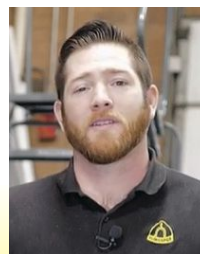
Eliminate Static build-up Because loading can be such an issue, opt for an open coat abrasive where the grains are spaced further apart. This spacing allows the loaded particles to basically fall off of the surface of the belt. Additionally, belts with Antistatic properties are available as well. During the sanding process, static builds up in the machine and wood dust clings to the machine and the belt. Antistatic abrasives reduce the static allowing the dust to be taken away by your dust extraction.

Grit Sequence is key to avoid loading of your abrasive belt.

Don't jump from 80 to 220 grit on bare wood sanding. Overworking the 220 grit in an attempt to remove 80 grit scratches is a losing proposition. Overworking creates excessive heat and the heat usually traps the sanding debris between the belt and the workpiece.



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– Luke Dombrowsky, Technical Advisor



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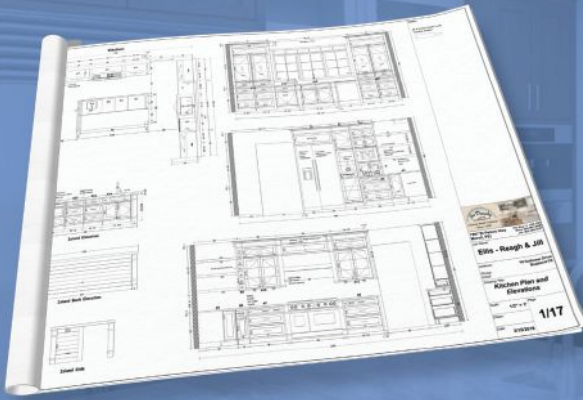
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BLOGS



Over the Workbench

Talkin' shop with former editor A.J. Hamler

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TAKING STOCK

with JOHN ENGLISH

An experiment with wood that's out of this world

This fall, the European Space Agency (ESA) will launch a satellite from New Zealand that might just catch the notice of woodworkers everywhere. That's because the CubeSat will be made almost entirely out of birch plywood. This isn't your average base cabinet being catapulted through the atmosphere. For a start, it's really small. It's a 10 cm (4") cube of Finnish multi-ply with an accordion-arm selfie stick and some aluminum corner trim. Called WoodSat, it's an effort to test how well plywood does in space.

The mission is a follow-up to a 2017 wooden satellite that was launched into the stratosphere aboard a weather balloon. That mission was successful, so hopes are high for this one. The concept here is that wood is a lot less expensive to work, engineer and purchase than the traditional carbon fiber composites that are used to build satellites. Also, a wooden structure should completely burn up on re-entry, leaving little or no litter in the upper atmosphere.

Some of the challenges the space engineers are facing are very familiar to woodworkers because most of them relate to moisture and wood movement. More inert materials such as metals and plastics don't have natural grain, which offers the possibility of fissures. Think about how a board splits along the grain under impact. Wood also expands and contracts across its grain, and even though this is multi-layered plywood with cross-lamination, in the vacuum of space with no protection from radiation, it's anyone's guess how it will behave.

But beyond movement, the engineers at ESA are most concerned about minute quantities of moisture. As woodworkers know, there are two kinds of water in wood, bound and free. The free water usually sits inside the cells, and the bound moisture is pretty much locked inside the cell walls. ESA is using a thermal vacuum to try to dry the wood completely.

The satellite project is also going to test how various lacquer and varnish coatings behave in space. Ironically, WoodSat's base coat is made from plywood's nemesis, aluminum oxide, to limit outgassing, since the vapors might interfere with the satellite's highly sensitive electronics.

Radiation is definitely going to be a big issue with using wood in space. It will darken the epidermal (outer) layer of cells and will inevitably degrade the strength of the material. Think how a veneered sideboard might react to sitting in front of a sunny south window for years. The furniture has the advantage of seven layers of atmospheric protection from solar radiation, while WoodSat is going to have a direct and essentially uninterrupted view of the sun every time it comes out of Earth's shadow.

The experiment is going to raise more questions than it answers, which means there will probably be more wooden satellites in the future. For example, is plywood the best representative of this material or would a composite such as MDF be more stable? And should ESA be trusting this project to a bunch of engineers when everyone knows that woodworkers are far more creative? **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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Associate professor Chris Todd (right) with student Benjamin Eckley.

Bucks County school receives grant for woodworking program

By Jennifer Hicks

Bucks County Community College in Newtown, Pa. has been awarded a \$100,000 grant from the Windgate Foundation to support the fine woodworking program in the school's Arts Department. The award for the Windgate Fine Woodworking Legacy Residency will support the program for two years.

"The support of our wood program from the Windgate Foundation allows us to continue offering opportunities for students to pursue the skills of woodworking and furniture design in Bucks County," says associate professor Chris Todd.

The program offers associate degree and certificate programs for students of all ages that focus on a wide range of techniques such as bending and veneering, table systems, woodturning, chair construction and more. As a result of the grant funding, a new beginner's course will be added.

"The grant will specifically fund the continuation of a dedicated, full-time faculty

member in charge of the wood programs," says Todd. "In addition to the focused attention on maintaining the shop, seeking job opportunities for students, and attention to keeping up with current trends in the industry, this grant award affords Bucks the opportunity to offer Woodworking Fundamentals courses for students in the college at-large. The entry-level course allows students from any major the chance to gain familiarity with fine woodworking skills and learn to work with their hands."

In previous years, the program has received other grants from the foundation that have helped outfit the shop and sponsored awards for outstanding student work. The college is an accredited institutional member of the National Association of Schools of Art and Design.

Based in Little Rock, Ark., the Windgate Foundation is a private grant-making foundation established in 1993.

For more, visit www.bucks.edu and www.windgatefoundation.org. [W](#)

Record-setting year for WCA student enrollment

By Jennifer Hicks

The Woodwork Career Alliance of North America reports a record number of students enrolled in its credentialing program, signifying a growing interest in woodworking career opportunities, which has always been a top goal of the organization, according to WCA president Scott Nelson.

"This year sets a record. We already had 470 kids sign into the program this semester in January 2021, and that is a record number for us in one semester. We usually get about 500 a year at most and we've had 200 in the last two months," Nelson said in June.

The WCA supports workforce development by providing a nationally recognized, standardized system that includes certification of training of new and existing woodworking professionals as well as students at both the high school and post-secondary levels. It offers opportunities for teachers at those schools to become certified evaluators of their students, and for manufacturing companies to train enrolled employees and reward them with credentials.

There's also been strong interest in the Accredited Skill Evaluator training, moved online because of the pandemic, according to Nelson.

"Last year was an interesting year with Covid, but I think we came out of it better," he says. "We had to change our training to online for the ASE for teachers that become accredited, and that process has been a much better process because they have to video themselves. We have to grade the videos, so there was a lot more one-on-one interaction with the teacher. I think it gives WCA a better view of the quality of the teachers we have out there."

But remote learning didn't work as well for the student certifications, which require passing a 40-question written test and machinery evaluations.

"Everybody was sent home around March 15 last year, so the teachers that had done testing before knew and had already done hands-on evaluations. The others were unable to because of Covid and consequently the students, unless they came back this year, weren't able to finish their certificate," says Nelson.

For more about the WCA and its credentialing programs, visit www.woodworkcareer.org. [W](#)

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AWI Education Foundation receives \$2 million donation

By Jennifer Hicks

The Architectural Woodwork Institute Education Foundation (AWIEF) has received a donation of \$2 million from the Quality Certification Corp. to help enhance programs at qualifying architectural woodwork programs. The donation was timed with the retirement of Randolph Estabrook, a long-standing executive director of the Quality Certification Corp.

"This generous donation allows AWIEF to reach out to a greater number of education institutions in support of their architectural woodwork programs and also enables the Education Foundation to provide more scholarships to qualified students," AWIEF president Kent Gilchrist said in a statement.

Presently, AWIEF awards scholarships to eligible students who aspire to careers in the architectural woodwork industry as recommended by faculty of secondary and post-

secondary institutions.

The funding designates \$1 million for Randolph Estabrook Educational Scholarships for individuals in eligible secondary and post-secondary architectural woodwork programs, and \$1 million for grants to support those programs.

The terms of the donation require the Foundation to award approximately \$50,000 in scholarships and \$100,000 in grants annually.

Over the next several months, the seven-member AWIEF board of directors will meet periodically to identify eligibility criteria and devise an application process for academic grants.

For more, visit www.awinet.org. 



2021 BENCHMARK SURVEY SEEKS INSIGHTS FROM U.S., CANADIAN SHOP OWNERS

The Cabinet Makers Association requests that shop owners complete their 2021 Benchmark Survey. The responses will provide a clearer picture of the woodworking industry in the U.S. and Canada, while also helping other shops have a better idea of where they stand in relation to the rest of the industry.

Open until October 31, the annual survey establishes benchmarks for the industry by exploring business outlook, staffing and compensation, shop rates, CNC automation, construction methods, and marketing. On the demographic side, the survey paints a portrait of where shops are located, number of employees, and what kind of work they do.

The 2021 Benchmark Survey is sponsored by Lockdowel. Qualifying participants can enter a drawing for a Lockdowel FastBox or a one-year complimentary CMA membership. All who complete the survey will receive a copy of the full results. Individual survey responses are kept strictly confidential regarding the participant's name and company.

Review the 2020 results and access the 2021 survey at www.cabinetmakers.org.



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Cabinet made with reclaimed chestnut (left) and a pile of salvaged redwood.

Buyers turn to reclaimed for price and character

By Jennifer Hicks

With 'new' wood costing a lot more than it used to, 'old' wood is looking like a bargain. Sellers of reclaimed or salvaged timber are reporting strong sales and steady prices.

"We're busy, that's for sure," says Ryan McNary of Elmwood Reclaimed Timber in Peculiar, Mo. "We typically sell a lot of reclaimed woods for commercial work, but we've seen a large spike in our residential sales so we're doing a lot more residential homes, floors, paneling, beams, island countertops, fireplace mantles, things of that nature," says McNary.

"We have had a number of people who had been looking at imported hardwoods as well as softwoods for different parts of their homes but switched to reclaimed woods for a little bit better lead time. It's a material that's a little bit more readily available for how things are going with the hardwood market especially."

Emile Smith of Sebastian's Specialty Hardwoods in Seneca, Wis. has been selling reclaimed woods since the 90's. He hasn't seen much fluctuation in popularity during the pandemic or its aftermath but notes that greater awareness about reclaimed woods has strengthened the market over time.

"Reclaimed woods are selling as well as they always have. There's been a consistent realization in viability of reclaimed wood as a product as manufacturers get to know how to handle the stock. I think it's a viable product as it's ever been. It's a very vibrant industry," says Smith.

Digital photography and email have made purchasing reclaimed stock much easier for someone in Smith's position.

"It can be difficult for dismantlers to properly represent what's coming down. A No. 1 heart pine joist may have been a No. 1 heart pine joist 100 years ago but really, how do you represent that timber? You can't really represent it structurally. You can represent it as it once was."

He also has some good news for prospective buyers.

"People were getting the impression for a little bit there, or maybe even still, that all lumber has shot to the moon, and I don't think that's true. I think that the market value of a semi-load of reclaimed timbers is about the same as it was two years ago. I don't think my raw prices have spiked or anything and if they did, I'd bow out immediately."

Jeffrey Schucker of Bailey Wood Products in Kempton, Pa. says customers seeking reclaimed woods are going straight for unique character.

"What I have is just what I come across, and we move it for people who are just looking for a rustic mantle or something like," says Schucker.

"We've done a library in the past where we used reclaimed chestnut for millwork several years ago. Other times it's oak, sometimes pine and hemlock. It's anything local from the barns and buildings that's indigenous to what they had when they built them." **W**

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Finalist Picked For VISIONARY AWARDS

Finalists for the 2021 Visionary New Product Awards, presented at the AWFS Fair in Las Vegas (held after press time), were announced. The awards recognize creativity and innovation and are evaluated on quality, production impact, practicality, innovation, and user-friendliness.

The finalists in their respective categories are:

COMPONENTS

Biesse for the Biesse Dual Glue System and Viet ARS

Felder Group USA for the Gluebox

Graco for the Graco Gauge for PerformAA Auto Air Assist Spray Guns

MACHINERY OVER \$50,000

BACCI America for the T4MO CNC Turning Lathe

LestaUSA for the Self-Learning Robot and Cart System

SCM North America for the Lean Robot Sorting Cell

Voorwood for the A5615 Automatic Double-Side Cope & Stick Shaper

MACHINERY UNDER \$50,000

Felder Group USA for the Preventive Contact System
Guffey Systems for

the Pivot Line
Northtech Machine for the iDovetail

MATERIALS

Cascade Distribution Group for the Mirlux Premium Panel
Roseburg Forest Products for Armorite Exterior MDF

POWER TOOLS

Apollo Sprayers International for the Power-5 VS

+ TrueHVLP Turbo Paint Spray System

Oneida Air Systems for the Supercell Mobile 14 Gal. High-Pressure Dust Collector

SOFTWARE

Kval for KvalCAM

Nordfab Ducting for the Quick-Fit Visual 3D Duct Design Tool

RazorGage/Technical Services for the RazorGage Face Frame Scribe

TOOLING

OnRobot for the OnRobot Sander

The Pinske Edge for the Edge Butler

GENERAL

Merlin Technology for Pinless Wood Moisture Meters

PaintLine for the Portable Jobsite Spray Booth

Sames-Kremlin for the FPro Gravity and GSP Manual Airspray Gun 

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TOOLS & TECHNIQUES



Grizzly Industrial adds a pair of benchtop planers

By Jennifer Hicks

Grizzly Industrial introduces two new portable 13" benchtop planers, the G0939 with a three-knife cutterhead and stainless-steel table, and the G0940 featuring a helical cutterhead and granite table. Both can plane 13" wide boards up to 6" thick.

"Grizzly Industrial's new portable 13" benchtop planers are perfect for garage workshops, job sites, or even production facilities that need an auxiliary planer for multiple setups. With an entry-level straight-knife model and the upgrade which features a helical cutterhead, solid granite table, and depth stop for repeat operations, there's not much you can't do with these compact machines," says Grizzly's Will Kersten.

Each planer is powered by a 2-hp single-phase motor that delivers a cutterhead speed of up to 8,500 rpm and material feed rate of

25 fpm, according to the company.

The G0939 has a 2" diameter straight knife cutterhead which features three SK5 double-sided knives that are 1/16" thick and measure 13" long x 1/2" wide. The stainless-steel table bed with extensions is 13" x 25".

The G0940 has a 2" helical cutterhead with two-row spirals and 30 indexable carbide inserts and is equipped with a depth stop for repeat operations. The 1"-thick granite table bed with extensions measures 13" x 28".

Both models feature folding steel tables and carrying handles for storage and transportation, board return rollers, a dust port with 4" adapter, and a fixed-height table design which allows for permanent outfeed roller setups.

The G0939 and G0940 sell for \$595; and \$895, respectively.

For more, visit www.grizzly.com. 

'Stop on a dime' with new Bosch jig saw

By Jennifer Hicks

Bosch Power Tools introduces the 18-volt barrel-grip jig saw, model GST18V-47N, designed with ergonomics and precision in mind, according to the company.

"When making curve cuts at length, it is of the utmost importance to have solid control and precision in your tool. Our new barrel-grip jig saw allows you to keep your hand nice and close to the work piece, maximizing the control of the tool, similar to working with a pen or pencil," says product manager Corey Hinkel.

"The GST18V-47 also offers an auto-stop feature, allowing the user to stop on a dime and providing more precision by eliminating possible nicks or mars in the workpiece. The tool provides enough power for plunge cuts in hard wood or aluminum, making it ideal for cutting and fitting cabinetry and even sink cutouts."

The jig saw features variable speed, four orbital action settings, tool-free blade changing, and LED work light.

The bare tool, compatible with the Bosch 18-volt battery platform, sells for \$149.

For more, visit www.boschtools.com. 



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FStart spray guns suited for all-day use

By Jennifer Hicks

Sames-Kremlin presents the FStart manual spray guns, available in gravity, pressure and suction configurations. The new guns are a cost-effective solution for professionals working with solvents and water-based materials, according to the company.

"The FStart line is our entry level category of Airspray guns," says product manager Mike Malavolti. "It's capable of spraying stains, primers, sealers, conversion varnishes,

topcoats, and UV coatings, to name a few.

"The FStart is well-suited for all day spraying due to its light trigger pull and light weight. It is very adaptable and can be converted from conventional Airspray to HVLP by just changing the fluid nozzle and air cap. The gun body stays the same."

The gravity model (FStartG) feeds material through a top-mounted pot for basic applications. The pressure model (FStartP) is suited for spraying low to medium viscosity materi-



From top, the FStartG, FStartP and FStartS entry-level spray guns from Sames-Kremlin.

als. The suction model (FStartS) is a conventional spray gun with bottom-mounted pot for hard to atomize coatings.

Each model has an aluminum body for easy cleaning, features a fine atomization aircap adjustable to 360 degrees, soft springs for a responsive and reduced trigger pull, and new trigger design for more comfort, according to the company.

The guns sell for \$145 to \$229, depending on the setup.

For more, visit www.sames-kremlin.com. 

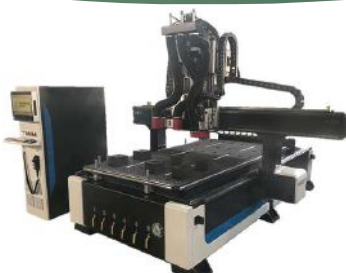

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SandNet reusable products save time and money

By Jennifer Hicks

Diablo Tools recently introduced its line of reusable SandNet products, a novel solution for woodworkers and other professionals who constantly replace discs, sheets, and blocks. Designed to outperform paper-based alternatives by delivering up to 10 times longer sanding life, SandNet eliminates waste while saving end-users time and money, says the company.

"SandNet takes the most dreaded task of any project, for woodworkers, carpenters, drywallers, painters and other industry workers alike and developed multiple innovative sanding solutions that meaningfully improve and enhance production for all sanding jobs," Russell Kohl, president and CEO of Diablo/Freud Tools, said in a statement.

"These superior reusable products increase productivity through fewer labor hours and dollars spent completing the job, and fewer disc/sheet/sponge changes result in increased dollar savings. SandNet creates less product waste, which in turn is better for the environment."

All SandNet products feature a clog-reducing, lattice-style nylon net design that's coated with an aluminum oxide grit that allows sanding fibers to simply pass through the net without damaging the underlying surface. Any clogging or build-up can be cleaned away by shaking, vacuuming, or rinsing.

SandNet sanding discs and sheets are available in a variety of grits and sizes for stripping material to final sanding.

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Three cheers for veneer

A woodworker's guide to cuts, adhesives, substrates and more

By John English

Veneer can be purchased as a sheet (with or without adhesive applied), or as a pre-made, coated or raw panel with a substrate such as MDF or plywood, or as an edge banding tape, again with or without adhesive. Some jobs require all three.

There's no such thing as a standard thickness for veneer. Mills adjust this dimension to accommodate variables such as the rarity of the species, grain direction, cut, and density of the wood. Large commercial customers often require specific thicknesses. For example, some Japanese furniture manufacturers ask for extremely thin cuts from its most valuable logs, while chains offering knock-down, DIY furniture may use thicker cuts of less expensive species. There are some norms when it comes to thickness, and those have been getting a little thinner as technology makes it easier to do. Many mills now supply straight-grained, well-behaved hardwoods in a range of thicknesses from around half a millimeter (that's 0.02" or 1/50") to 2-1/2 mm (a hair over 3/32"). Perhaps the most common spec for commercial veneer is a thickness in the vicinity of 1/42" (0.0238").

Veneer allows woodworkers to create large objects with unbroken grain patterns, such as a wall of doors and panels. This can be visually stunning, especially on a large scale.

Veneer also helps avoid the unpredictability and movement associated with edge-glued solid boards, as an MDF or plywood core is far less likely to react to seasonal changes in the environment. And veneering can save money if a rare or expensive species is sliced thin and spread wide.

There are basically two ways to create veneer. A rotary cut is the least expensive and involves suspending a log between centers as one would a spindle blank on a wood lathe, and then rotating it into a knife. The second method is to use a knife to slice across the log while the wood is stationary. The rotary cut delivers a wide sheet of veneer with a broad pattern in most species. It's often found on the back of a sheet where the front is an appearance grade high value species, or as the good face on sheet stock found in big box retail stores, or as a paint grade.

Sliced veneer can be quartered (as in having the look of quartersawn solid stock), rift or plain sliced. Quarter slicing gives the woodworker tight, straight, thin lines, which means edge matching can be a little easier. It features decorative medullary rays (flake) in some species. Rift slices are cut at 15 to 30 degrees and that eliminates most of the medullary rays but still delivers a straight, tight pattern. This is one of the more expensive cuts because there's so much waste and a lot

ADOBE STOCK

of setup and milling time.

Plain slicing is the most common cut, and it results in a familiar cathedral grain pattern that shows up a lot on hollow core doors and more affordable kitchen cabinets.

Some veneers are intentionally sliced to reveal drama, such as burls and crotches. Burls are growths that occur on the side of a tree trunk or down near the base, while crotches are harvested where the main trunk branches off to form a Y.

The most defining aspect of working with veneer is perhaps scale. Large shops use veneer as sheet stock in casework or perhaps to laminate entry door skins, while small custom shops might only make a few cabinet doors every year or even just do a few small repairs or cover a curve or two. In most cases, glues and substrates on sheet stock are determined by the mill or are specified by an architect and applied at the mill. For smaller projects, those decisions are left up to the woodworker. And for intermediate scale projects, veneer presses come into play.

Veneer adhesives

The thing to keep in mind when gluing veneer is that it's very thin, so whatever happens to the substrate is probably going to telegraph through the veneer. There are a lot of discussions about whether to use hide glue, aliphatic resins, contact cement or other solutions.

Franklin makes an adhesive called Titebond Cold Press (titebond.com), formulated for cold press laminating of wood veneer to solid woods, particleboard, MDF, plywood and other porous materials. The two big advantages over contact cement are that this non-flammable product doesn't set too fast or too slow (there's a 15-minute window for adjustment) and it doesn't emit harmful fumes. It also prevents bleed-through on open-grained and unbacked wood veneers, which is a big advantage with figured grain. A mechanical spreader is recommended, and clean-up before curing is with a damp cloth.

Better Bond X-Press is a fast-setting veneer glue with an advanced fibrous-resin additive that reduces bleed-through issues in all wood veneers. Available through veneersupplies.com, it is specially tinted to reduce glue line visibility and fill voids in burl veneers. It works with most standard-thickness domestic and exotic wood species. From 45 to 60 minutes of clamping time is needed, and the company says that its reusable glue roller is the recommended tool for applying this adhesive. It's formulated for vacuum press veneering but will also work with many other veneer clamping methods.

Veneer Supplies also stocks Ultra-CAT veneer glue, which is a high-solid content, pre-catalyzed powdered resin with an extra-long



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Hardwoods Specialty Products

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L.L. Johnson Lumber Mfg. Co.

Veneered panels
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Lenderink Technologies

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Northwest Lumber Co.

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Oakwood Veneer

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open time. It was developed using catalyzed adhesive technology and it cures rock-hard. That eliminates veneer creep caused by seasonal humidity changes, and it also prevents joint lines from separating. It will permanently lock in the form of curved and contoured veneer projects, and that makes it suitable for bent laminations such as curved doors, skateboards or guitars.

Bob Morgan at Veneer Factory Outlet says that the three most common ways to glue wood veneers down are a self-stick, 3M peel and stick adhesive, or two coats of contact cement on both surfaces, or using woodworker's glue such as Titebond II and applying pressure with clamps. Bob has an interesting article at veneer-factory-outlet.com that should be

quite interesting for shops doing occasional veneering or small projects.

Vacuum clamping

This is the preferred way to apply larger sheets of veneer and manufacturers offer some clever solutions.

For example, Vac-u-Clamp (vac-u-clamp.com) designs and builds commercial vacuum clamps for veneering in California and offers three ranges of presses. The company's FP model is a folding press that can fold up to a vertical position and be pushed up against the wall for space savings in the shop. The SP (standard press) is available in 4' x 8' and 5' x 10' sizes and includes standard equipment such as oil-cooled rotary vane vacuum pumps

and a silicon membrane. And the TP (table press) is made from the same aircraft aluminum as the SP and is designed to sit on the table the shop builds.

Vacuum Pressing Systems (vacupress.com) offers a full range of veneering and laminating products including flip-top table press kits, vacuum pressing bag systems, Vacupress vacuum pumps, veneer glue and specialty veneering tools.

Then there's Quality Vacuum Products (qualityvak.com), which offers pumps, presses and a wide variety of veneering accessories such as cutters, glue spreaders, rollers, tapes, tubes and clamps.

Visit the Joe Woodworker site (joewoodworker.com) for tips and tricks on vacuum veneering.

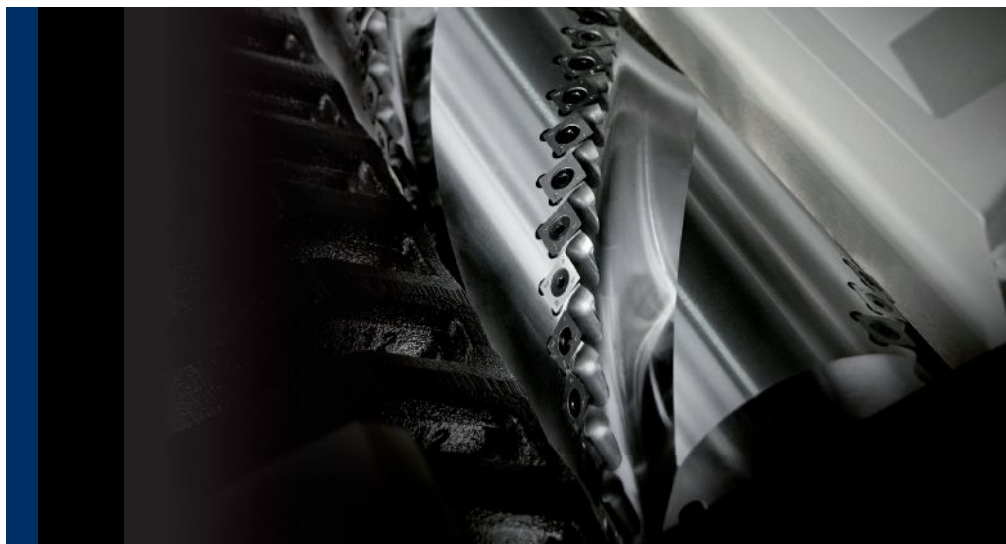
Veneer substrates

Historically, the substrate of choice for veneer was a lesser wood with a stable nature, such as poplar or alder. The veneer was laid so that its grain matched the grain direction of the substrate, to avoid cross-grain bond failure. Solid wood substrates were best made from straight stock such as quartersawn or rift, which was a bit of a problem as these are the most expensive cuts. Softwoods were widely used, too. When plywood came along, its alternating laminations gave it both strength and stability. The thin veneers stacked one upon another at right angles didn't allow for much cross-grain movement. But plywood can warp if stored incorrectly or exposed to the elements.

Next, even more stable composites such as MDF and particleboard became popular substrates because they had no grain, and therefore no movement of consequence in any one direction. It didn't take long for woodworkers to figure out that most substrates benefited from having a backer, and still do. This is a lesser grade of veneer that is applied to the hidden face of the substrate, to balance it and hopefully avoid warping. It's a good idea to finish this face as well, as the coating will allow both faces to absorb or release moisture at essentially the same rate and thus avoid any imbalance.

The two keys here with these materials are that they were much less expensive than the veneer, and they could also be rendered flat and remain essentially so.

To be frank almost any flat, stable surface can be used as a substrate for veneer, so long as the adhesive sticks. It must, however, be dry. That is, the moisture content must be close to the relative humidity in the woodshop, so it's a good idea to let substrates acclimate in the shop before using them. And each face should be flat but not microscopically smooth, as a minutely scuffed surface will adhere better than a polished one. **W**



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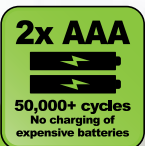
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◀◀ **SOUTH BEND** introduces a 16" band saw, model SB1080, with a 3-hp motor and 14" of resaw capacity. Features include a 20-7/8" x 25-5/8" cast-iron table, trunnion with a rack-and-pinion tilt mechanism, and dual ball-bearing blade guides. The band saw also features a cast-iron fence with a two-position aluminum face attachment that can be mounted for resawing applications or for cutting thin workpieces. The saw comes with two 4" dust ports, foot-operated brake system, quick-change blade release/tensioner, and powder-coated finish. It sells for \$3,150. For more, visit <https://southbendtools.com>.



◀◀ **WOODPECKERS** presents its new Precision Taper Jig, which offers instantly repeatable quarter-degree angle setting, material clamping, zero-clearance material support and length capacity that can extend up to 48", according to the company. For more, visit www.woodpeck.com.



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Tips & tricks for working with small-diameter bits

I teach an Intro to CNC routers class. Each semester an inevitable day arrives when we need to have the “tiny bits” discussion. It’s about why, when and how to

avoid using tiny bits when they are not required, as well as when and how to use them when they are.

So, what’s a “tiny bit”? I consider it to be

any tool with a diameter that’s less than 1/4”.

This topic usually comes up when class projects begin to involve fitting machined parts into one another. One early project that is likely to trigger the discussion is called the Child’s Puzzle and it requires fitting machined parts into machined pockets. It’s an excellent assignment for illustrating the necessity of precise drawing and some other factors involved in fitting parts together.

One of those is clearance, which is a matter of the relative size of the two parts.

A second is the phenomenon of working with radiused inside corners. If we machine a 2” square part and a 2” square pocket, obviously the square will not fit into the pocket if the tool that created the pocket is round. The inside corners of the pocket will have the radius of the bit that formed them. And as any woodworker knows, a 2” part does not easily slip into a 2” pocket anyway. It might need to be persuaded by a mallet, but the result may not be pretty and the parts are unlikely to disassemble without damage.

There are various remedies to these challenges and those are part of the journey of learning how to work with a CNC router. In the case of the Child’s Puzzle, one appropriate remedy for the radiused inside corners is to use inlay toolpaths. The square part can be machined with a male inlay toolpath and the pocket with a female one. That means the part is machined with radiused outside corners that match the inside radiused corners of the pocket.

Another solution is to make the 2” square pocket slightly larger. This clearance is often referred to as “offset” or “allowance”. For our Child’s Puzzle, a clearance of 1/32” works well. The parts are intended to be freely inserted and removed over and over. For parts

SPRAY FINISHING WORKSHOP ANNOUNCED

Carlisle Fluid Technologies and Owens Community College are teaming up to present a three-day Spray Finishing Technology Workshop, scheduled for Nov. 3-5, in Toledo, Ohio.

Classes meet from 8:30 a.m. to 4:00 p.m. daily and include both classroom and hands-on sessions. Attendees should be involved with industrial, contractor, or maintenance spray finishing applications, or spray equipment sales and distribution.

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intended to be permanently assembled, .005" or less is a better fit.

These solutions are workable for a basic square part in a square hole, but they can be hard to swallow for the student who has chosen to use letters of the alphabet, or perhaps a silhouette of an object. A simple example is the letter V. Imagine if we machine it as a part, and machine a pocket with the same shape. With inlay toolpaths, the point in the pocket can be rounded to match the tool radius, and also to match the internal corner of the part. However, depending on the size of the parts and the design of the font, the V may no longer be fully recognizable.

It is this sort of situation that can trigger the "tiny bit" conversation. Students are encouraged to cut their Child's Puzzle with a 1/4" diameter end mill, but at this point they frequently propose to use a 1/8" or even 1/16" diameter tool.

Yes, that will reduce the size of the internal corners, but it has several significant consequences. The first is that it takes a lot longer to cut the parts when using a smaller bit. And as the bit diameter is reduced, there are corresponding changes to the depth of cut, feed rate, stepover and chip load.

Let's use the 2" square in the 2" square pocket as an example.

If we cut these parts in 3/4" thick MDF and plan to have the square part (tile) set 3/8" deep into its pocket, it will require 7 seconds to cut the tile on the school's CNC and 12 seconds to cut the pocket. These times are based on a two flute 1/4" diameter end mill with a pass depth of 1/2" (twice the diameter) and a chip load of .015". This is the center of the chip load range for MDF in the Vortex Tool chip load chart for a 1/4" diameter bit. That load is achieved with a spindle speed of 20,000 rpm and feed rate of 500 ips. The stepover is a modest 40 percent. Those are fairly aggressive cutting parameters and the time to cut the parts is pretty trivial.

If we cut the same parts with a 1/8" diameter end mill, we will need to use different parameters. If we continue to use a pass depth of two diameters, the depth of cut will now be 1/4". The Vortex chart suggests a chip load of approximately .006" for a 1/8" diameter bit in MDF. To achieve that, we need to reduce the feed rate to 200 ips. Under these conditions the tile is cut in 18 seconds and the pocket in 105 seconds.

AWI AND SMA RELEASE ANSI-APPROVED STAIR STANDARD

The Architectural Woodwork Institute (AWI) and the Stairbuilders and Manufacturers Association (SMA) announce the release of ANSI/AWI SMA 0643-2021 Wood Stair, Handrail, and Guard Systems Standard which was approved on Mar. 1 by the American National Standards Institute (ANSI).

The standard is available online for free access at www.awinet.org and www.stairways.org and will take effect Aug. 15.

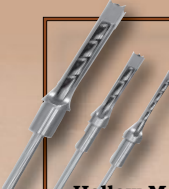
ANSI/AWI SMA 0643 supersedes, replaces, and supplants Section 7 of Architectural Woodwork Standards, Edition 2 (2014) as the most current version of the AWI Standard for wood stair, handrail and guard systems. It is the first standard of its kind for SMA.

ANSI/AWI SMA 0643-2021 provides standards and tolerances for the quality fabrication and field installation of wood stair, handrail, and guard systems, that are comprised of: stairs, which encompass stringers, risers, treads and landings; handrails; and guard systems, which are part of the assembly of stairway components. Further, it addresses common guard infill systems of glass and metal, and establishes minimum aesthetic tolerances and performance requirements intended to provide a well-defined degree of control over a project's quality of materials, workmanship, and/or fabrication.



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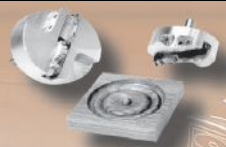
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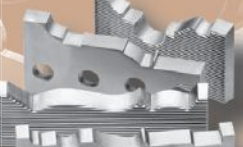
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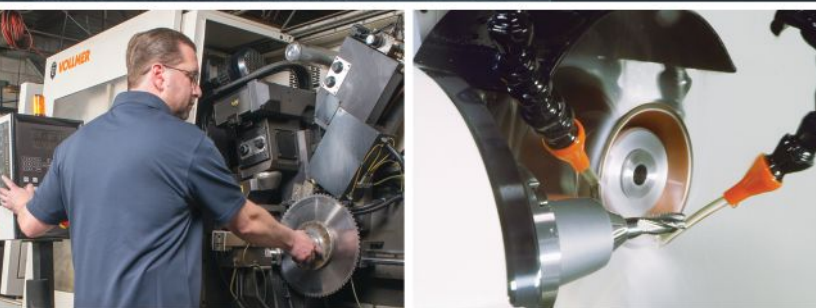
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With roughly equivalent cutting parameters for a 1/16" diameter bit, the increased cut time is exponentially greater. Here, the tile would be cut in about a minute and the pocket would require nearly 10 minutes.

And there's another huge consideration – the strength and geometry of the bits.

Quarter-inch diameter bits are very robust when compared to the smaller diameter bits. They are widely available with flute lengths greater than 3/4", which means they can cut through a 3/4" thick piece of material. Off-the-shelf 1/8" diameter bits are available with flutes 13/16" long, but 1/16" diameter bits are not generally able to cut through 3/4" stock. Long, skinny bits are at great risk of snapping and that translates into downtime and possibly even damage to the parts.

In a class setting, these differences in cut times are dramatic. A typical Child's Puzzle would have a half dozen or more parts. Keep in mind that the cut time estimates don't include set-up for the job. To enable a class of a dozen students to each cut their own project, the total cut time for each student needs to be less than 15 or 20 minutes. So, for the class environment, I have to insist that the Child's Puzzle project be cut with a bit no smaller than 1/4" diameter.

The upside

There are strategies available for dealing with the excessively long cut times involved with using tiny bits. One approach is to use a combination of larger and smaller bits. Other solutions involve clever use of the larger bits to sidestep the unwanted consequences of the radiused internal corners.

One approach in that first category is to use a larger diameter "clearance bit" to remove the bulk of the material, and then use a smaller bit for a final pass to clean out the areas that the larger diameter bit was unable to cut. This is an efficient approach for cutting parts where a very small radius is required in internal corners. The trade-off is that a tool change is required. On a machine with an automatic tool changer, this is not a significant increase in time. However, on a machine with manual tool change, it can add

PROVIDENCE WILL HOST TWO SHOWS LATER THIS YEAR

KL Communications announced it will produce a show and market this Fall and holiday season. The 26th annual Fine Furnishings Show will be held Nov. 5-7 and the Holiday Market will be held Dec. 4-5.

Both shows will be held at the WaterFire Arts Center on Valley Street in Providence, R.I. and support local artists, craftsmen and small businesses.

"We are looking forward to our 26th annual Fine Furnishings Show in November", said show owner Karla Little. "With our 25th show last year being held under strict Covid guidelines we are excited about being back to normal and having all the fun activities we planned for our 25th celebration including the Best in Show Awards, Parade of Chairs, Art Bar and more. We also hope to have our indoor concession stand available too."

The Fine Furnishings Show is an annual show offering American made, handcrafted furniture, accessories and art for the home, office and garden. The show also includes the work of students in furniture making programs at the Rhode Island School of Design and the North Bennet Street School. A selected group of fine craftsmen will also exhibit jewelry, scarves and clothing. All exhibitor work is for sale, order and commission.

The Holiday Market will feature artists, craftsmen and vendors offering a wide range of art, gifts, natural products and more.

For more, visit www.finefurnishingshows.com.

enough time and opportunity for error to make it unproductive.

The other approaches involve using the larger diameter tool in ways that overcome the issues related to radiused inside corners. Examples of these approaches include the familiar “dog-bone” and “T-bone” fillets, and the use of blind stopped dados.

The “dog-bone” and “T-bone” fillets cut a bit of extra material in the corner to remove the material that interferes with the square corner on the mating part. However, that leaves a square part sitting in a hole with oversized round corners, so that the sides are flush but there’s a void around each corner. For a purely functional part, this may not matter. But for an assembly where aesthetics matter, visible cavities could possibly be turned into design features. There’s an old woodworking adage that says if you can’t hide it, then celebrate it. Or, if located with care and good planning, the cavities may not even be apparent if they can be located, say, under a tabletop.

A blind stopped dado is widely used in cabinet construction, when cabinets are constructed of sheet goods and the panel edges are banded. Adapting this solution can be a clever and attractive way to work around the challenge of inside corner radii.

Another characteristic of tiny bits is their sensitivity to CNC router characteristics such as runout of the spindle, or deflection and backlash of the structure. Runout or deflection of .0005” is trivial for a .250” diameter bit, but it can be very significant for a tiny bit. In addition to appropriately slow feed rates, tiny bits require especially precise collets as well as a CNC machine with insignificant deflection or backlash. Broken bits can be the result when these parameters are not tightly controlled.

The chisel solution

Occasionally a student will tell me that they plan to chop the inside corners square with a chisel to eliminate the radius. While this could work, it defeats the objective of having the machine do the work. Part of learning to design for a CNC router involves learning to design parts and assemblies to take fullest advantage of the machine’s capabilities. The CNC router can maximize productivity only if parts are designed to eliminate manual work. Therefore, the prime objective of the design should be to have an assembly go together with minimal manual work and time.

Tiny bits have an essential place in the CNC router toolkit, but only for tasks that require their unique characteristics. For small inlays or perhaps for tasks such as creating fret slots for the neck of a guitar, they are the tool of choice. But they are not the best choice for tasks where larger bits can do the job.

And that’s why I teach my students that it’s good practice to prefer larger diameter bits over tiny bits whenever possible. **W**

CALI ACQUIRED BY VICTORIA PLC

Cali Bamboo, a flooring and building products company in San Diego, is now a wholly owned subsidiary of the global flooring company, Victoria PLC.

Established in 1895 and based in Kidderminster, England, Victoria is a publicly traded company (LSE: VCP) with approximately \$1 billion in annual sales and employs about 3,800 people across 25 sites in the UK, Europe, and Australia. The company specializes in the design, manufacturing, and distribution of innovative floor covering products including carpeting, ceramics, artificial turf, and luxury vinyl plank.

The deal will lead to the expansion of Cali’s product offerings with access to European and Australian substrates, fabrications, partnerships with sister companies, and potentially new markets, according to the companies.



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- Rotation: Forward and reverse
- Min. workpiece length: 7"
- Rollers: (3) 2 1/4" x 4 3/8"
- Roller suspension: 3/4"
- Max. height of rollers: 7"
- Overall size: 43 1/2" W x 8 1/2" D x 13" H
- Approx. shipping weight: 144 lbs.



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G7873 ONLY \$1125⁰⁰



7 1/2 HP 3-PHASE SPINDLE SHAPER

- Motor: 7 1/2 HP, 220V/440V* (prewired 220V), 3-phase, 20A/10A
- Max. cutter height: 5 1/8"
- Max. cutter diameter: 5 5/8"
- Spindle diameters: 3/4", 1", 1 1/4"
- Spindle lengths: 6" - 7"
- Spindle capacity under nut: 4 1/4", 4 5/8", 5 1/8"
- Spindle speeds: 3600, 5100, 8000, 10,000 RPM
- Spindle travel: 3 1/4"
- Spindle insert sizes I.D.: 2", 3", 3-1/2"
- Spindle insert sizes O.D.: 3", 3-1/2", 7"
- Table counterbore: 7" dia. x 5/8" deep
- Table size: 28" x 35"
- Floor-to-table height: 34 3/4"
- Footprint: 26" x 27"
- Overall dimensions: 34 3/4" W x 35 1/2" D x 43" H
- Approx. shipping weight: 613 lbs.



WARNING! †

G7214Z ONLY \$3645⁰⁰



HEAVY-DUTY DRILL PRESS WITH DOWNFEED

- Motor: 2 HP, 220V, 3-phase, 6.4A
- Coolant pump: 60W, 220V, 3-phase, 0.2A
- Max. spindle-to-column distance: 13 3/4"
- Max. spindle-to-table distance: 30 3/4"
- Spindle travel: 7"
- Spindle taper: MT#4
- Spindle speeds: 60 - 1740 RPM
- Table size: 22" L x 19 1/8" W x 1 7/8" H
- T-slot size: 5/8"
- Vertical table travel: 20"
- Table swivel: 360
- Downfeed speeds: 2, 0.10 mm, 0.20 mm
- Quill diameter: 3"
- Column diameter: 6"
- Footprint: 20" W x 29" D
- Overall size: 22" W x 37" D x 89 1/2" H



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Due to product size, this
item must be delivered
to a loading dock or
unloaded with a forklift.
Liftgate not available.



WARNING! †

G0793 ONLY \$4745⁰⁰



*To maintain machine warranty, 440V operation requires additional conversion time and a \$250 fee. Please contact technical service for complete information before ordering.

HORIZONTAL BORING MACHINE

- Motor: 2 HP, 220V, single-phase, TEFC
- Amps: 12
- Table size: 15 3/4" wide x 9 3/4" deep
- Spindle travel: 3"
- Table travel, vertical: 3 1/2"
- Drill bit capacity: 3/16"
- Spindle speed: 3450 RPM
- Air consumption: 0.5 CFM @ 90 PSI
- Max. SPM: 12 @ 90 PSI
- Overall size: 15" W x 47 1/2" H x 37 1/4" D
- Approx. shipping weight: 346 lbs.

Boring heads must be
purchased separately.



WARNING! †

G4185 ONLY \$2395⁰⁰



24" 5 HP INDUSTRIAL BANDSAW WITH FOOTBRAKE

- Motor: 5 HP, 220V, single-phase, 23A
- Table size: 33 1/2" x 23 3/8" x 2"
- Table tilts 45° right
- Floor-to-table height: 32 1/2"
- Max. cutting width left of blade: 24 1/2"
- Max. cutting height (resaw capacity): 16 1/4"
- Blade size: 180" - 181 1/2" long (1/4" to 1 1/2" wide)
- Blade speed: 5300 FPM
• Footprint: 41 3/8" x 23 1/2"
- Overall size: 48" W x 32" D x 83 1/2" H
- Approx. shipping weight: 951 lbs.

MADE IN AN
ISO 9001
FACTORY



Due to product size, this item must be delivered
to a loading dock or unloaded with a forklift.
Liftgate not available.

WARNING! †

G0568 ONLY \$4050⁰⁰



20 3/4" GEARHEAD DRILL PRESS WITH CROSS-SLIDE TABLE

- Motor: 1 1/2 HP, 220V, 3-phase, 5.5A
- Required power source: 220V, single-phase, min. 15A circuit
- Spindle taper: R-8
- Spindle travel: 4 7/8"
- Spindle speed: variable, 0 - 2500 RPM
- Drilling capacity: 1 1/8" mild steel
- Head tilt: 30° left, 90° right
- Max. distance from spindle to column: 10 1/8"
- Max. distance from spindle to table: 17 1/2"
- Table dimensions: 7 1/2" x 23 1/2"
- Quill diameter: 2 1/8"
- Drawbar length: 16 1/8"
- T-slots size: 1/2" (4 on table, 2 on base)
- Footprint: 18 1/2" x 26"
- Overall dimensions: 42" W x 46 1/2" D x 77 1/2" H
- Approx. shipping weight: 739 lbs.

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G0808 ONLY \$5450⁰⁰



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- Spindle travel: 6⅝"
- Spindle tilt: -5 to +45°
- Spindle size: 1¼"
- Spindle capacity: 6"
- Spindle length: 7"
- Spindle speeds: 3900, 5000, 7200 & 9400 RPM
- Max. cutter diameter: 10"
- Table counter bore: 13¾"
- Table size: 47¼" x 35½"
- Floor-to-table height: 34¼"
- Switch: magnetic with thermal overload protection
- Two 5" dust ports
- Approx. shipping weight: 1096 lbs.



WARNING! †¹

G0608X ONLY \$5950⁰⁰



3 HP THREE-SPINDLE SHAPER

- Motor: (3) 3 HP, 220V, single-phase, 18A
- Max. cutter height: 4⅞"
- Max. cutter diameter: 6"
- Spindle diameter: 1¼"
- Spindle length: 5⅞"
- Spindle capacity under nut: 4½"
- Spindle speeds: 7000 & 10,000 RPM
- Spindle travel: 4"
- Spindle openings: 3¼", 6¼", 8¼"
- Table counterbore: 8¼" dia., ⅜" depth
- Table size: 21¾" x 28¼"
- Floor-to-table height: 35"
- Footprint: 34¼" x 37¼"
- Overall dimensions: 45½" W x 52⅞" D x 45" H
- Approx. shipping weight: 1260 lbs.



WARNING! †¹

G9933 ONLY \$6995⁰⁰



10" 7-1/2 HP 3-PHASE SLIDING TABLE SAW

- Motor: 7½ HP, 220V/440V*, 3-phase, 18A/9A
- Rip capacity: 33"
- Crosscut capacity: 63"
- Blade tilt: 0 - 45°
- Max. depth of cut: 3⅝" @ 90°, 2¼" @ 45°
- Main table size with extensions: 40" x 47"
- Sliding table size: 12¼" x 63"
- Main blade arbor: 5"
- Main blade speed: 4000 RPM
- Scoring blade arbor: 22mm
- Scoring blade speed: 8000 RPM
- Overall dimensions: 76" W x 125" D x 46" H
- Approx. shipping weight: 670 lbs.

MADE IN AN
ISO 9001
FACTORY



WARNING! †¹

G0623X3 ONLY \$4125⁰⁰



12" SLIDING TABLE SAW

WITH INDEPENDENTLY-POWERED SCORING BLADE

- Main motor: 7½ HP, 220V/440V* (prewired for 220V), 3-phase, 20A/10A
- Main table size: 35¼" x 21½"
- Sliding table size: 126" x 14"
- Rip capacity with standard rip fence: 49¾"
- Max. crosscut width with crosscut fence: 126"
- Max. depth of cut: 3⅝" @ 90°, 2⅝" @ 45°
- Main blade arbor: 1"
- Scoring blade arbor: 20mm
- Overall size: 139" W x 133" D x 45" H
- Approx. shipping weight: 1498 lbs.

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FACTORY



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WARNING! †¹

G0699 ONLY \$8245⁰⁰



16½" EXTREME SERIES DOVETAIL MACHINE

- Motor: 1 HP, 110V/220V* (prewired 220V), single-phase, 10A/5A
- Table size: 24" x 7¾"
- Floor to table height: 46⅞"
- Number of spindles: 1
- Spindle speed: 18,500 RPM
- Dovetail bit: 10° angle x ⅝" long
- Dovetail shank: ½"
- Max. dovetail height: ¾"
- Min. dovetail height: ⅜"
- Max. thickness: 2⅝"
- Min. thickness: 1⅜"
- Max. stock size: 59" L x 16½" W
- Min. stock size: 7⅞" L x 2⅝" W
- Overall size: 38⅝" W x 26½" x 56⅞" H
- Approx. shipping weight: 539 lbs.



WARNING! †¹

G0611X ONLY \$4559⁰⁰



20" 7½ HP 3-PHASE PLANNER WITH SPIRAL CUTTERHEAD

- Main motor: 7½ HP, 220V/440V*, 3-phase, 20A/10A
- Feed motor: 1 HP
- Table elevation motor: ½ HP
- Max. stock width: 20"
- Max. stock thickness: 9"
- Min. stock thickness: ¼"
- Min. stock length: 10"
- Max. cutting depth: ¾"
- Cutterhead diameter: 4⅝"
- Cutterhead type: 6-row spiral, 144 inserts
- Insert size & type: 14mm x 14mm x 2mm, 30° indexable carbide
- Cutterhead speed: 5000 RPM
- Feed rate: Variable, 20-40 FPM
- Overall dimensions: 38½" W x 35⅞" D x 42½" H
- Approx. shipping weight: 1765 lbs.

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G9740Z ONLY \$8698⁰⁰



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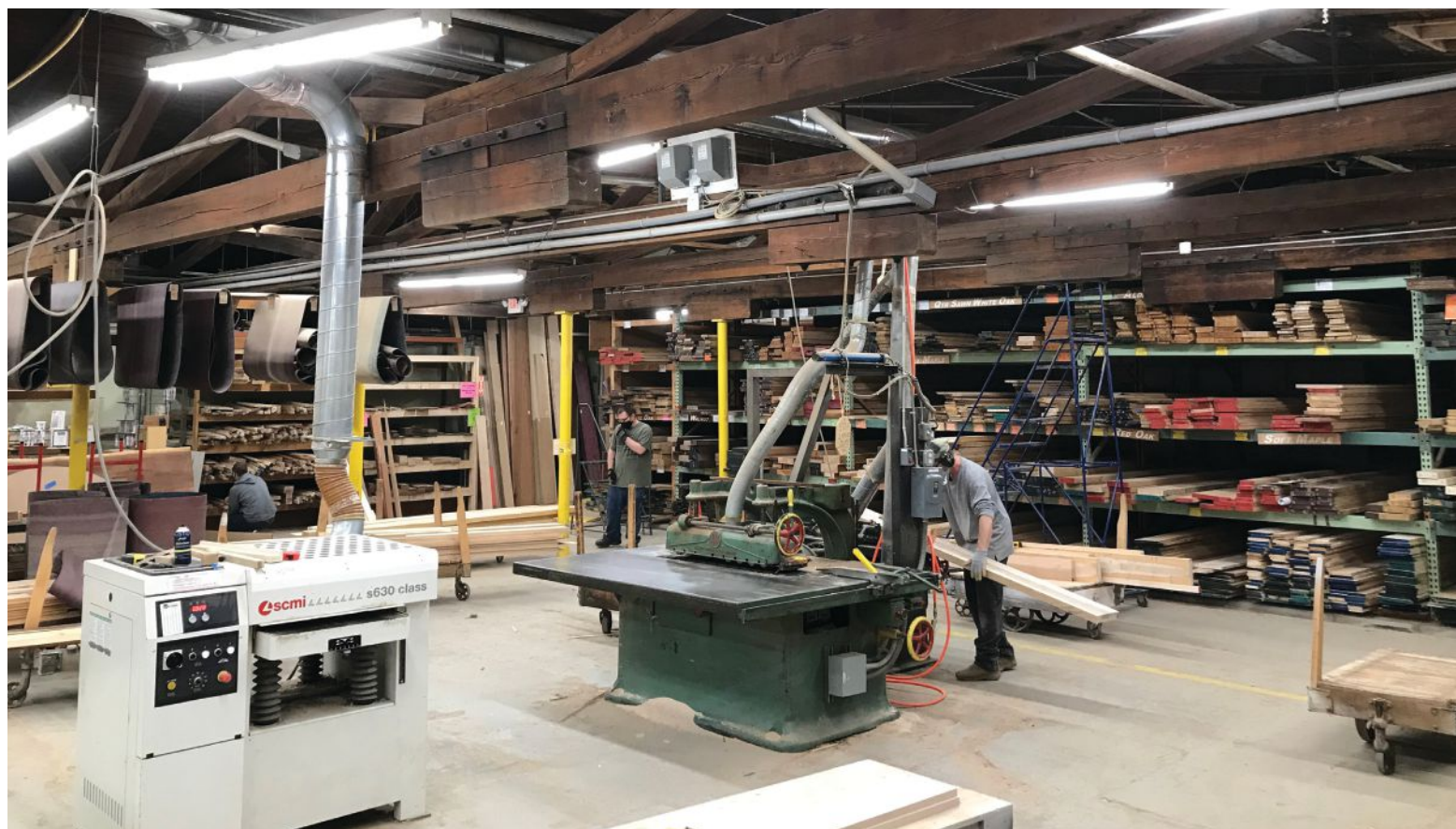
Parkerville's portfolio includes this lecture and choir room at Marist College in Poughkeepsie, N.Y. (opposite page), custom kitchen and living room cabinetry.



SHOP

Parkerville Wood Products is so much more than a source for good wood
BY JENNIFER HICKS





First-time customers at Parkerville Wood Products in Manchester, Conn. are often in for a surprise. They usually know about the vast selection of hardwoods and panel products, then learn about the turnkey millwork and cabinet manufacturing services.

"Very often, people come in here thinking they need one thing, and they end up working with us on a whole other project that they never expected to because the common reaction is, 'Oh, I didn't know you guys did that.' It's a diversified environment. You never know what's coming through the door," says assistant manager Dave Norman.

Founded in 2005 as boutique lumber company, Parkerville is co-owned by David Harris and his son Brendan Harris. The operation has grown exponentially in the past 10 years due to David's desire to offer much more than high-quality hardwoods.

A fresh start

Parkerville started as Harris Woodworking over four decades ago.

"I've been in business for 42 years," says Dave Harris. "I built a company that was more or less a manufacturing company that sold wood. I sold that company in 2004 and started Parkerville in 2005. The former company was a similar model where we did select woodworking and sold lumber, but here we seemed to gravitate towards more complex, higher end work."

Harris Woodworking, officially known as Harris Enterprise Corp., offered custom furniture, light construction and home improvement services. By the mid 80s, it was producing store fixtures for large department stores, Connecticut casinos, Ivy League schools, and Fortune 500 companies. Harris sold the company in 2004, but the new owners decided not to maintain the lumber and supply portion and sold it back to Harris.

Parkerville, which is named after the area's former Parker Village that once supported a cluster of production mills, began as a source for hard-to-find materials in southern New England. Today, it carries a huge inventory of hardwoods and panel products, which has become a gateway to its custom woodworking division.

"We get a lot of first-time customers here every single week. Saturdays it's not uncommon to have 10 new customers," says Norman. "Customers can be anywhere from five minutes to two hours away. Some are just looking for domestic lumbers like cherry and walnut they can't find at their local lumberyards, while others are looking for more exotic woods like purpleheart and bubinga.

"And a lot of people walk in that need help. They have their own wood, but they don't have a way to mill it or process it. What I tell people consistently is if there's any woodworking project that you have but you don't have the time, tooling, or experience, bring it to us. If the project is 12 steps and you want us to do three or four, we'll do it."

The commercial woodworking division accounts for about 50 percent of the business. Projects are coordinated through architects, interior designers, contractors and builders, and the occasional homeowner.

Installation services, when required, are subbed out through a network of talented professionals, but if something is quick, easy, and local, it may be taken care of by the crew.

"The manufacturing end of our business specializes in things that are complicated," says Dave Harris. "We do museum-quality type work. We're really good at replicating historical trim, making custom entryways. We just replaced a couple of old window sashes at the Hill-Stead Museum in Farmington, Connecticut that couldn't be replaced anywhere else."

Open for tours

Customers are welcome to tour Parkerville's 22,000-sq.-ft. facility, an old brick paper mill full of character with exposed timber trusses inside.

The Parkerville shop (left) and some cuts made with the Biesse CNC router.

"People like to see all these woodworkers hustling about and see these cool projects in development in their different areas and you see the eyes open up. We'll take people up to our CNC router and to the cabinet area. They'll see all the different things we can do up there, whether it be basic milling of cabinet parts or milling of slabs or the sign work we do," says Norman.

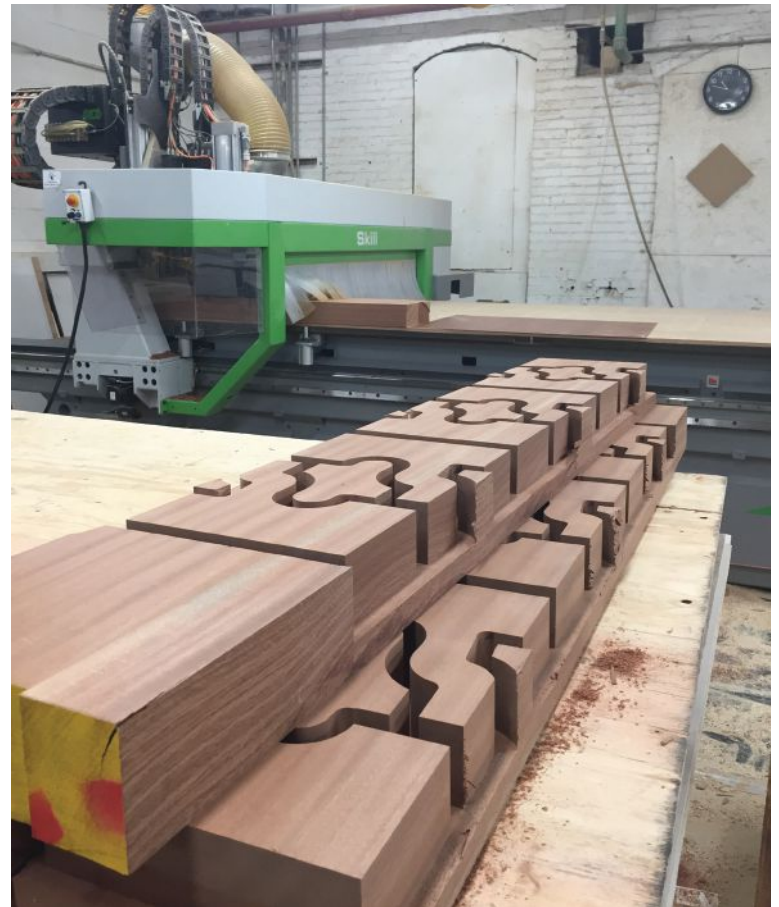
Shop equipment includes a Biesse CNC router and boring machine, Brandt edgebander, SCM shaper and planer, Butferring wide-belt sander, Altendorf panel saw, Diehl rip saw, Oliver jointer and Wadkin planer/molder.

Parkerville has an average of 20 employees, including retail associates who work with customers selecting wood and basic milling applications, craftsmen and finishers on the shop floor, estimators, draftsmen and administrators.

Talk of expansion

Parkerville recently began working with an analysis specialist to give management an organized picture of its client base. Results have indicated a few thousand customers visit consistently year after year, and that new customer relationships are developing significantly with social media efforts. Brendan Harris, who's been with the company since age 15, says opening another location or two is often discussed. "We've talked for years about trying to move into a plant that's more conducive to manufacturing, but it's expensive to move and we've gotten by here for years. So now we're more and more thinking that we should have a separate location versus moving this location," he says.

"We've had a lot of growth over the past few years without putting a



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Matt Laflamme operates the shop's rip saw.

lot of effort into our marketing and things like that, so as we continue to push that we're looking for some more growth."

"If we could get a bigger footprint, I think there's unlimited potential," adds David Harris. "What I'm trying to do in the not-too-distant future is not be here running the day-to-day operation the way I do now. It's very time consuming, but it's just part of my personality in

the way I built the company that I stay and be involved in a lot of aspects of it. I'm trying to build a team where I don't have to be here every day."

Contact: Parkerville Wood Products, 580 Parker St., Manchester, CT 06042. Tel: 860-649-9663. www.parkervillewoodproducts.com. [W](#)

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THE FINISHING TOUCH

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Whether a shop is producing spray-coated or thermofoil doors and drawers, the first aspect of any job that a customer notes is the finish. In this post-pandemic world, many customers want a surface that is chemical and moisture resistant, or even impervious to fluids, so that it can be wiped down regularly without excessive wear. It doesn't hurt if the surface also offers a huge range of color choice.

Two new Chemcraft pre-cat coatings called Varicure® Select and Variset® Select are designed to take chemical and moisture resistance to a whole new level. Both systems' tint bases are included in Chemcraft's automated color matching system, MaestroHue, so color options are pretty much unlimited. And both are high solids formulae that come in a full canon of glosses from high to flat.

Thermofoil also meets the needs of customers who are concerned about coatings and want a vast array of choice. Here, the finish can extend beyond monotonies and include grain and pattern options. And entering the thermofoil market has never been easier, thanks to the new Cyclone 4896 from CNC Factory. This machine can press virtually any 3D shape using PVC sheets, rigid sheets, PS sheets, acrylic, ABS and wood veneers. It's easy to use and needs only one operator. Plus, it has a small footprint when equipped with the optional mobile base.

Block Chain Addition (BCA) is a cure chemistry from Milesi Wood Coatings that concentrates the finest characteristics of pre-catalyzed and post-catalyzed polyurethane, acrylic and ureic finishes in a single technology. Some of the characteristics that it yields are high surface hardness, resistance to abrasion and yellowing caused by light, and to stains caused by liquids. BCA also offers very fast drying times and long pot life.

Woodworkers looking for these and other solutions can visit Woodshop News and click on the Resource Guide near the top of the homepage to search for suppliers.


www.chemcraft.com36-37

cncfactory.com39

milesi.us38

Varicure® Select and Variset® Select

Chemical and Moisture Resistant Coatings

Two new product families from Chemcraft®, an AkzoNobel wood coatings brand, offer special advantages to woodshops that are coating various wood substrates and MDF. Varicure® Select and Variset® Select Pre-catalyzed systems take chemical and moisture resistance to a whole new level.

Varicure Select Clear Topcoat is the newest addition to the company's highly regarded Varicure line. It exceeds the current pre-catalyzed industry standards for chemical and moisture resistance, delivering the type of performance that woodworkers usually find only in higher performance technologies. It's fast building due to its high solids, and it demonstrates excellent moisture, household wear, household chemical, solvent and mar resistance. This is a one-component, high solids, pre-catalyzed coating. Its high solids formulation is easy-to-use, and it delivers excellent feel and appearance. The topcoat comes in flat, matte, low gloss, satin, semi-gloss and high gloss versions. It meets the Kitchen Cabinet Manufacturer Association (KCMA) and Architectural Woodwork Association (AWI) standards.

Varicure Select Vinyl Sealer is also a one-component, pre-catalyzed coating that's designed to be used with the Varicure Select system. It dries fast and sands easily to provide a smooth finish, and it's provided at a ready-to-use viscosity for ease of application. The bases are in MaestroHue, an automated digital color-matching tint system developed by Chemcraft.

The other innovation from Chemcraft is Variset Select HH White Topcoat, which is a white pre-catalyzed pigmented topcoat. It, too, exceeds the current pre-cat industry standards for chemical and moisture resistance, which is an impressive feat for a pigmented product. This system has high hide and excellent coverage, even on MDF. Variset Select's high solids formulation is user friendly with excellent feel and appearance, and it's formulated to provide maximum color stability.

It is recommended for kitchen cabinets, office and household furniture, as well as other interior wood applications.

Variset Select Clear Tint Base Topcoat is for use when deep, dark colors are desired, as it has excellent color stability. This tinting base is specially formulated to minimize color flooding and floating, and it's compatible with the other primers and topcoats available in the Variset Select line. Those include Variset Select White and Neutral Vinyl Primers, which are one-



component, high solids, pre-catalyzed coatings that have excellent hiding and filling properties. They are easy to use, sand quickly and easily, and have superior moisture resistance. They have excellent adhesion and outstanding vertical hang/sag resistance. All Varicure and Variset Select tint bases are in Chemcraft's automated tint system, MaestroHue.

A pre-catalyzed coating has a catalyst added to it at the factory, so the woodworker doesn't need to include this step in the finishing process. The catalyst initiates a reaction that begins the curing process on applied coatings as it creates a bond between polymer chains.

The Chemcraft team understands the challenges being faced by woodshops in a changing world. The company's distributors have deep industry experience, and many of them worked in wood finishing shops before moving to distribution. Chemcraft builds on that experience by offering its distributors in-depth product and application technique training at the company's training facility. And through them, woodworkers have access to product information, material safety information, color and finishing trends, and all the latest innovations such as Varicure Select and Variset Select.

AkzoNobel Chemcraft has offices in High Point, N.C., Salem, Ore., Port Hope, Ontario and Warwick, Quebec. The company offers a

complete range of coatings, stains and color systems for professional wood finishes including pre-catalyzed and post-catalyzed products, plus polyurethane and waterborne finishes. Woodshops can visit chemcraft.com for more information and to locate their nearest distributor.



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BCA Will Change the Way You Finish



Milesi Wood Coatings is a brand of IVM Chemicals SRL, which is one of the largest and most influential wood coatings manufacturers in the world. Based in Milan, Italy, IVM has its North American headquarters and training facility in Glendale Heights, IL.

Milesi is the first manufacturer in the world to launch Block Chain Addition (BCA), a revolutionary technology that marks the beginning of a new chapter in the history of wood coatings.

Generating unprecedented competitive advantages, BCA is a cutting edge, unique, patent-pending cure chemistry that could only be achieved by Milesi and IVM. For the first time ever, it concentrates the finest characteristics of pre-catalyzed and post-catalyzed polyurethane, acrylic and ureic finishes in a single technology. The result boosts their performance, and offers the market some previously unthinkable functional properties. Surpassing today's maximum performance standards, BCA has characteristics that exceed all expectations in terms of surface

hardness, resistance to abrasion, yellowing caused by light, and stains caused by liquids. Additionally, the product offers very fast drying times and long pot life, to ensure extremely easy use without sacrificing great aesthetic results.

This superior performance comes with a rigorously green approach, which is one of the main characteristics of the Milesi brand. BCA products contain no aromatic compounds, isocyanates or formaldehyde, and these don't develop during use of the coatings. The groundwork for BCA, whose name comes from the process that allows film curing, is the result of a resin never previously deployed in the wood coatings market. It is also a reflection of the constant research of new raw materials that is conducted by IVM Chemicals as part of its commitment to ongoing innovations.

The key features of BCA are no off-gassing, aromatics, formaldehyde or isocyanate. It is HAPS-free, and offers both open grain and high build systems. It is water-white (non-yellowing), extremely flexible and hard, chemically resistant and has a long pot life (72 hours). It also has quick drying and stacking times.



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Thermofoil and the Cyclone 4896 Deliver the Ultimate Finishing Touch



"The Cyclone has full process area access, so nothing gets in the way of pressing."

Finish may be the last attribute applied to a cabinet, but it's the first that a customer sees and touches. Thermofoil elevates the quality of a finish by offering more durability, lower maintenance, and a range of aesthetic choices that goes far beyond clear coats or paint. Thermofoil stands up better to high

use in bathrooms and kitchens, eliminates wear issues such as dents and scratches, and doesn't need to be periodically renewed or refinished. Unlike solid wood, the MDF substrate in thermofoil doors and panels is very stable. And in this new world of ours, thermofoil is easy to clean, sanitize and keep safe.

Applying thermofoil requires an easy-to-use but powerful press. The Cyclone 4896 from CNC Factory is a mobile vacuum membrane press that delivers exactly that. It has an automated heating, vacuum forming, and cooling process, plus a small footprint so it doesn't impede the shop's workflow. Integrated heat sensors deliver accurate and even heating, and the press has automated shell opening and closing. Plus, there's a full, unobstructed 48" x 96" working table and an easy-to-operate, one-button digital PLC monitor.

The Cyclone 4896 only requires a single operator who can produce over 300 pieces in an 8-hour shift. It can press virtually any 3D shape using PVC sheets, rigid sheets, PS sheets, acrylic, ABS and wood veneers. And its independent, interchangeable heating lamps last about 3,000 hours each and are easy to replace. Caster wheels are available as an optional upgrade, to make the press mobile.

Located in Southern California, CNC Factory designs and manufactures high-quality, precision 5th generation CNC routers and machining cen-

ters. The Cyclone 4896 comes with an 18-month parts and components warranty, 2 years machine support, and a 5-year Advanced Exchange Program. Direct factory pricing for the Cyclone 4896 starts at \$26,900.



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SHOPPING FOR SANDERS

With so many options, the trick is matching the machine to the task

By John English



It's just about unanimous – woodworkers would prefer not to sand. That's because it's a dirty, temperamental task that can ruin parts and entire projects in a heartbeat. It creates more waste than any other aspect of working wood and keeping ahead of the dust is both expensive and noisy. The airborne fines are toxic because of their microscopic size, and they're often contaminated with man-made additives such as adhesives, resins, plastic and fillers.

But the trade-off is dramatic. There are few things as satisfying as applying a stain or clearcoat to a well-sanded project, and then watching the grain and color jump off the surface.

Woodworkers don't just sand flat boards, so a variety of machines reflects the diversity of needs. There are wide belt sanders for panels, brush sanders for textures and moldings, profile sanders, edge sanders and buffers. Then there's equipment for CNCs, aggregates and robots. If the surface isn't right, the whole project looks wrong. So, it's important to match the machine to the task.

Wide belt models

Biesse (biesse.com) offers eight wide belt sanders plus brush sanders and calibrating machines for wood. There are three models in the entry-level Viet S line. These are compact, high performance machines that can handle the workload in smaller shops. The S211 is the smallest, and it has disc brakes with floating calipers, just like a motorcycle. It can be set up with pads or rollers and, depending on the hardness of the rubber used and the roller's cross-section, it can be used to calibrate, sand or finish. The middle range machines are the Opera 5, Opera 7 and Opera R, while the Valeria is a calibration-sanding center designed for large-scale industry applications.

The range of wide belt sanders from **SCM Group** (scmgroupp.com) starts out with the small shop DMC SD 10, which has a 37.4" working width, automatic table positioning, and a diamond-shaped belt pattern to prevent slipping. At the top of the range is the DMC System BT line that offers top and bottom calibrating, a vacuum hold-down and an air

blade for panel cleaning. Eight other models fill out the catalog to meet the needs of any sized woodshop, and the company also offers the Minimax LS stroke sander with more than 8' of worktable length.

Felder USA (felder-group.com) has three edge sanders, the FS 900 KF with a veneering device the FS 900 K (both with 5-7/8" capacity) and the Hammer HS 950 that has a belt oscillation feature than can be turned on or off. The company also offers three wide belt sander series. Its FW machines come in 37" and 43" wide models with continually adjustable speed and a selection of sanding modules. And Felder's Structura 60.02 brushing machine handles stock up to 25-5/8" wide and 7-7/8" tall, with either a steel or Tynex brush aggregate.

Stiles Machinery (stilesmachinery.com) in Grand Rapids, Mich. carries a massive range of sanding machines including wide belt, brush and profile models, plus edge sanders and buffers. The catalog includes **Heeseman**, **Ironwood**, **Homag** and **Steinemann** wide belt units in every size and configuration. There are **Makor** profilers and edge sanders, **Gottschild** sanding, polishing and buffing machines, and Unique shape and sand units. Stiles also carries planer sanders from Ironwood.

Timesavers (timesaversinc.com), is based in a suburb of Minneapolis and offers orbital sanders, segmented polishers, planer sanders and self-centering planers in addition to wide belt models. Among the latter are the entry-level Speedsander that uses a combination of drum and platen head action, and the 53 Series that is made for large-scale sanding and calibrating plus heavy stock removal, panel sanding, and veneer and lacquer sanding during 24/7 operations. Then there's the highly customizable 33 Series that's built like a tank and is packed with features, and the 23 Series that includes wide belt, planer, orbital and veneer capabilities, and the 13 Series that can be set up with up to three heads.

The catalog at **Global Sales Group** in Chico, Calif. (globalsales-groupllc.com/machinery) includes both new and used belt, disc, curve, double drum, edge, finish, orbital and wide belt sanding machines



(Clockwise, from top left) DMC SD 10 and System BT available from SCM; Timesavers 23 Series, and Castaly 52" wide belt.

from manufacturers such as **Dotul** and **Castaly**. The latter (online at lobomachine.com) supplies many models including some planer/sanders where the machine has a planer head with carbide inserts that work in combination with either one or two sanding belts. Castaly/Lobo offers a full catalog of innovative, and sometimes very specific machines that shape, sand, profile, texture and follow curves and other shapes.

Martin Woodworking Machines (martin-usa.com) carries five **Weber** models. The LCS has a segmented platen, single or double belts, and does calibrating or finish sanding, or both in combination. The KSN models are either compact or wide, and they include a cross-sanding option. And the large KSL industrial model has reinforced construction, contactless work-piece detection and high-speed electronics.

Northtech Machine (northtechmachine.com) offers edge, planer, profile and wide belt sanders, including the NT 10-1100PRP that has a working width of 43". It has an insert planer head and two sanding heads including a spiral fluted contact drum and a 3-1/4" pad. Feed speed is from 15 to 60 feet per minute and the table lift is 4-3/4", by PLC touchscreen. It draws up to 136 Amps of 3-phase, 460-volt power.

JLK Machinery in Brighton, Mich. (jklmachinery.com) carries wide belt sanders from **Casadei-Busellato** and SCM Group. The lines include single-head sanders that are ideal for custom and small shop work to three-head sander/planers that are designed for heavy-duty workloads. The Casadei machines include the Libra 30, 40, 50 and 60 wide belt machines. The Libra 30, with a roller and roller/pad combination, is primarily used for calibrating and sanding solid wood and pre-sanding and sanding veneered panels while the 60 is designed for medium to high volume production. Its long belt length allows efficient cooling that extends the life of the abrasive and increases the quality of the finish.

Laguna Tools (lagunatools.com) also makes five different wide



(Clockwise, from top left) Maksiwa LD 300 disc sander and LDF 6" x 9" belt and disc sander; Ritter Machinery CR25814 ; GPD GUHDO Sanding Head CNC; OnRobot Sander, and Mirka Airos robot heads.

belt machines and they range from the very affordable Wood Compact 25" single drum 7-1/2-hp model through 37" and 43" units to the Wood Pro 51". That machine has a double drum setup (as does the 43") and a beefy 30-hp main motor.

Specialty sanders

Laguna also offers a full range of smaller sanders through its **Super-Max** and Laguna lines. Those range from 16/32" open-ended drum models to a 19/38" brush/drum sander that's equipped with a 180-grit flap sanding head and variable speed. Other sanding machines from Laguna include three profile units and two brush sanders (single and double brushes).

Maksiwa (maksiwa.com) in Pompano Beach, Fla. makes two small sanding machines, a combination 9" disc and 6" x 48" belt sander floor model, and a benchtop disc sander with a 12" disc, tilting table and electronic brake.

Mirka (mirka.com) offers a number of robotic sanders including the Airos, which works with both collaborative and industrial robots. The company's solutions include sanding heads, controller unit and abrasives.

Opti-Sand (opti-sand.com) in Geneva, Ill., has machines designed to sand molding, trim, flooring, paneling, siding and other linear parts. They are modular so a shop can start with one configuration and add

top, bottom or side spindle modules in the future as needs change. Opti-Sand's rotary machines can be used to sand cabinet doors, drawer fronts, face frames, entry doors, shutters and other three-dimensional parts. They come standard with a vacuum conveyor belt and are also available with edge sanders.

For small shops, there are a family of nine disc, belt or combination sanders and an oscillating spindle sander in the **Rikon Power Tools** (rikontools.com) catalog. The discs run the gamut from 5" to 12", and the belts are 1", 4" or 6" wide. The abrasive sleeves on the spindle sander are 1/2", 3/4", 1", 1-1/2" and 2" in diameter.

SandMan Products (sandmanproducts.com) sanding machines aren't abrasive. Rather, they provide a safer, more controlled method of sanding. Eight models range from a 48" x 26" work area to a full 96" x 48". This largest model, the Sand Pro DL9648, doubles as a workbench and includes electric receptacles, shelves, drawers and even a magnetic tool holder. It's available in single or three phase versions.

Voorwood (voorwood.com) is known for innovative solutions that include shape sanding machines that can be configured to accommodate multiple stations. For example, the A11 Table Shaper Sander shapes all components of cabinet doors, parts of drawers, and other wooden components and simultaneously sands the desired profiles, sizes the substrate to the desired finished dimensions, squares the substrate as all four sides are being processed, and processes straight edges as well



as contoured shapes using a template system.

Hardwood floor installers face a whole slew of challenges not addressed by stationary machines. To bring the machine to the wood, companies such as **American Sanders** (americansanders.com) in Sparta, N.C. offer belt, drum, rotary and orbital portable sanding machines and edgers.

The **ShopFox** (woodstockint.com) catalog includes a wide range of smaller machines from benchtop disc/belt combinations to oscillating spindles, open and closed end drum sanders, oscillating edge sanders and half a dozen wide belt sanders designed specifically for small professional shops. They run from a 20"-wide single belt unit to a 43"-wide double head that calibrates and finishes simultaneously.

Cantek America (cantekamerica.com) in Blaine, Wash. carries four edge sander models, ten wide belt machines and a molding sander, the LBS300-5S, that is a three-sided lineal brush sander that was designed for everyday linear profile needs. It can be used for white wood sanding and sealer sanding of linear parts such as moldings, flooring, furniture components, window parts and the like. The machine works well as a standalone unit, or as part of the finishing line.

The **Chatternator** (profilesander.com) is a patented machine that allows woodshops to mold and sand in one operation. Designed by woodworker Bill Grom, it removes the chatter marks left behind by cutting knives. It's a small volume, 110-volt, variable speed brush sander that runs trim at about nine feet per minute.

The Danish company **Alpha Brush** (alpha-brush.com) has created a line of innovative and very flexible machines for brush sanding wood profiles. There are models that accommodate most production line volumes, including large heavy-duty machines and short-run, one-man models for hands-on work.

Ritter Machinery (rittermachinery.com) in Holland, Mich. has developed five edge sanders including the very tall CR25814 with a 14" wide oscillating belt.

Sand-Rite (sand-rite.com) in Bangor, Mich. offers the Duo-DLX all-purpose finishing sander that is set up with a pneumatic drum and a brush head. The company also supplies abrasives and can make any size belt, sleeve or roll in aluminum oxide, cloth back in both X and J weights and P-Grade.

Finishing up

South Bend Tools (southbendtools.com) recently introduced a 9" oscillating edge sander, model SB1117, with a 3-hp motor. The machine has 1/4" oscillation action and an auxiliary contour sanding table that

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Sand Pro DL9648 downdraft table and South Bend Tools SB1117.

acts like a drum sander. The platen size is 9-1/2" x 47-1/2", and the surface is graphite coated. The main table is 11-3/4" wide and 47-3/4" long, which is ideal for working on the edges of cabinet doors. It tilts from zero to forty-five degrees and can be raised or lowered up to 8" to take advantage of lesser used portions of the belt.

South Bend also presents a 37" wide belt sander, model SB1096, with a 15-hp, 3-phase main motor and digital controls for the table elevation and conveyor speed. The operator can dial in exact settings from a minimum of 1/8" thick work to large tables and slabs. The belt moves side to side automatically (it's variable from 5/16" to 5/8") to get the best sanding results, and also to prolong the belt life. There's an Amp/load meter to monitor the machine's performance, a built-in regulator/water separator, and an emergency stop panel and disc brake for safety. There are keypad controls for the table elevation, with a digital readout.

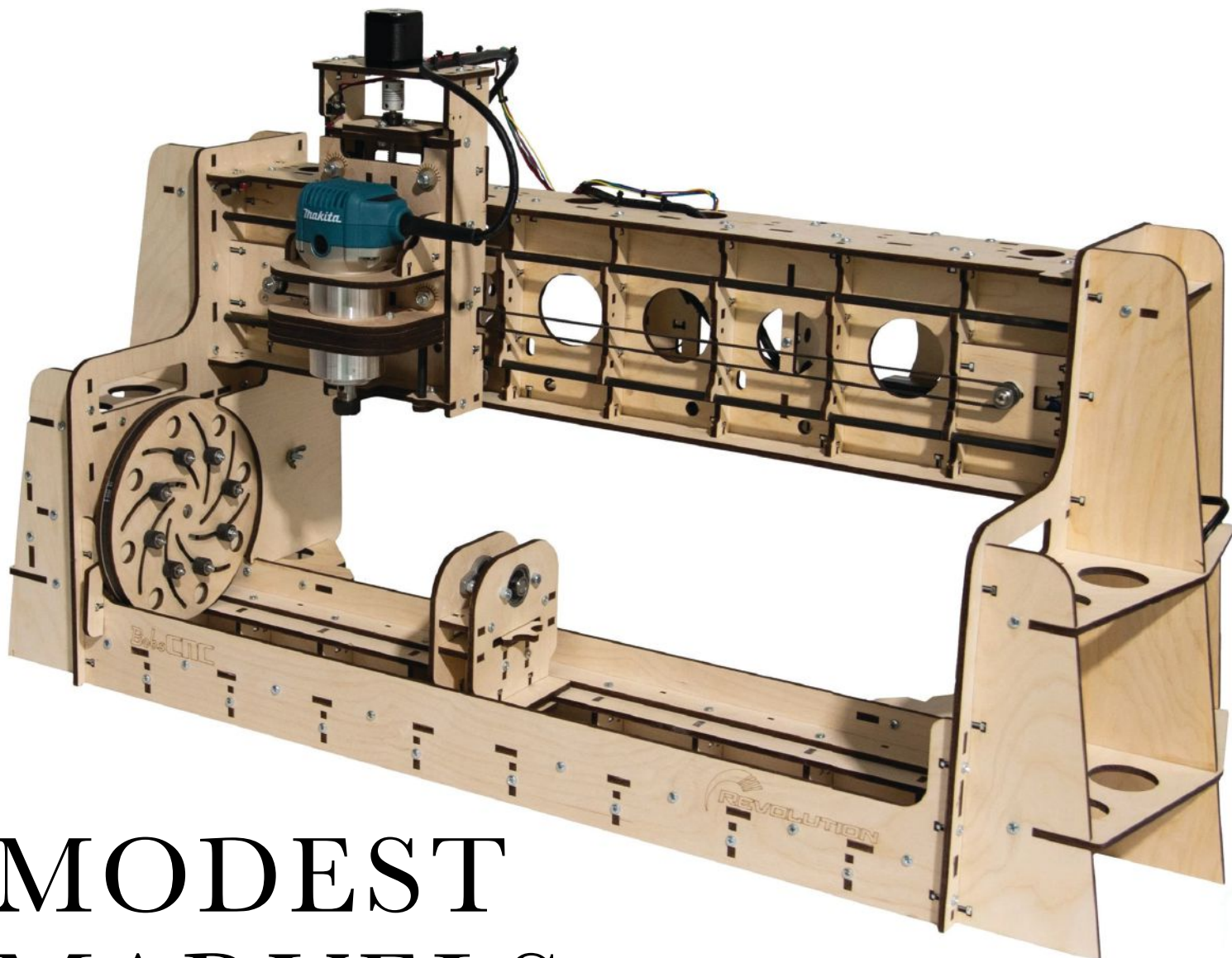
GDP GUHDO (guhdo.com) has developed a new CNC Sanding Unit named the CNC-Ag, which is designed for use on CNC routers and machining centers such as Weeke, Homag, SCM, Biesse, HolzHer and

others. Made in Germany, this unit is ideal for sanding flat panels such as cabinet doors and furniture tops. It simply mounts to a standard tool holder (16mm shank), or, if the machine has an HSK interface then the shop can order it on a 16mm HSK heat shrink holder, which is the preferred clamping system for optimum performance. GDP will mount the sanding unit to the tool holder at no charge. The unit has a floating distance of 3.2 mm and a Velcro backed 150 mm (5.9") diameter sanding plate. It's equipped with three different springs for presetting pressure (resistance). GDP says that until now, the only viable option for sanding parts on a CNC machine was an investment in a floating head aggregate. With the new CNC Sanding Unit, it is within reach of many smaller shops. The company is based in Mariette, Ga.

Smaller professional woodshops have an opportunity to enter the world of robotics with a new sander from **OnRobot** (onrobot.com). The all-electric random orbital sander is an out-of-the-box tool that's easy to use with all major collaborative and lightweight industrial robots. Included is a plug-and-play sanding tool, a variety of standard sanding and polishing pads, easy-to-use programming software, an optional force/torque sensor and a Grit Changer that changes grits without any operator intervention. The sander supports flat, curved and uneven part geometries, and adding a force/torque sensor lets it adapt to surface variations or part misalignment.

Triton's new oscillating spindle/belt sander, the Tspst450, was introduced a few months ago and has just been added to the *Woodworker.com* catalog (Woodworker's Supply). The benchtop machine has dual action rotating and oscillating movement, and the tabletop tilts as far as 45 degrees for chamfering and edge work. It takes sanding sleeves from 1/2" to 2" diameter that are 4-1/2" tall and the belt is 4" x 24".

Stanza Machinery in Charlotte, N.C has added the Galaxy Double Rotation sander to its catalog. Each of the sanding heads rotates on the Z axis as it spins on the X axis, so all of the parts are sanded equally from all angles and directions. Each of four sanding units rotates around its own axis while the main carousel is also turning. The Galaxy comes standard with a 7.5 kw vacuum table motor, which holds parts securely while they go through the machine. The rotation, carousel and conveyor speeds are all variable, and the machine is equipped with an easy-to-use PLC and vacuum suction belt. **W**



Rotary Axis Desktop Kit from Bob's CNBC.

MODEST MARVELS

Desktop CNCs can be a gateway to automation

By John English

It's getting a little more difficult to define a desktop CNC. The description used to be limited to small, tabletop routers, but now it refers to a whole category of machines that can rout, carve, cut, engrave, burn or 3D print in at least three planes. Woodshops invest in a desktop machine because it can be used to create and decorate small components, or because it's a learning platform for larger machines. Often, both goals are served simultaneously. And deciding which desktop CNC to buy is all about capabilities.

Engravers and lasers

Mechanical engravers use a small diameter tool to physically cut the surface of the wood. These are sometimes used to mark parts to iden-

tify them during the manufacturing or assembly processes, but more often they incise artistic designs such as graphics, lettering or photographic images. The depth of cut is very shallow, and operators of these machines tend to value speed and accuracy over torque.

Some of the models in this category are surprisingly inexpensive, but small. They can provide a startling level of detail in two- and three-dimensional wood carving. Some are controlled using a laptop or tablet, while others use a separate controller with a button array or touchscreen. The least expensive models don't have a probe for establishing the Z axis, so setting the height to zero before you start milling can mean some trial and error.

The desktop CNC format is also ideal for hosting small lasers and these are becoming more popular because of their versatility and low operating cost. For example, two of the three new models recently introduced by **AP Lazer** (aplazer.com) qualify as desktop – the SN2616 and SN4836LR. Adding a laser to the shop can free up time on a CNC and provide customers with more intricate custom designs. The SN2616 has a 26" x 16" engraving area and plugs into a standard 110-volt outlet. The larger SN4836LR has a 28" adjustable Z-axis and a 48" x



(Clockwise, from bottom) ShopBot Desktop Max; SainSmart Genmitsu ProverXL 4030; Inventables X-Carve Pro, and Axiom Pro Series.



36" engraving area. These are easy to operate, C02 laser machines with patented open architecture design.

i2R CNC (i2rcnc.com) offers a 6-watt laser engraving package that works with several models of the company's desktop CNCs. It's a plug and play set-up. The company also offers a rotary for CNCs that turns a router into a lathe. The kits (laser and rotary) are currently priced at \$999 each.

And **LightObject** (lightobject.com) has introduced a new 24" x 16" desktop laser, the Ranger II, that has a built-in air pump. An optional honeycomb bed allows better heat dissipation and reduced flash-backs during operations. The controller has a color display and the Ranger II works with CorelDraw, AutoCAD, Illustrator, Inkscape and other software packages. It also supports LightBurn, which allows users to complete work with little to no training. And by allowing file transfer directly over flash drives and other USB media devices, the controller eliminates the need for an external PC.

SainSmart (sainsmart.com) offers laser engravers, small CNCs and 3D printers. The company's Genmitsu ProverXL 4030 is a benchtop CNC machine that is a new class of easy to assemble, ready-to-go kits for cutting, drilling, and carving operations on a variety of materials including wood, MDF, plastics, foams, vinyl, and aluminum.

er" when they hear someone mention a "desktop CNC". Some entry-level models use portable routers as the motor, while others have dedicated spindles. There are woodshops that use desktop routers to make multiple parts, and others that are best suited to creating prototypes or unique joinery.

Desktop/benchtop routers are small, so they don't eat up floor-space; inexpensive, so they don't swallow the budget; and relatively easy to learn and use, as they don't often have a lot of automation or accessories such as tool changers or vacuum clamping. Many of them are well designed and built, have long histories that have taken advantage of user input and feedback, and are backed by impressive customer service.

ShopBot (shopbottools.com) offers a desktop model with a 24" x 18" work area that has two bed options including a removable tool bed, and it runs on household power. The company also offers the Desktop Max, which has a 36" x 24" work area, and the Desktop Max ATC that adds a six-position automatic tool changer. This machine is at the border between desktop prototyping and full production machines. It can be ordered with an aluminum deck or a vacuum hold-down deck kit that includes a plywood plenum, MDF spoil board, and the company's Vacuube that's designed to hold down sheet goods without screws.

Desktop CNCs from **Axiom Precision** (axiomprecision.com) can be

Routers

Most woodworkers think "rout-



LightObject Ranger II and closeup of controller.

set up with optional stands and toolboxes so they essentially become mobile floor models. The entry-level Iconic models include three size options (24" x 24", 24" x 36" and 24" x 48"), each with prismatic guides, ball screws, and the same powerful yet easy to use DSP pendant controller that the company includes with its larger machines. Targeted specifically at first-time CNC users, they're supported by a comprehensive manual and video library to shorten the learning curve.

NextWave CNC (nextwavecnc.com) offers half a dozen models of U.S. built desktop CNCs in its Shark product line. They range from the Shark SD100 with a 12" x 18" table and 3" of Z travel (up and down) to the HD520 that has a range of 25" x 50" x 7". NextWave's HD series all come with a color touchscreen pendant,

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Digital DWC1824 Mini CNC Carver.



One way to get around the small workspace is to look at portable routers. The concept here is that you bring the machine to the work, rather than the other way around.

the latest VCarve software, a one-year warranty and lifetime tech support. They also include the company's patented Virtual Zero technology that maps the surface of the table or workpiece by averaging five specific points of reference and then automatically adjusts the G-code to smooth out any imperfections. This drastically reduces problems caused by warped boards or inconsistencies in the table.

Bob's CNC (bobsnc.com) offers various kits that are already machined so a woodworker

can assemble a wooden desktop CNC. It takes a lot of time and patience and it's a bit challenging, so one should do a little research before jumping in. But the machines look quite impressive and get some great reviews. There's even one with a rotary axis.

Carbide 3D (carbide3d.com) has three models to choose from including the Nomad (8" x 8" x 3"), the Shapeoko 4 (three sizes: 17-1/2" x 17-1/2", 17-1/2" x 33" and 33" x 33"), and two versions of the Shapeoko Pro (17-1/2" x 33" and 33" x 33"). The Pro uses linear rails for added rigidity and better cutting performance. The company also offers free design software called Carbide Create that is easy to learn and quite powerful. Shapeoko models have a Hybrid Table option that includes a grid with custom extrusions that make it very easy to fixture work.

The DWC1824 Mini Carver from **Digital Woodcarver** (digitalwoodcarver.com) is primarily designed for carving and it has a work area of 18" x 24" and 4" tall. The company also offers the DWC2440, which can handle projects as large as 24" x 40" x 5" and comes standard with Vectric's VCarve design software. An upgrade of this model is a self-standing floor model that includes a fourth axis attachment for creating 3D carvings.

Inventables (inventables.com) says its X-Carve Pro is "the easiest and most affordable CNC machine on the planet", and that a woodworker can "go from concept to design

to product in minutes". It's very affordable, and there's no CNC knowledge required to use the company's Easel design software. The Pro comes in either a 2' x 4' or 4' x 4' configuration, with a 5-1/2' rigid aluminum gantry.

Worried about size?

One way to get around the small workspace is to look at portable routers. The concept here is that you bring the machine to the work, rather than the other way around. Good examples are the Shaper Origin and the Yeti. Unfortunately, ShopBot has discontinued its groundbreaking HandiBot.

Shaper (shapertools.com) has added the Workstation to its Origin hand-held precision router, essentially creating a hybrid desktop system that excels at solid wood joinery such as dovetails, mortises and the like. The Workstation keeps everything perfectly aligned and secure while the machine moves across the part.

Yeti (yetismartbench.com) is a full-size portable CNC router that comes in three models. This is a large format, easy to use, space friendly, affordable option that sets up and packs down in a few minutes.

Another small router/large part work-around is the **Maslow CNC** (maslowcnc.com). This is a largely shop-built CNC that comes in a small box for under \$500 and assembles into a 4' x 8' machine that is arranged vertically, so it takes up less floorspace. **W**

NHFMA presents springtime work

By Jennifer Hicks

The New Hampshire Furniture Masters Association, a group of professional makers, recently presented some of their members' latest work in the "Spring is in the Air" exhibition, which ran from March 19 to June 18 at the Smile Building in Concord, N.H., located within the Concord Chamber of Commerce's Welcome Center.

Organized to show fresh work with the timing of a new season, featured pieces included wooden heirloom art and furniture made by the Masters in 2020. Participating Masters include Owain Harris, Roger Myers, Tim Coleman, Garrett Hack, Richard Oedel, Liz Grace, Jeffrey Cooper, Jon Brooks, Leah Woods and John Geraghty.

The exhibition is featured online at the NHFM website, www.furnituremasters.org, and includes a "Look Book" digital catalog that includes materials/dimensions for each piece and information about the maker.

Wood in contemporary art

Sperone Westwater, a New York gallery, is currently hosting "Wood Works: Raw, Cut, Carved, Covered", a diverse exhibition showcasing innovative uses of wood in contemporary art. The show opened June 4 and will run through Aug. 27.

Featured work includes pieces by artists Carla Accardi, Carl Andre, Richard Artschwager, Abraham Cruzvillegas, Kim Dingle, Michele



Chest by Garrett Hack and Tim Coleman's "Ruby Bench" in the NHFMA exhibit.

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Oka Doner, Rico Gatson, Helmut Lang, Richard Long, Emil Lukas, David Lynch, Katy Moran, Paulo Nazareth, Noah Purifoy, Brent Owens, Tom Sachs, Andrew Sendor, Jean Tinguely, Richard Tuttle and William Wegman.

"Among the classic artists in the show, Richard Long utilizes 285 irregular pieces of wood, gathered from the Quantock Hills in Somerset, England, near his hometown in Bristol, to create Quantock Wood Circle (1981). Carl Andre, by contrast, uses identical ele-

ments which stand and hold together by their own mass. In Nixes Mate (1992), Andre utilizes eight Western red cedar timbers, measuring 12" x 12" x 36", the standard size for his sculptures of uncarved blocks. Carla Accardi's Verde (1974) utilizes wooden stretcher bars which remain visible under sicofoil, a pliable and transparent industrial plastic, rather than canvas," according to a gallery statement.

For more, visit www.speronewestwater.com. [W](http://www.speronewestwater.com)



(Clockwise, from top left) Wall cabinets by NHFMA member Leah Woods, Richard Long's "Quantock Wood Circle" from the Sperone Westwater exhibit, and bench by NHFMA member Jeffrey Cooper.

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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.

— Compiled by Jennifer Hicks

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, in Encino. www.sfvw.org

Monthly — Society of Wood Manufacturing, a chapter of AWFS consisting of educators, manufacturers, hardware and industrial suppliers, and machinery dealers, meets dur-

ing the second week of each month. For location and dates, visit www.awfs.org

COLORADO

Sept. 23-25 — Stairbuilders and Manufacturers Association annual conference featuring industry-related presentations, seminars, shop tours networking events and more. Location: Embassy Suites Denver Downtown in Denver. For more, visit www.stairways.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.

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

Sept. 22-23 — National Hardwood Lumber Association annual convention & exhibit showcase. The event, themed "Turn the Tide with Innovation", is open for hardwood industry professionals to trade, learn, network and more. Location: Palm County Convention Center in West Palm Beach. www.nhla.com

MAINE

Oct. 6-7 — Wood Product Manufacturers Association annual meeting for networking, educational seminars and more. Location: Portland Regency Hotel in Portland. www.wpma.org

MARYLAND

Monthly — The Howard County Woodworkers Guild meets the first Saturdays of the month at the Bain Senior Center at 5470 Ruth Keeton Way in Columbia from 9 a.m. to 12 p.m. Open to all those working in wood. For information, email Manny Flecker at aaron0641@hotmail.com.

MASSACHUSETTS

Oct. 9-11 — Paradise City Northampton. Featuring handmade, contemporary crafts including furniture, sculptures and more by juried artists and makers. Location: Three County Fairgrounds in Northampton. www.paradisecityarts.com

NEW YORK

Monthly — The Woodworkers of Central New York hold meetings on the first Thursday of each month at 6:30 p.m. at the Belgium Cold Springs Fire Department in Baldwinsville. www.woodcny.org

Monthly — Northeast Woodworkers Asso-

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ciation meetings held on the second Thursday of the month at various locations in the Albany area. www.woodworker.org

Monthly — The Long Island Woodworkers meet on the first Wednesday of each month at 7 p.m. at the Frank Brush Barn of the Smithtown Historical Society in Smithtown. www.liwoodworkers.org

NORTH CAROLINA

Monthly — Triangle Woodworkers Association meetings held on the third Tuesday of each month at 7 p.m. at Klingspor's Woodworking Shop in MacGregor Village in Cary. www.trianglewoodworkers.com

Oct. 22-26 — High Point Market. Largest furnishings industry trade show in the world with over 12 million sq. ft. of show space, bringing more than 75,000 retail home furnishings buyers, interior designers, architects and others in the industry every six months. www.highpointmarket.org

OHIO

Ongoing — Cincinnati Woodworking Club meets the second Saturday in the months of Jan., March, May, Sept. and Nov. from 8:30 a.m. to 12:30 p.m. at the Northminster Presbyterian Church, 703 Compton Road, Cincinnati. www.cincinnatiwoodworkingclub.org

RHODE ISLAND

Nov. 5-7 — 26th annual Fine Furnishings Show offering handcrafted furniture, accessories and art for the home, office and garden. Featuring 100 local and regional artists and craftsmen and students with prizes, concessions and more. Location: Waterfire Arts Center in Providence. 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

TEXAS

Oct. 6-8 — Architectural Woodworkers Institute annual convention, AWI Strong, featuring educational seminars, networking opportunities and more. Location: Margaritaville Lake Resort at Lake Conroe in Montgomery. www.awinet.org

WYOMING

Sept. 9-12 — The 29th annual Western Design Exhibit + Sale. A juried event featuring handcrafted works from over 100 exhibitors in the areas of furniture, fashion, jewelry and

accessories for the home that embracing traditional and contemporary Western styles. Location: Snow King Sports and Events Center in Jackson. www.westerndesignconference.com **W**

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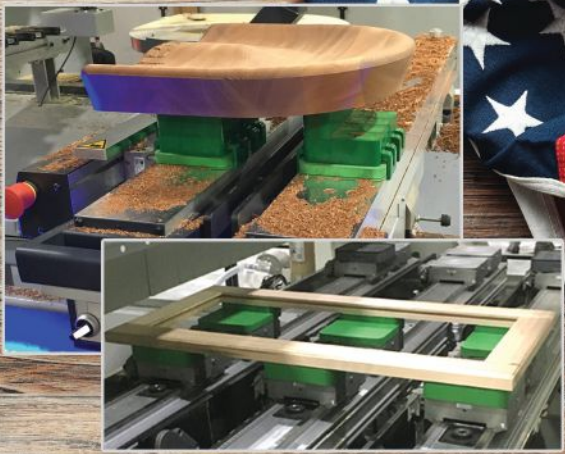
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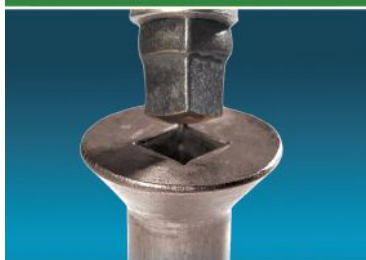
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The Maine school filmed 50 instructional videos, presented by Tim Rousseau, while its classes were suspended due to the pandemic.

Free woodworking tutorials

The non-profit Center for Furniture Craftsmanship in Rockport, Maine has launched a free online library of best practices in woodworking at www.woodscool.org/video library.

"Welcome to Woodschool" is a series of 50 professionally filmed, instructional videos that feature best-practice techniques from the center's professional-track curricula, presented by lead instructor Tim Rousseau. Topics range from tool sharpening and hand-cut dovetails to five different ways of machine-cutting tenons, to building forms and laminating curves.

"Filming these videos gave us a way to share the incredible depth of knowledge that hundreds of outstanding woodworkers from around the globe have contributed to our curricula through teaching," Peter Korn, the center's founder and executive director, said in a statement. "Making this knowledge accessible to the world at large, regardless of financial, geographic, or cultural barriers, goes right to the heart of our mission as a nonprofit school."

The videos were filmed in the spring and summer of 2020, while classes were suspended due to the pandemic. They were instrumental to the safe reopening of the center in September 2020, as they allowed students to maintain social distancing while watching demonstrations that require close-up viewing.

The center hopes to expand the free library in future years with additional instructors and topics. www.woodscool.org

60 Grit

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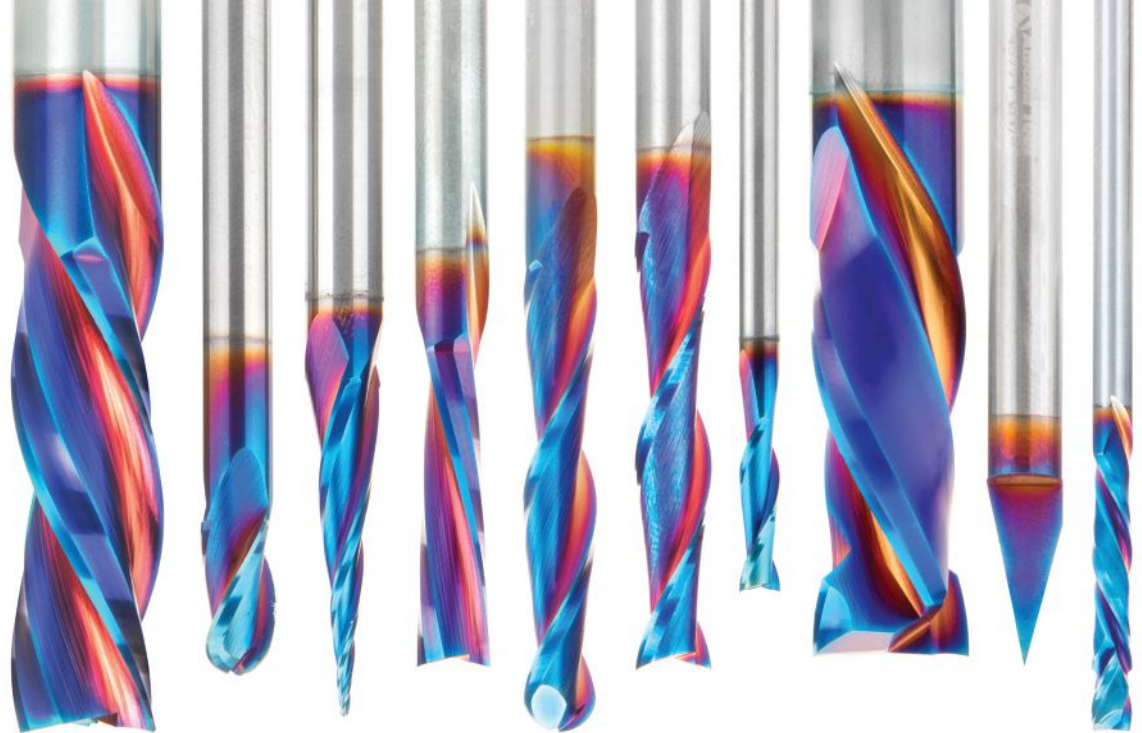
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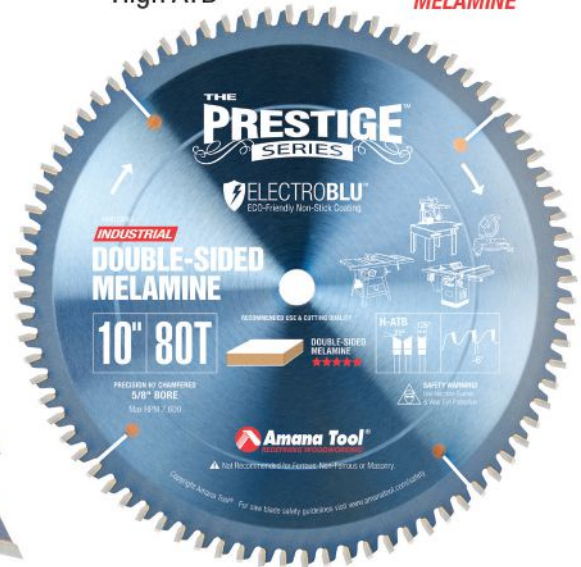


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